

Project code: FRCE10
Client: Transport Scotland
Date: January 2012

Forth Replacement Crossing: Compiled results of Land Based Invasive Archaeological Survey and Evaluation

Archaeological Consultant: Jacobs Arup
Archaeological Contractor: Headland Archaeology



CONTENTS

VOLUME 1: Land Parcels 1-3

Contents	2
Land Parcel 1 Trial Trenching Report	3
Land Parcel 2 Trial Trenching Report	26
Land Parcel 3 Trial Trenching Report and Desk Based Assessment	44

VOLUME 2: Land Parcels 4-7

Land Parcel 4 Trial Trenching Report	70
Land Parcel 5 Trial Trenching Report	131
Land Parcel 6 Trial Trenching and Excavation Report	154
Land Parcel 7 Trial Trenching Report	180

VOLUME 3: Land Parcels 8-13

Land Parcel 8 Trial Trenching Report	193
Land parcel 9 Trial Trenching Report	215
Land Parcel 10 Trial Trenching Report	226
Land parcel 11 Trial Trenching and Excavation Report	243
Land parcel 12 Trial Trenching Report	265
Land Parcel 13 Trial Trenching Report	283

VOLUME 4: Land Parcels 14-18

Land Parcel 14 Trial Trenching Report	295
Land parcel 15 Trial Trenching and Excavation Report	310
Land Parcel 16 Trial Trenching Report	344
Land Parcel 17 Trial Trenching Report	356
Land Parcel 18 Trial Trenching Report	369

VOLUME 5: Land Parcels 19-22 and Echline Clearance Cairns

Land Parcel 19 Trial Trenching and Excavation Report	383
Land Parcel 20 Trial Trenching Report	405
Land Parcel 21 Trial Trenching Report	419
Land Parcel 22 Trial Trenching Report	431
Echline Clearance Cairns Excavation Report	444

Project code: FRCE10
Client: Transport Scotland
Date: 6th May 2011

The Results of an Archaeological Field Evaluation by Trial Trenching at Castlandhill Hill, Rosyth (Land Parcel 1)

Archaeological Consultant: Jacobs Arup
Report Authors: Elizabeth Jones
Report Status: Approved



Executive Summary

Headland Archaeology conducted an archaeological evaluation by trial trenching on the Forth Replacement Crossing at Castlandhill Hill Rosyth (Land Parcel 1), NGR: NT 1222 8196 (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.

Twenty-two trenches totalling 1630m² were excavated comprising just over a 5% sample of Land Parcel 1. A metal detector survey of the trench locations and the spoil arising from the trial trenching was also undertaken.

The Parcel was divided between two fields, Field A and Field B. Field A was on the south eastern slopes of Castlandhill Hill. No archaeological remains or deposits were discovered during the trial trenching and no significant finds were recovered during the metal-detecting survey in Field A.

Field B was located on flat ground to the south and east of Field A and a number of features were identified, generally concentrated at the southern end of the field. Trench 9 contained a small pit from which burnt chert was recovered indicating a prehistoric date for the pit, Trench 9 also contained a shallow gully feature and the terminal end of a ditch, which continued to the north-west. Trench 8 contained a wide shallow ditch and Trench 5 contained a large pit; neither of these features contained dateable artefacts. There were also a series of narrow drainage channels, of 19th century or later date running across the southern half of the site. At the northern end of Field B was a shallow ditch, which was dated to the 18th/19th century by the artefacts recovered from it.

A number of metal artefacts were recovered during the metal-detecting survey in Field B. These were concentrated in the trenches on the eastern side of the field nearest the B980 and consisted mainly of railway 'staples', fragments of agricultural implements and aluminium cans.

ARCHAEOLOGICAL EVALUATION

Forth Replacement Crossing: Land Parcel 1, Whinny Hill, Rosyth

PROJECT SUMMARY SHEET (FRCE10)

<i>Client</i>	Transport Scotland
<i>Consultant</i>	Jacobs Arup
<i>National Grid Reference</i>	NT 1222 8196
<i>Project Manager</i>	Edward Bailey
<i>Senior Archaeologist</i>	Kirsty Dingwall
<i>Text</i>	Elizabeth Jones
<i>Illustrations</i>	Julia Bastek
<i>Evaluation Team</i>	Samira Ben Mohammed Claire Delahunty Ian Hill Elizabeth Jones Richard Tuffin Don Wilson
<i>Schedule</i>	
Fieldwork	20 th – 25 th April 2011
Report	May 2011

CONTENTS

1	Introduction	5
	1.1 <i>General</i>	5
	1.2 <i>Project Background</i>	5
	1.3 <i>Aims and Objectives of the Archaeological Works</i>	5
2	Site Background	6
	2.1 <i>Archaeological and Historical Background</i>	6
	2.2 <i>Site Topography and Land Use</i>	6
	2.3 <i>Site Geology</i>	6
3	Methodology	7
4	Results of Fieldwork	7
	4.1 <i>Trial Trenching</i>	7
	4.2 <i>Metal detector survey</i>	9
5	Conclusions	9
6	References	9
	6.1 <i>Bibliographic References</i>	9
	6.2 <i>Cartographic References</i>	9
7	Appendices	10
	<i>Appendix 1: Trench Register</i>	10
	<i>Appendix 2: Context Register</i>	12
	<i>Appendix 3: Trench Matrices</i>	13
	<i>Appendix 4: Photographic Register</i>	15
	<i>Appendix 5: Drawing Register</i>	16
	<i>Appendix 6: Sample Register</i>	17

1 Introduction

1.1 General

1.1.1 This draft 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 the 20th and 25th April 2011, Headland Archaeology (UK) Ltd. undertook a programme of archaeological evaluation by trial trenching and metal detecting on Land Parcel 1 on the northern 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 Liz Jones. Six 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 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 Land Parcel 1 was identified as a site of potential cultural heritage significance due to the presence of Castlandhill House to the west. Recent research confirms that Castlelandhill Hill was used as a defensive position by the Scottish Royalist forces at the Battle of Inverkeithing fought in 1651.

2.1.3 Pre-historic activity in the wider area is evidenced by the discovery in 1961 of an axe head rough out on Castlandhill Farm to the north. Reports of the presence of a lead mine in the area from the 18th century give an indication of previous land use.

2.2 *Site Topography and Land Use*

2.2.1 The site is located to the south-east of the Rosyth and is bounded by the B980 to the east, Castlandhill Woods to the north and west and Ferry Toll Road to the south. The Land Parcel comprised two areas, designated Field A and Field B. Field A was situated on the south eastern slopes of Castlandhill Hill and comprised rough grazing and gorse. Field B situated to the south and east of Field A was generally flat arable land and at the time of the evaluation was under young crop. The site is under the ownership of C R M Franks, G W Bruce and R D Pierotti.

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 of firm to very stiff boulder clay deposits with occasional granular till deposits. The trial trenching (below) has identified small patches of free-draining sands and larger bands of bedrock.
- 2.3.1 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**

- 3.1.1 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 Land Parcel 1 was 32, 425 m² and just over a 5% sample (or 1630 m²) of this was investigated by trial trenching. An indicative trench plan was agreed with the consultant archaeologists, Jacobs Arup. A number of the trenches in Field A could not be excavated due to their location on steep or gorse-covered slopes. These were moved and relocated within the same field where possible. A number of additional trenches were excavated at the southern end of Field B in order to ensure the full sample was excavated and to clarify the extent of features encountered in that area.
- 3.1.2 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 2 m 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.
- 3.1.3 Bulk soil samples were collected from secure archaeological contexts for processing and assessment. Where possible a 30 litre bulk sample was collected from each archaeological deposit and given a unique number (Transport Scotland 2010, 59). All finds were recorded by individual context and their cleaning, storage and conservation undertaken in accordance with the Institute for Archaeologists Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials (Transport Scotland 2010, 65-66).

4 **Results of Fieldwork (Illus 2)**

4.1 *Trial Trenching*

- 4.1.1 A total of 22 trenches were excavated across Land Parcel 1 (Illus 2) with a combined total area of 1630 m² comprising just over 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 [020] in the trenches in Field A was generally reddish brown to grey clay, with exposed bedrock occurring in most of the trenches. This was generally overlain by 0.30 m – 0.40 m of mid brown clayey silt topsoil [001]. In Trenches 13 and 15, towards their southern ends, the natural was overlain by up to 0.30 m of colluvium[023] comprised of brown clayey silt, which was overlain by topsoil [001]. At the north-east end of trench 18 the natural was overlain by colluvium[023] up to 0.60 m deep, this was overlain by topsoil [001]. The topsoil [001] contained occasional recent ceramic material.
- 4.1.3 The natural geology [021] in Field B varied from orange brown/grey clay to reddish brown/grey gravel across the site. This was overlain by mid brown clayey silt topsoil [001] 0.30 m – 0.50 m in depth. Colluvium comprised of light brown sandy silt [024] was encountered in trenches 3, 4, 5 and 10. This was generally towards the southern and western ends of the trenches and varied from 0.20 m to 0.60 m in depth, with the deeper deposits of colluvium recorded in trenches 3 and 4 at the northern end of the field.
- 4.1.4 Trench 1 was located at the north end of the field within an area of boggy ground that was uncultivated. It contained 0.20 m of mid brown clayey silt topsoil [001] over a thin layer of light grey clay subsoil [025] 0.10 m deep. This overlay a deep deposit of peat [022], a machine excavated sondage was excavated through the peat, revealing it to be at least 1 m in depth. The full extent of the peat was not established as excavation of the trench ceased at 1.2m, for health and safety reasons.
- 4.1.5 Trench 2 contained a ditch oriented north-east to south-west across the trench (Illus 3). The ditch [015] was 0.50 m wide and 0.15 m deep with near vertical sides and a flat base. It was filled with dark grey fine clay with occasional small (6 - 20mm) stone inclusions [014] containing white glazed ceramic fragments.
- 4.1.6 Trench 5 contained a sub-circular pit [011]. The pit measured 1.70 m by 1.30 m and was 0.40 m in depth (Illus 3 & 4). The pit had gradually sloping sides and a concave base that was filled with mid brown clayey silt [010] with gravel inclusions. A lense of charcoal was present within [010]. To the south of the pit was a possible posthole [012], 0.40 m in diameter and 0.22 m deep, with steep sides and an irregular base. It was filled with orange brown fine clayey sand [013].
- 4.1.7 Trench 8 contained a broad ditch [007] oriented roughly north to south across the trench (Illus 3 & 5). The ditch was 0.35 m wide and 0.24 m deep. The sides were irregular and the base was concave. It was filled with orange brown clayey sand [006] with occasional small stones. The ditch continued into Trench 20, where it turned to the south-west.

- 4.1.8 Trench 9 contained the possible terminal end of a ditch [008], which ran roughly north to south and appears to continue into Trench 21 to the north (Illus 3). The ditch was 1.95 m wide and 0.26 m in depth and had gently sloping sides and a concave base. It was filled with dark greyish brown clayey silt [009] with occasional small to large stones. To the north-east of this feature was a U-shaped cut [019], with shallow sides and a flat base (Illus 6). The feature was 2 m in total width, with the 'arms' measuring 0.75 m wide and 0.10 m deep. It was filled with loose yellow sand [018]. Immediately east of this was an oval pit [017], which measured 1.20 m by 0.45 m and was 0.19 m deep. It had steep sides, a concave base and was filled with orange brown fine clayey sand. Two burnt chert fragments were recovered from the fill.
- 4.1.9 Trench 10 contained two narrow linear features [003] and [005], oriented east to west and north-west to south-east respectively. Cut [003] was 0.32 m wide and 0.28 m deep with near vertical sides and a concave base. It was filled with orange brown clayey sand with occasional inclusions of small stone and charcoal flecks [002]. Cut [005] was similar in form and filled with similar material [004]. It was 0.35 m wide and 0.15 m deep. The narrow width and near vertical sides suggest these are drainage channels.
- 4.1.10 Trenches 19 – 22 were additional trenches excavated to compensate for the reduced area excavated in Field A. They were sited to confirm the continuation of features seen in trenches 5, 9, & 10. Trenches 20 and 21 demonstrated the possible continuation of ditches [007] and [008] (see above). Trenches 19 and 22 contained no features. A wide band of clay observed in Trench 6 was found on investigation to be a geological test pit.
- 4.1.11 Rubble drains were recorded in most of the trenches in Field B. These were oriented in varying directions suggesting a network of drains that fed into each other were spread across the field. A number of plastic and ceramic drains were also recorded.

4.2 *Metal Detector Survey*

- 4.2.1 Prior to the excavation of the trenches the area to be excavated was surveyed using metal detectors. No finds were recovered from Field A during the survey. A number of metal artefacts were recovered from the trench locations in Field B. These were mostly concentrated in the trenches on the eastern side of the site, nearest the B980 and comprised railway 'staples', fragments of agricultural implements and aluminium cans. No finds related to the Battle of Inverkeithing were recovered.

5 **Conclusions**

- 5.1.1 The evaluation has revealed a small group of features on the south side of the site that appear to be prehistoric in date. These comprise the two ditches, which although shallow may relate to an enclosure of some kind and a small pit containing burnt chert. The U-shaped feature close to the pit may be associated with this activity and may represent the convergence of two gullies. However the sandy fill suggests it might be naturally formed. The larger pit to the north of these features is currently relatively isolated and undated; however it is possible it relates to the activity further down slope. Further excavation will clarify the nature and extent of the

archaeological deposits in this area and hopefully produce more precise dating evidence.

- 5.1.2 The ditch in Trench 2 and the narrow channels recorded in Trench 10 appear to be post-medieval in date and relate to the drainage of the field. The presence of rubble and ceramic drains elsewhere in the Parcel demonstrate the continued requirement for drainage of the field for agricultural purposes.
- 5.1.3 Based on the results of the evaluation it is recommended that further excavation be undertaken targeting features recorded in trenches (5, 8, 9, 10, 20 & 21) to the south of the site.

6 References

6.1 Bibliographic References

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

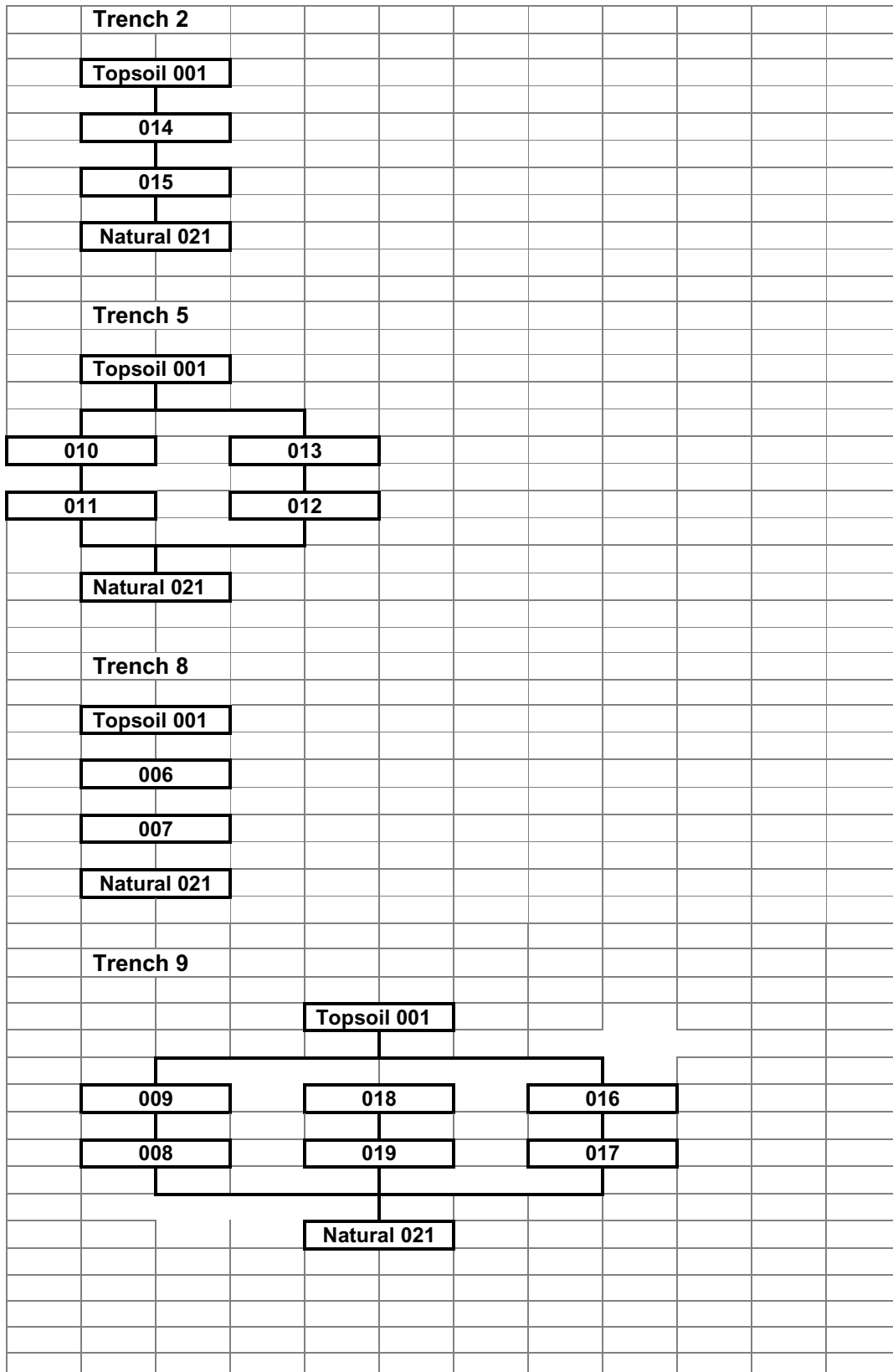
Trench No	Length (m)	Maximum Depth (m)	Description
1	50	1.2	SW-NE. Rubble drains N-S and E-W, ceramic drains N-S and E-W, peat
2	50	0.5	S-N. Ditch SW-NE (014), [015], rubble drain E-W, drain N-S
3	50	0.9	S-N. Rubble drains SE-NW and SW-NE, plastic drains SW-NE
4	50	1.0	S-N.
5	50	0.5	SW-NE. Drain S-N, ditch SE-NW, pits (013), [012] and (010), [011]
6	50	0.75	NW-SE. Rubble drain SW-NE
7	20	0.4	SW-NE.
8	50	0.6	W-E. Rubble drains SW-NE, N-S and NW-SE, ditches N-S (006) [007]
9	50	0.5	SW-NE. Ditch (009) [008], pits (018) [019], (016) [017], rubble drain S-N
10	50	0.5	N-S. Rubble drains NW-SE and NE-SW, ditches (004) [005] and (002) [003]
11	50	0.3	NW-SE.
12	25	0.4	S-N.
13	50	0.6	SW-NE.
14	25	0.4	SW-NE.
15	25	0.7	NW-SE.
16	25	0.4	SW-NE.
17	50	0.4	NW-SE.
18	25	0.6	SW-NE.
19	15	0.4	NW-SE.
20	30	0.5	E-W. Rubble drain N-S, drain N-S, continuation of ditches N-S and SW-NE in Trench 8

21	15	0.5	SW-NE. Continuation of N-S ditch in Trench 9
22	10	0.5	SW-NE.

Appendix 2: Context Register

Context No.	Trench	Description
001	10	Topsoil
002	10	Fill of cut [003], orangey brown clayey sand with occasional small stones and charcoal flecks.
003	10	Linear cut with very steep sides and a concave base, filled by (002). W: 0.32 m, D: 0.28 m.
004	10	Fill of cut [005], mid orangey brown fine clay sand with occasional small stones and charcoal flecks.
005	10	Linear cut with very steep sides and a slightly concave base, filled by (004). W: 0.35 m, D: 0.15 m.
006	8	Fill of cut [007], orangey brown fine clayey sand with occasional small stones.
007	8	Linear cut with steep sides and slightly concave base, filled by (006). W: 1.34 m, D: 0.24 m.
008	9	Semi-linear cut with sloping sides and a rounded base, filled by (009). W: 0.74 m, D: 0.26 m.
009	9	Fill of cut [008], dark grayish brown clayey silt with occasional small and large stones.
010	5	Fill of cut [011], mid brown clayey silt with gravel and occasional angular stones and frequent gravel towards the deposit's base.
011	5	Sub-circular cut with gradually sloping sides and concave base. Dia: 1.7m, Depth: 0.40 m. Filled by (010)
012	5	Sub-circular cut with steep sides and irregular base, filled by (013). Dia: 0.40 m, Depth: 0.22 m.
013	5	Fill of cut [012], orangey brown clayey sand with frequent small stone inclusions.
014	2	Fill of [015], dark grey fine clay with occasional small stones.
015	2	Linear cut with steep-to-vertical sides and flat base, filled by (014). W: 0.50 m, D: 0.15 m.
016	9	Fill of [017], orangey brown fine clayey sand with frequent small stones.
017	9	Sub-rectangular cut with steep sides and a concave base, filled by (016). L: 1.20 m, W: 0.48 m, D: 0.19 m.
018	9	Fill of cut [018], yellow sand with occasional small stones.
019	9	Irregular 'U-shaped' cut with shallow sides and a flat base, filled by (018). L: 2 m, W: 2 m, D: 0.06-0.10 m.
020		Natural reddish brown clay encountered in trenches in Field A
021		Natural deposits encountered in trenches in Field B; These varied from orange brown/grey clay to reddish brown/grey gravel
022		Peat deposit encountered in trench 1. Full thickness not known, but at least 1m.
023	13, 15 & 18	Deposit of brown silty clay. Colluvium within Field A
024	3, 4, 54 & 10	Deposit of light brown sandy silt. Colluvium within Field B.
025	1	Light grey clay subsoil
026	5	Lense of charcoal within fill deposit [010] of cut [011]

Appendix 3: Trench Matrices



	Trench 10												
	Topsoil 001												
	004			002									
	005			003									
	Natural 021												

	Remaining trenches		
	Topsoil 001		
	Natural 020, 021		

Appendix 4: Photographic Register

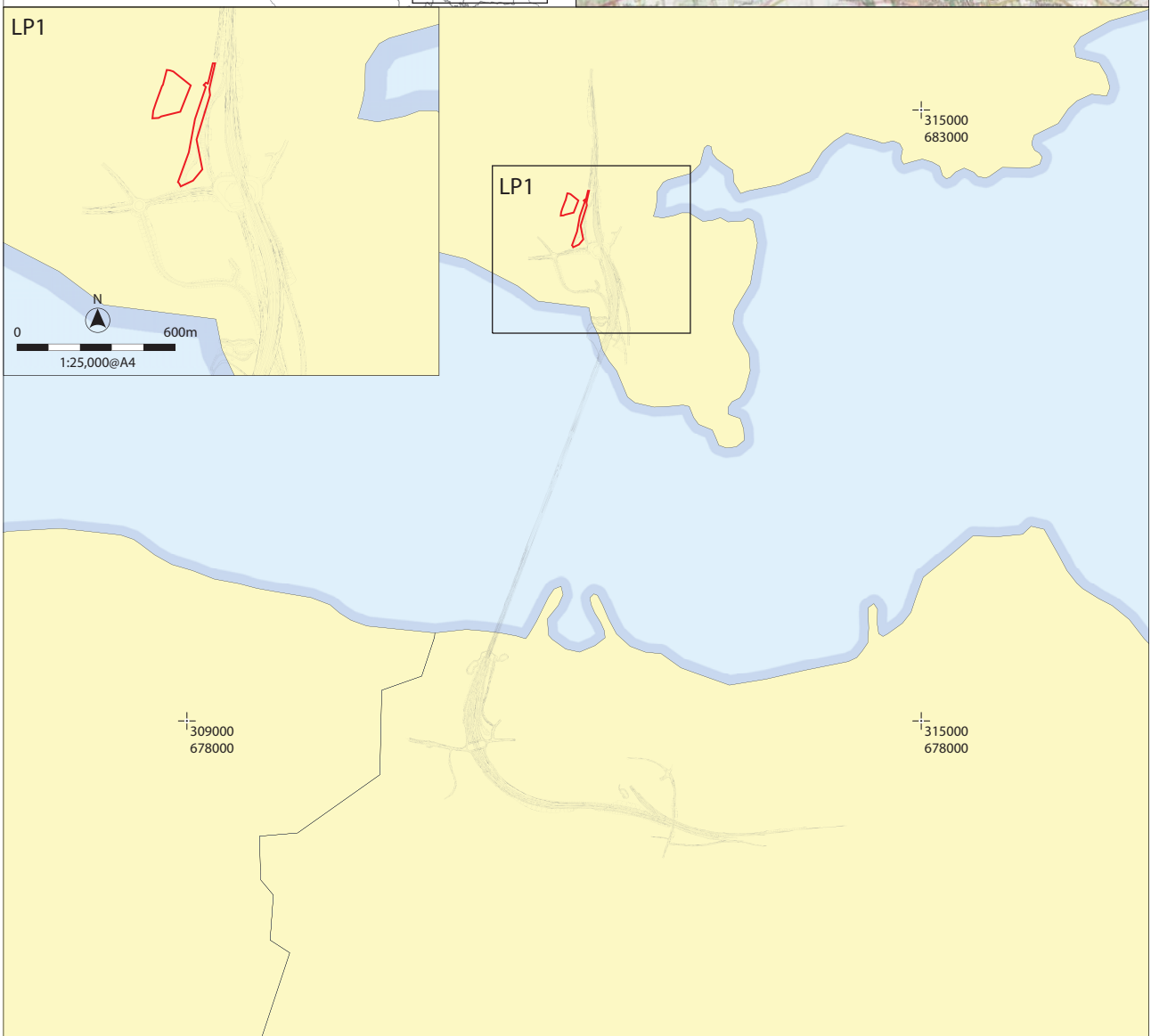
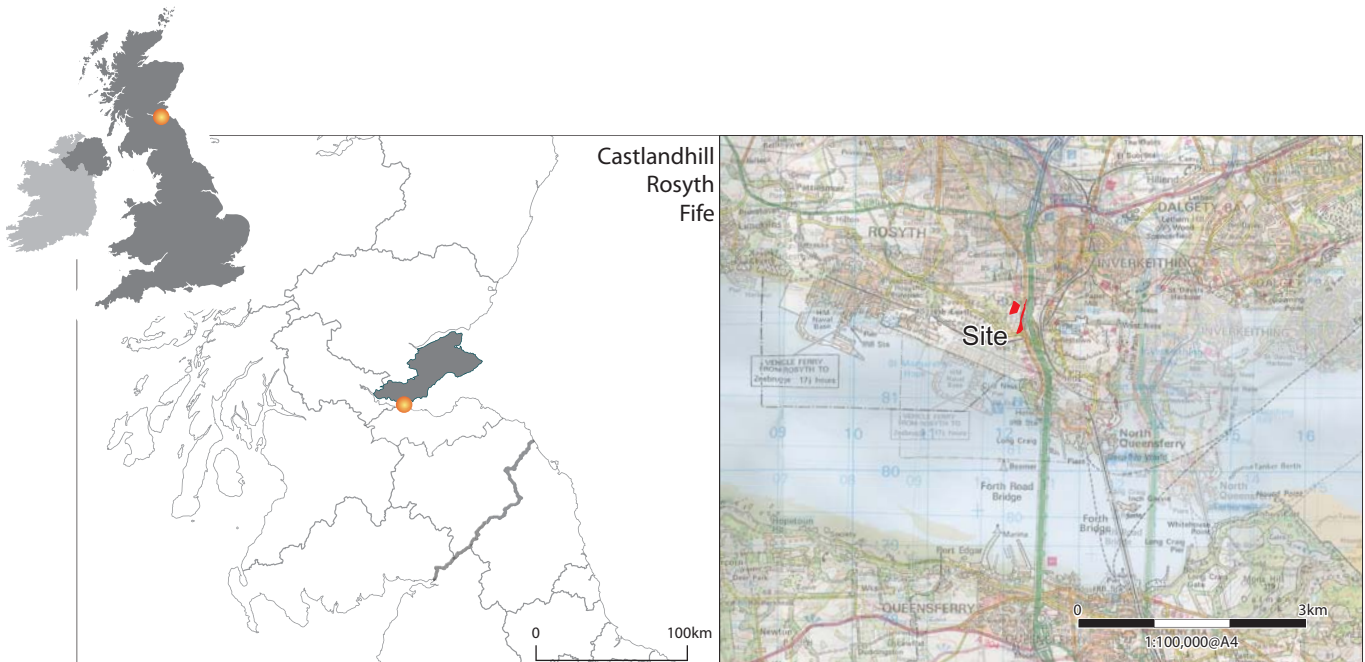
Photo No.	Direction	Description
663	NE	LP 1. Trench 1, general shot
664	NW	LP 1. Trench 1 showing peat deposits in section to 1.2m
665	N	LP 1. Trench 2, general shot
666	N	LP 1. Trench 3, general shot
667	N	LP 1. Trench 4, general shot
668	NE	LP 1. Trench 5, general shot
669	SE	LP 1. Trench 6, general shot
670	E	LP 1. Trench 8, general shot
671	E	LP 1. Trench 9, general shot
672	SE	LP 1. Trench 10, general shot
673	NE	LP 1. Trench 7, general shot
674	NW	LP 1. Trench 11, general shot
675	N	LP 1. Trench 12, general shot
676	SW	LP 1. Trench 13, general shot
677	S	LP 1. Trench 14, general shot
678	S	LP 1. Trench 15, general shot
679	SE	LP 1. Trench 16, general shot
680	SW	LP 1. Trench 18, general shot
681	NW	LP 1. Trench 17, general shot
682	W	LP 1. View of linear cut [003]
683	W	LP 1. View of linear cut [005]
684	S	LP 1. View of linear cut [007]
685	W	LP 1. View of linear cut [007]
686	W	LP 1. West facing quadrant section of semi-circular cut [008]

Appendix 5: Drawing Register



Drawing No.	Plan	Section	Description
1	1:10		South east facing section of pit [011], Trench 5

Appendix 6: Sample Register

Sample No.	Context No.	Description
001	009	Fill of butt-end of ditch [008], Trench 9
002	010	Fill of pit [011], Trench 5
003	016	Fill of pit [017], Trench 9



Client

HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LAND PARCEL 1 (FRCE10)

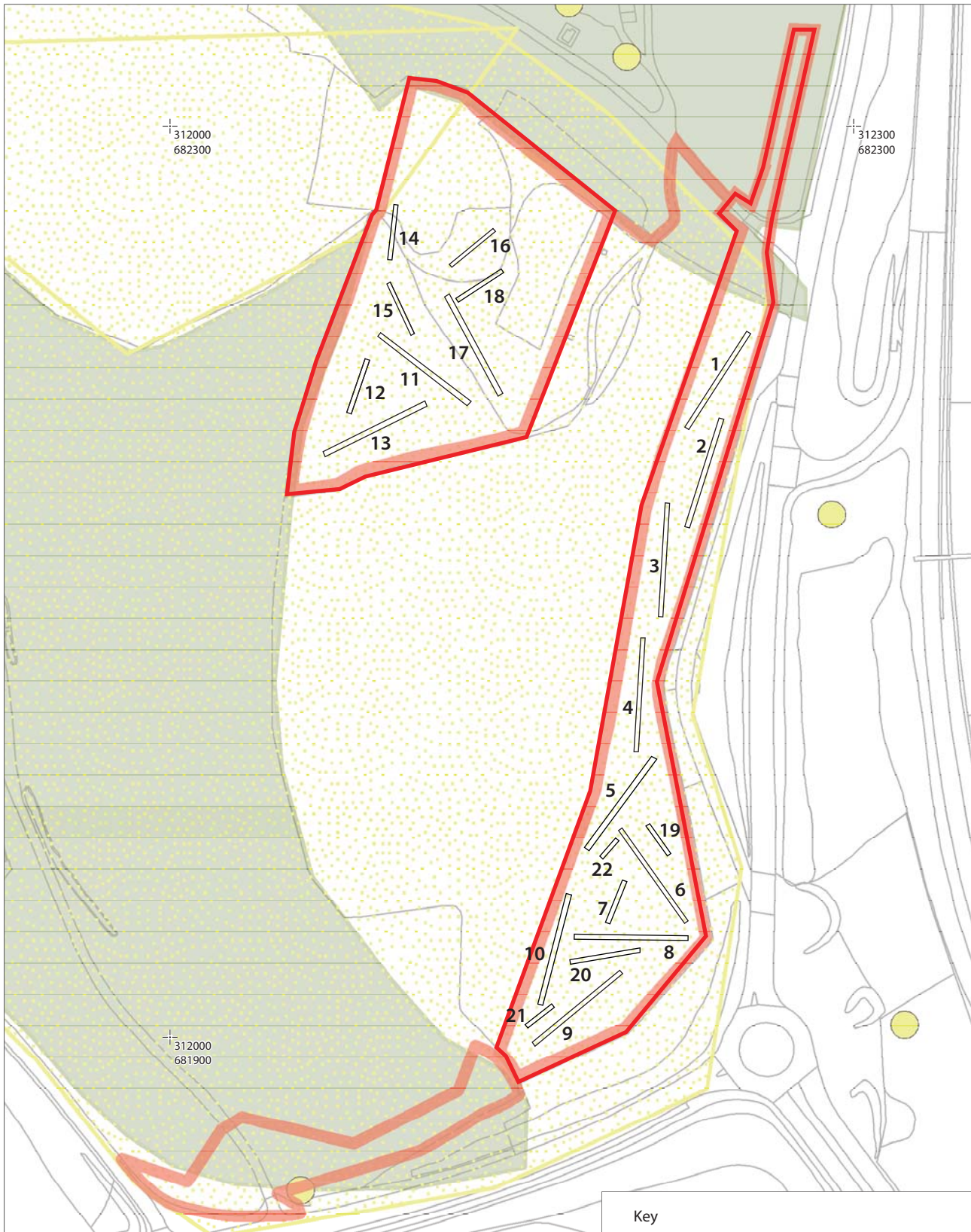
Reproduced using 2007 OS 1:50,000 Landranger No. 65 and digital 1:10,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011 All rights reserved. Licence No. AL 100013329

0 2.5km

1:55,000 @ A4

Detailed description: This block contains the client information, project title, and a detailed scale bar. The client is Transport Scotland. The project is titled 'FORTH REPLACEMENT CROSSING, LAND PARCEL 1 (FRCE10)'. A note states the data is reproduced from 2007 OS 1:50,000 Landranger No. 65 and digital 1:10,000 data supplied by Transport Scotland. A north arrow and a scale bar (0 to 2.5km) are provided. The map is at a scale of 1:55,000 @ A4.

Illus 1
Site location



© Headland Archaeology (UK) Ltd



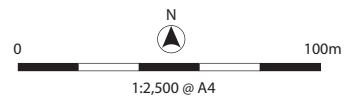
FORTH REPLACEMENT CROSSING, LAND PARCEL 1 (FRCE10)



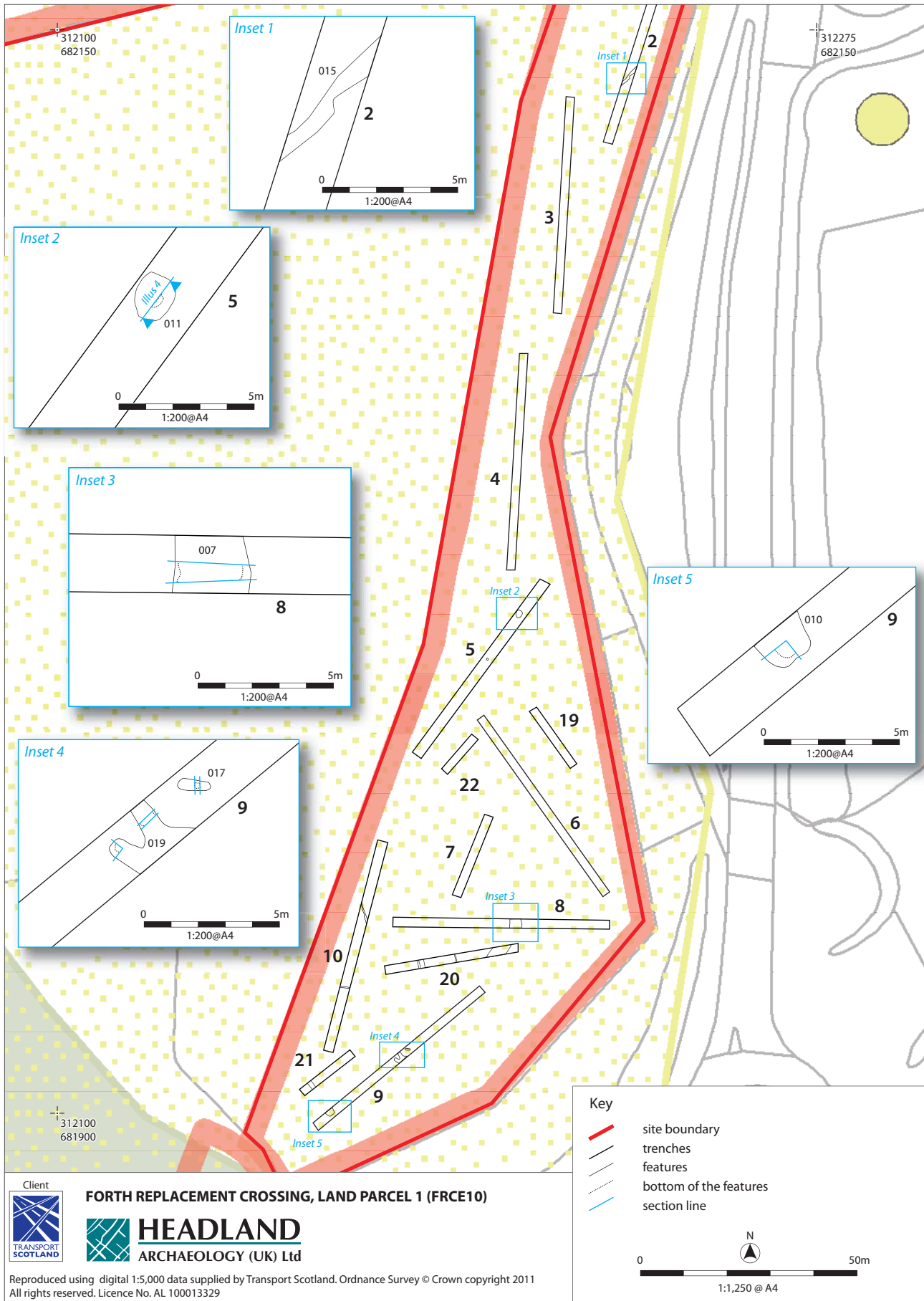
Reproduced using digital 1:5,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011
All rights reserved. Licence No. AL 100013329

Key

- site boundary
- trenches



Illus 2
Trench plan



© Headland Archaeology (UK) Ltd

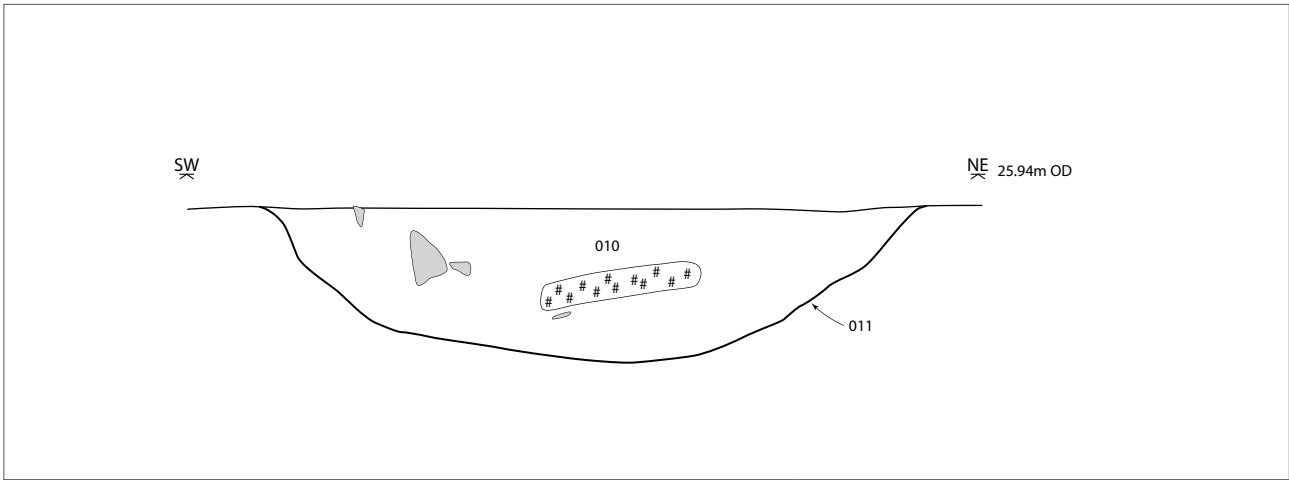


FORTH REPLACEMENT CROSSING, LAND PARCEL 1 (FRCE10)



Reproduced using digital 1:5,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011
 All rights reserved. Licence No. AL 100013329

Illus 3
 Plan of features



Client



FORTH REPLACEMENT CROSSING, LAND PARCEL 1 (FRCE10)




HEADLAND
ARCHAEOLOGY (UK) Ltd

Reproduced using digital 1:5,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011
All rights reserved. Licence No. AL 100013329

Key

- # charcoal
- stone



0 1m

1:20 @ A4

Illus 4
S-E facing section through pit [011]



Illus 5
Trench 8: Section through ditch [007] looking N



Illus 6
Trench 9: Section through feature [019] looking N-W

Project code: FRCE10
Client: Transport Scotland
Date: May 2011

The Results of an Archaeological Field Evaluation by Trial Trenching on the Forth Replacement Crossing at Castlandhill House (Land Parcel 2)

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 Castlandhill House(Land Parcel 2), NGR: NT 12041 81844 (centred), to assess the presence/absence of archaeological remains or deposits and to target the possible remains of site 1305 Castlandhill Southern Gate Lodge identified during previous ground investigation works and noted 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 5 trenches totalling 84.75m² were excavated comprising a 2.3% sample across the Parcel. A small building was identified in the south-eastern corner of the site. Trenches were extended in order to identify the limits of the building, which established that it was rectangular in shape and had associated external features. The building is depicted on the first edition Ordnance Survey map of 1856 and is the Southern Gate Lodge associated with Castlandhill House to the north.

ARCHAEOLOGICAL EVALUATION
Forth Replacement Crossing: Land Parcel 2, Castlandhill

PROJECT SUMMARY SHEET (FRCE10)

<i>Client</i>	Transport Scotland
<i>Consultant</i>	Jacobs Arup
<i>National Grid Reference</i>	NT 12041 81844
<i>Project Manager</i>	Edward Bailey
<i>Text</i>	Ian Hill
<i>Illustrations</i>	Julia Bastek
<i>Evaluation Team</i>	Clare Delahunty Kirsty Dingwall Ian Hill
<i>Schedule</i>	
Fieldwork	19 th April – 21 st April 2011
Report	May 2011

CONTENTS

1	Introduction	30
	1.1 <i>General</i>	30
	1.2 <i>Project Background</i>	30
	1.3 <i>Aims and Objectives of the Archaeological Works</i>	30
2	Site Background	31
	2.1 <i>Archaeological and Historical Background</i>	31
	2.2 <i>Site Topography and Land Use</i>	32
	2.3 <i>Site Geology</i>	32
3	Methodology	32
4	Results of Fieldwork	32
	4.1 <i>Trial Trenching</i>	32
5	Conclusions	34
6	References	35
	6.1 <i>Bibliographic References</i>	35
	6.2 <i>Cartographic References</i>	35
7	Appendices	36
	<i>Appendix 1: Trench Register</i>	36
	<i>Appendix 2: Context Register</i>	37
	<i>Appendix 3: Trench Matrices</i>	38
	<i>Appendix 4: Photographic Register</i>	39
	Illustrations	40

1 Introduction

1.1 General

1.1.1 This draft 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 the 19th March and 21st April 2011, Headland Archaeology (UK) Ltd. undertook a programme of archaeological evaluation by trial trenching on Land Parcel 2 on the northern 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. 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).

1.2.3 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 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 Land Parcel 2 was identified as a site of potential cultural heritage significance due to the presence of Castlandhill House to the north. Castlandhill House Southern Gate Lodge (Site 1305) is shown on maps lying to the south of the main house, and structural remains potentially relating to it were identified during monitoring of ground investigation trial pits (Curtis 2010).

2.1.3 Pre-historic activity in the wider area is evidenced by the discovery in 1961 of an axe head rough out on Castlandhill Farm to the north. Reports of the presence of a lead mine in the area from the 18th century give an indication of previous land use. Recent research has confirmed that Castlandhill Hill was utilised as a defensive position by the Scottish Royalist forces at the Battle of Inverkeithing fought in 1651.

2.2 Site Topography and Land Use

2.2.1 The site is located to the east of the Port of Rosyth and lies at the entrance to the driveway of Castlandhill House (NMRS No. NT18SW 218). It is bounded to the south and west by Ferry Toll Road. The ground is very uneven, with steep sided rocky outcrops to the east. It generally slopes downhill towards the south. At the time of the evaluation the site was under open tree cover and hedgerow. The site is under the ownership of I E D Job and J S D Job.

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. The trial trenching (below) has identified small patches of free-draining sands and gravels.
- 2.3.1 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**

- 3.1.1 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 to be evaluated measured 3,673m² and a 2.3% sample of this was investigated by trial trenching, the total area of which comprised 84.75m². A large portion of the site was inaccessible due to near vertical rocky outcrops and the current driveway to the property, which is still in use. Prior to the works an indicative trench plan was agreed with the consultant archaeologists, Jacobs Arup. Trenches were sited to test the survival of the Southern Gate Lodge (Site 1305) of Castlandhill House and to provide good spatial coverage of the remainder of the site. Due to the tree cover on site, Trenches 1, 2 and 4 were re-positioned slightly. Trench 3 was re-located to the north of Trench 5 in order to reveal the extent of the Southern Gate Lodge.
- 3.1.2 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 JCB 3-CX mechanical excavator, fitted with a back actor and a 1.6m 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 encountered 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 Five trenches were excavated across Land Parcel 2 (Illus 2) with a combined total area of 84.75m² comprising a 2.3% 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 (007) seen in the trenches varied from brownish grey clay to free draining gravels and orange-brown sand. This was generally overlain by 0.30m of mid brown clayey silt topsoil (020) containing dense roots.
- 4.1.3 Colluvial deposits (021) were identified in Trenches 1, 2 and 4, which ran across a sharp north to south dip to the west of the current driveway. These were up to 1m in depth and comprised brown silts containing dense tree roots.
- 4.1.4 Archaeological remains were identified in Trenches 3 and 5. No archaeological remains or deposits were found in Trenches 1, 2 or 4. Trench 1 contained a rubble field drain.
- 4.1.5 Trench 5 contained the remains of a small building. The trench was extended to the south and north in order to determine the extent of the building. The southern, western and eastern walls (011, 012 & 015) of the structure were exposed, confirming the building was 6m wide. The total length of the building from the southern most wall (011) to the northernmost wall revealed in trench 3 (001) was 7.5m.
- 4.1.6 The southern (011), western (012) and eastern (015) walls of the building were constructed of random coursed mortar bonded dressed dolerite boulders up to 0.36m x 0.25m x 0.20m. The exposed southern wall (011) was 5.50m in length and was 0.50m wide. The wall three courses high survived to a height of 0.32m. The exposed western wall (012) was 2.50m in length and was 0.40m wide and consisted of two courses surviving to a height of 0.25m. The exposed eastern wall (015) was 1.80m in length and was 0.50m wide and consisted of three courses surviving to a height of 0.30m.
- 4.1.7 The interior remains of the building were very disturbed with two unbonded brick surfaces identified; both of which had been partially truncated away. The first, (017), was adjacent to the interior of wall (011) at the western end, surviving over an area 1.5m by 0.4m. The bricks were laid on edge and were stamped 'BonnyBridge' on the base. The second surface (010) was seen at the north end of the trench in the western half of the building. The bricks had been laid on bed, and the surface survived over an area measuring 2m by 0.60m. A deposit of stone and brick rubble (018) was present between the two surfaces. Further rubble and debris deposits were exposed along the eastern exterior of the building, consisting mainly of broken slate roof tiles (016).
- 4.1.8 The western wall (012) was cut by ceramic drain (013). The drain ran into the building and underlay deposit (010).
- 4.1.8 The foundations for the building had been cut into natural sand (007), and a mixed silt and rubble infill deposit (014) filled the foundation cut for the building on the southern and western sides.
- 4.1.9 Trench 3 was excavated to the north of Trench 5 in order to determine the northern extent of the building. Similar remains were discovered with the foundations of the

building cut into the natural orange sands (007) and a mixed silt and rubble infill deposit (006) filled the west side of foundation cut of wall (002).

- 4.1.10 Two random coursed mortar bonded dressed dolerite walls were exposed in Trench 3. Wall (002) was a continuation of the western wall (012) from Trench 5. It was exposed to a length of 3m and was 0.50m wide. Two courses survived to a height of 0.20m. Wall (001) formed the northern wall of the building. 1.50m of the wall was exposed in the trench and it was 0.40m wide and consisted of three courses surviving to a height of 0.37m.
- 4.1.11 The interior of the structure consisted of a mixed rubble infill deposit (005) that was 0.37m deep and overlay a compacted, red sand and stone surface (009).
- 4.1.12 Abutting the northern wall (001) was a concrete platform (003) with a moulded gutter (004). The exposed platform was 1.40m in length and was 0.90m wide and continued beyond the limit of excavation. The moulded gutter was 0.30m in width and had a U shaped profile and was 0.03m in depth. This feature formed paving possibly at an entrance to the building.
- 4.1.13 A further random coursed mortar bonded dolerite wall (019) is located to the east of the building remains. It is aligned north-west to south-east, running parallel with the building remains at a distance of 2m. The wall stands to a height of 0.90m, with a maximum five courses visible, although it is lower towards its northern end where three courses were visible. The wall is 6m in length marking the limit of the steeply sloping ground to the north-east. It forms a revetment for this material and is thought to be contemporary with the building.

5 Conclusions

- 5.1.1 The building that was revealed in Trenches 3 and 5 represents the remains of the southern gate lodge associated with Castlandhill House (NMRS No. NT18SW 218). The house and lodge first appear on the Ordnance Survey (OS) six inch to the mile 1st edition map published in 1856. The lodge is shown sitting to the east of the drive leading up to the main house, the location of the lodge was confirmed by the trial trenching.
- 5.1.2 The gate lodge continued to appear on Ordnance Survey mapping until the 1961 edition from which it is absent. This indicates the gate lodge was demolished sometime during the mid 20th Century.
- 5.1.3 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

Curtis, A. 2010 *Forth Replacement Crossing Additional Ground Investigation: Archaeological Monitoring*. Unpublished Jacobs Arup client report

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

1856 (surveyed 1854) *Fifeshire Sheet 39* 1:10560

1896 (surveyed 1895) *Fifeshire Sheet XLIII.2* 1:2500

1915 (surveyed 1913) *Fifeshire Sheet XLIII.2* 1:2500

1927 (surveyed 1925) *Fifeshire Sheet XLIII.2* 1:2500

1961 (surveyed 1960) *Sheet NT1281 and NT 1381* 1:2500

1967 (surveyed 1965) *Sheet NT1281 and NT 1381* 1:2500

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

7 Appendices

Appendix 1: Trench Register

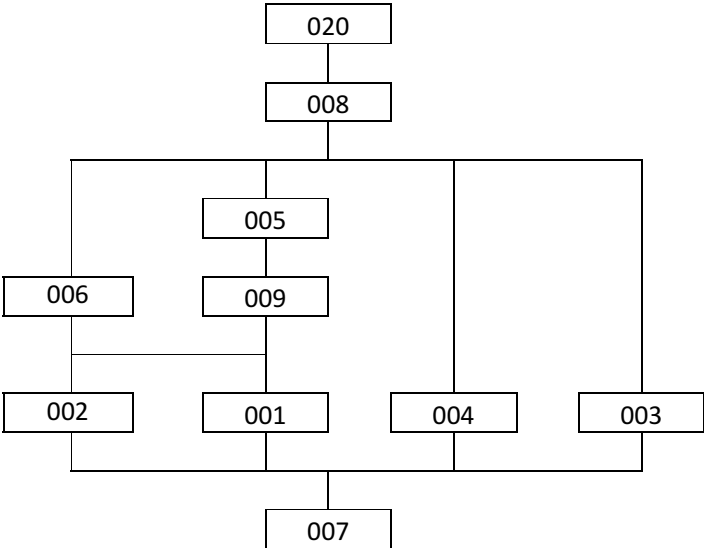
Trench No	Area (m²)	Maximum Depth (m)	Description
1	17.6	0.80m	SE-NW. Rubble drain S-N.
2	16	0.30m	NW-SE.
3	13.75	0.40m	S-N. Contains built structure [001-009].
4	10.4	1.00m	S-N.
5	27	0.40m	E-W. Contains built structure [010-014].

Appendix 2: Context Register

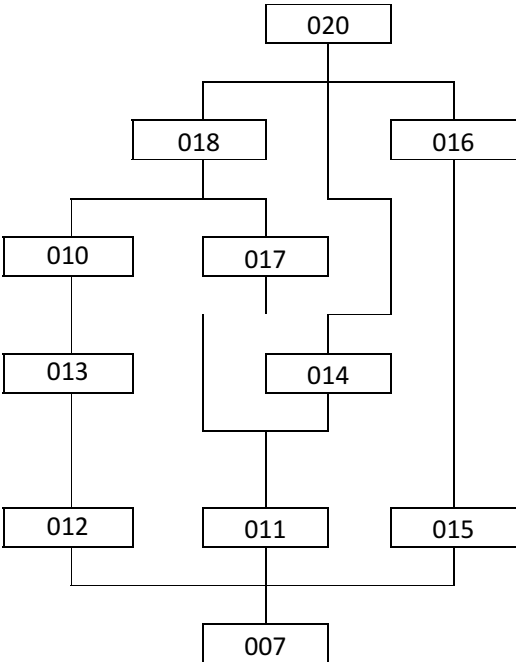
Context No.	Trench	Description
001	Tr 3	Mortar bonded dolerite wall. Measured 1.50m in length by 0.40m wide and to maximum height of 0.37m.
002	Tr 3	Mortar bonded dolerite wall. Measured 3m by 0.50m and to a maximum height of 0.20m.
003	Tr 3	Concrete platform. Measured 1.40m by 0.90m.
004	Tr 3	Moulded concrete guttering. Measured 0.30m wide and 0.03m deep with a U shaped profile, extended 2m north-west to the limit of excavation and 1.80m north-east to the limit of excavation.
005	Tr 3	Mixed rubble infill. Measured 2.40m by 0.90m. Continued beyond the limit of excavation.
006	Tr 3	Rubble infill of foundation trench. Measures 1.4m by 0.19m. Not excavated.
007	All	Orange-brown natural sand
008	Tr 3	Mixed silty and rubble subsoil. Measures 0.80m by 0.70m.
009	Tr 3	Compacted red sand and stone surface.
010	Tr 3	Brick surface at northern edge of trench. Measured 2m by 0.60m.
011	Tr 5	Southern wall, Mortar bonded stone wall. Measured 5.50m by 0.50m and 0.32m in height.
012	Tr 5	Western wall, mortar bonded stone wall. Measured 2.50m by 0.40m wide and 0.25m in height.
013	Tr 5	Drain cutting through western wall
014	Tr 5	Brown silty infill of possible foundation trench.
015	Tr 5	Eastern wall, mortar bonded stone wall. Measured 1.80m by 0.50m and 0.30m in height.
016	Tr 5	Rubble infill. Measured 1.5m by 1.4m. Not excavated.
017	Tr 5	Brick surface abutting (011) to the north. Measured 1.50m by 0.40m.
018	Tr 5	General rubble within interior of building at western end.
019	-	Mortar Bonded stone wall to the east of the building
020	All	Topsoil
021	Tr 1, 2 & 4	Colluvium

Appendix 3: Trench Matrices

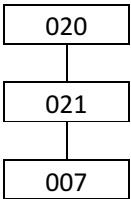
Trench 3



Trench 5

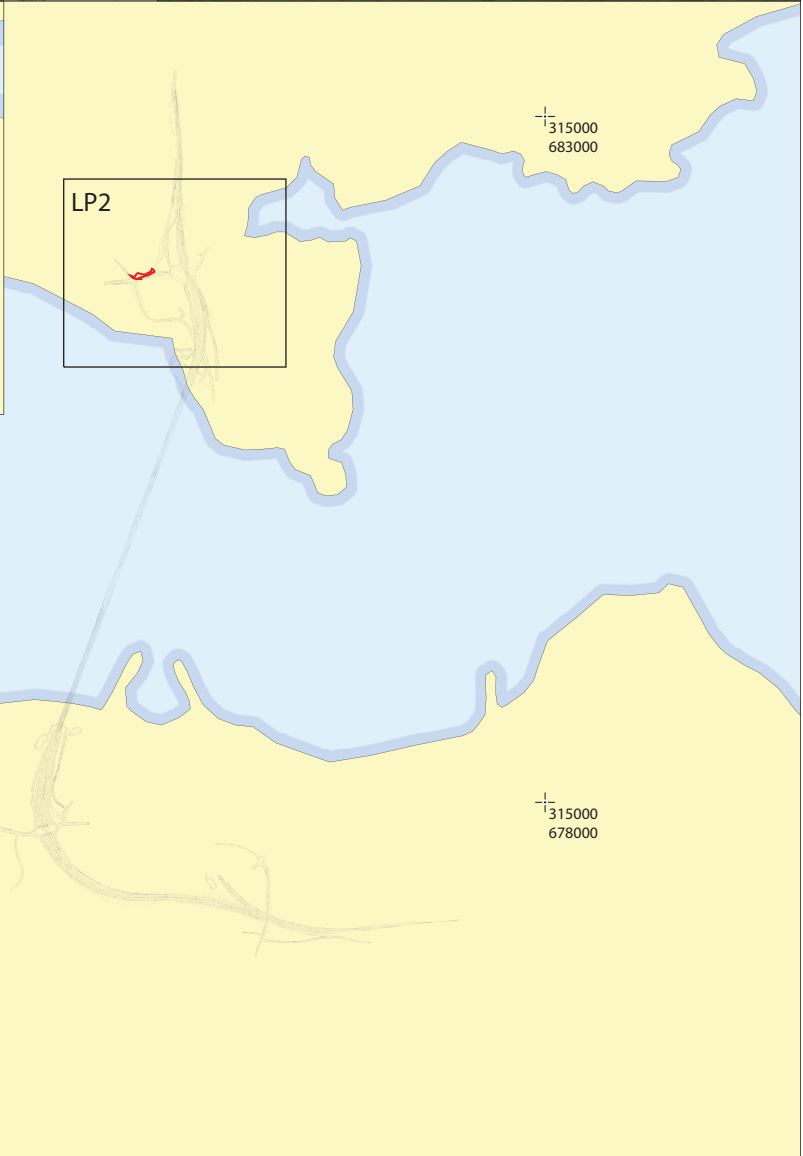
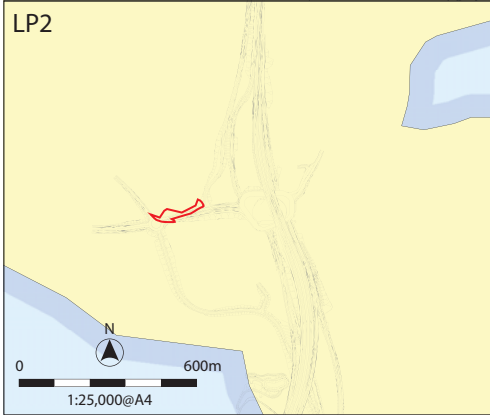
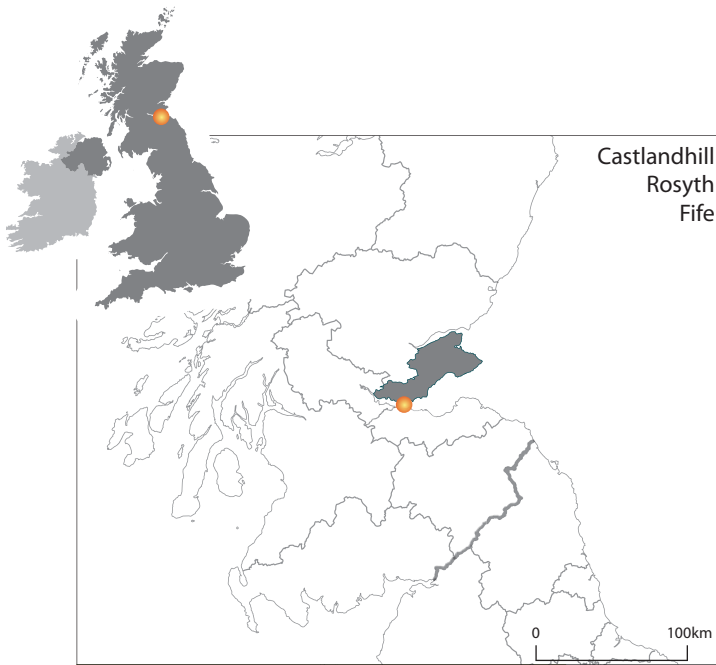


Other Trenches



Appendix 4: Photographic Register

Photo No.	Direction	Description
188	E	General Shot of Tr 5 LP2
189	S	General Shot of Tr 4 LP2
190	SW	General Shot of Tr 1 LP2
191	WSW	General Shot of Tr 2 LP2
192	SE	General Shot of Features in Tr 3 LP2
193	N	Shot of (003) and (004) Tr 3 LP2
194	E	Shot of (002) Tr 3 LP2
195	N	Shot of (001) and (009) Tr 3 LP2
196	W	General Shot of features in Tr 5 LP2
197	NE	General Shot of features in Tr 5 LP2
198	N	General Shot (010) Brick Surface
199	E	General Shot South Wall (011)
200	E	General Shot West Wall (012)
201	E	Drain (013) close-up
202	E	General Shot East Wall (015)
203	S	General Shot Bricks (017)
204	E	Detail of Mortar Bonded Stone Wall to E of Building (019)
205	SE	General Shot of Wall (019) to E of Building



Client



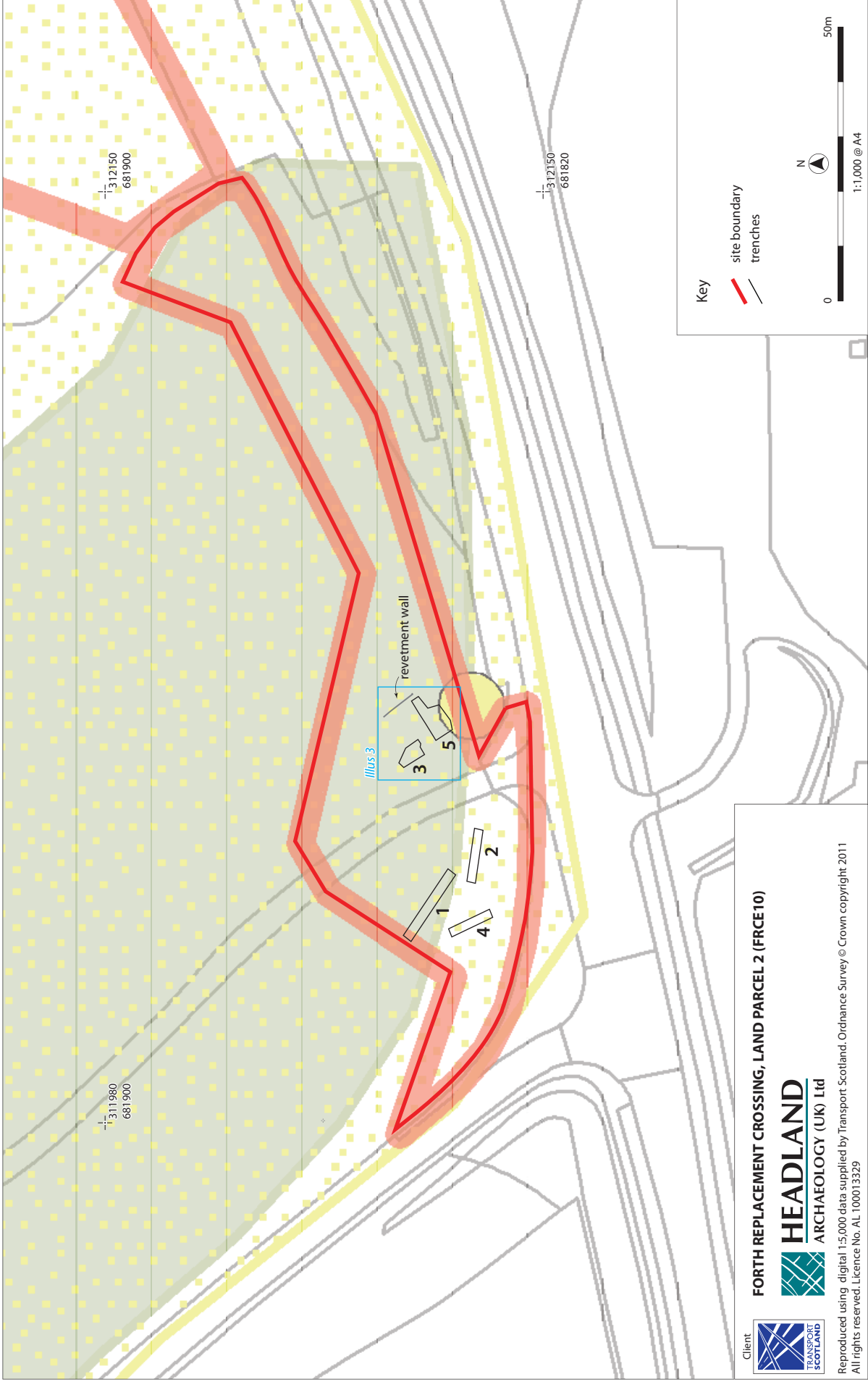

HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LAND PARCEL 2 (FRCE10)

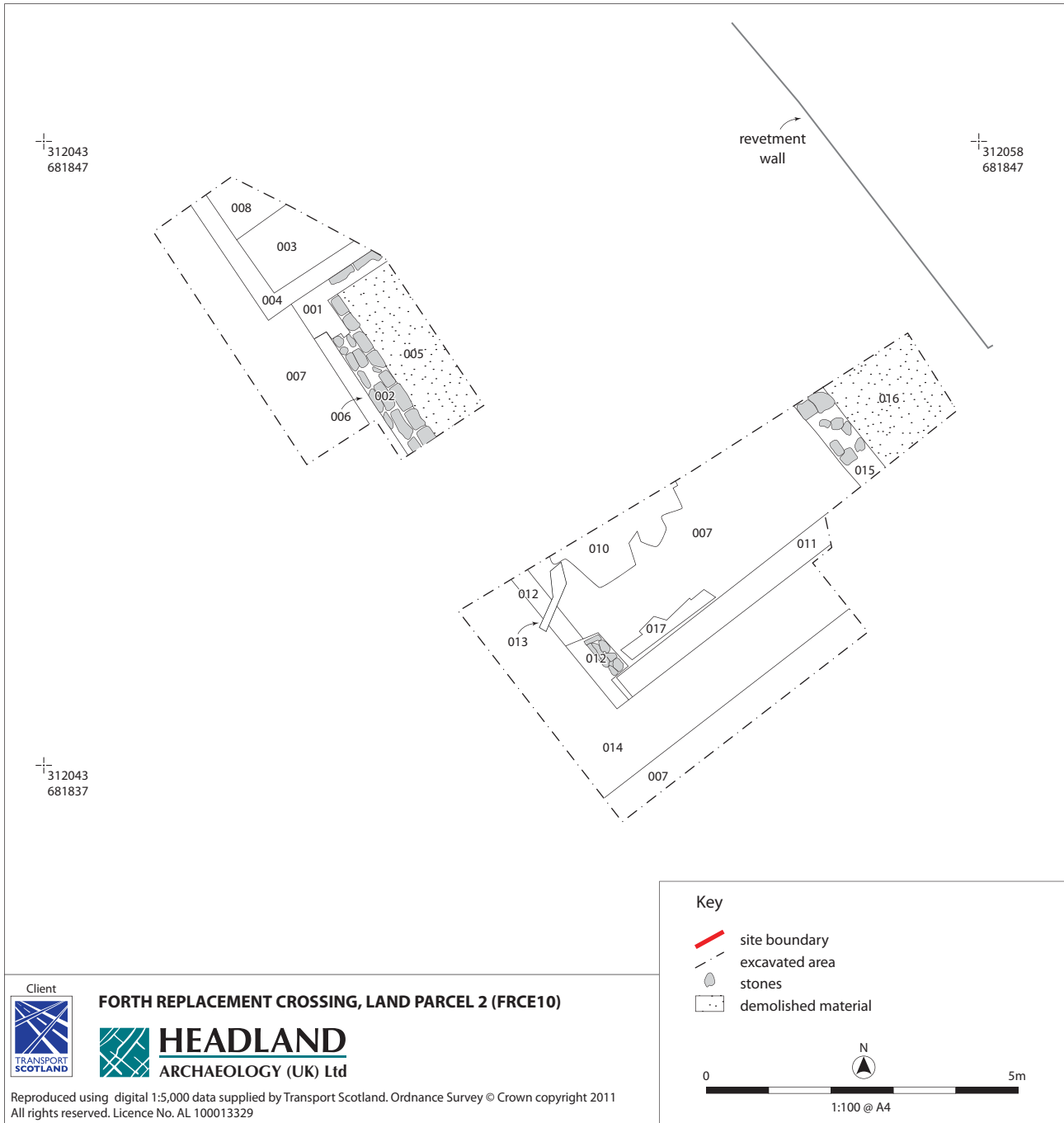
Reproduced using 2007 OS 1:50,000 Landranger No. 65 and digital 1:10,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011 All rights reserved. Licence No. AL 100013329

0 2.5km
1:55,000 @ A4

Illus 1
Site location



Iillus 2
Trench plan



Illus 3
Features in Trenches 3 and 5



Illus 4
Building remains in Trench 5



Illus 5
Building remains in Trench 3



HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LP2 (FRCE10)

Project code: FRCE10
Client: Transport Scotland
Date: 7th December 2010

The Results of a Desk-Based Assessment and Archaeological Field Evaluation of St Margaret's Hope Wharf, Rosyth

Archaeological Consultant: Jacobs / Arup
Report Authors: Kirsty Dingwall
Report Status: Approved



Executive Summary

Headland Archaeology conducted an archaeological evaluation by desk-based assessment and trial trenching at St Margaret's Wharf, Rosyth, NGR: NT 12412 81474. The aim of the work was to record an upstanding wharf that survived within an area of reclaimed land, and to establish if any earlier structures or vessels were present adjacent to the wharf. The work was commissioned by Transport Scotland, managed by Jacobs Arup and undertaken in advance of the proposed Forth Replacement Crossing (FRC).

Three trenches totalling 63.6m² were excavated around the wharf identified in the Environmental Statement (Transport Scotland 2010). Due to the constraints of groundwater levels and the presence of services, limited areas were available for trenching along the relict shoreline close to the wharf. An assessment of all readily available documentary and cartographic sources was undertaken following the completion of fieldwork. Trial trenching established that the main structure of the wharf survived in good condition including features such as a protective wooden framework present along the seaward elevation. No evidence of any vessels were identified. The structure of the wharf was recorded as part of the programme of works, as well as the location of an earlier wharf to the north, and the remnants of part of a later pier further to the south-west. A study of desk based sources indicated that the wharf was constructed c 1900, and was in use for around 30 years, probably for transporting stone and coal from small scale local enterprises mainly quarrying. There was one low rectangular structure to the rear of the wharf, but this was removed in the mid 20th century, during which time the whole of St Margaret's Bay was being infilled and reclaimed as part of the wider expansion of Rosyth Naval Dockyard. Any structures present in the wider area to the north of the wharf now lie under the extensive embankments relating to the A90 and B981 slip-road.

ARCHAEOLOGICAL EVALUATION

Forth Replacement Crossing: Land Parcel 3, St Margaret's Hope Wharf

PROJECT SUMMARY SHEET (FRCE10)

<i>Client</i>	Transport Scotland
<i>Consultant</i>	Jacobs Arup
<i>National Grid Reference</i>	NT 12412 81474 (wharf)
<i>Project Manager</i>	Edward Bailey
<i>Text</i>	Kirsty Dingwall
<i>Illustrations</i>	Caroline Norrman Tom Small
<i>Evaluation Team</i>	Kirsty Dingwall Calum Henderson Jurgen van Wessel
<i>Schedule</i>	
Fieldwork	22 nd – 23 rd Nov 2010
Report	Dec 2010

CONTENTS

1	Introduction	48
	1.1 <i>General</i>	48
	1.2 <i>Project Background</i>	48
	1.3 <i>Aims and Objectives of the Archaeological Works</i>	48
2	Site Background	49
	2.1 <i>Archaeological and Historical Background</i>	49
	2.2 <i>Site Topography and Land Use</i>	49
	2.3 <i>Site Geology</i>	50
3	Methodology	50
4	Results of Desk- Based Assessment	51
5	Results of Fieldwork	53
	5.1 <i>General</i>	53
	5.2 <i>Southern wharf</i>	53
	5.3 <i>Northern Wharf</i>	55
	5.4 <i>Concrete foundations</i>	55
6	Conclusions	55
7	References	56
	7.1 <i>Bibliographic References</i>	56
	7.2 <i>Cartographic References</i>	56
8	Appendices	57
	<i>Appendix 1: Trench Register</i>	57
	<i>Appendix 2: Context Register</i>	58
	<i>Appendix 3: Trench Matrices</i>	59
	<i>Appendix 4: Photographic Register</i>	60
	<i>Appendix 5: Drawing Register</i>	61
	Illustrations	62

1 Introduction

1.1 General

1.1.1 This Data Structure Report reports on a programme of archaeological investigation 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) wherein a programme of trial trenching was recommended. The report was initially submitted to Jacobs Arup and Transport Scotland.

1.1.2 Between the 22nd and 23rd November, Headland Archaeology (UK) Ltd. undertook a programme of archaeological evaluation by trial trenching on Land Parcel 3 on the northern 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 Kirsty Dingwall (Project Officer). Two further staff assisted during the fieldwork.

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') (Transport Scotland 2010, 30).

1.2.2 The cultural heritage component of the FRC EIA was largely completed in 2008. The purpose of the assessment 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 in accordance with the principles set out in DMRB Volume 11 (1993) (Archaeological Assessment Stages 1-2). Further information was also gathered during an archaeological watching brief on the Ground Investigations for the proposed scheme that was carried out during 2008 and 2009 by 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).

1.3 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;
- 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 The ES identified a total of 356 sites (within a study area ranging from 500m from the development corridor to 6km from the proposed main crossing), whilst an archaeological desk-based assessment of a wider study area undertaken in advance of the proposed scheme, identified a total of 1200 sites of cultural heritage significance. The results from these studies show that the proposed development corridor and the wider study area collectively constitute 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 Land parcel 3 (Illus 1) was highlighted as a site of potential cultural heritage significance against the background of increasing industrial activity across the Firth of Forth as a whole from the 18th century onwards, with the advent of coal mining and associated salt panning (Transport Scotland 2010, 34). A study of the Ordnance Survey mapping in the area indicates this process, with quarries, railways and harbour developments appearing from the mid 19th century onwards. The assessment also notes the presence of a number of wrecks known in the Firth of Forth, the majority of which are 19th century cargo ships. There is also potential for previously unknown wrecks in the area, either from ships which sank in the Firth, or from vessels which were berthed at the wharf and had begun to decay and sank as a result. In general, the main focus of activity highlighted in the EIA was post-medieval in date and industrial in nature.

2.1.3 The ES identified Land Parcel 3 as having archaeological potential due to the presence of a wharf. The wharf, along with another slightly to the north, had been recorded as part of a desk-based assessment undertaken in 2000 (Farrell 2000) in association with a watching brief on the insertion of a water pipe (NMRS No: NT 18 SW 256). The current works were intended to record the details of the wharf, and establish whether further structures or remains associated or predating it survived in the adjacent area.

2.2 *Site Topography and Land Use (Illus 1)*

2.2.1 The site lies on the eastern fringe of a large area of reclaimed land. At the time of the fieldwork, it was largely covered by bracken and reeds, with extensive marshland extending out to the south-west. The larger part of St Margaret's Marsh is statutorily designated as a Site of Special Scientific Interest (SSSI), and as a result there were specific requirements in the methodology which are outlined below. The site is under the ownership of Scarborough Muir Group and Fife Council.

2.3 *Site Geology*

2.3.1 Geotechnical investigations have demonstrated that the subsurface stratigraphy underlying the development corridor as a whole 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 This part of the route of the crossing straddles the boundary between the quartz dolerite and the Sandy Craig formation sequence along much of its length. At the west of the area, beyond the old shoreline, made ground was underlain by reclaimed estuarine deposits up to 2.2 m thick and marine beach deposits up to 4.0 m thick. To the east above the former shoreline, weathered and fresh glacial till lay under the made ground.

3 **Methodology**

3.1.1 The agreed methodology for evaluating St Margaret's Wharf was to excavate a trench around the base of the extant remains, down to foundation level. This was to be done by machine. A further five 25m trenches were to be excavated to the north, west and east of the wharf, again by machine, to establish the extent of land reclamation deposits and presence or absence of further archaeological remains.

3.1.2 Initially two trenches were excavated along the sides of the wharf, one on the top whilst the area to the south-west of the wharf was cleared of vegetation to reveal the structure. As a result of ground water appearing at a depth of c 2.00 m, it became apparent it would not be possible to fully reveal the foundations of the structure to its base. In addition, a combined sewer outfall pipe ran across the site from south-east to north-west (the construction of which, the watching brief of 2000 had monitored). This meant there was a wide strip across the middle of the site not available for trenching. Much of the remainder of the area was occupied by steep embankments leading up to the B981.

3.1.3 Following the excavation of Trenches 1-3, and as a result of the limited areas available for trenching, on site discussion took place between Jacobs, the consultants for the project, and Headland Archaeology. It was agreed that further trenching was not practical and would not help to achieve the aims of the project. Further discussion later took place, where it was agreed that a retrospective desk-based assessment would be undertaken for the site and immediate area, to place the wharf remains in context.

- 3.1.4 The trenches were excavated by a 3CX JCB fitted with a back-actor using a ditching bucket 1.8m wide. The excavator was operated under continuous archaeological supervision and vegetation, turf and landfill material was removed down to the first archaeological horizon, or to the point where ground water made further excavation impossible. Spoil was stored in two separate areas, differentiating between 'Type 1' silt and similar and 'Type 2' hardcore and landfill material. As the trenches did not end up encountering material other than these two types, no third storage areas were utilised. Due to the RED nature of the site (as a SSSI and in accordance with the Site Investigation Steering Group's 'Guidelines for the Safe Investigation by Drilling of Landfills and Contaminated Land'; Transport Scotland 2010, 51) consent to work had to be granted by Scottish Natural Heritage and a number of conditions in place before work could begin. A decontamination unit was used by the site team to ensure no contamination was transferred to the 'clean' area beyond the site boundary. In addition, the spoil was stored on two layers of impermeable plastic sheeting to ensure there was no contamination of the ground the spoil was sitting on.
- 3.1.5 Once the wharf was exposed as fully as practicable, a photographic and drawn record was made of the extant remains, including details of the metal and wood fixings. Photographs were taken using colour slide film, black and white negative film and digital.
- 3.1.6 Due to the potentially contaminated nature of the site, no finds or environmental samples were removed from the site. Finds within the deposits excavated were noted on context sheets and are included in the context descriptions.

4 Results of Desk-based Assessment (Illus 2)

- 4.1.1 The desk based assessment comprised a systematic search of all relevant archaeological/historical records, maps and photographs with the following resources consulted:
- National Monuments Record of Scotland (NMRS)
 - Fife Council Sites and Monuments Record (SMR)
 - National Map Library for historic maps of the area
 - National Archives of Scotland
 - Fife Council Archives Catalogue
 - SCRAN (www.scran.ac.uk)
 - Special Collections Department of the University of St Andrews Library
 - Statistical Accounts of Scotland
 - Scottish Burgh Survey
- 4.1.2 St Margaret's Wharf (NMRS No: NT 18 SW 256) lies within a broad bay to the west of North Queensferry. The NMRS number relates to a watching brief event carried out in 2000 when the wharf, along with a second wharf structure further to the north, was first recorded (Farrell 2000). The area is included within the parish of Inverkeithing and the bay is known as St Margaret's Hope. Pre-Ordnance Survey maps of the area show settlement further to the south at North Queensferry, with little detail in the bay to the north. A map from the first half of the 19th century (Greenwood, Fowler and Sharp, 1828) shows a single building halfway along the bay, but there are no structures extending out into the bay.

- 4.1.3 By the mid 19th century (Illus 2, OS 1st edition 1856 map), at least two individual structures are illustrated along the bay to the north of the later location of the wharf under investigation. One of these lies next to the label 'North Ferry T. P'. T.P normally marks the location of a turnpike, and in this situation could have been marking the road to the ferry i.e. North Queensferry. A rectangular inlet in the coastline to the north of this may be an indication of a pier, and this could suggest that a ferry also ran from this location. The 1st edition OS map also indicates two whinstone quarries to the north-west and south-east of the ferry terminal.
- 4.1.4 Later in the 19th century, the North Queensferry branch of the North British Railway ran alongside the bay (Illus 2, OS 1896). The ferry toll is still marked and to the south a square ended wharf has been constructed. A track leads from the surviving southern whinstone quarry down to the wharf. Presumably the wharf was constructed to allow the transport of the stone from what appeared to be a reasonably sized enterprise. The location of the wharf which is the subject of this evaluation still shows a blank coastline, although a track leads south past the site.
- 4.1.5 By the early 20th century, Ordnance Survey mapping (Illus 2, OS 1915 map) shows the northern wharf extended by a wooden pier, which reaches out some distance into the bay. There is also a tramway marked leading from the inland quarry to the end of the pier. To the south is the wharf under investigation within this document. The actual date of construction can be more closely defined as there are postcard images of St Margaret's Hope dated prior to 1920 showing the second wharf from various angles and held in the Robert M Adam Collection held in the University of St Andrews. One postcard dated 1909 shows the wharf in some detail, with wooden facing on the seaward side, and a compacted surface (perhaps packed earth?) with a mound of what might be coal sitting on the wharf. The wharf structure extends back several metres on the south-eastern side, although on the side not facing the camera, it looks to be more extensive.
- 4.1.6 On the basis of the photographic and map evidence, the second wharf must have been constructed between 1896 and 1909. The specific reason for the construction of this second wharf is not clear, but must be an indication of the expansion of the quarries and coal mines around Inverkeithing which the wharves were serving. A map from 1915 shows what may be an associated building adjacent to the track leading from the quarry (Illus 2, OS 1915 map). On the same mapsheet, to the north of the older ferry toll building two further structures are visible, noted as "Mission Hall" and "Labour Exchange".
- 4.1.7 By the 1927 edition of the OS map there have been substantial changes within the bay as a whole (Illus 2, OS 1927 map). These mostly relate to the construction of Rosyth Naval base at the north end of the bay, with a curved groyne introduced to gradually reclaim some of the ground at the north. The military acquired the site in the early years of the 20th century and construction began in 1909. By the late 1920s the northern wharf and pier appear to have gone out of use. The tram line which ran from the quarries to the north-east has been removed and the end of the pier seems to be in disrepair. An additional railway line, or siding runs immediately to the rear of the southern wharf, effectively cutting off access to the quarry. The reason for the shift of focus away from these two wharves is the construction of a substantial pier on the southern edge of the bay. This had rail access and a number of buildings seem

to have been constructed to service it. Even in 1927, the southern wharf must have been on the verge of being abandoned.

- 4.1.8 From the 1930s onwards the bay was in-filled and by the 1960s, there is no sign of the northern wharf and pier, and little evidence of the southern one. Something of the outline of the southern edge is visible on maps (Illus 2, OS 1961 map), but the northern side is indistinct and the whole structure lies within solid ground. Any evidence of structures to the rear have gone, and there is what appears to be a rough track running south across the landward side of the wharf. A few years later, even more land around the wharves has been reclaimed, although a large pond occupies much of the central part of the old bay.
- 4.1.9 As a general comment, there are very few documentary sources relating to the wharves, the quarries and mines they presumably served, any ferry services across the Forth, or the process by which the bay was then used as landfill. The implication is that the wharves were relatively small, local enterprises. It is interesting to note that in all the images of the wharves in use, there is never more than one vessel berthed, and there appears to be little traffic on the roads and railways they serve.
- 4.1.10 The Statistical Accounts for Inverkeithing (which include the parish of Rosyth) make little mention of the bay, ferries, wharves or industry related to them. The Old Statistical Account (OSA, 1791-99, vol 10) merely indicates the presence of the bay between Rosyth Castle and North Queensferry, commenting that the name (St Margaret's Hope) refers to Queen Margaret, wife of Malcolm III. No mention is made of a harbour or ferry of any description. By the time the New Statistical Account was produced in the middle of the 19th century, it seems likely that any ferry would have been active, but again no mention is made of it (NSA, 1834-45, vol 9). The only mention is of the fact that the name of the bay supposedly is the result of an incident when Queen Margaret had to land in the bay during a storm.
- 4.1.11 The results of the desk-based assessment seem to suggest that the two wharves within the bay were relatively short-lived and not of great significance. Whilst they must have had a role in the transport of stone from the quarries behind them, this does not appear to have been a massive industry at this location, and the second wharf in particular (the specific study of this phase of work) was relatively short lived, being constructed sometime between 1896 and 1909 (and most likely well before 1909), and then probably went out of use in the 1930s.

5 Results of Fieldwork (Illus 3)

5.1 General

- 5.1.1 The evaluation was focused on the southern wharf, the later of the two discussed above. Whilst on site however, the opportunity was taken to survey in the visible remains of the northern wharf, and also upstanding concrete posts which lay to the south-west of the wharf. These are discussed briefly below.

5.2 Southern wharf (Illus 4)

- 5.2.1 One trench was excavated alongside each side of the wharf, one on the surface, and the vegetation was cleared away from the south-eastern (seaward) side (Illus 5). The

three trenches revealed the structure and construction method of the wharf. On the north-western side, Trench 1 (Illus 6) was 12.20 m in length extending from the visible remains on that side of the wharf. Following excavation to a depth of 1.90m, the water table was encountered and excavation ceased. Approximately 9 m from the upstanding (??) original corner of the wharf, deposit c.002 appeared, extending back to the north-east. This deposit comprised a silty clay probably *in-situ* estuarine deposits. The interface between this and deposit C001 above may indicate the original waterline prior to the bay being in-filled. Deposit C001 comprised dark sandy silt with a high concentration of ash throughout with large amounts of broken glass, mostly bottles, china, tableware, tin cans, plastic bottles and other general domestic debris. At the south-western end of the trench the final depth of this deposit was not ascertained. Local tradition holds that this area was used for dumping material from a nearby papermill (close to Inverkeithing harbour), which may account for the high concentration of ash.

- 5.2.2 The wharf structure (C003) revealed along the side of the trench was constructed from large roughly dressed whinstone blocks, laid in rough courses but with no formal bonding longer visible or present. Some of the larger blocks measured up to 0.80 m by 0.50 m by 0.50 m. The facing surface of the blocks had been dressed and was flat and even. There did not appear to be any appreciable batter to the face of the wharf. About 9 m from the terminus of the wharf (roughly the same point that C002 begins to appear), the well-built structure became much looser, with large amounts of rubble present in the section, and no obvious face to the structure. It is thought that the wharf had either collapsed or been dismantled at this point.
- 5.2.3 To the south-east of the wharf, Trench 2 measured 10.60m in length from the southern corner of the wharf, to the north-east. The face of the wharf C003 was revealed within this trench, demonstrating the same construction of large roughly shaped blocks. Estuarine silts (c002) were visible at a depth of around 1.60 m, 5.00m to the north-east of the corner of the wharf, where similar deposits of domestic waste (c001) were revealed. Again, ground water was encountered at a depth of around 2m, and excavation ceased at this depth. A sondage was then excavated within the trench below the level of the water, using the JCB bucket to test the full depth of the stone foundation. While the full extent of the foundation was not visible, the machine driver was able to note the depth at which bucket encountered soft deposits rather than the stone construction of the wharf. This occurred at a depth of 4.40 m below the top of the wharf. It was also possible to examine the material being removed from the sondage, and from this establish that the river silts (c002) were encountered to the foundation courses of the wharf with no indication that the wharf had been constructed upon natural gravels or bedrock.
- 5.2.4 Following the discovery of high groundwater levels, it was decided that excavating into the area on the seaward side of the wharf would only reveal further ground water. Therefore, it was considered more effective to concentrate on clearing back the vegetation from this area to more fully reveal the structure. What this revealed was a series of wooden uprights, 0.40 m square, deeply embedded in the ground and aligned with the wharf. There were five uprights present, although the location of a sixth, now absent, was noted. Across the top was a large wooden lintel, comprising a single beam (Illus 8). The north-west corner of the wharf was badly damaged and collapsed, and although the uprights along this section were still *in-situ*, the lintel had collapsed and was badly decayed in places. Where the lintel and uprights joined,

iron fittings were visible attaching the two, and where the upright was absent, the fittings were visible fixed into the wharf.

5.2.5 These wooden features form a protective timber framework (C004) on the wharf (Illus 9). This protective superstructure, attached in this case to the seaward elevation, was to protect both the wharf itself and the vessels berthed alongside. There was no evidence found during excavation to suggest it had ever been present along the sides of the wharf, and this fits with the evidence seen in the photos from the early 20th century, where the framework can be clearly seen on the seaward side of the wharf.

5.2.6 A final shallow test trench was excavated on the surface of the wharf (Trench 3). Below the surface vegetation a layer of irregularly shaped quarried stone (C006), was revealed with individual stones generally measuring less than 0.05 m by 0.05 m by 0.05 m. This deposit was c 0.30 m in depth. Underlying it was a layer of larger stones (C005), similarly quarried, and measuring c0.10m by 0.10m by 0.20m. The smaller stones of c.006 appear to comprise a surface for the wharf, although it is likely that further compacted layers would have overlain this deposit when the wharf was in use.

5.3 *Northern wharf*

5.3.1 The visible remains of this wharf comprise an L-shaped length of wall face, overgrown with vegetation and constructed from blocks similar to those from which the southern wharf was constructed. No evidence of a wooden pier was noted.

5.4 *Concrete foundations*

5.4.1 Approximately 140 m to the south-west of the southern wharf, close to where the reed beds of the former bay become much more extensive, five small square concrete foundations were identified (Illus 10). They measured c 0.40 m across, and were aligned south-west – north-east. These foundations are thought to relate to the remains of a pier on the southern side of the bay constructed between 1915 and 1927 on the basis of map evidence. This coincides with a period during which there is considerable development on the southern side of the bay with further railway construction and the construction of several large buildings (Illus 2, OS 1927 map).

6 **Conclusions**

6.1.1 The evaluation has established that the wharf survives in good condition although partially buried by landfill which mainly comprises domestic refuse and ash from a large paper mill currently being demolished nearby in Inverkeithing. The protective timber framework visible in a contemporary photograph of the wharf also still survive largely intact, although a portion on the north-west corner is somewhat damaged. Estuarine silts were encountered at a depth of around 2 m and overlain by the landfill. This sequence is similar to the one revealed during a previous archaeological watching brief (Farrell 2000). This evaluation has recorded the construction of the wharves and the industrial activity in the area and demonstrated that no earlier features or structures are present.

6.1.2 The trial trenching and desk-based study suggests that the wharf was of low importance, even when in use, with few records relating to it and no indication that it

was ever a major location for the shipment of goods. It seems that it was intended for the movement of small amounts of locally quarried stone and potentially coal. As such, there were few associated structures, with only a single long building lying to the rear of the wharf. Overlaying the current road layout onto the 1927 OS map and onto the survey of the surviving remains shows that building would lie under the route of the current track down from the B981 road to the east (Illus 11). This track slopes down steeply from the main road, and much of the width of this, and the A90 even further east, was built up extensively during its construction in the late 20th century. The embankments visible today overlie over the location of the buildings that once served the two wharves.

7 References

7.1 *Bibliographic References*

Farrell, S 2000 St Margaret's Bay. Waste Water Treatment Work. Archaeological Watching Brief (Unpublished Client Report)
'United parishes of Inverkeithing and Rosyth' in New Statistical Account of Scotland: vol 9, 1834-45
'The parish of Inverkeithing' in Old Statistical Account of Scotland: vol 10, 1791-99
Transport Scotland 2010 *Forth Replacement Crossing*. 'Competition for the Land Based Invasive and Non-Invasive Archaeological Survey and Evaluation Contract Volume 2: Tender Document'
Turner Simpson, A & Stevenson, S 1981 Historic Inverkeithing. Scottish Burgh Survey

7.2 *Cartographic References*

Greenwood, C, Fowler, W & Sharp, T 1828 Map of the Counties of Fife and Kinross

1856 (surveyed 1854) *Fifeshire Sheet 39* 1:10560
1896 (surveyed 1895) *Fifeshire Sheet XLIII.2* 1:2500
1915 (surveyed 1913) *Fifeshire Sheet XLIII.2* 1:2500
1927 (surveyed 1925) *Fifeshire Sheet XLIII.2* 1:2500
1961 (surveyed 1960) *Sheet NT1281 and NT 1381* 1:2500
1967 (surveyed 1965) *Sheet NT1281 and NT 1381* 1:2500
1967 (surveyed 1966) *Sheet NT1081 and NT1181* 1:2500
1992 (surveyed 1991) *Sheet NT18SW* 1:10000

8 Appendices

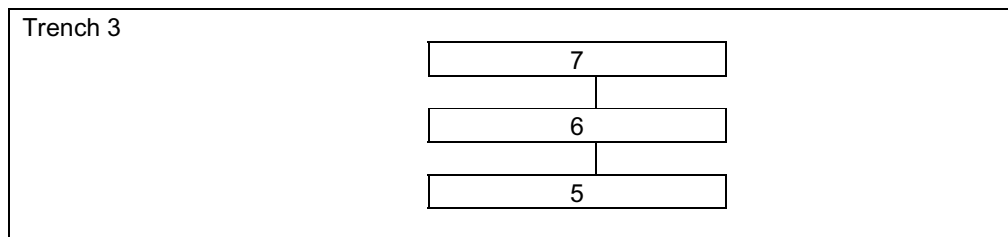
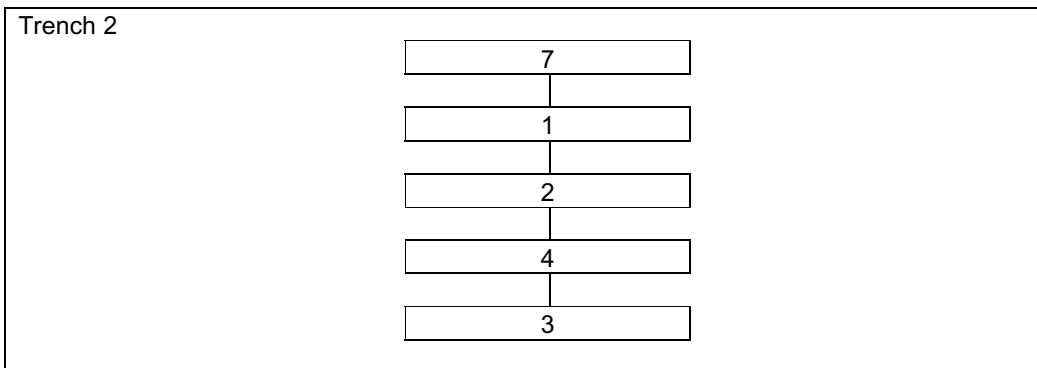
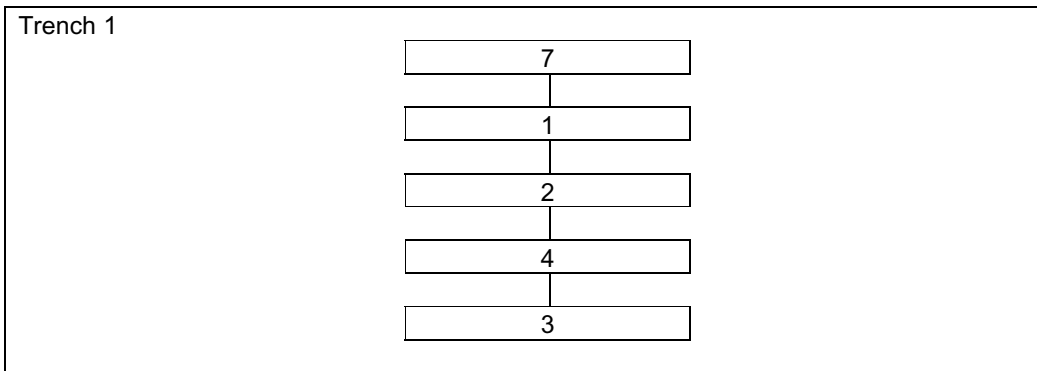
Appendix 1: Trench Register

Trench	Length (m)	Maximum depth	Description
1	12.20 m x 2 m	1.90 m	Excavated alongside north-west side of wharf, to depth of 1.90 m. Revealed substantial stone built structure, with relatively modern landfill deposits abutting it, overlying in situ silt deposits which would have once been at the edge of the River Forth. On the landward (north-east) side, the structure of the wharf appeared to have been deliberately demolished or removed. Ground water encountered at depth of 2m and excavation stopped.
2	10.60 m x 2 m	4.40 m	Excavated alongside south-east side of wharf, to depth of 2.20 m. Revealed substantial stone built structure with same deposits present as to northern side of wharf. In situ river silts appear at north-east end of trench, c 2m down from top of wharf. Ground water was encountered at roughly the same depth and the excavation stopped. A sondage was later excavated below the level of ground water, and the foundation of the wharf was reached at a depth of c 4.40 m below the top of the wharf.
3	3 m x 3.20 m	0.40 m	Excavated on top of wharf to depth of 0.40 m. Revealed internal construction of wharf – layer of large irregularly shaped blocks, covered with layer of much smaller stones.

Appendix 2: Context Register

Context	Location	Description
1	Trenches 1 & 2	Loose light greyish black sandy silt with high ash content. Contains large amount of domestic waste, of seemingly recent date – glass, bottles, food containers, plastic bottle, some pipe fittings, lighting units etc. Material is the result of landfill at the site, which took place from the 1930s onwards. At the south-west end of the wharf the deposit was not bottomed, however, where river silts were encountered at the base of the trenches, it was found to be 1.30 m deep. Abuts wharf structure [003].
2	Trenches 1 & 2	Dark greyish brown firm silty clay. Not bottomed. Probable in situ river silts. Abuts wharf structure [003]
3	Trenches 1 & 2	Stone structure of wharf. Comprises stone retaining wall constructed of very large roughly faced stone blocks, up to 0.80 m x 0.50 m x 0.50 m. The stones were more carefully shaped on their outer (visible) face, whilst the back faces were more rough. Each course is made up of some squared blocks, with the spaces between filled by more randomly shaped stones. No bonding was visible between the stones. At least 5 courses were visible above the level of ground water, but the full depth was not seen. The wharf is thought to be 4.40 m deep. The structure is abutted by wooden posts [004] on its seaward side.
4	Seaward side of Wharf	Wooden uprights and lintel abutting south-western side of wharf structure, forming a protective framework. The uprights are 0.40 m square and are presumed to reach at least as far as the stone wharf structure into the ground. The lintel is 0.25 m square, and there appears to be a second lintel lying above it which has been lost. On the western corner of the wharf, the protective framework did not survive well although two uprights were still visible in the ground. There were iron brackets tying together the uprights and cross beams, which then were embedded in the stones of the wharf [003]. The purpose of the protective framework was to protect the structure of the wharf from vessels when they were mooring, and also to protect the vessels from being damaged.
5	Trench 3	Layer of medium to large quarried stones (0.20 m x 0.10 m x 0.10 m) forming top of wharf, contained by structure of wharf [003]. Probably forms much of body of wharf, faced by wharf walls [003]. Overlain by deposit C006 probably forming surface of wharf.
6	Trench 3	Layer of small 'Type 1' style stones (0.05m x 0.05m x 0.05m) overlying larger stones on wharf, forming surface.
7	Trenches 1, 2 & 3	Vegetation and thin topsoil present over whole site. Mostly bracken and reeds with rotting leaf matter.

Appendix 3: Trench Matrices

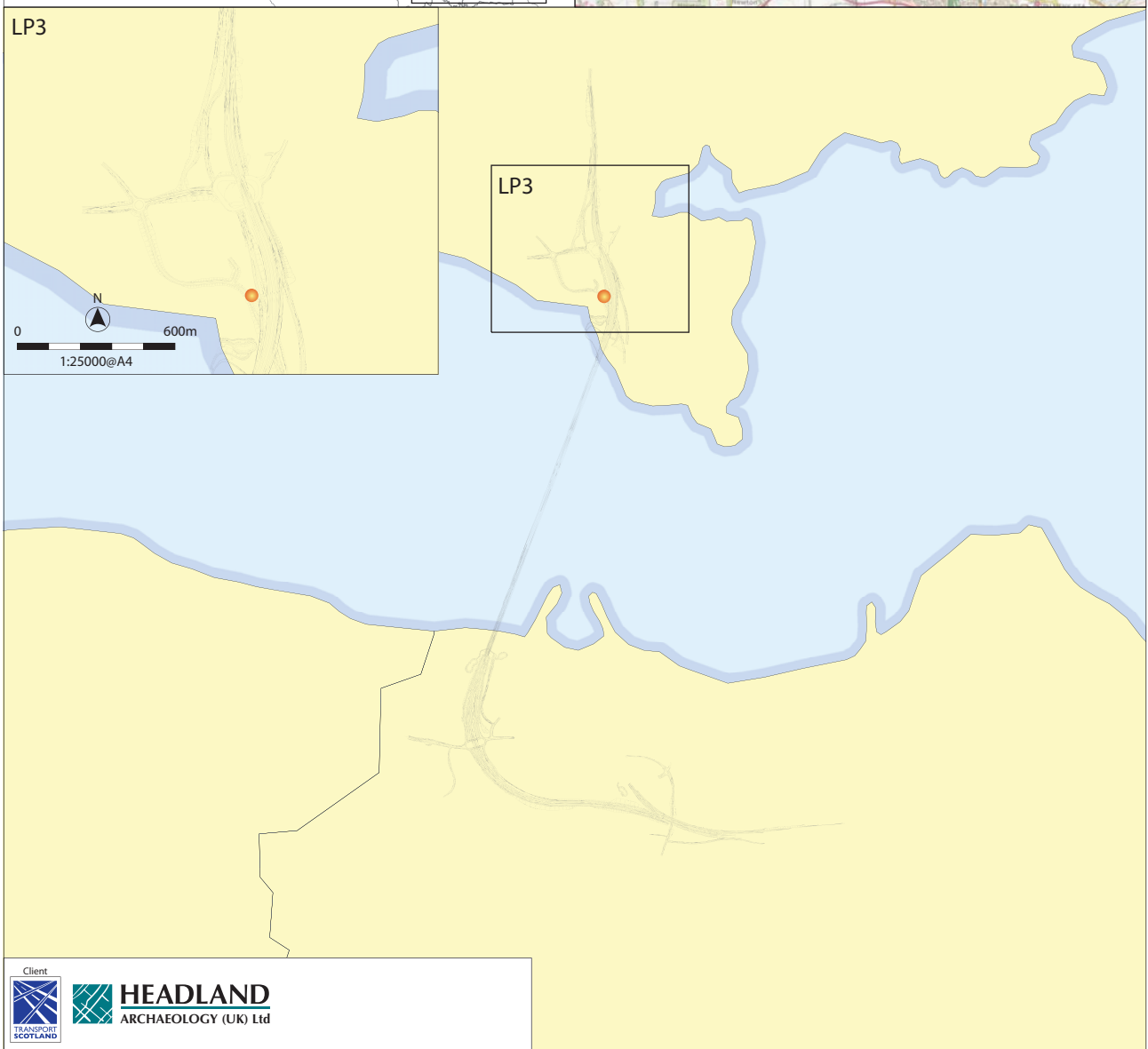
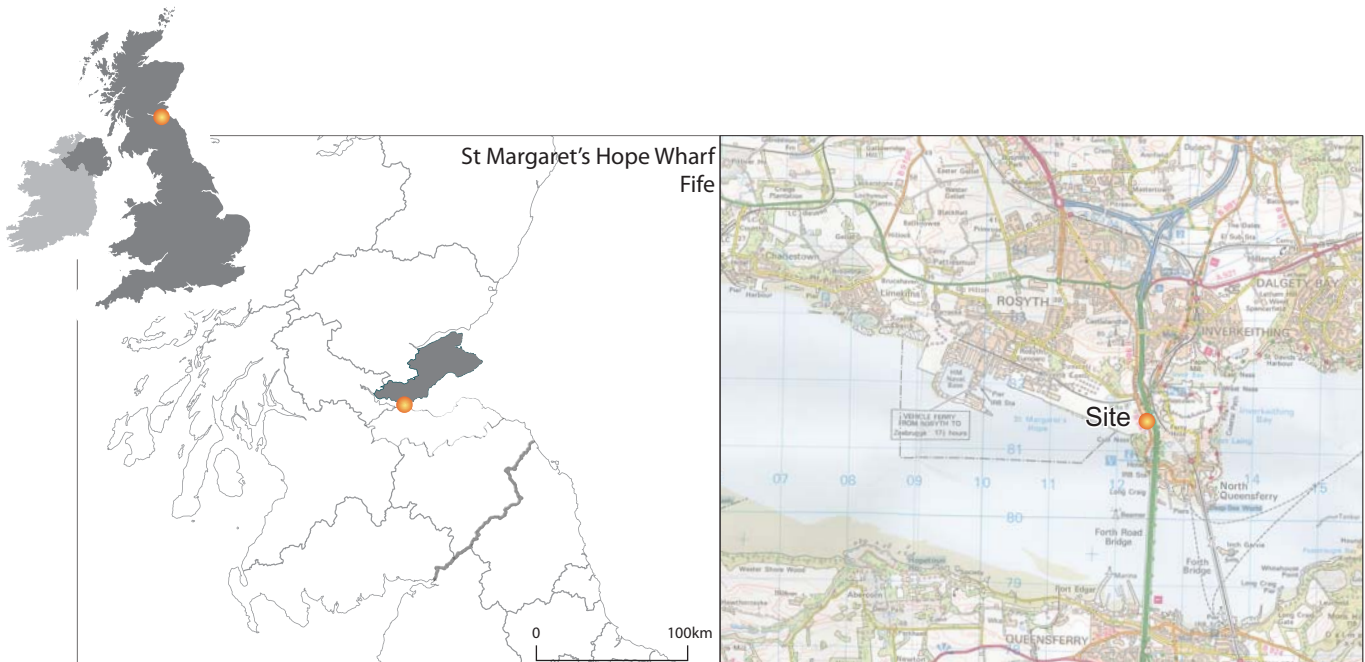


Appendix 4: Photographic Register

Photo	Direction	Description
1	-	ID Shot
2	NE	Pre-condition shot of wharf
3	NW	Pre-condition shot of wharf
4	NW	Pre-condition shot of wharf
5	NE	Pre-condition shot of wharf
6	NE	Pre-condition shot of wharf
7	SW	Pre-condition shot of wharf
8	NE	NW-facing elevation of north-west side of wharf, 0-5m
9	NE	NW-facing elevation of north-west side of wharf, 0-5m
10	NE	NW-facing elevation of north-west side of wharf, 5-10m
11	NE	NW-facing elevation of north-west side of wharf, 5-10m
12	NW	SE side of wharf showing rising ground water
13	NW	SE side of wharf showing rising ground water
14	SW	General shot of Trench 1
15	NW	SE-facing elevation of south-east side of wharf, 0-3m
16	NW	SE-facing elevation of south-east side of wharf, 3-6m
17	NW	SE-facing elevation of south-east side of wharf, 6-9m
18	N	General shot of Trench 2
19	NE	SW-facing elevation of end of wharf, showing Trench 3
20	NE	SW-facing elevation of end of wharf
21	NE	Detail of iron bracket on upright, 1 st from south
22	NE	Detail of iron bracket on upright, 2 nd from south
23	N	General shot of seaward side of wharf
24	E	General shot of seaward side of wharf showing collapse/damage at western corner.
25	NE	Detail of iron bracket and stone with socket
26	E	Sondage in Trench 2
27	E	Sondage in Trench 2
28	E	Sondage in Trench 2
29	S	Shot of remains of pier to south
30	S	Shot of remains of pier to south
31	S	Detail of remains of pier to south

Appendix 5: Drawing Register

Drawing	Section	Plan	Description
1	1:50	1:100	Plan and section of Trench 1
2	1:50	1:100	Plan and section of Trench 2
3	1:50		SW-facing elevation of seaward side of wharf, showing detail of the protective framework



Client


HEADLAND
 ARCHAEOLOGY (UK) Ltd

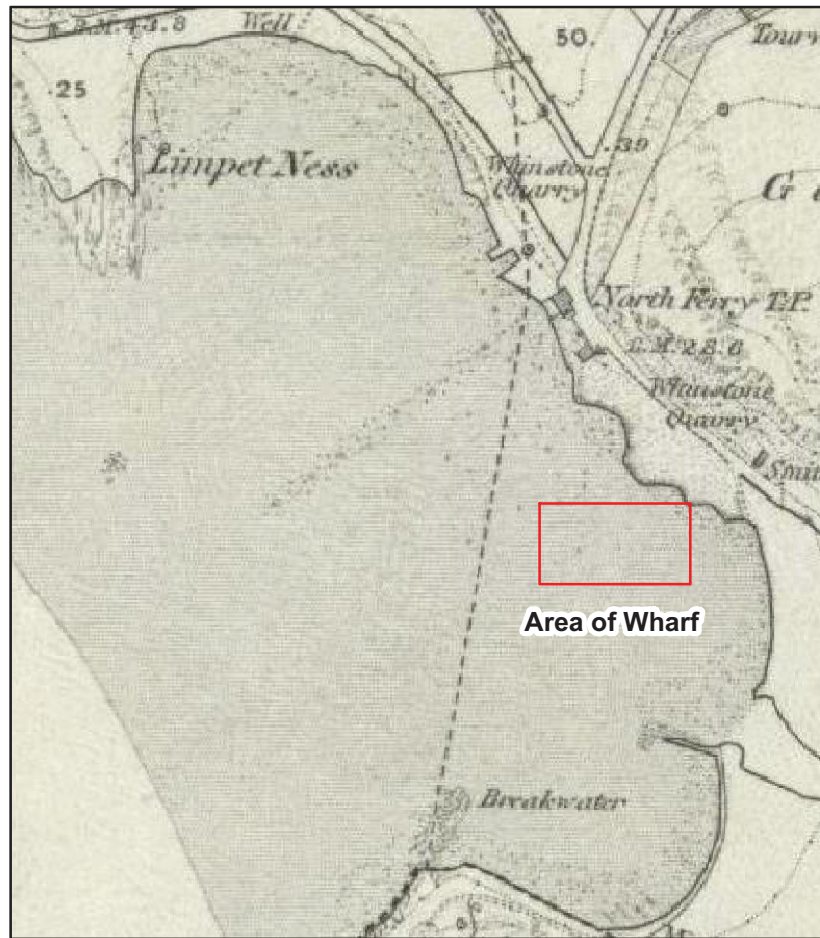
FORTH REPLACEMENT CROSSING, LAND PARCEL 3 (FRCE10)

Reproduced using 2005 OS 1:50,000 Landranger No. 65 and digital 1:10,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2010 All rights reserved. Licence No. AL 100013329

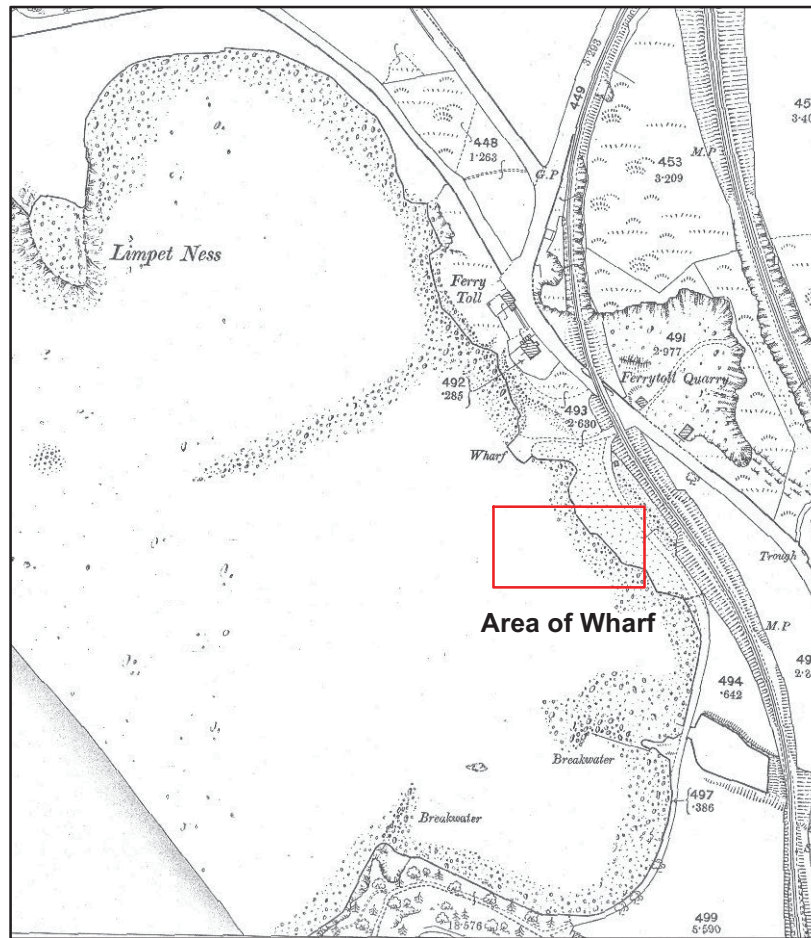
Scale 1:55,000 @ A4



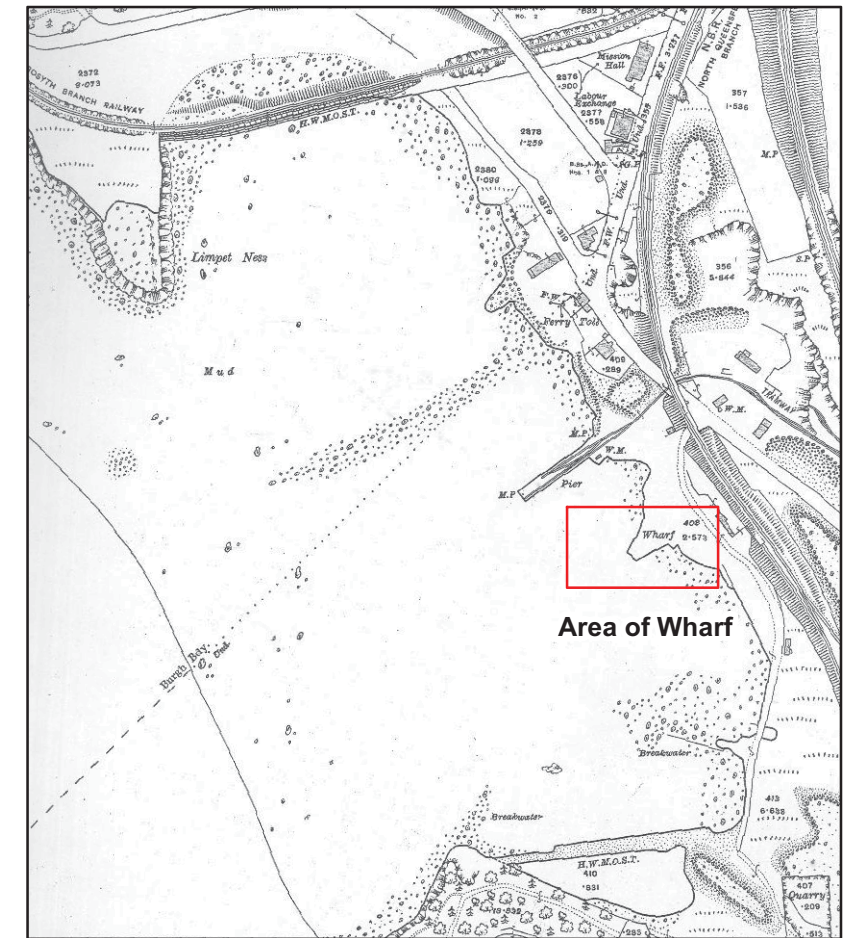
Illus 1
 Site location



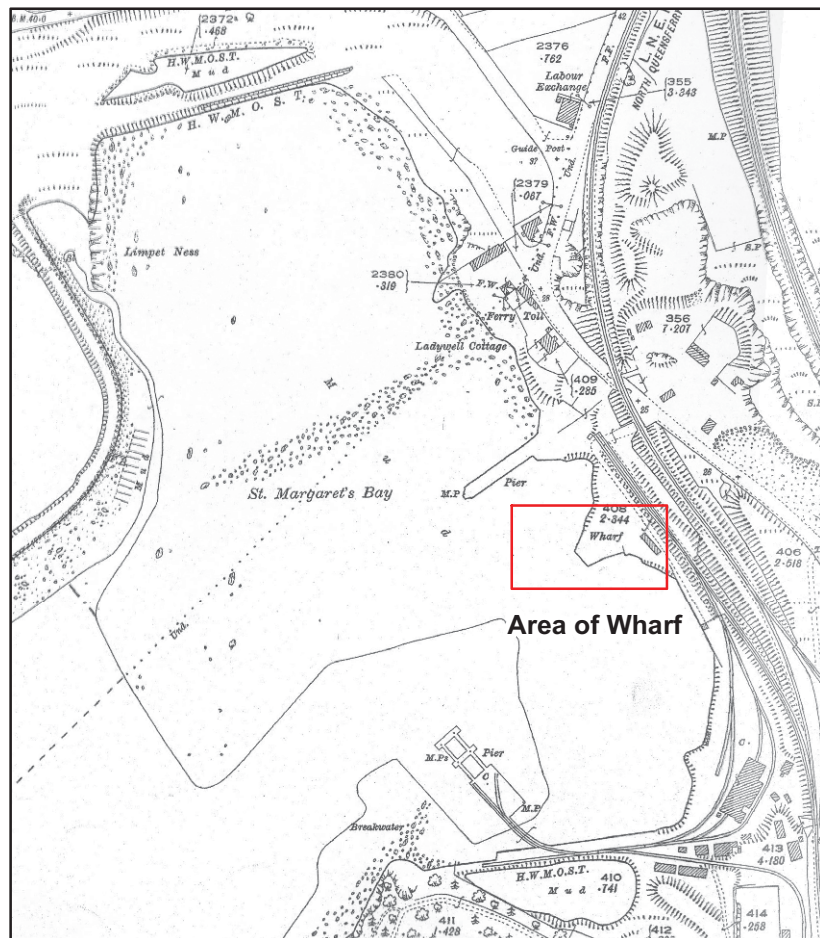
Ordnance Survey Map Published 1856



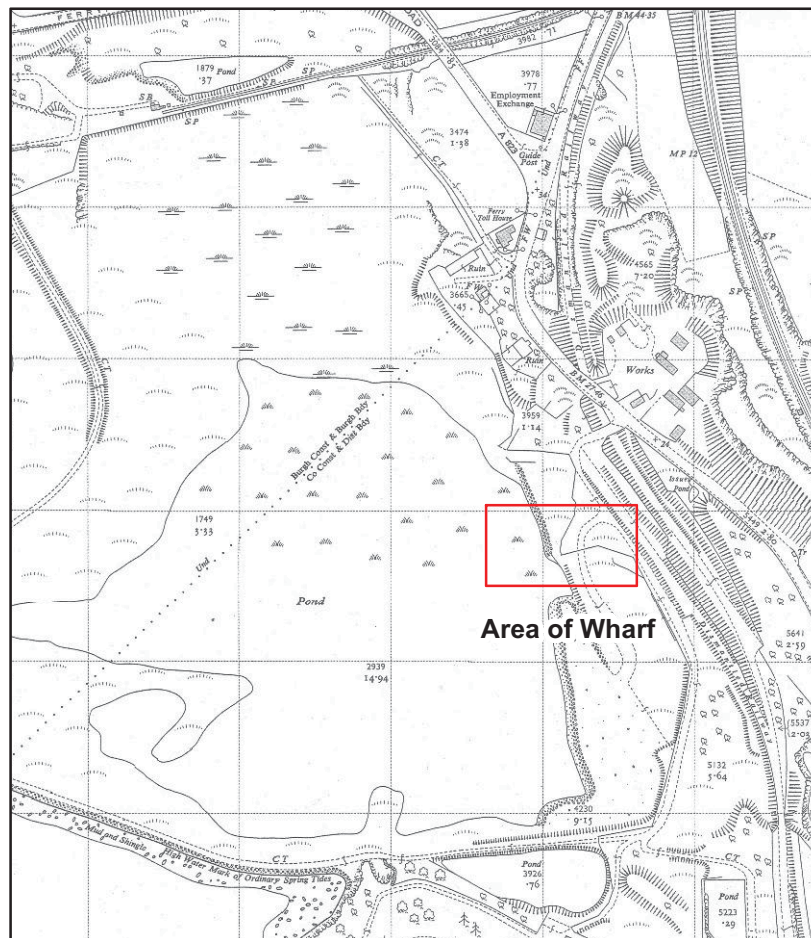
Ordnance Survey Map Published 1896



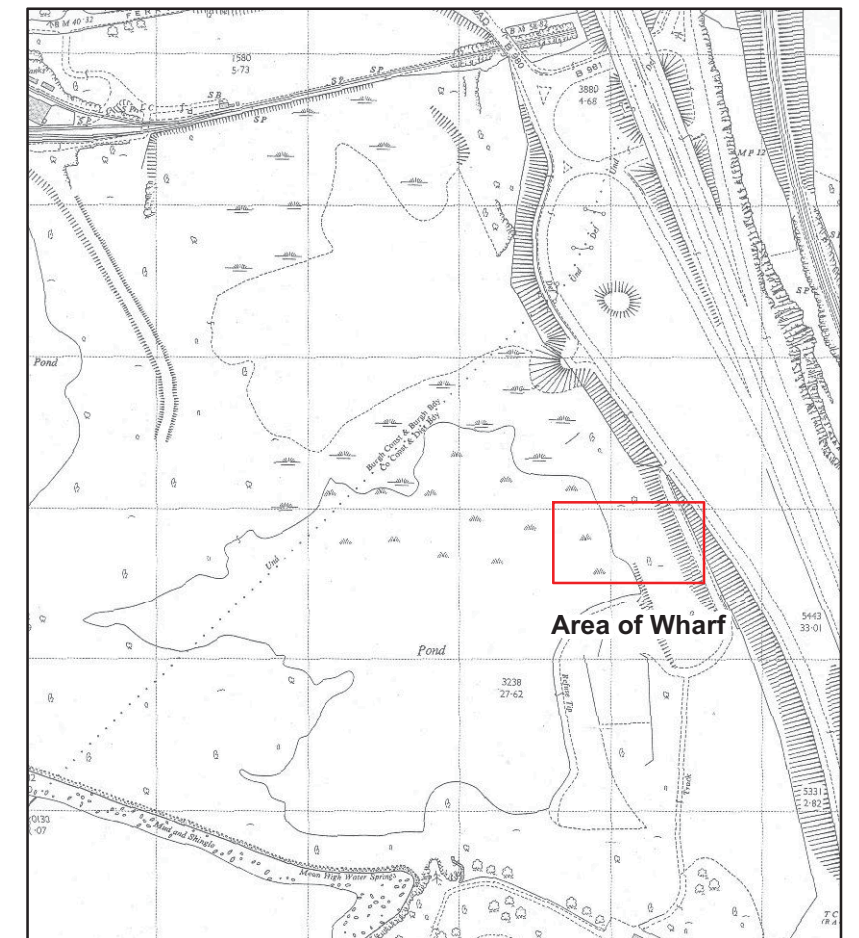
Ordnance Survey Map Published 1915



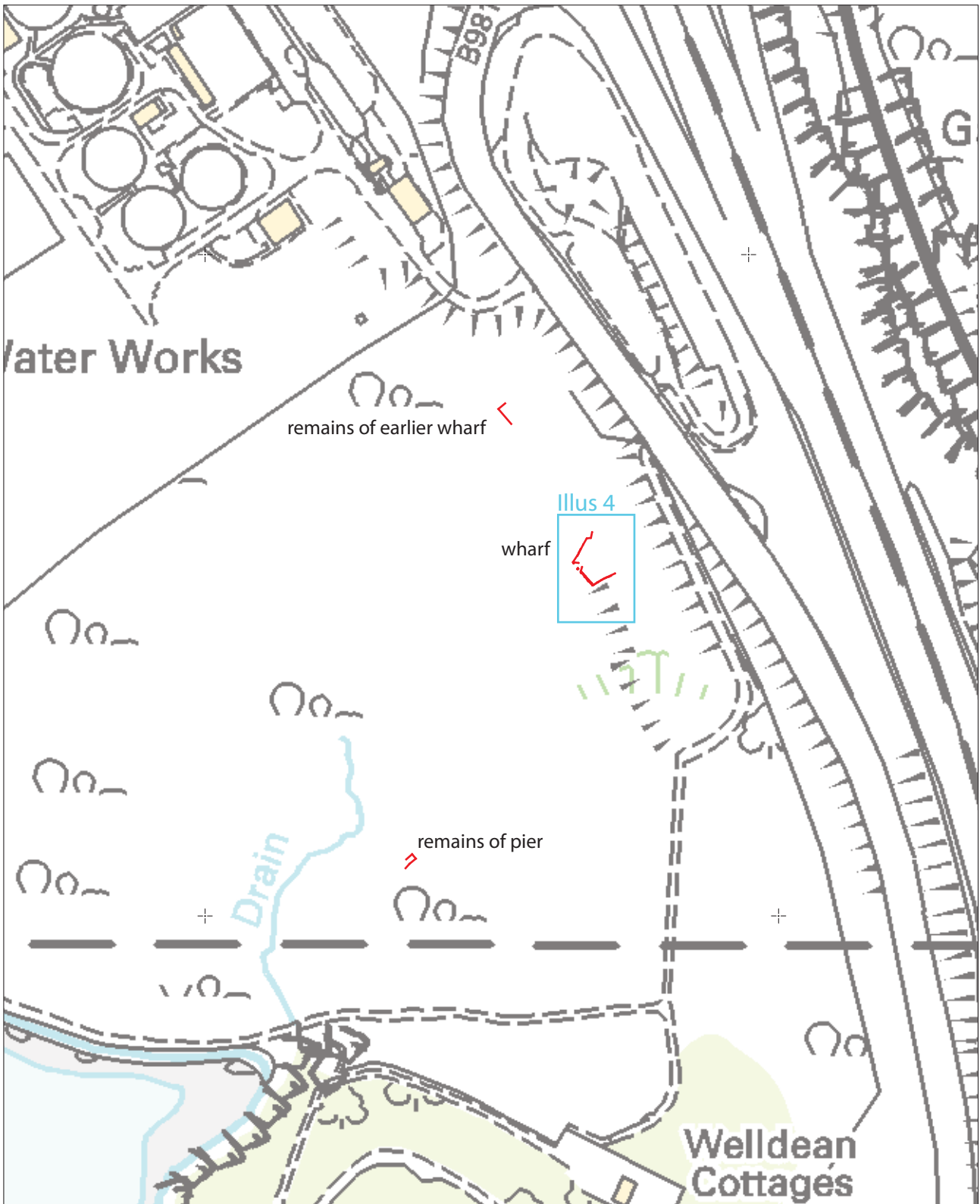
Ordnance Survey Map Published 1927



Ordnance Survey Map Published 1961



Ordnance Survey Map Published 1967



© Headland Archaeology (UK) Ltd



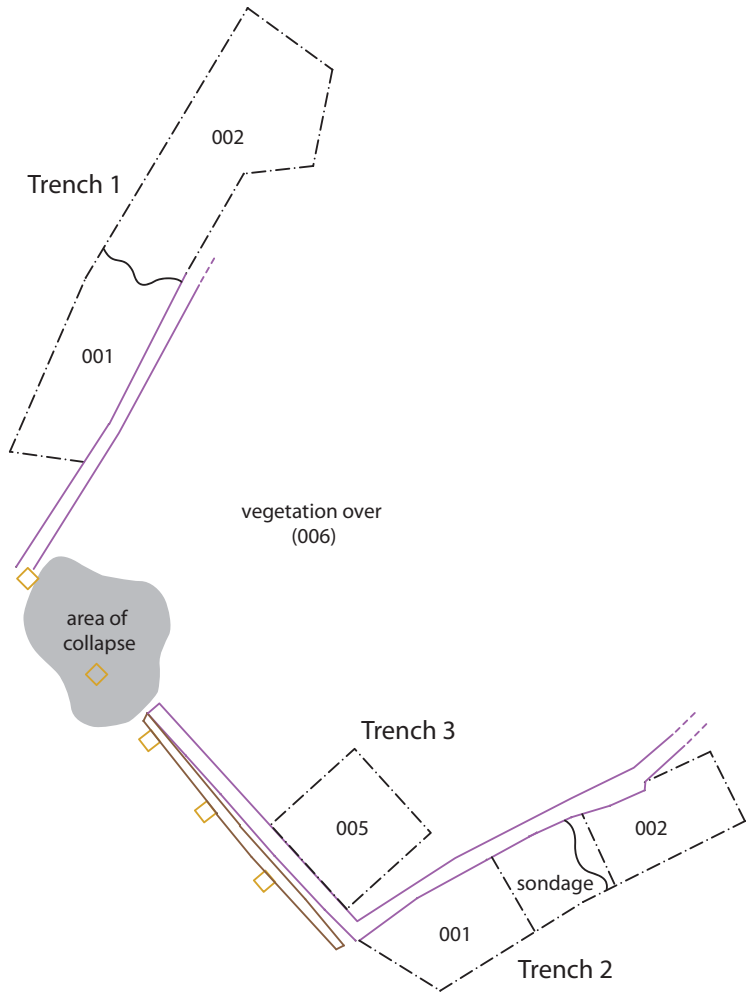
HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LAND PARCEL 3 (FRCE 10)

Reproduced using OS 1:10,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2010 All rights reserved. Licence No. AL 100013329



Illus 3
Wharf location



FORTH REPLACEMENT CROSSING, LAND PARCEL 3 (FRCE 10)
© Headland Archaeology (UK) Ltd 2010

Key

- uprights of branding
- lintel of branding
- wharf
- limit of excavation

0 5m
1:200 @ A4

Illus 4
Detail of wharf structure



Illus 5

Wharf from west, prior to clearing of vegetation



Illus 6

Trench 1 from north



Illus 7

SE elevation of wharf showing 'loose' nature of construction



Illus 8

Lintel of branding



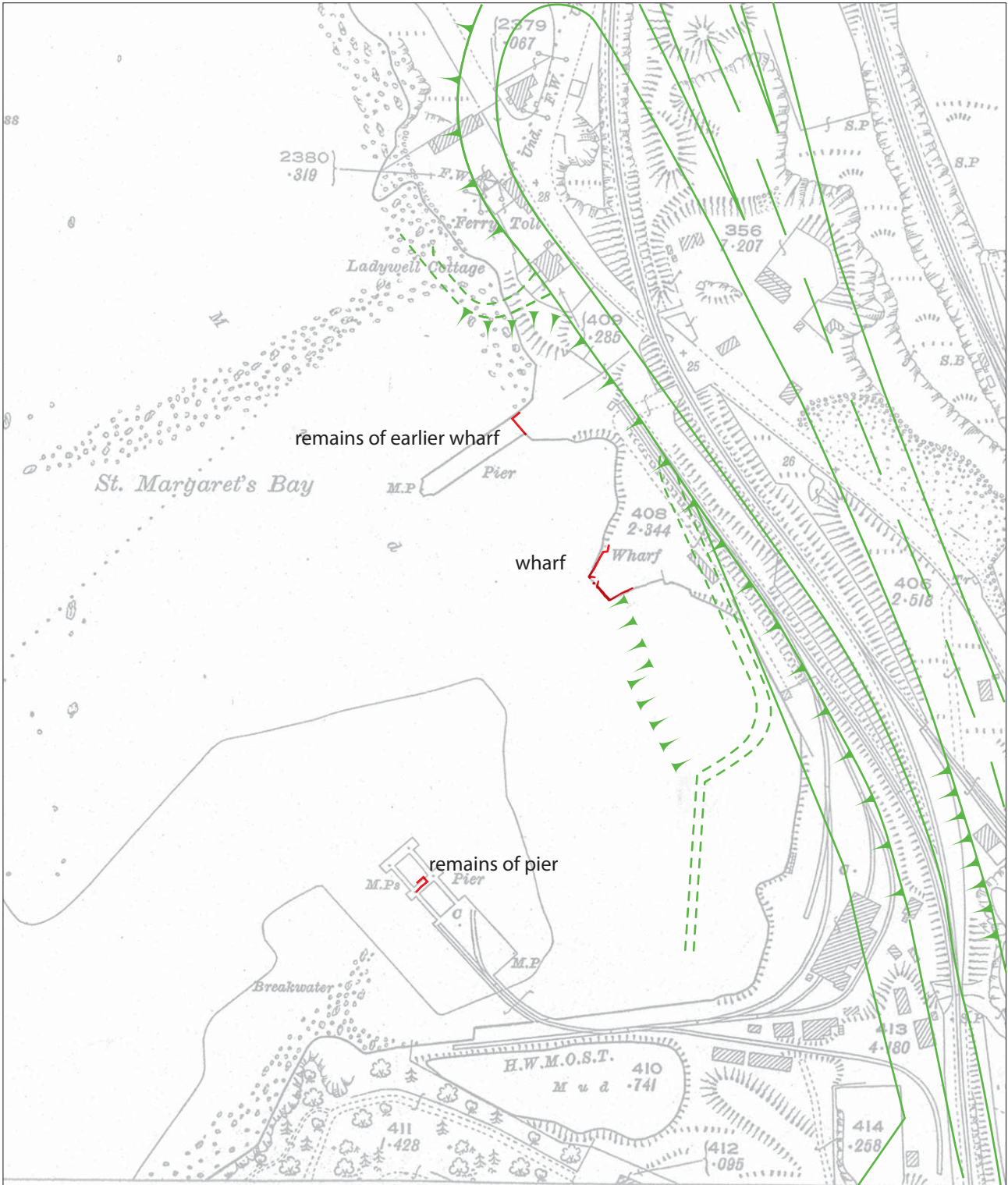
HEADLAND
ARCHAEOLOGY (UK) Ltd



Illus 9
Branding across front of wharf



Illus 10
Concrete remains of pier




© Headland Archaeology (UK) Ltd





HEADLAND
 ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LAND PARCEL 3 (FRCE 10)

Reproduced using OS 1:10000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2010 All rights reserved. Licence No. AL 100013329

 overlay of features from modern map

 N

 0 100m

1:2500 @ A4

Illus 11
Wharf location overlaid on 1927 OS Map

Project code: FRCE10
Client: Transport Scotland
Date: 7th January 2011

The Results of an Archaeological Field Evaluation by Trial Trenching of Echline Fields, South Queensferry

Archaeological Consultant: Jacobs / Arup
Report Authors: Jamie Humble, Edward Bailey
Report Status: Approved



Executive Summary

Headland Archaeology conducted an archaeological evaluation by trial trenching at Echline, South Queensferry, NT 11422 78220 (centred), to assess the presence/absence of archaeological features 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 189 trenches (17, 198m²) were excavated comprising a 7.5% sample across three fields. Trenches were targeted following assessment of the results of a geophysical survey undertaken between 30th August and the 16th September 2010 and also included trenches sited to ensure good spatial coverage. The trial trenching revealed a cluster of prehistoric features in the north-west sector of the evaluation area. The features comprised curvilinear features, pits, post-holes, some containing Neolithic Impressed Ware pottery, lithics and charred plant remains. Other isolated features were also revealed during the works; these included a pit (probably prehistoric) and a large stone-filled feature, possibly a medieval kiln.

ARCHAEOLOGICAL EVALUATION
Forth Replacement Crossing: Land Parcel 4, Echline Fields

PROJECT SUMMARY SHEET (FRCE10)

<i>Client</i>	Transport Scotland
<i>Consultant</i>	Jacobs Arup
<i>National Grid Reference</i>	NT 11422 78220 (centred)
<i>Project Manager</i>	Edward Bailey
<i>Text</i>	Jamie Humble Edward Bailey
<i>Environmental Assessment</i>	Sarah-Jane Haston
<i>Artefact Assessment</i>	Julie Lochrie
<i>Illustrations</i>	Anna Sztromwasser
<i>Evaluation Team</i>	Jamie Humble Ali Robertson Ross Murray Jurgen van Wessel Abby Mynett Calum Henderson Sandra Mulligan Guillem Marti
<i>Schedule</i>	
Fieldwork	27 th Sept – 15 th Oct 2010
Report	Jan 2011

CONTENTS

1	Introduction	74
	1.1 <i>General</i>	75
	1.2 <i>Project Background</i>	75
	1.3 <i>Aims and Objectives of the Archaeological Works</i>	75
2	Site Background	76
	2.1 <i>Archaeological and Historical Background</i>	76
	2.2 <i>Site Topography and Land Use</i>	77
	2.3 <i>Site Geology</i>	77
3	Methodology	77
	3.1 <i>General</i>	77
4	Results of Fieldwork	78
	4.1 <i>Trial Trenching</i>	78
5	Finds Assessment	80
	5.2 <i>Prehistoric Pottery</i>	80
	5.3 <i>Lithics</i>	80
	5.4 <i>Medieval and Modern Finds</i>	80
	5.5 <i>Discussion</i>	81
	5.6 <i>Recommendations for Further Work</i>	81
6	Palaeoenvironmental Assessment	81
	6.2 <i>Method</i>	81
	6.3 <i>Results</i>	82
	6.4 <i>Discussion</i>	82
	6.5 <i>Recommendations</i>	84
7	Conclusions	84
8	References	85
9	Appendices	86
	<i>Appendix 1: Trench Register</i>	86
	<i>Appendix 2: Context Register</i>	93
	<i>Appendix 3: Environmental Results</i>	98
	<i>Appendix 4: Trench Matrices</i>	101
	<i>Appendix 5: Photographic Register</i>	108
	<i>Appendix 6: Sample Register</i>	114
	<i>Appendix 7: Drawing Register</i>	115
	<i>Appendix 8: Finds Register</i>	117
	<i>Appendix 9: Finds Catalogue</i>	118
	Illustrations	120

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) wherein the requirement for a programme of trial trenching was identified.

1.1.2 Between the 27th September and the 15th October, Headland Archaeology (UK) Ltd. undertook a programme of archaeological evaluation by trial trenching on Land Parcel 4 on the southern side of the landfall for the FRC. This project was managed by Edward Bailey (Project Manager), the fieldwork and reporting was overseen by Alistair Robertson (Senior Archaeologist) and Jamie Humble (Project Officer). Six 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 2009,).

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 (1993) (Archaeological Assessment Stages 1-2). Further information was also gathered during an archaeological watching brief of the Ground Investigations for the proposed scheme that was carried out during 2008 and 2009 by 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).

1.3 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;
- 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 The ES identified a total of 356 sites (within a study area ranging from 500m from the development corridor to 6km from the proposed main crossing), whilst an archaeological desk-based assessment of a wider study area undertaken at route corridor selection stage of the proposed scheme, identified a total of 1200 cultural heritage sites. The results from these studies show that the proposed development corridor and the wider study area collectively constitute 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 Evidence for prehistoric activity close to Land Parcel 4 includes two cairns which may date to the Neolithic or Bronze Age identified to the south-west (NGR 11180 78390, NMRS No NT 17NW 1.0) and to the north-east (NGR 11440 78620, NMRS No. NT 17NW20.0) of the Category C(s) Listed Inchgarvie House (Transport Scotland 2010, 31-32). The presence of such sites in this area is important as it has been suggested that such sites were associated with territorial ownership arising as a result of more settled domestic occupation and consequently, land ownership. Further to the east (NGR NT 12175 78184) of the area under discussion, recent excavations recorded Neolithic activity indicated by clusters of pits at Echline Place, South Queensferry (Kirby 2008).
- 2.1.3 Roman artefacts including several silver medals of Marcus Antoninus (138-161AD) and a sherd of Samian pottery were recovered within the vicinity of Inchgarvie House, whilst long cists which probably date to the early Medieval period were also identified during ground improvement and levelling works undertaken in the grounds of the house during the 19th century (Transport Scotland 31-32).
- 2.1.4 Further medieval activity has been recorded near the site, with the possible presence of medieval ruins suggested by the presence of a carved stone window, a square pillar and hewn stones uncovered near Inchgarvie House during the 18th century and later removed to Dunkirk (OSA: Vol 1, 238, 1791-9). The Royal Burgh of South Queensferry also has its origin in the medieval period.
- 2.1.5 The ES identified Land Parcel 4 as having a high archaeological potential and recommended that an earth resistance survey should be undertaken of the Land Parcel, the results of which would be used to inform the trial trenching. The resistance survey was carried out by Headland Archaeology (UK) Ltd during September 2010 and identified a number of geophysical anomalies across land parcels

4 and 5 (Harrison & Lyons 2010). Although none of these could be identified definitively as archaeological in nature without testing, the results of the survey facilitated targeted trial trenching of potential archaeological features.

2.2 *Site Topography and Land Use*

2.2.1 The south-west of the site was roughly ploughed at the time of evaluation, but the bulk of the site was primarily used as an amenity area, typified by rough grassland traversed by a series of pathways. The site is under the ownership of the Scottish Ministers.

2.2.2 The survey was divided into discrete areas informed by the location of topographical features such as field boundaries and fences: 'South-West Field' (ploughed) and 'Centre Field' and 'North Field' (grassland).

2.3 *Site Geology*

2.3.1 The results from the geotechnical investigations that were carried out demonstrate that the subsurface stratigraphy underlying the development corridor 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 areas of free-draining sands and gravels, where most of the archaeological features have been identified so far.

2.3.2 The solid geology of the site is typified by igneous alkali dolerite (BGS Livingstone 32W). 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 *General*

3.1.1 The total area to be evaluated was 229,307m² and 7.5% of this was investigated by trial trenching, the total area of which comprised 17,198 m². An indicative trench plan was agreed with the consultant archaeologists, Jacobs Arup. Targeted trenches were centred on geophysical anomalies identified during the earth resistance survey, whilst random trenches were sited to test blank areas and to provide good spatial coverage of the entire site. It was ensured that no trenches were placed close to overhead power lines running through the 'Centre Field' and 'North Field' of the site. This resulted in two 18m wide corridors running across the site that were not evaluated. During the works, a number of trenches had to be shortened to avoid encroachment into a 30m exclusion area relating to presence of a badger sett. Additional trenches were excavated in order to replace those shortened due to the proximity of the badger sett.

3.1.2 All trenches were individually numbered and a pole-mounted Trimble G6 differential GPS programmed with the relevant coordinates was utilised to identify and mark out the locations of trenches. The trenches were excavated using two 14 ton 360° tracked mechanical excavators, each fitted with 2m wide flat-bladed ditching

buckets. The machines were 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. 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 and black and white negative film, as well as digital.

- 3.1.3 Bulk soil samples were collected from secure archaeological contexts for processing and assessment. Where possible a minimum 30-litre sample was collected from each archaeological deposit and given a unique number (Transport Scotland 2010, 59). All finds were recorded by individual context and their cleaning, storage and conservation undertaken in accordance with the Institute for Archaeologists Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials (Transport Scotland 2010, 65-66).

4 Results of Fieldwork

4.1 Trial Trenching

- 4.1.1 One hundred and eighty-nine trenches were excavated within Land Parcel 4 (Illus 1 & 2) with a combined total area of 17,198 m². Full detailed descriptions of each trench and individual contexts can be found in Appendix 1 and Appendix 2. Results are summarised below.
- 4.1.2 Archaeological features were present in several areas. The greatest concentration of archaeological features was in the north-west corner of the site, in the North Field. Trenches in this area (Trenches 4-7, 20, 22, 189, 190 and 192) contained a total of 15 negative features (Illus 3a and 3b). This cluster of features were all located within an area that saw a change in subsoil from the hard boulder clays seen across the Centre and South-West Fields to more freely draining sugary sands and gravels.
- 4.1.3 Within Trenches 4 and 5 (Illus 2) a ditch [070, 072] and rubble drain [110] on the same N-S alignment were revealed. The ditch had steeply sloping sides and a rounded base, varied from 1.10m to 1.80m wide and survived up to 0.40m in depth. The deposit [071,073] filling the ditch was comprised of mid brown sandy silt. A large rubble [110] drain lay 1m to the east of the ditch [070, 072] in both Trenches 4 and 5.
- 4.1.4 Within Trench 6 (Illus 3a, Illus 4 & Illus 5a) a pit [040] and three curvilinear features [088, 102, 106] were revealed. The pit [040] was sub-circular in plan, measured 0.60m by 0.55m and was 0.25m deep. This pit contained a fill [041] of dark grey to black, charcoal rich, clayey sand from which large amounts of pottery, identified as Neolithic Impressed Ware (see Finds Assessment below) were recovered. The curvilinear feature [088] measured 1.05m by 0.35m and survived to a depth of 0.28m, while feature [102] measured 2.00m by 0.20m and survived to a depth of 0.22m. The curvilinear feature [106] was 0.40m wide and survived to a depth of 0.30m; it

measured a minimum of 1.30m in length and extended beyond the trench section. Both [088] and [102] had fill deposits [089 and 103] of dark brown sandy silt.

- 4.1.5 Trench 7 contained two sub-circular pits [076, 084] and a linear ditch [078] (Illus 3a). Pit [076] measured 0.50m by 0.48m and survived to a depth of 0.09m, it was filled with a single deposit of mid brown clayey sand [077]. Pit [084] was more substantial, measuring 0.88m by 0.80m, surviving to a depth of 0.51m; within its fill [085] of dark brown clayey sand occasional charcoal fragments were noted (Illus 6). The section of linear ditch [078], was oriented north-east to south-west, it was 0.65m wide, 2m long and extended beyond the trench section. It survived to a depth of 0.30m had steep sides and an uneven rounded base. Within the mid brown clayey sand fill [079] of this feature occasional flecks of charcoal were noted.
- 4.1.6 Within Trench 20, a single oval pit [034] with steep sides and an uneven base was recorded (Illus 3b, Illus 5b & Illus 7) measuring 1.15m by 0.90m and surviving to a depth of 0.36m. The fill [035] of pit [034] comprised dark brown loamy sand flecked with frequent charcoal and from which two sherds of prehistoric pottery were recovered.
- 4.1.7 Trench 22 (Illus 3b) contained two oval inter-cutting pits [036, 038]. Pit [036] measured 0.40 by 0.50m and pit [038] measured 0.52m by 0.45m the depths were 0.20m and 0.15m respectively. The primary fills [042, 039] of the features comprised homogeneous orange brown silty sand confined to the western end of pit [036] and the eastern end of [038]. These deposits were overlain by black loamy sand [037]. from which it was not possible to determine which pit was excavated first (Illus 8).
- 4.1.8 Trench 189, to the south of Trench 20 (Illus 3b) contained four features [082, 090, 096, 098]. Ditch [082] was aligned north-west to south-east, was 1.10m wide and was 0.35m in depth. It was not encountered in the trenches sited to the north and south. This feature contained two fills; a primary fill of dark brown clayey sand [087], which contained occasional charcoal fragments, and a secondary deposit of dark brown sandy silt [082], The remaining three features [090, 096, 098] had their termini present within the trench and extended beyond the trench section, but did not continue as far as the trenches to the north or south. These features were similar in size with a width of approximately 0.30m, both [090 and 098] survived to a depth of 0.15m deep, while [096] was 0.25m deep. The fills [091, 097 & 099] of all three features were also very similar comprising a brownish orange sandy silt. As only the termini were present it was not possible to ascertain if these features were linear features or elongated pits. All four features recorded in this trench were on the same NW-SE alignment and may be relict agricultural features.
- 4.1.9 Trench 190 (Illus 3a) contained a single oval pit [045] that measured 1.40m by 0.85m and survived up to 0.25m deep. The pit contained a single deposit [056] of dark grey clay.
- 4.1.10 Trench 78 contained a pit [030] (Illus 9) and curvilinear ditch [032]. Pit [030] was sub-circular in plan measuring 0.70m by 0.65m, surviving up to 0.60m deep. The single fill [031] of this pit comprised dark brown sandy silt with numerous fragments of charcoal present within it. The curvilinear ditch [032] was oriented north-south across the trench, with steep sides and a rounded base, measured 0.55m wide and survived up to 0.17m deep.

- 4.1.11 Trench 84 contained a single oval pit [002] (Illus 10) measuring 1.00m by 0.60m and surviving to 0.22m deep. The single dark brown clayey silt fill [003] of this pit was charcoal-rich, contained a variety of charred plant material (see Palaeoenvironmental Assessment below) and contained 51 sherds of prehistoric pottery and four pieces of worked flint including a late Neolithic oblique arrowhead.
- 4.1.12 A possible kiln was revealed within Trench 49 (Illus 11 & 12). This feature [051] was formed of a pit measuring 4.60 by 2.86m in and up to 0.69m deep with the possible flue 1.70m long and 0.15m deep running off to the north-east. The possible kiln contained a primary fill of greyish brown sandy silt [093], a silting deposit that indicates the kiln had been left open prior to the accumulation of overlying deposits. Overlying the primary fill was dark grey sandy silt [092] containing frequent large charcoal inclusions, and occasional inclusions of burnt bone, very large stones, coal and medieval pottery (see Finds and Palaeoenvironmental Assessments below). The upper fill deposit [052] comprised brown sandy silt which contained a large number of large stones (up to 0.60m by 0.40m) which may have been the remains of a masonry superstructure which had collapsed or been demolished into the bowl of the possible kiln. Two fragments of medieval pottery were recovered from deposit [052]. This feature was initially thought to be a possible grain drying kiln, however the environmental evidence recovered from the feature would seem to discount this (see Environmental Assessment below).
- 4.1.13 Located within the possible flue of [051] was a small cut feature [094] 0.75m in diameter and 0.15m deep. This feature was filled by a single deposit of light brown sandy silt [095] and overlaid by the upper fill deposit [052]. The exact stratigraphic relationship between features [051] and [094] was not possible to determine, as no definite evidence for truncation of either feature was visible in the excavated section, or in plan (Illus 11 & 12).
- 4.1.14 A possible wall was uncovered within Trench 94 (not illus) and further trenches (180, 183) were excavated on either side to ascertain its orientation. Excavation of this feature demonstrated a lack of structure to the stonework and an absence of bonding material. This along with the presence of other rubble field drains nearby and its location in a low lying area of site suggests that the feature is probably a large (up to 0.85m wide) silted-up rubble field drain.
- 4.1.15 Across the evaluation area a number of possible furrows were recorded [014, 016, 064, 066, 074, & 086]. The orientation of the furrows and the field drains were often on a similar alignment, suggesting that when the field drains were constructed the furrows were still evident as above ground features. The furrows were consistently filled with brown sandy silt [015, 017, 112] or brown clayey sand [065, 067, 075] from which no anthropogenic material was recovered.

5 Finds Assessment

Julie Lochrie

5.1.1 An assemblage of 413 finds (see appendix 9) was recovered, including 393 sherds of prehistoric pottery, 12 lithics, five sherds of medieval pottery and a modern clay pipe stem. The assemblage has been summarised below, by material type, with a detailed catalogue in Appendix 9.

5.2 *Prehistoric Pottery*

5.2.1 Prehistoric pottery was found in three trenches, Trenches 006, 020 and 084. All the prehistoric pottery has been identified as Impressed Ware and dates to between the middle and later Neolithic, c 3500 – 2900 BC, with sherds from around seven vessels recovered from features across the site.

5.2.2 Most of the sherds, 340 of the 393, came from Trench 006, pit fill [041]. Two vessels are present, one represented by substantially more sherds than the other, although without further detailed analysis it is unclear exactly how many sherds there are of each vessel. The first is a large vessel with a round/saggy based profile. It is decorated with impressed half moons on the upper body and linear incisions on the mid and lower body. The second is a large vessel of indeterminate profile with unusual twisted cord decoration.

5.2.3 The single vessel found in Trench 020, pit [035] is a horizontally rilled (corrugated) rim sherd, not a common decorative technique on Impressed Ware. The fabric is similar to the other prehistoric pottery from this evaluation and is also likely to be middle-late Neolithic in date.

5.2.4 Trench 084, pit fill [003] contained at least four vessels. Three of these are decorated with schemes including small impressed dots and twisted cord. A rather small, flat base sherd is present amongst the sherds, which is something found in other Impressed Ware assemblages and appears to be influenced by later Neolithic Fengate Ware of southern England (Lochrie 2010; Sheridan *forthcoming*). The late Neolithic arrowhead is also from this context.

5.3 *Lithics*

5.3.1 A small collection of flint and chert flakes were retrieved from several samples (see Appendix 9). Notable amongst these is a distal blade fragment and an oblique arrowhead. The oblique arrowhead indicates a Later Neolithic date.

5.4 *Medieval and Modern Finds*

5.4.1 A possible kiln found in Trench 49 contained two sherds of redware, and three sherds of white gritty pottery, dating the feature to between the 12th-15th centuries AD. A modern clay pipe stem dating to the late 18th/19th century was retrieved from Trench 65, context [014], and two small lumps of lead alloy of an indeterminate date were found in Trench 78, context [031].

5.5 *Discussion*

- 5.5.1 The prehistoric pottery from this evaluation has been identified as Impressed Ware of the mid to later Neolithic period. This pottery has been traditionally dated to the later Neolithic but as more is discovered it is clear that the pottery first appears in the mid 4th millennium, c 3500 BC (Lochrie 2010).
- 5.5.2 The large amount of this pottery found in pit [040] has close contextual similarities with the nearby site at Meadowend Farm, near Kincardine (Sheridan in Jones et al *forthcoming*). In this instance two pit groups were found, one group with pits containing large quantities of Impressed Ware, plus charred plant remains and charcoal. The material was interpreted as hearth sweepings and domestic remains, and despite a lack of structural settlement evidence is most likely related to settlement in the immediate vicinity (*ibid*).
- 5.5.3 The pottery associated with the possible kiln indicates that this feature dates to the medieval period (12th-15th centuries AD).

5.6 *Recommendations for Further Work*

- 5.6.1 Specialist analysis and reports are recommended for the pottery and lithics. The pottery and lithic assemblage provides an important contribution to understanding the occupation and pottery of the middle to late Neolithic in the Forth area, particularly when combined with other recent discoveries in the surrounding landscape, at Echline, South Queensferry (Johnson 2008) and Upper Forth Crossing (Jones et al *forthcoming*).
- 5.6.2 A short report by a medieval pottery specialist is recommended on the medieval finds which at present provide the only dating evidence associated with the possible kiln.

6 **Palaeoenvironmental Assessment**

- 6.1.1 Thirty-six samples were taken during the trial trench evaluation at Echline, South Queensferry, Edinburgh and sixteen were initially processed for palaeoenvironmental assessment. The samples were taken from the fills of ditches and pit features and the possible remains of a corn-drying kiln discovered during the evaluation. The assessment aims to look at what the palaeoenvironmental potential of the material is and what evidence this material is showing us for the activities which once took place at the site and to assess the viability of material recovered during processing for scientific dating (Transport Scotland 2010, 58).

6.2 *Method*

- 6.2.1 Samples were processed in laboratory conditions using a standard floatation method (cf. Kenward et al, 1980). All plant macrofossil samples were analysed using a stereomicroscope at magnifications of x10 and up to x100 where necessary to aid identification. Identifications were confirmed using modern reference material and seed atlases including Cappers et al (2006).

6.3 Results

- 6.3.1 The results of the sample processing are provided in Tables 1 (Retent finds) and 2 (Floatation finds) of Appendix 3. One sample, (023) was archaeologically sterile. Suitable material for AMS dating is also identified within each table. All plant remains were preserved through charring.
- 6.3.2 Charred cereal grain is present in a four of the samples processed (10, 13, 30 and 42) (see Table 2). The grain assemblage includes, primarily, hulled barley (*Hordeum vulgare*), with lesser amounts of oat (*Avena* sp.), spelt wheat (*Triticum dicoccum*), and rye (*Secale cereale*). These cereals are generally associated with later prehistoric, medieval and post-medieval occupation (Hillman, 1981). Grains of naked barley (*Hordeum vulgare var nudum*) were found in one sample and may relate to prehistoric occupation. A small number of grains were in such a poor state of preservation that identification was not possible; these are shown as Cereal indet (see Table 2).
- 6.3.3 Weed seeds were generally sparse, found in limited amounts in three samples (1, 10 and 30) (see Table 2). The most commonly recovered seeds include heath bedstraw (*Galium saxatile*), wild radish (*Raphanus raphanistrum*), those of the fat hen family (*Chenopodium* sp.) and grasses (Poaceae sp.). They consist of typical ruderal/segetal species of Northern Britain, i.e. species associated with agricultural fields and disturbed ground. Other charred plant remains of interest include charred hazel (*Corylus avellana*) nutshell fragments recovered in occasional to abundant amounts from two samples (001 and 040).
- 6.3.4 Charcoal fragments are present in all fifteen samples producing archaeological remains, of which nine samples contained fragments of a size (larger than 1.0cm) suitable for identification and/or Accelerated Mass Spectrometry (AMS) dating (see Tables 1 and 2 for sample numbers and context information). The larger fragments of wood charcoal (>1cm) are suggestive of in-situ primary refuse from cooking or deliberately dumped fire debris. The smaller sized fragments (less than 1.0cm) may have been transported across the site by mechanisms such as windblow and surface run-off.
- 6.3.5 Finds such as pottery fragments and lithics including a flint arrowhead were recovered from the retent samples (See Table 1). For more information on these, please refer to the Finds Assessment by Julie Lochrie. Burnt bone was found in rare to occasional quantities in a limited amount of samples. Coal and cinders were recovered from three of the samples processed (28, 30 and 31) suggesting that coal was being utilised as a source of fuel.

6.4 Discussion

- 6.4.1 Charred cereal grain was found in only a limited number of the samples processed. Mostly these were small quantities of poorly preserved grain. The presence of a number of arable weed species within samples containing charred grain suggests that these taxa were being accidentally collected with the cereals during harvesting and have then been discarded when the grain is being used for domestic activities. No evidence was found for any processing of the cereals, such as chaff fragments, which could have provided evidence for activities such as threshing and winnowing.

6.4.2 The charred plant assemblages from four features are discussed below in relation to the different phases of activity on the site together with the other domestic materials recovered from the individual deposits.

6.4.2.1 *Prehistoric period*

6.4.2.2 The early prehistoric grain assemblage is represented by a small number of grains of naked barley, recovered in Sample 42 taken from the single fill (103) of the curvilinear feature [102]. Small quantities of charcoal up to 1cm in length were also recovered from the sample along with a chert artefact, possibly a core. The presence of these grains in the samples may provide evidence for the growth of crops, generally associated with the Neolithic and Bronze Age periods (Hillman, 1981).

6.4.2.3 Sample 001 was taken from the single fill (003) of pit [002]. Although no cereal remains were recovered, the sample showed a variety of charred plant remains. Large seed and seed pod fragments of heath bedstraw and wild radish are of a similar size to many cereals and their presence along with the grasses may indicate remains of small-scale processing. Other plant remains included occasional fragments of charred hazel nutshell and an abundance of charcoal fragments up to 2cm in length. The sample was also found to contain abundant sherds of prehistoric pottery and lithics including an arrowhead. This mixture of debris and charred plant material suggests the deposit may relate to domestic rubbish.

6.4.2.4 Sample 40, taken from the single fill (041) of pit [040] was found to contain an abundance of fragments of charred hazel nutshell fragments and frequent amounts of charcoal up to 1cm in length. Charred hazel nutshell is also present in small quantities in Sample 001 and is a ubiquitous find from prehistoric sites across the British Isles and Ireland. Hazel nuts would have been easy to gather from woodland and would have provided a dietary supplement to the domestic foodstuffs (e.g. cereal grain) with hazel nuts a good source of protein and fat (McComb and Simpson, 1999). These remains suggest the nuts were utilised on a small-scale throughout the occupation of the site. A large number of pottery sherds, the remains of two vessels, were also recovered from the deposit, along with lithic material.

6.4.2.5 *Medieval*

6.4.2.6 A number of samples were found to contain grain assemblages dominated by hulled barley and oat. The change in cultivation from the use of naked barley to hulled barley is thought to have taken place during the Bronze/Iron Age Period (Hillman, 1981). Hulled barley and oats were main cultivars during the medieval period in Scotland and are still cultivated today.

6.4.2.7 Sample 010 was taken from the charcoal-rich single fill of pit [030]. The sample was found to contain the largest assemblage of any of the samples processed. Cultivated plant remains included, primarily hulled barley, with lesser amounts of oat, spelt wheat and rye. The deposit also contained occasional fragments of burnt bone and an abundance of charcoal up to 2 cm

in length. The collective assemblage from the deposit may suggest either the in-situ or deliberately dumped remains of a cooking event.

6.2.4.7 Samples 030 and 031 were taken from the fills (092 and 093) of the possible remains of a grain drying kiln [051]. Charred plant remains from the two samples included a small number of oat and hulled barley and a single grain of spelt wheat along with infrequent charcoal fragments and abundant coal and cinders. The samples were also found to contain fragments of burnt bone and three sherds of medieval pottery (see Finds report for details). The paucity of charcoal and charred cereal grain indicate the feature may not be a corn-drying kiln; where such materials are often found in greater amounts. The presence of substantial coal and cinders, together with burnt bone fragments and pottery sherds suggest the material within the feature may relate to a domestic rather than an agricultural context.

6.5 *Recommendations*

6.5.1 The plant macrofossil evidence produced in the above samples shows good levels of preservation and indicates that there is good potential for further environmental evidence both from prehistoric and medieval features excavated during the evaluation for further information on cereal cultivation and the exploitation of wild food resources from these periods.

6.5.2 The primary value of the charred cereal grain and charcoal fragments recovered from the processed samples will be as a source of dating evidence. If wood charcoal were selected for radiocarbon dating, identification of the species represented would need to be undertaken prior to dating, this will also provide palaeoenvironmental data on the tree species used and aid in characterising the woodland resource of the area.

7 **Conclusions**

7.1 The evaluation has established that prehistoric remains, dating to the middle and later Neolithic period, exist in the north-western part of the site. These remains are very similar to those encountered in a similar evaluation for Transport Scotland prior to the construction of the Clackmannan Bridge, also on a terrace overlooking the Forth estuary. This site, Meadowend Farm, produced relatively few remains in the evaluation phase, but sufficient to prompt full excavation, which then found two large Neolithic pit groups, large quantities of Impressed Ware and at least 8 roundhouses of Bronze Age date (Jones et al forthcoming). The remains at Meadowend Farm were spread over a large area with gaps in between. The remains found at Echline Fields look very similar at this same evaluation stage, and appear to have the same potential to represent similarly dispersed and possibly intermittent prehistoric occupation.

7.2 Strangely, the only other features to survive on site, apart from the prehistoric ones, at Meadowend Farm were medieval kilns, although in that case the kilns were securely identified as corn-drying kilns. The possible kiln at Echline Fields is also of significance in representing the relatively rare remains of Scottish medieval settlement.

8 References

- 8.1.1 Cappers R.T.J., Bekker R.M. and Jans J.E.A. (2006) Digital seed atlas of the Netherlands (Barkhuis Publishing and Groningen University Library, Groningen).

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

Kirby, M 2008 *Echline Avenue, South Queensferry, Edinburgh*. Unpublished client report. CFA Archaeology Ltd.

Hillman G. (1981) Reconstructing crop husbandry practices from charred remains of crops, in Mercer R. (Ed) *Farming practice in British prehistory*. Edinburgh University Press, Edinburgh, pp.123-162.

Jacobs Arup (2009). Forth Replacement Crossing: Environmental Statement. November 2009.

Johnson, M 2008 '3.2 Pottery', in Kirby, M *Echline Avenue, South Queensferry, Edinburgh, Post-Excavation Archive Report No. 1552*. Unpublished excavation Report by CFA Archaeology.

Jones E, Sheridan A, Haston, S-J, Timpany S & Smith A forthcoming *Excavations at Meadowend Farm, Kincardine*. Headland Archaeology Monograph 1.

Kenward, H. K., Hall, A. R. and Jones, A. K. G. (1980). A tested set of techniques for the extraction of plant and animal macrofossils from waterlogged archaeological deposits. *Science and Archaeology* 22, 3-15.

Lochrie, J. 2010 'Prehistoric Pottery Report, Midmill, Kintore, Aberdeenshire'. Unpublished Specialist Report for Murray Archaeological Services

Old Statistical Account: Vol 1, 238, 1791-9

Sheridan, A forthcoming 'The Pottery', in Jones, et al forthcoming

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

8 Appendices

Appendix 1: Trench Register

Trench	Length (m)	Topsoil depth	Description
1			Unexcavated due to water main
2	10	1.2	Moved due to presence of water main and new Badger Sett
3	18	0.4	Furrow [086] runs NW-SE across the trench.
4	77	0.4	Ditch [070], probable rubble field drain [110] run N-S across this trench. These features extend into Trench 5 on the same alignment.
5	82	0.5	Ditch [072] and probable rubble field drain[110] run N-S across this trench. These features continue into Trench 4 on the same alignment.
6	72	0.3	Pits [040, 88, and 108] curvilinear ditch [106] and possible post-arc [102] located within this trench.
7	50	0.3	A furrow [074] runs NE-SW across this trench. Pits [076, 084] and curvilinear ditch [078] within this trench.
8	35	0.35	Shortened due to presence of badger sett. No archaeology
9	35	0.5	Shortened due to presence of badger sett. No archaeology
10	25	0.4	Field drains run NE-SW and NW-SE across this trench.
11	38	0.35	No archaeology
12	55	0.4	Linear ditch[108] and field drains run NE-SW across this trench.
13	50	0.45	Field drains run NE-SW across this trench.
14	50	0.45	No archaeology
15			Not excavated due to presence of water main.
16	50	0.25	No archaeology
17			Not excavated as it cut across an existing field boundary wall
18	50	0.3	No archaeology
19	20	0.4	No archaeology
20	50	0.4	Pit [034] located within this trench
21	50	0.4	No archaeology
22	55	0.45	Pits [036 and 038] located in this trench
23	20	0.45	No archaeology
24	40	0.4	No archaeology

25	50	0.45	Ditch [054] runs NE-SW across this trench.
26	50	0.4	No archaeology
27	55	0.3	Furrow[066] and ditch [068] run NE-SW across this trench.
28	50	0.5	A furrow and field drains run NE-SW across this trench.
29	50	0.3	A furrow and field drains run NE-SW across this trench.
30	70	0.3	Field drains run NE-SW across this trench.
31	70	0.25	No archaeology
32	70	0.25	A field drain runs NW-SE across this trench
33	75	0.3	No archaeology
34	50	0.4	Modern pit [049] located within this trench. A gravel filled field drain runs the length of the trench.
35	50	0.3	Furrow [047] runs NW-SE across this trench.
36	50	0.4	A field drain runs E-W across this trench.
37	50	0.4	Field drains run NE-SW across this trench.
38	50	0.4	Field drains run NE-SW
39	64	0.4	Furrows and field drains run N-S across this trench
40	50	0.4	A field drain runs N-S across this trench.
41	50	0.4	Field drains run NE-SW and NW-SE across this trench.
42	50	0.4	Modern ceramic field drain [058] and field drains run NE-SW across this trench.
43	50	0.4	No archaeology
44	45	0.45	Field drains run N-S across this trench
45	50	0.3	Field drains run NE-SW across this trench.
46	50	0.3	No archaeology
47	35	0.4	Field drains run NE-SW across this trench.
48	50	0.3	Field drains run N-S across this trench
49	57	0.4	Large pit / kiln [051] located within this trench, a furrow runs N-S and ditch [104] ran E-W across the trench.
50	60	0.4	Pits [024, 026, 028] Located within this trench.
51	50	0.3	A field drain runs NW-SE across this trench

52	50	0.3	Field drains run E-W across the trench
53	50	0.4	Field drains run N-S and E-W across the trench.
54	50	0.4	Field drains run E-W across the trench
55	50	0.4	Field drains run N-S and E-W across the trench.
56	50	0.25	A field drain runs NE-SW across the trench.
57	100	0.3	Field drains run E-W and NE-SW across the trench
58	50	0.3	A field drain runs NE-SW across the trench.
59			Not excavated due to dog walkers' path
60	50	0.3	A culvert ran E-W along the length of the trench, which was moved S after 9m to avoid this feature. A field drain ran along the remaining length of the moved trench.
61	68	0.4	Field drains ran E-W across the trench.
61a	8	0.4	Trench excavated at right angles to reveal more of possible feature (furrow).
62	50	0.3	A field drain ran NW-SE across the trench
63	50	0.25	Field drains ran N-S across the trench.
64	35	0.4	Furrow [016] and field drains ran NW-SE across the trench.
65	19	0.3	Furrow [014] ran NW-SE across the trench.
66	50	0.4	Pit [080] located in this trench, field drains run NW-SE.
67	50	0.3	Field drains run N-S
68	43	0.3	Field drains run E-W
69	50	0.4	Field drains run NW-SE
70	50	0.4	Field drains run E-W
71	22	0.3	No archaeology
72	50	0.4	No archaeology
73	13	0.5	Field drain running N-S.
74	50	0.4	Field drains running N-S and NW-SE
75	50	0.3	Field drain running E-W
76			Not excavated as it cut across a wall
77			Not excavated as it cut across the path
78	171	0.4	Linear ditch [032] and charcoal rich pit [030] located in this trench.
79	50	0.3	Two probable stone holes [060 and 062] located in this trench.

80	50	0.3	No archaeology
81	50	0.3	Field drain running SW-NE
82	50	0.4	Field drain running E-W
83	50	0.4	No archaeology
84	62	0.4	Pit [002] located in this trench
84a	3	0.4	Trench excavated to expose rest of pit [002]
85	37	0.3	Field drain running NW-SE
86	50	0.4	Furrow running NW-SE and field drains running NE-SW.
87	50	0.3	Field drains running E-W
88	50	0.35	No archaeology
89	50	0.4	Field drain running E-W
90	50	0.4	No archaeology
91	46	0.3	No archaeology
92	50	0.3	No archaeology
93	50	0.4	Field drains running NE-SW and NW-SE
94	50	0.5	Rubble drain [004] runs E-W across trench. Field drains running E-W
95	36	0.3	Field drains run N-S and NE-SW
96	75	0.3	Field drains run N-S and E-W across the trench.
97	37	0.6	Field drains run NW-SE
98	50	0.3	Field drains run NE-SW
99	50	0.3	Field drains run NW-SE and NE-SW
100	30	0.3	Field drains run NE-SW and NW-SE
101	59	0.3	Field drains run NE-SW and NW-SE
102	50	0.4	Field drains N-S and NW-SE
103	60	0.4	No archaeology
104	50	0.3	Field drains E-W
105	50	0.3	Field drains NW-SE
106	50	0.3	Field drains E-W
107	50	0.4	Field drains N-S
108	59	0.3	Field drains run NE-SW and NW-SE
109	50	0.3	Culvert runs NE-SW, field drains N-S
110	50	0.4	Field drains N-S and E-W
111	38	0.5	Furrow and field drain running NW-SE.
112	50	0.5	Field drain runs E-W
113	70	0.4	Field drains NE-SW and NW-SE
114	50	0.3	No archaeology
115	45	0.3	Furrow and drain running N-S
116	50	0.4	Field drains N-S and E-W
117	50	0.3	Field drains N-S
118	50	0.3	Field drains run N-S and E-W
119	57	0.4	Field drains run NE-SW and NW-SE
120	50	0.3	Field drains NE-SW and NW-SE
121	50	0.35	Filed drain runs N-S
122	50	0.3	Field drains run NW-SE

123	50	0.3	Field drains run N-S and NE-SW
124	50	0.3	Field drains run NW-SE
125	50	0.3	Modern pit [008] located in this trench; field drains run N-S.
126	50	0.4	Field drains run N-S
127	50	0.3	Field drains NW-SE and NE-SW
128	50	0.3	Field drains NW-SE
129	50	0.3	Field drain N-S
130	50	0.4	Field drains run N-S and NW-SE
131	25	0.4	Field drains NE-SW
131a	25	0.3	Continuation of Trench 131 on other side of hedge. Field drains run N-S and NW-SE
132	26	0.4	Field drains E-W and NW-SE
133	22	0.4	Field drains E-W and NW-SE
134	84	0.4	Field drain NW-SE
135	50	0.4	Field drains NE-SW
136	26	0.4	Field drains N-S
137	45	0.4	Field drains NE-SW
138	50	0.45	Field drains NE-SW
139	40	0.4	Field drains N-S
139a	10	0.3	Continuation of Trench 139 on other side of hedge. No archaeology
140	50	0.3	No archaeology
141	50	0.3	No archaeology
142	50	0.3	Field drains run N-S
143	31	0.4	No archaeology
144	50	0.35	Field drains run NW-SE
145	65	0.3	Field drains run NW-SE and NE-SW
146	50	0.3	Field drains run NE-SW
147	50	0.4	Field drains run N-S
148	50	0.4	Field drains run NW-SE and NE-SW
149	50	0.5	Field drains run N-S
150	50	0.3	Field drains run NE-SW
151	40	0.45	Field drains run NW-SE
152	50	0.3	Field drains run N-S
153	50	0.4	Field drains NW-SE and NE-SW
154	22	0.5	No archaeology
155	50	0.4	Field drains NW-SE
156	50	0.3	Field drains N-S
157	60	0.45	Furrow and field drains run N-S
158a	50	0.45	Furrow and field drain run E-W across trench.
158b	50	0.4	Furrow and field drain run NW-SE across trench
159	60	0.35	No archaeology
160	50	0.3	No archaeology
161	50	0.3	No archaeology
162	50	0.3	No archaeology
163	28	0.3	Field drain NW-SE

164	80	0.2	Field drains NW-SE
165	50	0.4	Field drains N-S and E-W
166	50	0.4	Field drains N-S and NE-SW
167	50	0.3	Field drains N-S and NE-SW
168	50	0.4	Field drains NW-SE and NE-SW
169	50	0.4	Field drains N-S
170	50	0.3	No archaeology
171			Void
172	25	0.3	No archaeology
173	70	0.25	Field drains N-S and E-W
180	22	0.3	Rubble drain [011] located in this trench. Field drains run NW-SE and NE-SW.
181	23	0.4	Trench excavated to look for continuation of possible linear feature [043] which investigation proved to be a shallow pit.
182	18	0.25	Trench excavated to investigate whether furrows in Trenches 64 and 65 were part of the same curvilinear feature. Neither of these furrows was present in Trench 182.
183	20	0.4	Trench excavated to look for continuation of rubble drain [005] from Trench 94. This feature was present in Trench 183.
184			void
185			void
186			void
187	25	0.3	Excavated to see if [051] continued to the SE of Trench 149. [051] was not present and excavation proved this feature to be a probable kiln.
188	35	0.3	Trench excavated across brow of hill. No archaeological features.
189	13	0.5	Immediately to the S of trench 20. Trench [082] runs NW-SE across the trench. Features [090, 096, 098] extend outwith the extent of the trench. It was impossible to determine if these were elongated pits or linear features with termini present in the trench.
190	45	0.4	Trench excavated immediately to the S of Trench 6. Pit [045] located within this trench.
191	25	0.4	Trench excavated immediately to the N of Trench 6. No archaeological features were revealed.

192	16	0.5	Trench immediately to N of Trench 20. No features apparent upon initial excavation, however when this trench was surveyed a possible curvilinear feature had weathered out to become visible. This was left unexcavated.
-----	----	-----	--

Appendix 2: Context Register

Context	Trench	Description
1	Topsoil	Dark brown humic clay sand
2	84	Sub-circular cut of pit, measuring 1.00m by 0.60m and 0.22m deep.
3	84	Dark brown clayey silt, contains prehistoric pottery. Fill of [002]
4	94	Linear cut running E-W across trench, 0.85m wide and 0.40m deep. Foundation cut of rubble drain [005]
5	94	Rubble drain filling cut [004], orientated E-W, constructed of undressed stones of mixed geology.
6	94	Dark brown clay. Soil matrix surrounding rubble drain [005]
7	94	Natural within Trench94
8	125	Sub-circular pit, measuring 0.63m by 0.45m and 0.16m deep (max).
9	125	Dark grey clay silt. Fill of [008]
10	180	Linear cut running NW-SE across trench, 0.81m wide and 0.40m deep. Foundation cut of rubble drain [011]
11	180	Rubble filled drain, oriented NW-SE, constructed using undressed stones of mixed geology.
12	180	Medium grey clay surrounding (011). Fill of [010]
13	void	
14	65	Linear cut running NW-SE across trench, 1.8m wide and 0.10m deep. Cut of furrow
15	65	Mid brown sandy silt. Fill of [014]
16	64	Linear cut running NE-SW across trench, 1.6m wide and 0.10m deep. Cut of furrow.
17	64	Light brown sandy silt. Fill of [016]
18	183	Linear cut running NE-SW across trench, measures 0.70m wide and 0.50m deep. Cut for rubble drain [019]
19	183	Rubble filled drain, oriented NW-SE, constructed using undressed stones of mixed geology. Probably same as [005]
20	183	Dark brown clay matrix surrounding rubble drain (019). Fill of [018]
21	183	Linear cut oriented NE-SW across trench, 0.80m wide and 0.75m deep. Foundation cut of rubble drain [022]
22	183	Rubble drain within cut [021], oriented NE-SW, constructed using undressed stones of mixed geology.
23	183	Dark brown clay matrix surrounding rubble drain 22. Fill of cut [021]
24	50	Circular cut feature measuring 0.95m by 1.00m and 0.09m deep. Probable natural depression.
25	50	Dark brown silty clay. Fill of [024]

26	50	Sub-circular stone-hole measuring 0.60m by 0.60m and 0.24m deep.
27	50	Dark brown sandy silt and gravel. Fill of [026]
28	50	Sub-circular feature measuring 0.45m by 0.42m and 0.14m deep. No anthropogenic material recovered from this feature.
29	50	Dark brown silty clay. Fill of [028]
30	78	Oval pit cut measuring 0.70m by 0.65m and 0.57m deep.
31	78	Very dark brown charcoal rich sandy silt. Fill of [030]
32	78	Curvilinear ditch cut measuring 0.55m wide and 0.17m deep.
33	78	Brown sandy silt. Fill of [032]
34	20	Oval pit cut measuring 0.90m by 1.15m and 0.36m deep.
35	20	Dark brown loamy sand with charcoal flecks and prehistoric pottery. Fill of [034]
36	22	Sub-circular cut of pit measuring 0.50m by 0.40m and 0.20m deep.
37	22	Black loamy sand. Upper fill of intercutting pits [036] and [037].
38	22	Irregular shaped cut of pit measuring 0.52m by 0.45m and 0.15m deep.
39	22	Orange brown loamy sand. Fill of [038]
40	6	Sub-circular cut of pit measuring 0.60m by 0.55m and 0.25m deep.
41	6	Dark grey to black charcoal rich clayey sand. Fill of [040]
42	22	Orange brown loamy sand. Primary fill of [036].
43	181	Oval cut of elongated pit measuring 1.70m by 1.10m and 0.15m deep.
44	181	Dark brown clay sand. Fill of [043]
45	190	Oval cut of pit measuring 1.40m by 0.85m and 0.25m deep.
46	190	Dark brownish orange sandy silt. Upper fill of [045]
47	35	Linear cut measuring 0.69m wide and 0.15m deep. Orientated NW-SE. Measures 4.14m in length continuing beyond the north and south LOE of the trench.
48	35	Dark brown sandy silt . Fill of [047]
49	34	Oval cut of pit measuring 0.70m by 0.50m and 0.40m deep. Cut of modern pit which truncates a modern gravel field drain.
50	34	Dark brown clay. Fill of [049]
51	49	Irregular shaped cut measuring 4.60m by 2.90m and 0.69m deep. Possible corn drying kiln.
52	49	Brown sandy silt containing frequent large undressed stones. Upper fill of [051]
53	Void	
54	25	Linear cut oriented N-S, measuring 2m in length, 1.20m wide and 0.21m deep. Ditch continues N & S beyond LOE

55	25	Greyish brown loamy sand. Fill of [054].
56		void
57		void
58	42	Cut of modern ceramic field drain trench
59	42	Fill of field drain cut[058]
60	79	Circular stone-hole measuring 0.45m by 0.40m and 0.07m deep.
61	79	Dark brown clayey sand. Fill of [060]
62	79	Circular stone-hole measuring 0.47m by 0.42m and 0.09m deep.
63	79	Dark brown clayey sand. Fill of [062]
64	14	Linear cut of furrow running NW-SE 2.00m wide and 0.05m deep. Measures 2.30m within trench and continues beyond the north and south LOE of the trench.
65	14	Dark brown clayey sand. Fill of [064]
66	27	Linear cut of furrow oriented NE-SW, 1.17m wide and 0.12m deep. Measures 2.40m within trench and continues beyond the north and south LOE of the trench.
67	27	Dark brown clayey sand. Fill of [068]
68	27	Linear cut of possible ditch oriented NE-SW 0.74m wide and 0.29m deep. Orientation of this feature matches furrow [066] to the east, with which it may be associated.
69	27	Dark brown clay sand. Fill of [068]
70	4	Linear ditch oriented N-S, 1.10m wide and 0.40m deep. Appears to align with probable rubble drain [110] 1m to east. Continues into trench 5 (same as [072]). Measures 2m in length across width of trench, continues below both the north and south LOE of trench.
71	4	Mid brown sandy silt. Fill of [070]
72	5	Linear ditch cut oriented N-S, 1.10m wide and 0.40m deep. Appears to align with probable rubble drain [110] 1m to east. Continues into trench 4. Extends 2m in length across width of ditch continues beyond both the north and south LOE of the trench.
73	5	Mid brown sandy silt. Fill of [072].
74	7	Linear cut of furrow oriented NE-SW. Measures 2m NE-SW, continuing beyond the trench LOE. Measures 1.50m wide and 0.10m deep.
75	7	Mid brown clayey sand. Fill of [074]
76	7	Sub-circular pit measuring 0.50m by 0.48m and 0.09m deep.
77	7	Mid brown clayey sand. Fill of [076]
78	7	Linear cut of ditch oriented NE-SW, 1.89m wide and 0.30m deep. Measures 2m in length and continues beyond the NE and SW LOE of the trench.
79	7	Mid brown clayey sand. Fill of [078]
80	66	Rectilinear cut measuring 1.68m by 0.71m and 0.12m deep. Orientated NE-SW. No anthropogenic material recovered from this feature.
81	66	Mid to dark brown clayey sand. Fill of [080]

82	189	Linear cut of ditch oriented NW-SE, 1.10m wide and 0.35m deep. Measures 2.08m in length across trench, extends beyond both N & S LOE of the trench.
83	189	Dark brown sandy silt. Upper fill of [082]
84	7	Sub-circular cut of pit measuring 0.88m by 0.80m and 0.37m deep.
85	7	Dark brown clayey sand. Fill of [084].
86	3	Linear cut of furrow oriented NW-SE, 0.70m wide and 0.14m deep. Measures 2.2m and extends beyond the east and west LOE.
87		Dark brown clay sand. Primary fill of [082]
88	6	Irregular shaped pit measuring 1.05m by 0.35m and 0.28m deep.
89	6	Dark brown charcoal rich loamy sand. Fill of [088]
90	189	Cut feature that terminates within trench but extends beyond the north-western LOE of the trench, 0.35m wide and 0.16m deep. Not possible to determine if the feature is a linear furrow or elongated pit. Measures 0.66m in length before continuing beyond the NW LOE of the trench.
91	189	Dark brown clay sand. Fill of [090]
92	49	Black charcoal rich sand. Fill of [051]
93	49	Grey brown sandy silt. Primary fill of [051]
94	49	Circular cut 0.75m diameter, located within the possible flue of kiln [051]
95	49	Light brown sandy silt. Fill of [094]
96	189	Cut feature that terminates within trench but extends beyond the south-eastern LOE of the trench. Feature is orientated NW-SE, 0.25m wide and 0.25m deep. Not possible to determine if the feature is a linear furrow or elongated pit. Measures 1.22m in length before continuing below the SE LOE of the trench.
97	189	Dark brown clay sand. Fill of [096]
98	189	Cut feature terminates within trench but extends beyond the south-eastern LOE of the trench. Feature is oriented NW-SE, 0.36m wide and 0.18m deep. Not possible to determine if the feature is a linear furrow or elongated pit. Measures 1.16m in length before continuing below the SE LOE of the trench.
99	189	Dark brown clay sand. Fill of [098]
100		void
101		void
102	6	Curvilinear cut, 2.0m by 0.2m and 0.22m deep. Possible post-arc.
103	6	Dark brown sandy silt. Fill of [102]
104	49	Linear cut of ditch oriented NW-SE, 0.87m wide and 0.37m deep. Measures 2.2m in length, continues below the east and west LOE of the trench.
105	49	Brown grey sandy silt. Fill of [104]
106	6	Possible curvilinear cut feature terminating within trench. Extending S beyond the north LOE of trench. Measures 0.4m wide and 0.3m deep. Measures 1.48m before continuing beyond the LOE.

107	6	Dark brown sandy silt. Fill of [106]
108	12	Linear ditch oriented NE-SW, 0.61m wide and 0.33m deep. Measures 2.40m in length and extends beyond the NW and SE LOE of the trench.
109	12	Mid grey silty sand. Fill of [108]
110	4 & 5	Probable Rubble Field drain
111		Natural
112	3	Mid brown sandy silt. Fill of 086.

Appendix 3: Environmental Results

Table 1: FRCE10: Retent Sample Results

Context Number	Sample Number	Feature	Sample Vol (l)	Ceramic Pottery		Stone Lithics	Burnt bone Mammal	Charred nutshell	Charcoal		Material available for AMS Dating	Cinders	Coal	Comments
				Prehistoric	Medi-PM				Quantity	Max Size (cm)				
				3	1	Fill of pit [002]	80		++++					
31	10	Fill of pit [030]	10				+		++++	1	Charcoal +			
33	11	Fill of curvilinear ditch [032]	10											Archaeologically sterile
35	12	Fill of pit [034]	10			+			+	1	Charcoal +			
37	13	Fill of pit [036]	10						+	<1				Charcoal under <1 not retained
39	14	Fill of pit [038]	10						+++	<1				
41	40	Fill of pit [040]	20	++++		+		++++	+	1	Charred nutshell +++++, Charcoal +			
42	15	Fill of pit [036]	10											Archaeologically sterile
71	23	Fill of ditch [070]	20											Archaeologically sterile
73	25	Fill of ditch [072]	20			+								
79	24	Fill of curvilinear ditch [032]	10						+++	2.5	Charcoal +			
89	28	Fill of pit [088]	10										++	Cinders and coal not retained

92	30	Possible drying kiln	10		+		+++				Burnt bone	++++	++	
93	31	Possible drying kiln	10						+	1	Charcoal +	++		

Table 2: FRCE10 Flotation Sample Results

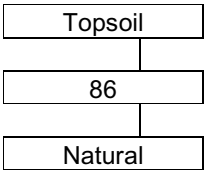
Context Number	Sample Number	Total flot Vol (ml)	Cereal grain:	<i>Avena</i> sp.	<i>Hordeum vulgare</i>	<i>Hordeum vulgare</i> var <i>nudum</i>	<i>Triticum spelta</i>	<i>Cereal</i> ia indet.	Other plant remains	Charcoal Quantity	Charcoal Max size (cm)	Material available for AMS	Comments
3	1	105							<i>Galium</i> sp.+, <i>Raphanus raphanistrum</i> + Poaceae sp. +	++++	<1		
31	10	30		+	+++	++	+	+	<i>Galium</i> sp.+, Chenopodium sp. +	+	<1		
33	11	5								+	<0.5		
35	12	20								+	<0.5		
37	13	6						+		+++	<1		
39	14	20								+	<0.5		
41	40	30								+	<0.5		
42	15	10								++	<0.5		
71	23	30											Archaeologically sterile
73	25	20								+	<0.5		
79	24	10								++	<1		
89	28	10								++	1.2	charcoal +	
92	30	70		+	+		+		<i>Raphanus raphanistrum</i> +	+	<0.5		Sample contained cinders +++++
93	31	5											Archaeologically sterile
101	41	10								+++	<1		
103	42	30				+				+	<0.5		

Key: + = rare, ++ = occasional, +++ = common and +++++ = abundant

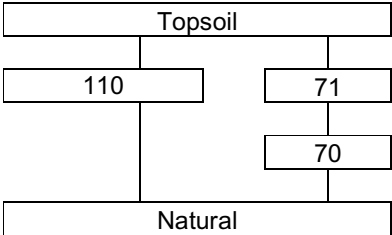
NB charcoal over 1cm is suitable for identification and AMS dating

Appendix 4: Trench Matrices

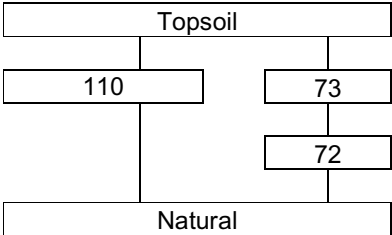
Trench 3



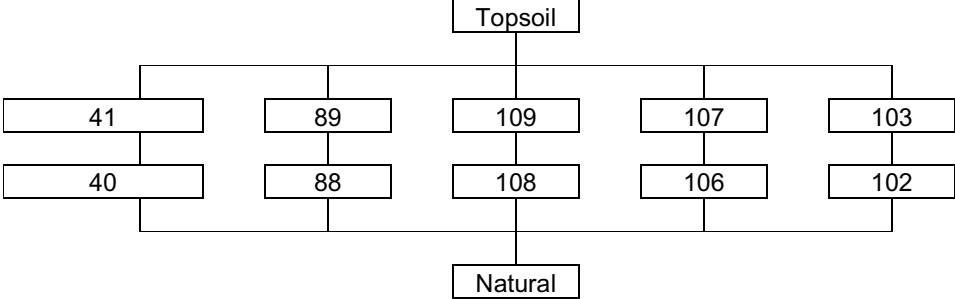
Trench 4



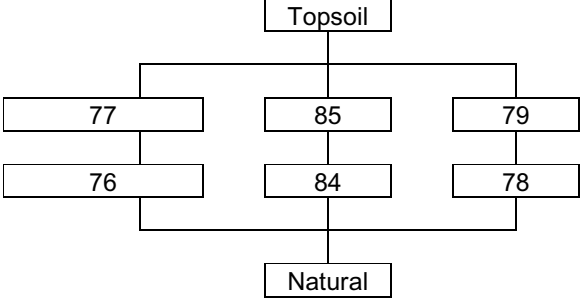
Trench 5



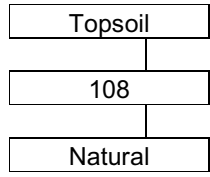
Trench 6



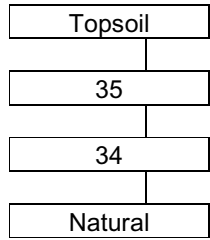
Trench 7



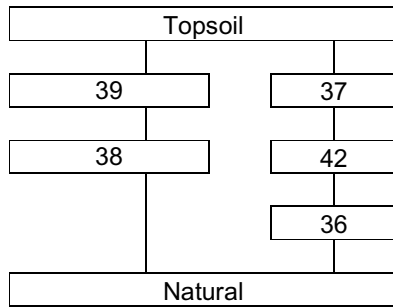
Trench 12



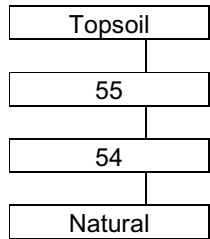
**Trench
20**



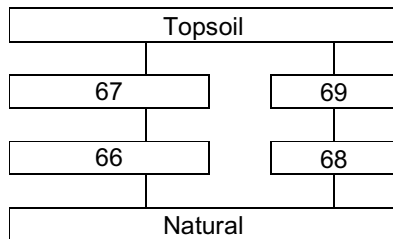
**Trench
22**



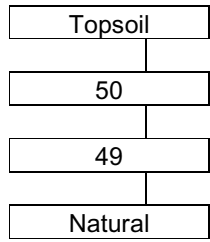
**Trench
25**



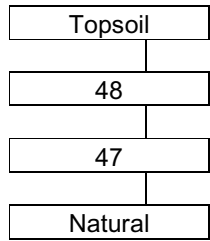
**Trench
27**



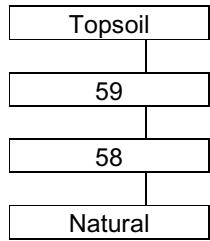
**Trench
34**



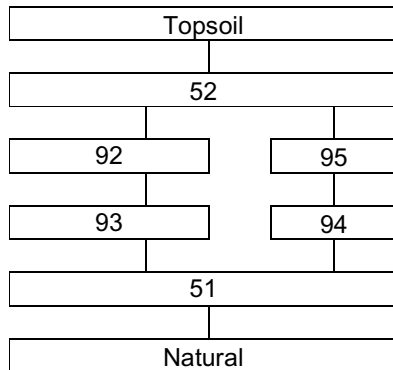
**Trench
35**



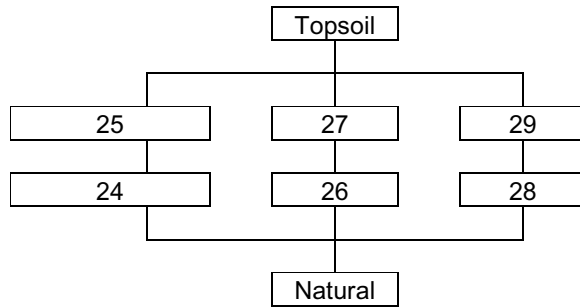
**Trench
42**



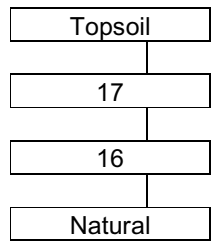
**Trench
49**



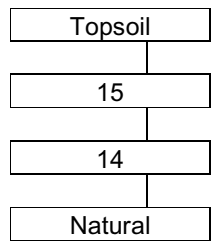
**Trench
50**



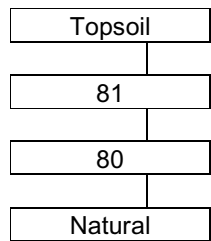
**Trench
64**



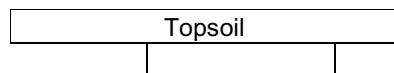
**Trench
65**

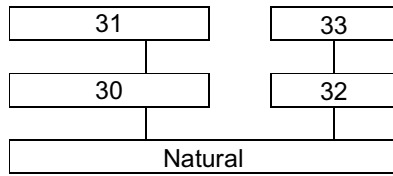


**Trench
66**

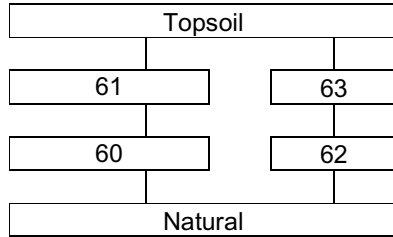


**Trench
78**

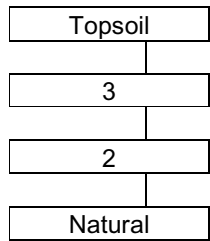




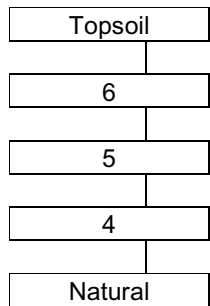
**Trench
79**



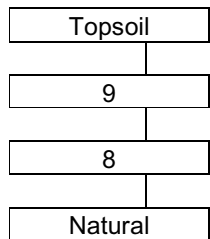
**Trench
84**



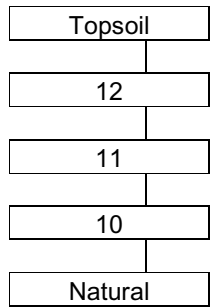
**Trench
94**



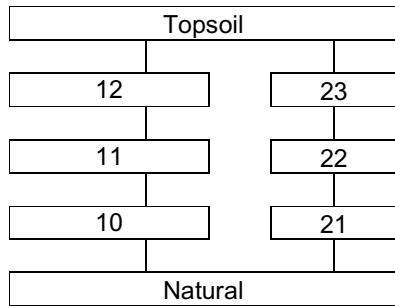
**Trench
125**



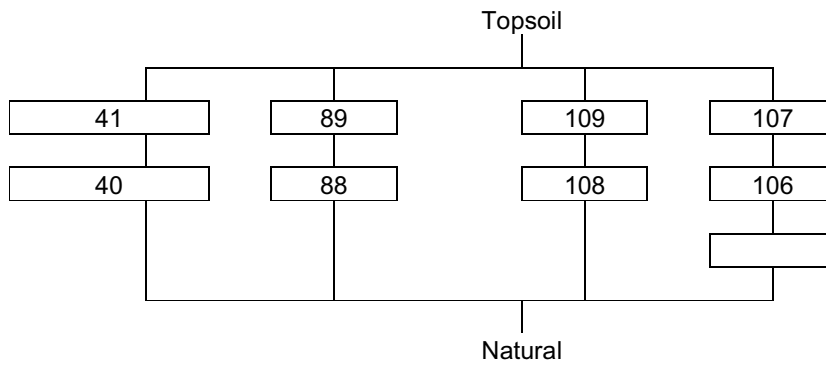
**Trench
180**



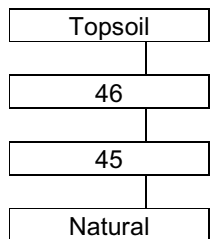
**Trench
183**



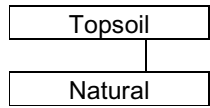
**Trench
189**



**Trench
190**



Remaining Trenches



Appendix 5: Photographic Register

Photo	Direction	Description
1	-	ID Shot
2	N	Trench 112
3	N	Trench 113
4	W	Trench 111
5	SE	Trench 135
6	NE	Trench 136
7	W	Trench 137
8	NW	Trench 129
9	NW	Trench 127
10	SE	Trench 117
11	NW	Trench 116
12	NW	Trench 128
13	NE	Trench 107
14	N	Trench 132
15	N	Trench 133
16	N	Trench 131
17	E	Trench 138
18	NW	Trench 134
19	NW	Trench 110
20	NW	Trench 90
21	E	Trench 139
22	W	Trench 124
23	NE	Trench 123
24	NW	Trench 120
25	N	Trench 105
26	W	Trench 103
27	W	Trench 102
28	N	Trench 101
29	W	Trench 02
30	NE	Trench 104
31	SW	Trench 106
32	NE	Trench 122
33	NW	Trench 118
34	W	Trench 119
35	NE	Trench 173
36	NE	Trench 108
37	NW	Trench 109
38	W	Trench 93
39	NW	Trench 94
40	NE	Trench 95
41	N	Trench 97

42	NE	Trench 98
43	NE	Trench 99
44	NE	Trench 100
45	-	ID Shot
46	W	Pit [002]- half excavated
47	N	Trench 86
48	N	Trench 87
49	W	Trench 88
50	SE	Trench 89
51	W	Trench 85
52	S	Trench 84
53	S	Trench 82 (No digital)
54	S	Trench 81 (No digital)
55	E	Trench 91 (No digital)
56	SE	Trench 96 (No digital)
57	SW	Trench 60 (No digital)
58	NW	Trench 58 (No digital)
59	W	Trench 56 (No digital)
60	W	Trench 16 (No digital)
61	E	Pre ex shot rubble drain [004] Trench 94 (No digital)
62	SE	Trench 96 (No digital)
63	S	Trench 113 (No digital)
64	SW	Trench 114 (No digital)
65	N	Investigative slot next to rubble drain [004] Trench 94
66	N	Trench 92
67	S	Trench 143
68	E	Trench 142
69	S	Trench 144
70	S	Trench 153
71	S	Trench 145
72	-	ID Shot
73	S	Trench 146
74	E	Trench 147
75	E	Trench 150
76	E	Trench 152
77	S	Trench 151
78	S	Trench 149
79	N	Trench 148
80	N	Trench 157
81	NE	Trench 109 pre-ex cobbled surface
82	W	Trench 140
83	S	Trench 154
84	E	Trench 155
85	SE	Trench 162
86	S	Trench 163

87	S	Trench 164
88	S	Trench 161
89	S	Trench 156
90	E	Trench 157
91	S	Trench 160
92	E	Trench 158b
93	W	Trench 159
94	S	Trench 165
95	E	Trench 166
96	E	Trench 167
97	NE	Trench 168
98	E	Trench 169
99	NW	Trench 158
100	NW	Pit [008] Trench 125. Mid-ex shot showing SE facing section
101	SW	Pit [002] Trench 84. Half sectioned showing NE facing section.
102	E	Trench 62
103	NE	Trench 61
104	NE	Trench 63
105	NE	Trench 54
106	SW	Trench 55
107	S	Working shot of backfilling (no digital)
108	-	ID Shot (No digital)
109	SE	Trench 67
110	E	Trench 66
111	S	Trench 80
112	E	Trench 141
113	N	Trench 131
114	E	Trench 130
115	S	Trench 126
116	N	Trench 139
117	W	Trench immediately north of Trench 139
118	SW	Trench 121
119	E	Pit [002] post-ex
120	N	Pit [008] Trench 125. Half sectioned.
121	E	Trench 19
122	E	Trench 51
123	NW	Trench 52
124	NE	Trench 50
125	NE	Trench 78
126	E	Trench 74
127	SE	Trench 47
128	NW	Trench 23
129	SE	Trench 22

130	SE	Trench 24
131	E	Trench 25
132	N	Trench 73
133	W	Trench 72
134	S	Trench 71
135	SW	Trench 70
136	W	Trench 69
137	S	Trench 68
138	NE	Rubble drain [011] Trench 180. Pre ex shot.
139	NE	Box section of rubble drain [011]
140	E	W facing section of furrow [014]
141	SE	Trench 182
142	SE	NW facing section of furrow [016]
143	SW	Trench 35
144	N	Working shot of backfilling (colour slide only)
145	-	ID Shot
146	E	Trench 30
147	E	Trench 31 Western half
148	E	Trench 32 Western half
149	NE	Trench 33 SW half
150	NE	Trench 33 NW half
151	E	Trench 32 E half
152	E	Trench 31 E half
153	N	Trench 153
154	S	Trench 154
155	E	Trench 61a
156	S	Trench 81
157		Voided
158		Voided
159	N	Rubble drain [018]. Slot excavated to find depth of drain.
160	N	Rubble drain [021]. Cleaned
161	E	Pit [024] Trench 50. Half sectioned.
162	N	Pit [030] Trench 78. Half sectioned.
163	S	Slot through Ditch [032] Trench 78
164	NW	General view of features Trench 78
165	W	Trench 48
166	W	Trench 46
167	W	Trench 44
168	NW	Trench 45
169	NW	Trench 26
170	E	Trench 38
171	NE	Trench 28
172	SW	Trench 20
173	NE	Trench 21
174	W	Trench 4

175	W	Trench 5
176	S	Trench 3
177	SE	Trench 18
178	NE	Pit [026] Trench 50. Half sectioned
179	SW	Pit [028] Trench 50. Half sectioned
180	-	ID Shot
181	NE	Slot through rubble drain [018]
182	SE	Slot through rubble drain[019]
183	N	Pit [034]. Half excavated
184	S	Pit [034]. Half excavated.
185	S	N facing section of pits [036, 038]
186	NW	SE facing section of pit [043]
187	NE	Trench 14
188	NW	Trench 13
189	SW	Trench 75
190	E	Trench 39
191	E	Trench 37
192	NE	Trench 36
193	NE	Trench 29
194	SW	Trench 27
195	W	Trench 11
196	E	Trench 12
197	NW	Trench 10
198	NW	Trench 9
199	N	Trench 8
200	NW	Trench 7
201	W	Trench 185
202	W	Trench 6
203	W	Trench 186
204	S	Pre-ex of features Trench 6/7
205	S	Slot through ditch [054]
206	NW	SE facing section [045]
207	N	View of slot through ditch [047]
208	W	Pits [060, 062] Trench 79 Half sectioned.
209	S	Slot through field drain (ceramic) Trench 42
210	NE	Slots through furrow [006] and ditch [068]
211	NE	SW facing section of furrow [066]
212	SW	NE facing section of ditch [068]
213	S	S facing section of ditch [072] in Trench 5
214	S	S facing section of ditch [070] in Trench 4
215	S	N facing section of furrow in Trench 7
216	-	ID Shot
217	S	North facing sections ditch [076] Trench 7
218	SE	NW facing section of post-hole [084]
219	NW	View of slot through ditch [082]

220	N	South facing section pit [088]
221	E	Curvilinear cut posthole arc [102] Trench 6 – half excavated
222	S	Pit [040] partially excavated showing in-situ pottery
223	S	Pit [040] partially excavated showing in-situ pottery
224	E	Curvilinear cut [102] Trench 6. Half excavated.
225	-	Pit [040] vertical view for photo rectification (Digital only)
226	-	Pit [040] vertical view for photo rectification (Digital only)
227	NW	Linear feature [090]. SE facing section.
228	NW	Linear feature [096]. SE facing section.
229	SE	Linear feature [098]. NW facing section
230	E	West facing section of post-arc [102]
231	S	Pit [040] post-ex
232	NW	General view of [051, 094]
233	NW	SE facing section of possible kiln [051]
234	NW	SE facing section of [051]
235	NW	SE facing section [104]
236	S	S facing section of ditch [108]

Appendix 6: Sample Register

Sample	Trench	Context	Description
1	84	3	Fill of pit [003]
2	125	9	Fill of pit [008]
3	84	3	Fill of pit [003]
4	84	3	Fill of pit [003]
5	84	3	Fill of pit [003]
6	84	3	Fill of pit [003]
7	84	3	Fill of pit [003]
8	50	28	Fill of pit [024]
9	50	29	Fill of pit [028]
10	78	31	Fill of pit [030]
11	78	33	Fill of curvilinear ditch [032]
12	20	35	Fill of pit [034]
13	22	37	Fill of pit [036]
14	22	39	Fill of pit [038]
15	22	42	Fill of pit [036]
16	85	44	Fill of pit [043]
17	190	46	Fill of [045]
18	35	48	Fill of furrow [047]
19	24	50	Fill of [049]
20	25	55	Fill of ditch [054]
21	190	56	Fill of [045]
22			Void
23	4	71	Fill of ditch [070]
24	7	79	Fill of [078]
25	5	73	Fill of ditch [072]
26	7	85	Fill of pit [084]
27	189	87	Fill of ditch [082]
28	7	89	Fill of pit [088]
29	189	91	Fill of Pit [090]
30	49	92	Fill of [051]
31	49	93	Fill of [051]
32	49	95	Fill of [094]
33	189	97	Fill of [096]
34	189	99	Fill of [098]
35			Void
36			Void
37			Void
38			Void
39			Void
40	6	41	Fill of pit [040]
41	7	101	Fill of curvilinear feature [100]
42	6	103	Fill of post-arc [102]

Appendix 7: Drawing Register

Drawing	Section	Plan	Description
1	1:10		Box section of rubble drain [005]
2	1:10		W facing section of rubble drain [005]
3	1:10		E facing section of rubble drain [005]
4		1:20	Plan of [005]
5		1:20	Plan of pit [002]
6		1:20	Plan of pit [008]
7	1:10		W facing section of pit [008]
8		1:20	Plan of rubble drain [011]
9	1:10		Box section of rubble drain [011]
10	1:10		Se facing section of rubble drain [011]
11	1:10		Box section of rubble drain [019]
12		1:20	plan of rubble drain [019]
13	1:10		Section of rubble drain [019]
14	1:10		Section of slot through rubble drain [019]
15	1:10		Section of pit [024]
16		1:20	Plan of pit [024]
17	1:10		Section of pit [026]
18		1:20	Plan of pit [026]
19	1:10		N facing section of pit [030]
20	1:10		N facing section of ditch [032]
21		1:20	Plan of rubble drain [022]
22		1:20	Plan of pit [030]
23		1:20	Plan of ditch [032]
24	1:10		section of rubble drain [022]
25	1:10		section of rubble drain [022]
26		1:20	Plan of pit [034]
27	1:10		S facing section of pit [034]
28	1:10		N facing section of pit [034]
29		1:20	Plan of pits [036, 038]
30	1:10		NW facing section of pits [036, 038]
31		1:20	Plan of pit [043]
32	1:10		Se facing section of pit [043]
33	1:10		Section of Furrow [047]
34		1:20	Plan of furrow [047]
35	1:10		Section of pit [049]
36		1:20	Plan of pit [049]
37	1:10		Section of ditch [054]
38		1:20	Plan of ditch [055]
39		1:20	Plan of pit 045
40	1:10		Section of pit [045]
41		1:20	Plan of pits [060, 062]
42	1:10		SW facing section of pit [060]

43	1:10		N facing section of pit [062]
44	1:10		NE facing section of ditch [068]
45		1:10	section of ditch [072]
46	1:10		N facing section of ditch [078]
47		1:20	plan of ditch [078]
48		1:20	Plan of pit [080]
49	1:10		SE facing section of pit [080]
50		1:20	Plan of pit [076]
51	1:10		N facing section of pit [076]
52	1:10		Section through [064]
53		1:20	Plan of [064]
54	1:10		N facing section of pit [084]
55		1:20	Plan of pit [084]
56	1:10		S facing section ditch [070]
57	1:10		Section of ditch [082]
58		1:20	Plan of ditch [082]
59	1:10		S facing section of pit [088]
60		1:20	Plan of pit [088]
61	1:10		section of pit [090]
62		1:20	Plan of pit [090]
63	1:10		Section of pit [096]
64		1:20	Plan of pit [096]
65	1:10		Section of linear feature [098]
66		1:20	Plan of [098]
67		1:20	Pit [040] plan
68	1:10		Profile pit [040]
69	1:10		NW facing section of kiln [051]
70	1:10		NW facing section of ditch [104]
71		1:20	Plan of kiln [051]
72		1:20	Plan of [104]
73		1:20	Plan of possible curvilinear feature [106]
74	1:10		SW facing section ditch [108]
75		1:20	Plan of post-arc [102]
76	1:10		N facing section of [102]
77	1:10		W facing section of [102]

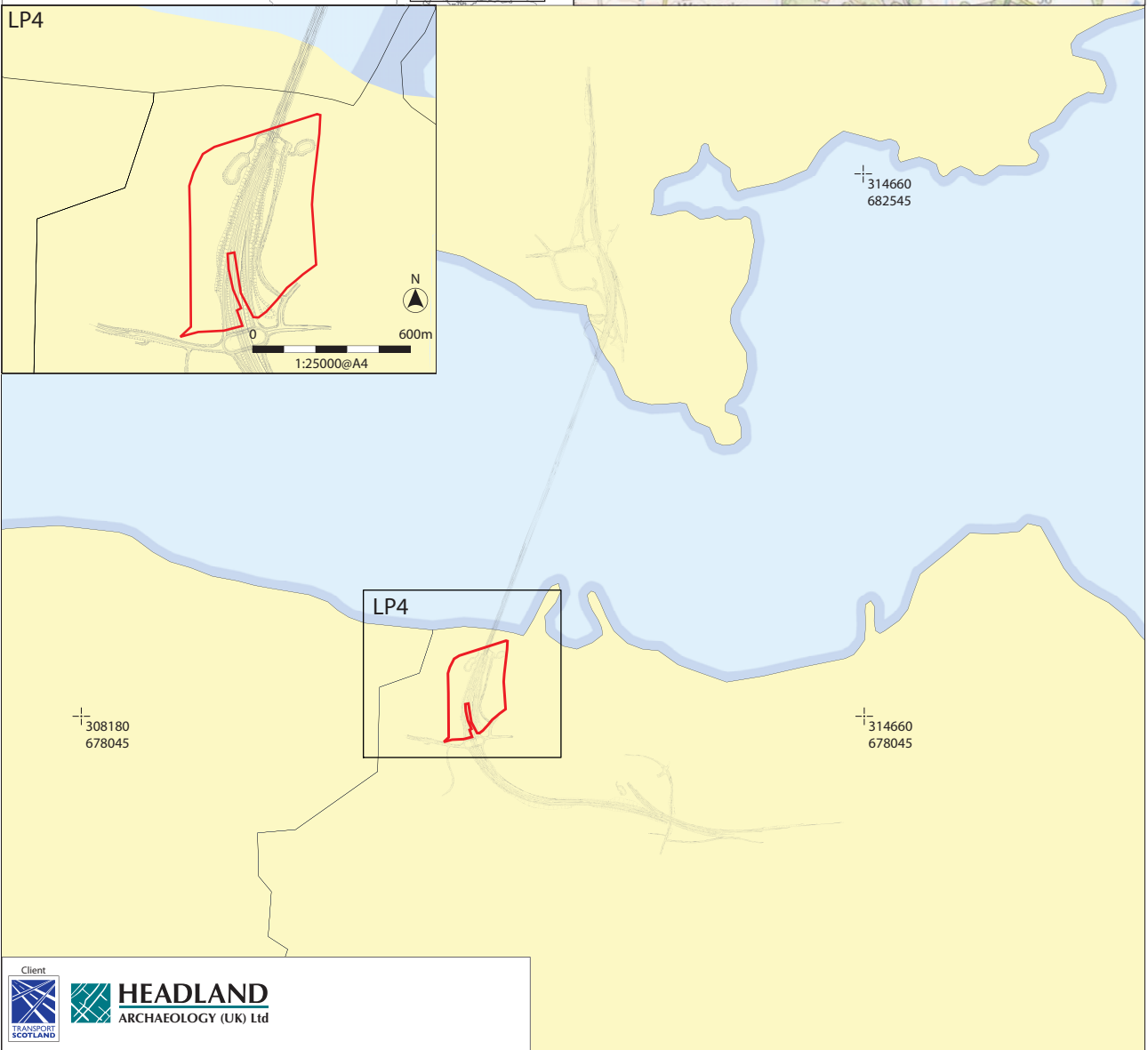
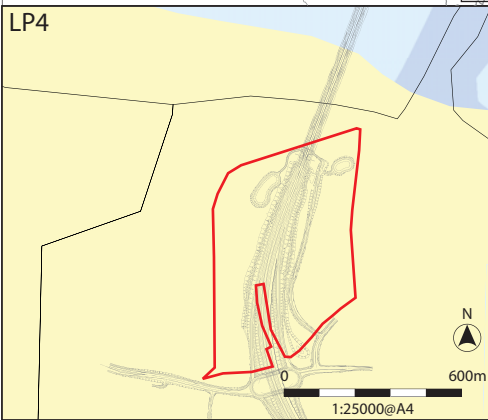
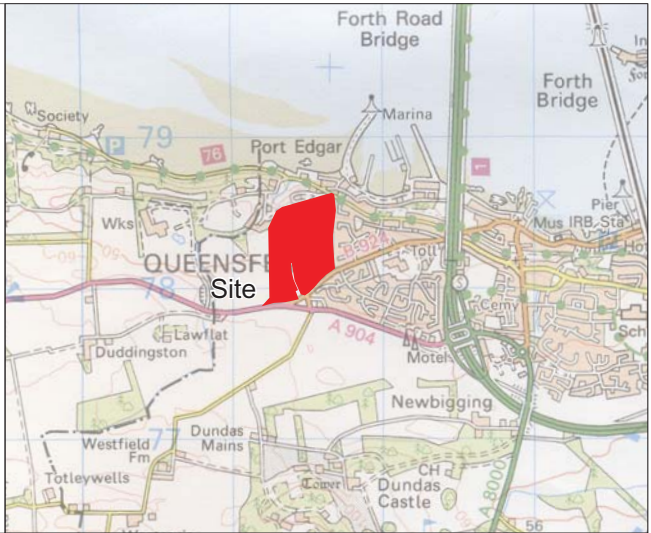
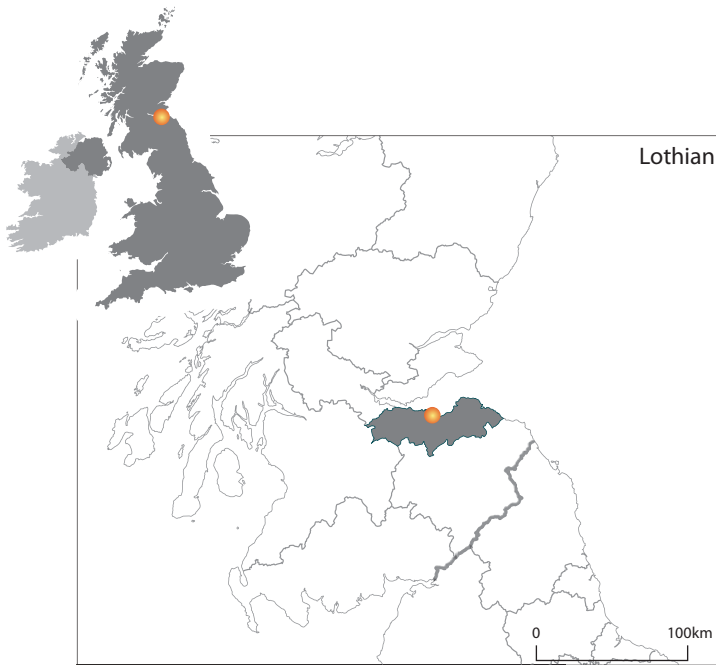
Appendix 8: Finds Register

Small Find	Context	Description
1	3	Prehistoric pottery
2	3	Possible hammer stone
3	23	Bone
4	35	Prehistoric pottery
5		Void
6	30	Possible pieces of metal and clay
7	52	Possible pottery
8	41	Prehistoric pottery
9	92	Pottery

Appendix 9: Finds Catalogue

Trench	Context	SF No	Sample No	Material	Qty	Object	Description	Spot Date	Period
005	073		25	Lithics	5	Flint and chert	Flakes		PH
006	103		42	Lithics	1	Chert	Chunk, poss core fragment		PH
006	041		40	Lithics	1	Flint	Chunk		PH
006	041	8		Pottery	116	Prehistoric	Coarseware. 100 sherds and 16 frags, MNI-2. Impressed Ware. One vessel is a large round/saggy based pot with small half moon impressions to upper body and shallow oblique linear grooves to lower half. The other pot has twisted cord impressions which appear internal	3300-2900 BC	M-L Neol
006	041		040	Pottery	224	Prehistoric	Sherds and frags from same as the two vessels from SF8		M-L Neol
020	035		12	Lithics	1	Flint	Chip		PH
020	035	4		Pottery	2	Prehistoric	Rim sherd and body sherd of coarseware. Rounded rim and gently curving profile. Horizontally rilled appearance, two 'cavettos' directly below rim		PH
049	052	7		Pottery	2	Medieval	Two redware body sherds	12-15th	Medi
049	092		30	Pottery	3	Medieval	White Gritty Ware	12-15th	Medi
065	014?			Clay Pipe	1	Stem	Narrow bore	L. 18th/19th	Mod
078	031?	6		Lead Alloy	2	Waste	Two small lumps		
084	003		6	Lithics	1	Flint	Oblique arrowhead.		L Neol
084	003		5	Lithics	1	Flint	Chip		L Neol
084	003		3	Lithics	2	Flint	Flake and Distal fragment of blade		L Neol
084	003	1		Pottery	19	Prehistoric	16 Body sherds and 3 frags. Appears to be two different vessels, one		L Neol

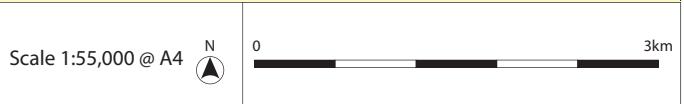
Trench	Context	SF No	Sample No	Material	Qty	Object	Description	Spot Date	Period
							thick and undecorated the other thinner, finer and decorated with small dotted impressions		
084	003		1	Pottery	12	Prehistoric	Body sherds including one decorated with twisted cord impressions and one with random dotted impressions		L Neol
084	003		3	Pottery	3	Prehistoric	Three body sherds		L Neol
084	003		5	Pottery	2	Prehistoric	Inturned, pointed rim sherd and body sherd		L Neol
084	003		6	Pottery	3	Prehistoric	Two body sherds and a frag; one sherd decorated with small dots, randomly applied		L Neol
084	003		7	Pottery	12	Prehistoric	Sherds including small flat base sherd, body sherd decorated with small dots and inturned, pointed rim sherd with twisted cord impressions		L Neol
084	003	2		Stone		Natural	DISCARDED		



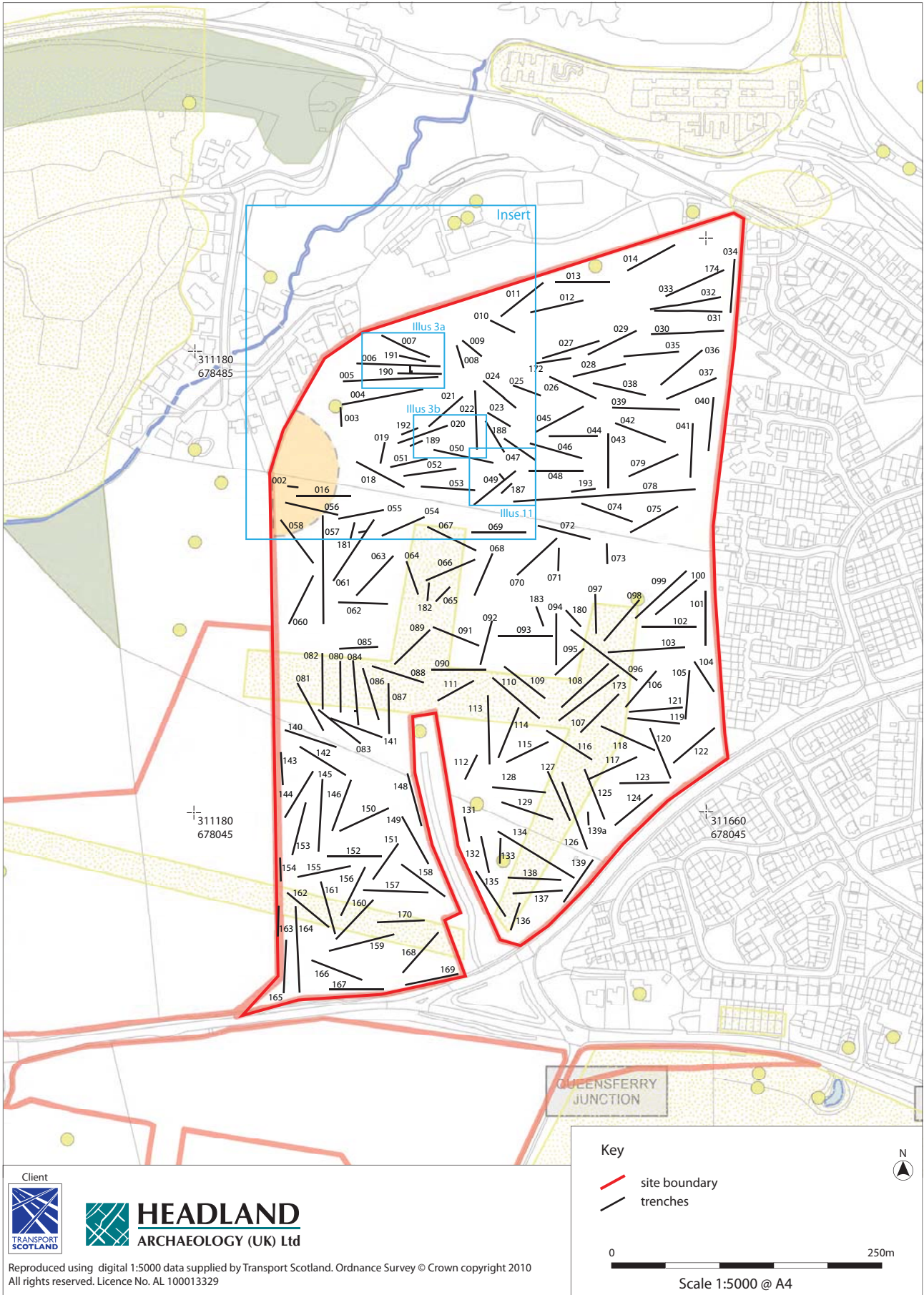
Client
 **HEADLAND**
 ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LAND PARCEL 4 (FRCE10)

Reproduced using 2007 OS 1:50,000 Landranger No. 65 and digital 1:10,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2010 All rights reserved. Licence No. AL 100013329



Illus 1
 Site location



© Headland Archaeology (UK) Ltd



HEADLAND
ARCHAEOLOGY (UK) Ltd

Reproduced using digital 1:5000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2010
All rights reserved. Licence No. AL 100013329

Key

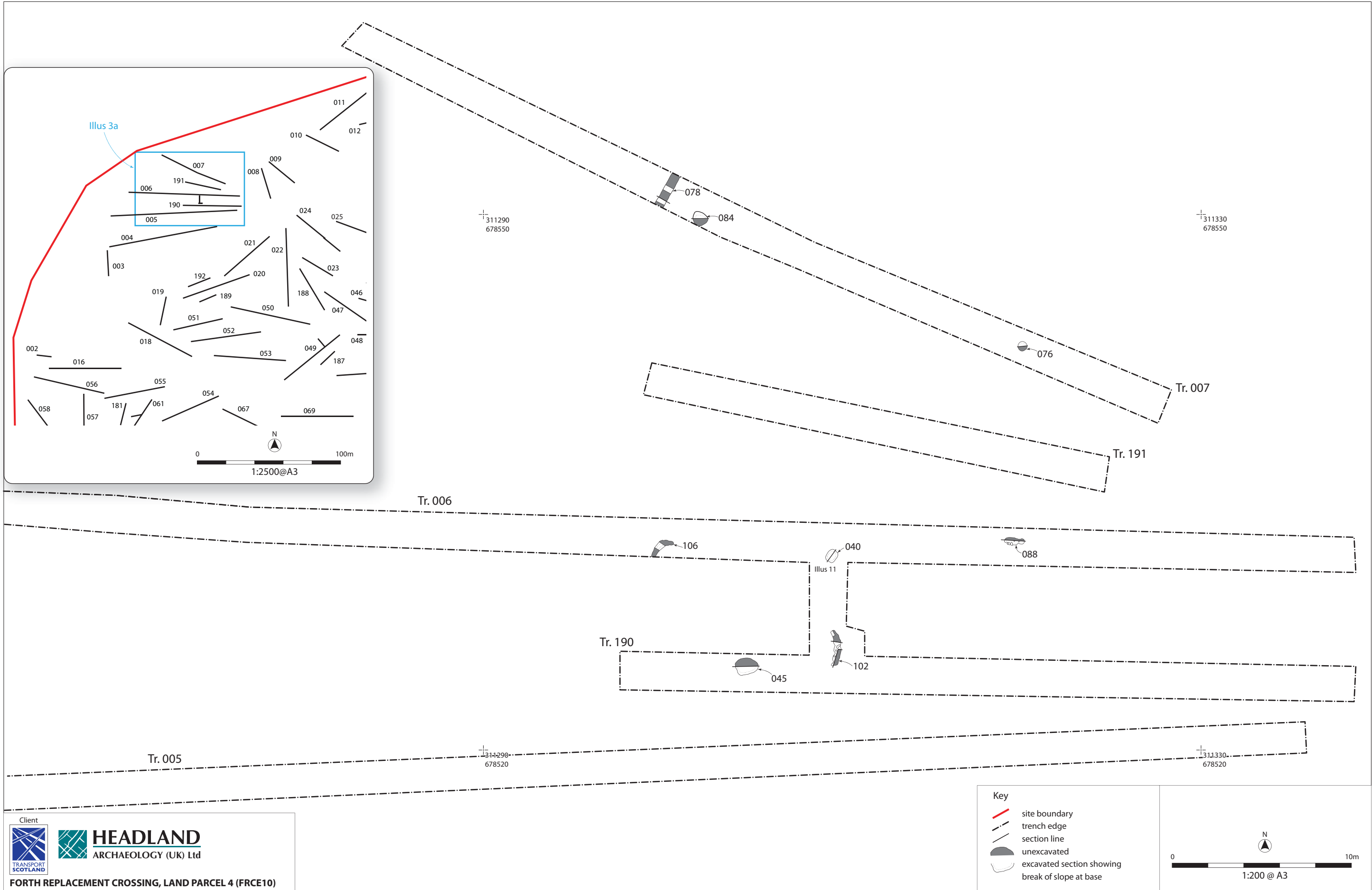
- site boundary
- trenches



0 250m

Scale 1:5000 @ A4

Illus 2
Trench plan



© Headland Archaeology (UK) Ltd

Client

HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LAND PARCEL 4 (FRCE10)

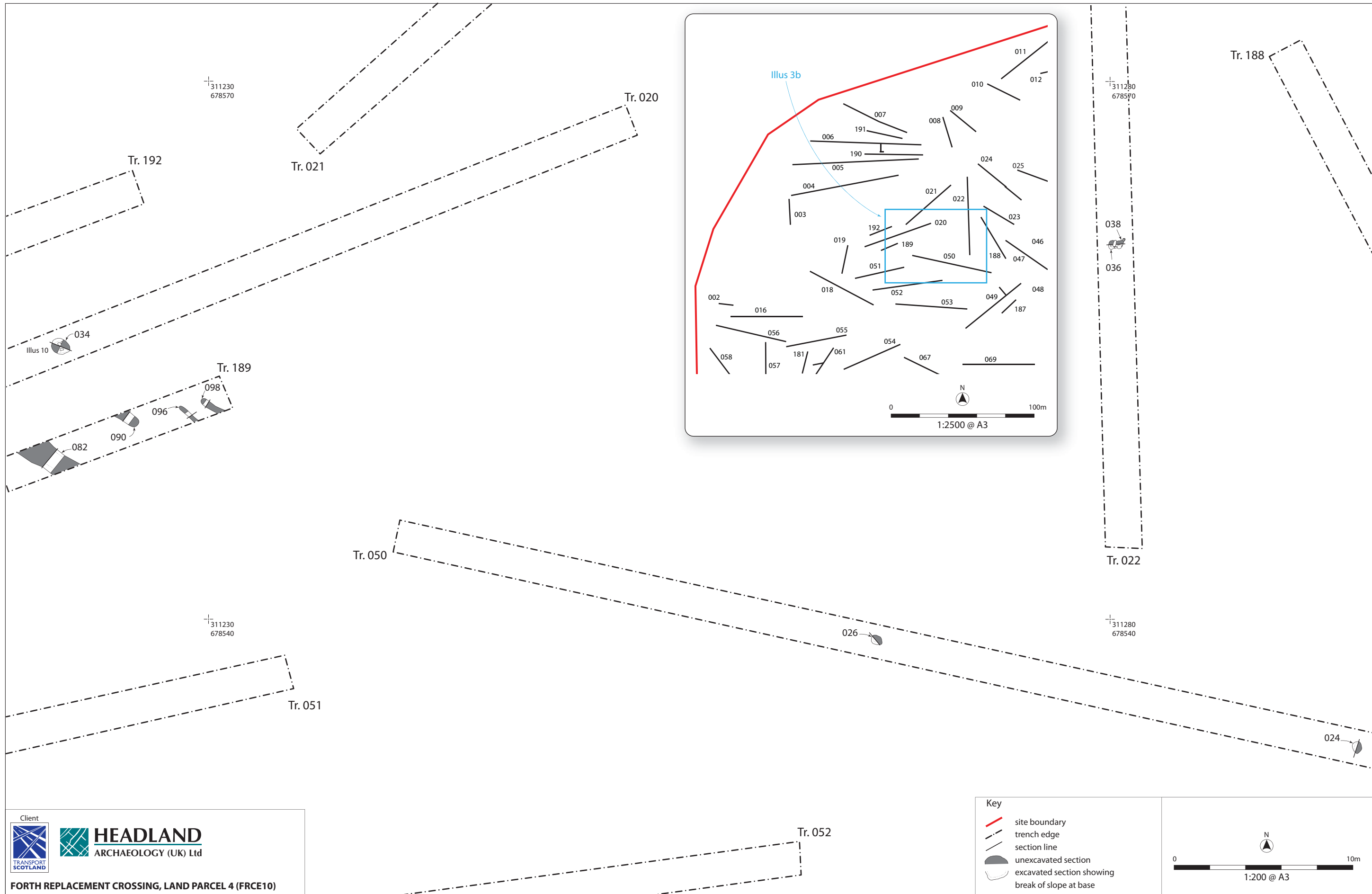
Key

- site boundary
- trench edge
- section line
- unexcavated
- excavated section showing break of slope at base

0 10m

1:200 @ A3

Illus 3a
Concentration of archaeological features in trenches 6 and 7



© Headland Archaeology (UK) Ltd






Client






HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LAND PARCEL 4 (FRCE10)

Key

-  site boundary
-  trench edge
-  section line
-  unexcavated section
-  excavated section showing break of slope at base

1:200 @ A3

Illus 3b
Concentration of archaeological features
in trenches 20, 22, 50 and 189



Illus 4

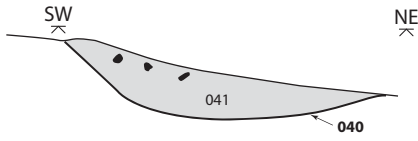
Plan shot of pit [040] with in situ pottery

Client

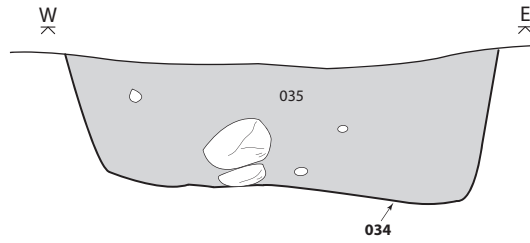


HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LAND PARCEL 4 (FRCE10)



Illus 5a
South-east facing section of pottery filled pit [040]



Illus 5b
South facing section of pit [034]



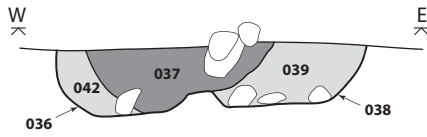


Illus 6
Plan shot of pit [084]

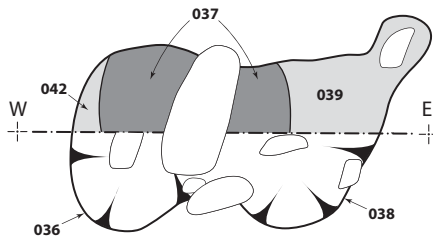


Illus 7
Plan shot of pit [034]





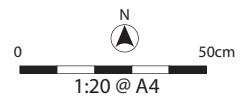
Illus 8a
South facing section of pits [036] and [038]



Illus 8b
Plan of pits [036] and [038]



Key



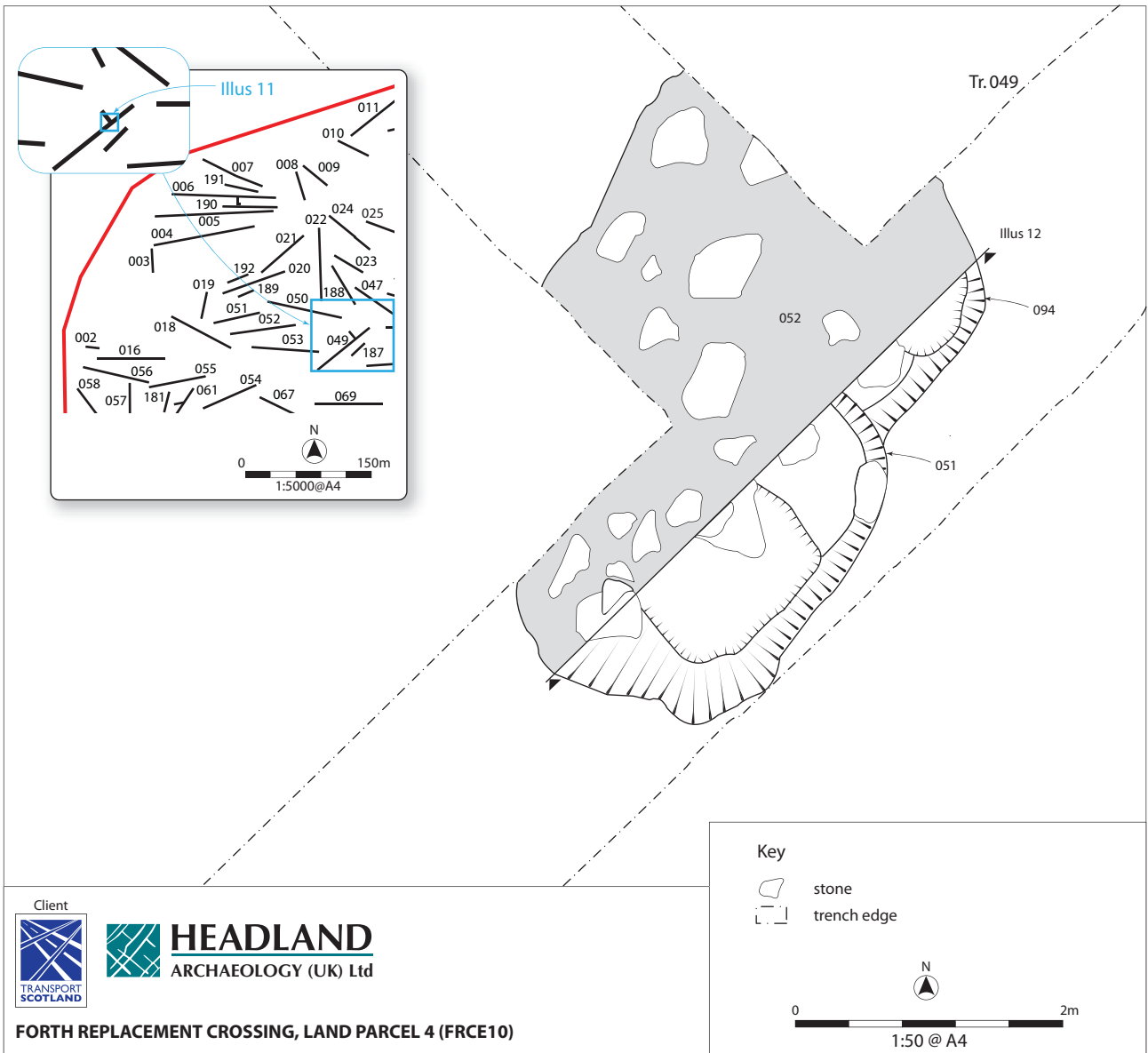


Illus 9
Plan shot of pit [030]

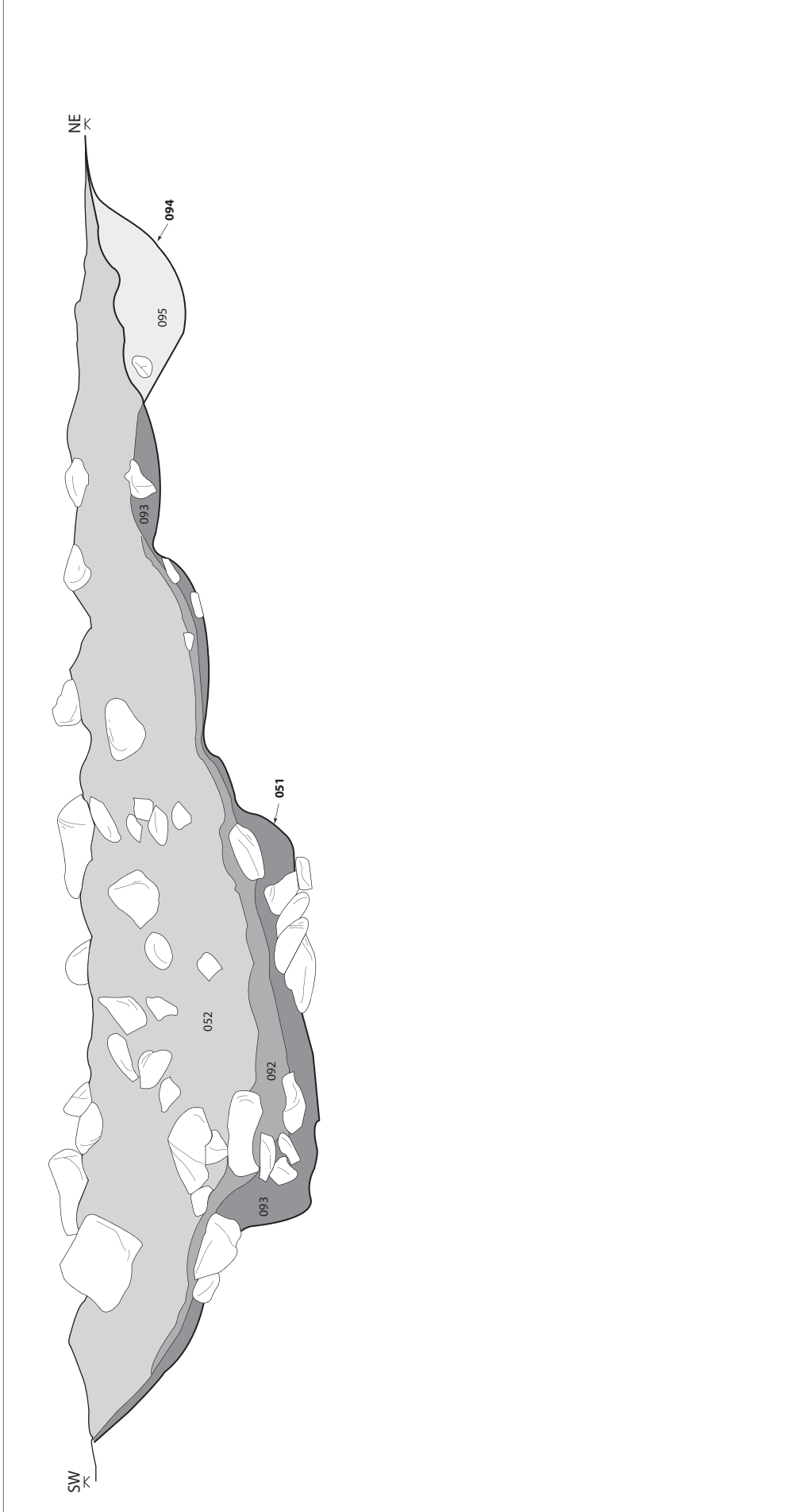


Illus 10
East facing section of pit [002]





Illus 11
Plan of possible kiln [051]



Client
HEADLAND
 ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LAND PARCEL 4 (FRCE10)



Illus 12
 South-east facing section of possible kiln [051]

Project code: FRCE10
Client: Transport Scotland
Date: 29th March 2011

The Results of an Archaeological Field Evaluation by Trial Trenching at Echline Fields, South Queensferry (Land Parcel 5)

Archaeological Consultant: Jacobs Arup
Report Authors: Kirsty Dingwall
Report Status: Approved



Executive Summary

Headland Archaeology conducted an archaeological evaluation by trial trenching at Echline, South Queensferry, NGR: NT 11135 77960 (centred), to assess the presence/absence of archaeological features 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 58 trenches (5346m²) were excavated comprising a 7.5% sample across three fields. Trenches were targeted following assessment of the results of a geophysical survey undertaken between 27th 30th August and the 16th September 2010 and also included trenches sited to ensure good spatial coverage. The trial trenching revealed ditches and furrows relating to post-medieval agricultural activity on site. No other features of archaeological interest were encountered.

ARCHAEOLOGICAL EVALUATION
Forth Replacement Crossing: Land Parcel 5, Echline Fields

PROJECT SUMMARY SHEET (FRCE10)

<i>Client</i>	Transport Scotland
<i>Consultant</i>	Jacobs Arup
<i>National Grid Reference</i>	NT 11135 77960
<i>Project Manager</i>	Edward Bailey
<i>Text</i>	Kirsty Dingwall
<i>Illustrations</i>	Caroline Norrman Tom Small
<i>Evaluation Team</i>	Samira Ben Mohammed Kirsty Dingwall Jamie Humble Jurgen van Wessel
<i>Schedule</i>	
Fieldwork	8 th – 14 th March 2011
Report	March 2011

CONTENTS

1	Introduction	135
	1.1 <i>General</i>	135
	1.2 <i>Project Background</i>	135
	1.3 <i>Aims and Objectives of the Archaeological Works</i>	135
2	Site Background	136
	2.1 <i>Archaeological and Historical Background</i>	136
	2.2 <i>Site Topography and Land Use</i>	137
	2.3 <i>Site Geology</i>	137
3	Methodology	137
4	Results of Fieldwork	138
	4.1 <i>Trial Trenching</i>	138
5	Conclusions	138
6	References	139
	6.1 <i>Bibliographic References</i>	139
7	Appendices	140
	<i>Appendix 1: Trench Register</i>	140
	<i>Appendix 2: Context Register</i>	143
	<i>Appendix 3: Trench Matrices</i>	144
	<i>Appendix 4: Photographic Register</i>	146
	<i>Appendix 5: Drawing Register</i>	148
	<i>Appendix 6: Sample Register</i>	149
	Illustrations	150

1 Introduction

1.1 General

1.1.1 This draft 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) wherein the requirement for a programme of trial trenching was identified.

1.1.2 Between the 8th and the 14th March 2011, Headland Archaeology (UK) Ltd. undertook a programme of archaeological evaluation by trial trenching on Land Parcel 5 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 Kirsty Dingwall (Senior Archaeologist). Three 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, 2009).

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 (1993) (Archaeological Assessment Stages 1-2). Further information was also gathered during an archaeological watching brief on the Ground Investigations for the proposed scheme that was carried out during 2008 and 2009 by 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).

1.3 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;
- 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 The ES identified a total of 356 sites (within a study area ranging from 500m from the development corridor to 6km from the proposed main crossing), whilst an archaeological desk-based assessment of a wider study area undertaken at route corridor selection stage of the proposed scheme, identified a total of 1200 cultural heritage sites. The results from these studies show that the proposed development corridor and the wider study area collectively constitute 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 Land parcel 5 (Illus 1) was highlighted as a site of potential cultural heritage significance against a background of human activity dating from the Mesolithic onwards. Evidence for prehistoric activity includes two cairns which may date to the Neolithic or Bronze Age in the vicinity of Inchgarvie House to the north-east of Land Parcel 5. Trial trenching undertaken as part of the mitigation measures recommended by the ES on the adjacent LP4 and resultant excavation identified prehistoric settlement immediately to the south-west of Inchgarvie House (Humble and Bailey 2011, Humble forthcoming). Roman artefacts including several silver medals of Marcus Antoninus (138-161AD) and a sherd of Samian pottery were recovered within the vicinity of Inchgarvie House, whilst long cists which probably date to the early Medieval period were also identified during ground improvement and levelling works undertaken in the grounds of the house during the 19th century (Transport Scotland 31-32).
- 2.1.3 Further medieval activity has been recorded near the site, with the possible presence of medieval ruins suggested by the presence of a carved stone window, a square pillar and hewn stones uncovered near Inchgarvie House during the 18th century and later removed to Dunkirk (OSA: Vol 1, 238, 1791-9). The Royal Burgh of South Queensferry also has its origin in the medieval period.
- 2.1.4 Within the land parcel there was one known cultural heritage site, a linear cropmark recorded aligned north-west to south-east. This cropmark also ran through Land Parcel 4 where trial trenching revealed no evidence of the feature.
- 2.1.5 The ES identified Land Parcel 5 as having high archaeological potential and recommended that an earth resistance survey should be undertaken, the results of which would be used to inform the trial trenching phase. The resistance survey was carried out by Headland Archaeology (UK) Ltd during September 2010 and

identified a number of geophysical anomalies across land parcel 5 (Harrison & Lyons 2010). Although none of these could be identified definitively as archaeological in nature without testing, the survey facilitated target trial trenching of potential archaeological features.

2.2 *Site Topography and Land Use*

2.2.1 The site was divided into two areas (Area A in the east and Area B in the west) during the evaluation, defined by a stone wall which ran north-south across the site. At the north of Area A, a hedge ran north-west to south-east. The majority of Area A and B was under young crop at the time of evaluation, with a small area beyond the hedge in Area A comprising rough grassland traversed by paths. Currently this grassland is used as an amenity area. The site is under the ownership of S N M Bowlby.

2.3 *Site Geology*

2.3.1 The results of geotechnical investigations carried out demonstrate that the subsurface stratigraphy underlying the development corridor 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 patches of free-draining sands and larger bands of bedrock.

2.3.1 The solid geology of the site is typified by igneous alkali dolerite (BGS Livingstone 32W). 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**

3.1.1 The total area to be evaluated was 70,152 m² and 7.5% of this was investigated by trial trenching, the total area of which comprised 5261 m². An indicative trench plan was agreed with the consultant archaeologists, Jacobs Arup. Targeted trenches were centred on geophysical anomalies identified during the earth resistance survey, whilst random trenches were sited to test blank areas and to provide good spatial coverage of the entire site. It was ensured that no trenches were placed close to overhead power lines running along the west and north of the site. As a result of the presence of the power lines, one trench was not excavated at the north of Area A and the location of two in the north-west of Area B was altered. A number of trenches were extended to ensure the full sample area was excavated.

3.1.2 All trenches were individually numbered and a pole-mounted Trimble G6 differential GPS programmed with the relevant coordinates was utilised to identify and mark out the locations of trenches. The trenches were excavated using one 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 encountered 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.

- 3.1.3 Bulk soil samples were collected from secure archaeological contexts for processing and assessment. Where possible a minimum 30-litre sample was collected from each archaeological deposit and given a unique number (Transport Scotland 2010, 59). All finds were recorded by individual context and their cleaning, storage and conservation undertaken in accordance with the Institute for Archaeologists Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials (Transport Scotland 2010, 65-66).

4 Results of Fieldwork (Illus 2)

4.1 Trial Trenching

- 4.1.1 Fifty-eight trenches were excavated across Land Parcel 5 (Illus 2) with a combined total area of 5346 m². Full detailed descriptions of each trench and individual contexts can be found in Appendix 1 and Appendix 2. Results are summarised below.
- 4.1.2 The natural geology seen in the trenches was largely yellowy grey clay, although outcropping of limestone bedrock was seen across the whole site, more frequently towards the south where the ground rises up slightly. In general this was overlain by between 0.10 m and 0.20 m of subsoil or interface material – an orangey brown sandy silt. Topsoil was between 0.30 m and 0.50 m deep and contained little in the way of recent ceramic material.
- 4.1.3 Colluvial deposits were identified in four trenches (Trenches 20, 21, 25 and 31) and were up to 0.70 m in depth, comprising orangey brown clayey silt. This appeared to have filled in a slight hollow in the centre of Area A, and was removed to ensure that no possible features were masked by the material.
- 4.1.4 Archaeological features were found in seven trenches (Trench 4, 14, 18, 44, 52, 53 and 54). These were concentrated in the north of Area A and in the middle part of Area B.
- 4.1.5 Within Trench 4, two sections of ditch were identified [004 and 018] running approximately north-south and east-west. [004] was not fully exposed within the limits of the trench, but measured 1.35 m wide and was 0.25 m deep. Ditch [018] to the west was 0.70 m wide and up to 0.30 m deep. Both sections of ditch had steep sides and flat bases. They may have formed two sides of an enclosure. To the south of [018] was an oval shaped pit [002], which measured 0.55m by 0.50m and 0.09m deep and filled with charcoal rich sandy silt. This appeared to be an *in situ* burnt deposit.
- 4.1.6 Furrows [006, 010, 012, 014, 016 & 019] were identified in Trenches 14, 44, 51, 52, 53, and 54. In each case only one or two sections of furrow were visible, and did not extend across the whole area. The furrows were between 0.70 m and 1.60 m wide, and up to 0.14 m in depth. They had shallow sloping sides and were filled [007, 011, 013, 015 017 and 020] with a compact grey silty clay. The furrow visible in Trench 14

was aligned approximately north-south while those in Trenches 44, 51, 52 and 53 ran roughly east-west.

5 Conclusions

- 5.1.1 The evaluation has established that there is little evidence of settlement activity. At the very north of the land parcel, there is a small concentration of features which currently undated, but likely to be contemporary with the possible post-medieval field system recorded during excavation of Land Parcel 4 to the north-east (Humble forthcoming).
- 5.1.2 The only other features identified relate to agricultural activity in the area, with a few surviving furrows present across the site and aligned north-south or east-west. This alignment respects existing field boundaries. The limited number of furrows present may be the result of later deep plough activity; however, no specific evidence was noted to confirm this.

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

Humble, J (forthcoming) *Results of an Archaeological Excavation at Echline Fields, South Queensferry*. Unpublished client report. Headland Archaeology (UK) Ltd

Humble, J and Bailey, E 2011 *Results of an Archaeological Evaluation by Trial Trenching of Echline Fields, South Queensferry*. Unpublished client report. Headland Archaeology (UK) Ltd

Jacobs Arup (2009). Forth Replacement Crossing: Environmental Statement. November 2009.

Old Statistical Account: Vol 1, 238, 1791-9

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

7 Appendices

Appendix 1: Trench Register

Trench No	Length (m)	Depth (m)	Description
1	12.2	0.64	N-S running. No features.
2	25.7	0.64	N-S running. No features.
3	20.5	0.66	SW-NE running. No features.
4	13.7	0.8	SW-NE running. Contains ditches [004] and [018] and pit [002].
5	35	0.8	NW-SE running. No features.
6	45.2	0.6	NW-SE running. No features.
7	26	0.69	E-W running. No features.
8	47.5	0.64	E-W running. No features.
9	72.5	0.52	E-W running. No features.
10	29.6	0.58	N-S running. No features.
11	45.3	0.58	NE-SW running. No features.
12	45.4	0.6	N-S running. No features.
13	74.3	0.95	E-W running. No features.
14	90.8	0.45	E-W running. Furrow [006].
15	46.2	0.6	NE-SW running. No features.
16	19	0.55	N-S running. No features.
17	46.2	0.55	NW-SE running. No features.
18	40.3	0.48	NE-SW running.
19	48.9	0.42	E-W running. No features.
20	46.4	0.6	N-S running. No features. Hillwash appears at 7 m and continues throughout trench.
21	37.7	0.75	E-W running. No features. Hillwash present.
22	26.4	0.45	E-W running. No features.
23	36.6	0.6	E-W running. No features.
24	45	0.7	NE-SW running. No features.

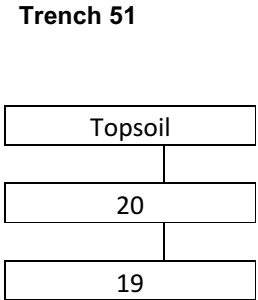
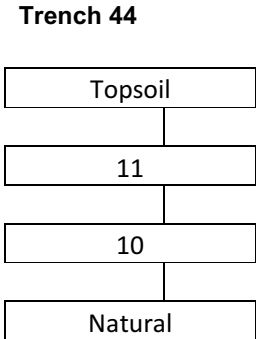
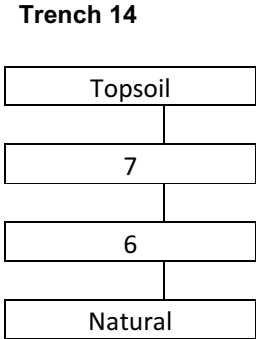
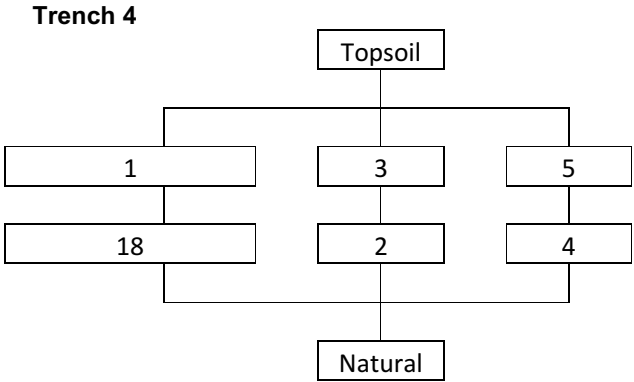
Trench No	Length (m)	Depth (m)	Description
25	38.2	0.9	N-S running. No features. Hillwash present and increases in depth at N end.
26	45.2	0.65	E-W running. No features.
27	51	0.8	SW-NE running. No features. Slight slope northwards.
28	51.2	0.55	NW-SE running. No features.
29	46.7	0.47	N-S running. No features.
30	46	0.65	NE-SW running. No features.
31	46	1.2	E-W running. No features. Hillwash present from 7m to 30m.
32	46	0.7	E-W running. No features.
33	46.4	0.7	NW-SE running. No features.
34	45.2	0.55	NW-SE running. No features.
35	22	0.7	NW-SE running. No features.
36	45.2	0.7	E-W running. No features.
37	47.4	0.7	NE-SW running. No features. Modern disturbance relates to pipe trench backfill at W end.
38	46.9	0.7	NE-SW running. No features.
39	47.2	0.65	NW-SE running. No features.
40	78.6	0.9	E-W running. No features.
41	32.3	0.55	N-S running. No features.
42	47.3	0.45	E-W running. No features.
43	43.3	0.8	E-W running. No features.
44	46.4	0.7	NE-SW running. Contains furrow [010].
45	21	0.45	E-W running. No features.
46	34.4	0.4	E-W running. No features.
47	29	0.55	N-S running. No features.
48	40.4	0.5	E-W running. No features.

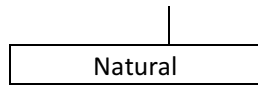
Trench No	Length (m)	Depth (m)	Description
49	24	0.5	NE-SW running. No features. Bedrock seen across most of trench.
50	33	0.6	E-W running. No features.
51	67.5	0.4	N-S running. Contains furrow [010].
52	96.6	0.75	N-S running. Contains furrow [012].
53	160	0.6	N-S running. Contains furrow [014]. Bedrock seen across most of southern half of trench.
54	89.7	0.75	N-S running. Contains furrow [016].
55	46.4	0.95	NW-SE running. No features. Bedrock seen across most of trench.
56	44	0.95	NE-SW running. No features.
57	38.7	0.45	N-S running. No features.
58	53.3	0.65	E-W running. No features.

Appendix 2: Context Register

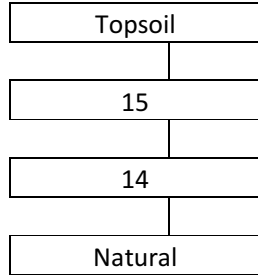
Context No.	Area	Description
001	TR 4	Fill of ditch [018]. Soft dark grey clayey silt with frequent small stones.
002	TR 4	Cut of pit. Semi-circular in plan with irregular base. Measures 0.55m by 0.50m and 0.09m deep.
003	TR 4	Fill of pit [002]. Loose dark blackish grey sandy silt with frequent charcoal and small stones
004	TR 4	Cut of ditch. North-south aligned linear with steeply sloping sides and flat base. Measures 2.2m by 1.35m and 0.25m deep.
005	TR 4	Fill of ditch [004]. Compact greyish brown clayey silt with frequent small, medium and large stones.
006	TR 14	Cut of furrow. Linear in plan, with gently sloping sides and a flat and stony base. Measures 2.5m by 1.17m and 0.07m deep.
007	TR 14	Fill of furrow [006]. Very compact brownish grey silty clay with frequent small to medium stones.
008	TR 18	Void.
009	TR 18	Void.
010	TR 44	Cut of furrow. Linear in plan with gently sloping sides, curved base and gradual break of slope. Measures 2m by 1.57m and 0.14m deep
011	TR 44	Fill of furrow [010]. Semi-compacted dark brownish grey clayey silt with occasional small stones.
012	TR 52	Cut of furrow. Linear in plan with gently sloping sides, rounded base and gentle break of slope. Measures 1.8m by 1.2m and 0.12m deep.
013	TR 52	Fill of [012]. Firm grey silty clay with very rare charcoal.
014	TR 53	Cut of furrow. Linear in plan with sloping sides, rounded base and gradual break of slope. Some animal disturbance at East end. Measures 2m by 0.90m and 0.06m deep.
015	TR 53	Fill of furrow [014]. Semi-compacted dark grey silty clay with occasional small stones.
016	TR 54	Cut of furrow. Linear in plan with gently sloping sides, rounded base and gentle break of slope. Measures 3.1m by 0.73m and 0.03m deep
017	TR 54	Fill of furrow [016]. Firm grey silty clay fill with very rare charcoal.
018	TR 4	Cut of ditch. East-west aligned linear with near vertical sides and irregular base. Runs E-W. Measures 6.00M (visible) by 0.68m and 0.30m deep
019	TR 51	Cut of furrow. Linear in plan with gently sloping sides, curved base and gradual break of slope. Measures 2m by 1.44m. Continuation of furrow [010] in trench 44. Not excavated.
020	TR 51	Fill of furrow [019]..

Appendix 3: Trench Matrices

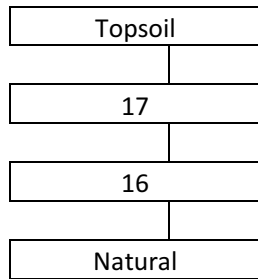




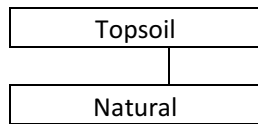
Trench 53



Trench 54



**Remaining
Trenches**



Appendix 4: Photographic Register

Photo No.	Direction	Description
01		ID shot
02	E	W-facing section through [018] and [002].
03	S	N-facing section through [004].
04	W	General shot of Trench 4
05	NE	General shot of Trench 5
06	SE	General shot of Trench 3
07	NE	General shot of Trench 1
08	NE	General shot of Trench 2
09	SW	Rubble drain in Trench 7
10	W	General shot of Trench 7
11	W	General shot of Trench 8
12	W	General shot of Trench 6
13	W	General shot of Trench 9
14	N	General shot of Trench 10
15	SW	General shot of Trench 11
16	S	General shot of Trench 12
17	E	General shot of Trench 13
18	SE	NW-facing section through [006]
19	W	General shot of Trench 14
20	S	General shot of Trench 15
21	S	General shot of Trench 16
22	W	General shot of Trench 17
23	S	General shot of Trench 18
24	S	N-facing section through possible pit [008] - now void
25	W	General shot of Trench 19
26	S	General shot of Trench 20
27	W	General shot of Trench 21
28	W	General shot of Trench 22
29	W	General shot of Trench 23
30	S	General shot of Trench 24
31	S	General shot of Trench 25
32	E	General shot of Trench 26
33	S	General shot of Trench 27
34	S	General shot of Trench 28
35	S	General shot of Trench 29
36	SW	General shot of Trench 30
37		ID Record Shot
38	W	General shot of Trench 31
39	W	General shot of Trench 32
40	E	General shot of Trench 33
41	NW	General shot of Trench 34

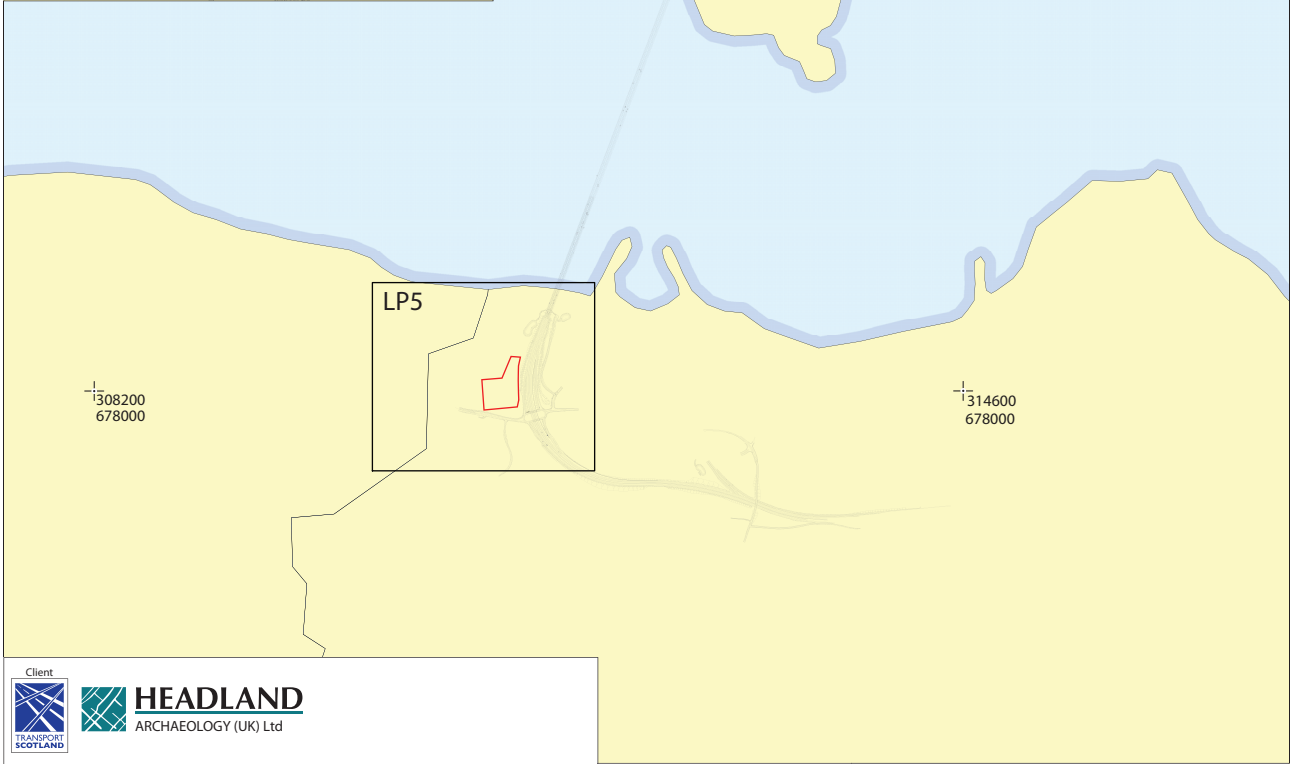
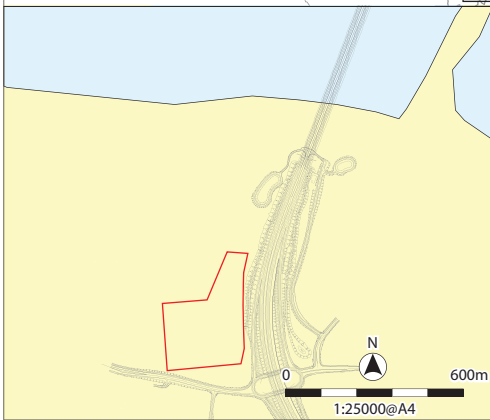
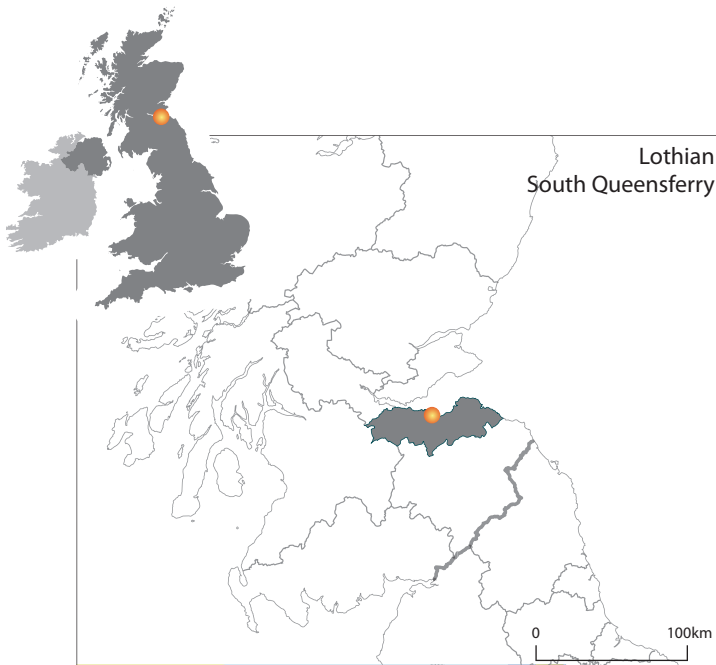
Photo No.	Direction	Description
42	NE	General shot of Trench 35
43	N	General shot of Trench 36
44	SW	General shot of Trench 37
45	W	General shot of Trench 38
46	W	General shot of Trench 39
47	E	General shot of Trench 40
48	S	General shot of Trench 41
49	E	General shot of Trench 42
50	E	General shot of Trench 43
51	S	General shot of Trench 44
52	SW	E-facing section through [010]
53	E	General shot of Trench 45
54	E	General shot of Trench 46
55	S	General shot of Trench 47
56	W	General shot of Trench 48
57	SW	General shot of Trench 49
58	W	General shot of Trench 50
59	S	General shot of Trench 51
60	S	General shot of Trench 52
61	SW	E-facing section through [012]
62	S	General shot of Trench 53
63	SW	E-facing section through [014]
64	NW	SE-facing section through [016]
65	S	General shot of Trench 54
66	S	General shot of Trench 55
67	S	General shot of Trench 56
68	S	General shot of Trench 57
69	E	General shot of Trench 58
70	S	General shot of Trench 29

Appendix 5: Drawing Register

Drawing No.	Plan	Section	Description
500		1:10	W-facing section through [018] and [002]

Appendix 6: Sample Register

Sample No.	Context No.	Description
001	5	Fill of ditch [004]
002	1	Fill of ditch [018]
003	3	Fill of pit [002]
004	7	Fill of furrow [006]
005	9	Fill of furrow [008]



Client


HEADLAND
 ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LAND PARCEL 5 (FRCE10)

Reproduced using 2007 OS 1:50,000 Landranger No. 65 and digital 1:10,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2010 All rights reserved. Licence No. AL 100013329

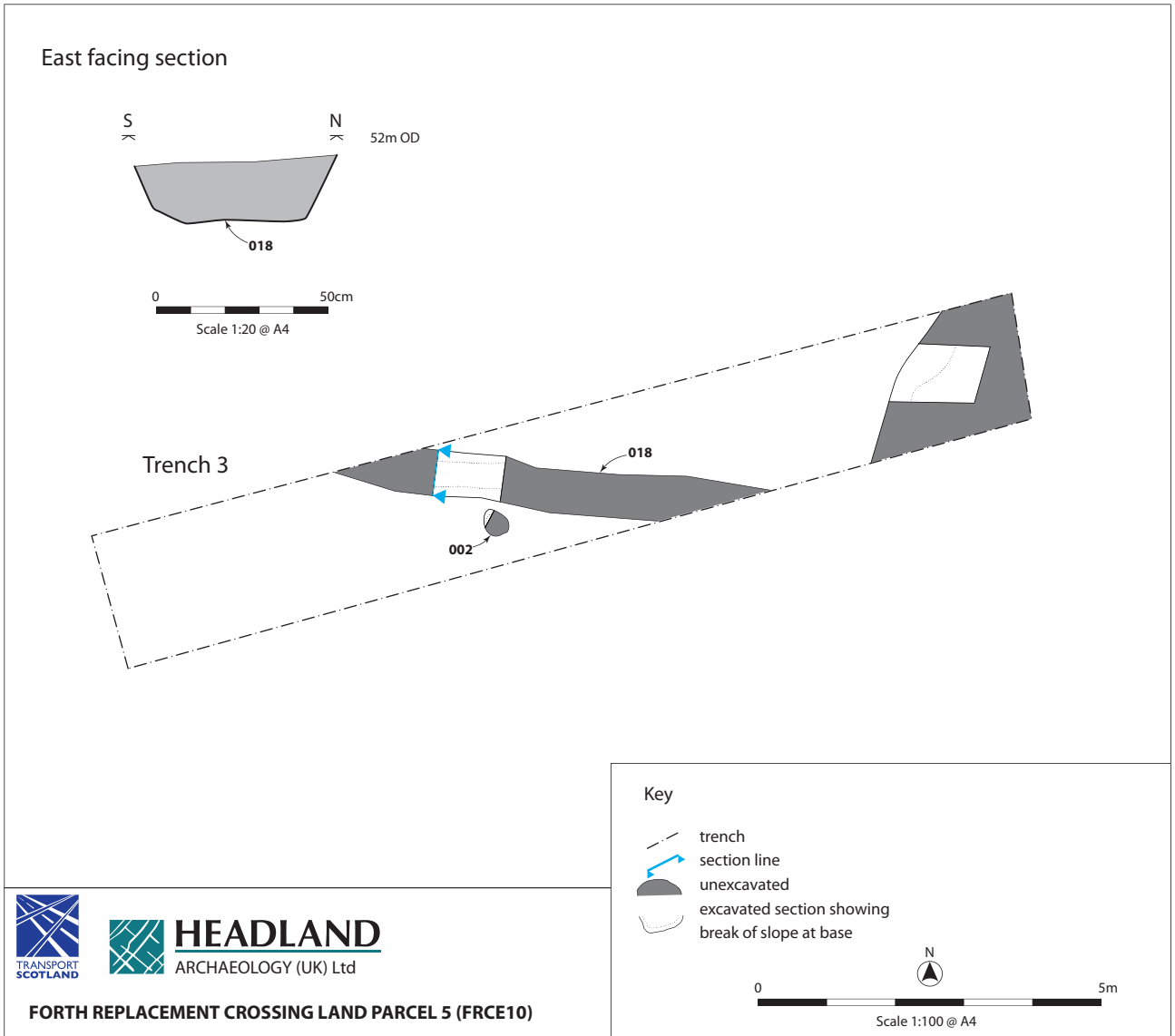
Scale 1:55,000 @ A4



Illus 1
Site location



Illus 2
Land Parcel 5 showing trench locations



Illus 3
Detail plan of trench 3 with section



Illus 4

Ditch 018 and pit 002 looking south

Project code: FRCE10
Client: Transport Scotland
Date: 5th May 2011

The Results of an Archaeological Field Evaluation by Trial Trenching and Archaeological Excavation on the Forth Replacement Crossing at Dundas Castle Farms (Land Parcel 6)

Archaeological Consultant: Jacobs Arup
Report Authors: Kirsty Dingwall, Jamie Humble
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 6), NGR:NT 1270 7779 (centred), to assess the presence/absence of archaeological features 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 36 trenches with an overall area of 3530m² were excavated comprising a 5% sample across two fields. Trenches were sited to ensure good spatial coverage. The trial trenching revealed two curvilinear ditches and an associated post-hole, all undated, around which a larger area of 788m² was opened to reveal its full extent. Ditches and furrows relating to post-medieval agricultural activity on site along with an isolated pit were also exposed.

ARCHAEOLOGICAL EVALUATION
Forth Replacement Crossing: Land Parcel 6, Dundas Castle Farms

PROJECT SUMMARY SHEET (FRCE10)

<i>Client</i>	Transport Scotland
<i>Consultant</i>	Jacobs Arup
<i>National Grid Reference</i>	NT 1270 7779
<i>Project Manager</i>	Edward Bailey
<i>Senior Archaeologist</i>	Kirsty Dingwall
<i>Text</i>	Kirsty Dingwall Jamie Humble
<i>Illustrations</i>	Julia Bastek
<i>Evaluation Team</i>	Samira Ben Mohammed Kirsty Dingwall Ian Hill Jamie Humble Claire Delahunty Emma Searle Steve Roe Richard Tuffin
<i>Schedule</i>	
Fieldwork	13 th – 19 th April 2011
Report	July 2011

CONTENTS

1	Introduction	158
	1.1 <i>General</i>	158
	1.2 <i>Project Background</i>	158
	1.3 <i>Aims and Objectives of the Archaeological Works</i>	158
2	Site Background	159
	2.1 <i>Archaeological and Historical Background</i>	159
	2.2 <i>Site Topography and Land Use</i>	160
	2.3 <i>Site Geology</i>	160
3	Methodology	160
4	Results of Fieldwork	161
	4.1 <i>Trial Trenching</i>	161
5	Palaeoenvironmental report	162
	5.1 <i>Plant Remains</i>	162
	5.2 <i>Other Finds</i>	162
	5.3 <i>Discussion</i>	163
	5.4 <i>Recommendations</i>	163
6	Conclusions	163
7	References	165
	6.1 <i>Bibliographic References</i>	165
	6.2 <i>Cartographic References</i>	165
8	Appendices	166
	<i>Appendix 1: Trench Register</i>	166
	<i>Appendix 2: Context Register</i>	168
	<i>Appendix 3: Trench Matrices</i>	170
	<i>Appendix 4: Photographic Register</i>	171
	<i>Appendix 5: Drawing register</i>	173
	<i>Appendix 6: Sample Register</i>	173
	<i>Appendix 7: Retent sample results</i>	174
	<i>Appendix 8: Flotation sample results</i>	174
	Illustrations	175

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 the 13th and the 19th April 2011, Headland Archaeology (UK) Ltd. undertook a programme of archaeological evaluation by trial trenching on Land Parcel 6 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 was overseen by Ian Hill and Jamie Humble and the reporting by Jamie Humble. Four additional staff members were involved throughout the evaluation.
- 1.1.3 Based on the results of the trial trenching excavation took place on Land Parcel 6 between the 16th and 20th May 2011. The project was managed by Edward Bailey (Project Manager), the fieldwork and reporting was undertaken by Elizabeth Jones. Three additional staff members were involved throughout the excavation.

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, including resistivity survey and 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;
- 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.

1.3.2 Following the results of the evaluation the objectives of the excavations were to:

- Clarify the nature, character and extent of the features identified during the evaluation and obtain a plan of any additional features identified during the excavation.
- Identify any structures or activity areas and the date and duration of any settlement remains
- Obtain artefactual and environmental evidence for the purposes of dating and interpretation of the site

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 15th century, although the castle may originate as early as the 12th century (Jacobs Arup 2009a, 32).

2.1.4 Land Parcel 4 which is situated a short distance to the north contained evidence of human activity dating from the Mesolithic period onwards (approx 10,000 to 4,000 BC).

2.2 *Site Topography and Land Use*

2.2.1 Land Parcel 6 occupies two fields. The eastern of these and the larger of the two was under a young crop at the time of the evaluation. The western field contained a mature crop of oil seed rape. Both were bounded to the north by the A904 and by Builyeon Road to the south and the east. The ground rose up slightly towards the west of the land parcel and down beyond its southern limit. Thirty three trenches were excavated in the eastern field and three in the western field. The site is under the ownership of S N M Bowlby.

2.3 *Site Geology*

2.3.1 The results of geotechnical investigations (Jacobs Arup 2009b) carried out demonstrate that the subsurface stratigraphy 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 70,272m², of which a 5% sample (3530m²) was investigated 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. The location of one trench in the western field was altered to avoid blocking the gate between the fields. Following the discovery of features within Trench 31 a further area totalling 788m² was stripped to expose the full extent of these features.

3.2 All trenches were individually numbered and a pole-mounted Trimble G6 differential GPS programmed with the relevant co-ordinates was utilised to identify and mark out the locations of trenches. The trenches were excavated using one 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 met 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.

- 3.3 Bulk soil samples were collected from secure archaeological contexts for processing and assessment. Where possible a minimum 30-litre sample was collected from each archaeological deposit and given a unique number (Transport Scotland 2010, 59). Samples were processed in laboratory conditions using a standard floatation method (cf. Kenward *et al* 1980). All plant macrofossil samples were analysed using a stereomicroscope at magnifications of x10 and up to x100 where necessary to aid identification. Identifications were confirmed using modern reference material and seed atlases including Cappers *et al* (2006).
- 3.4 All finds were recorded by individual context and their cleaning, storage and conservation undertaken in accordance with the Institute for Archaeologists Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials (Transport Scotland 2010, 65-66).

4 Results of Fieldwork (Illus 2)

4.1 Trial Trenching

- 4.1.1 A total of 36 trenches were excavated across Land Parcel 6 (Illus 2) with a combined total area of 3530m², subsequently a further area, centred on Trench 31, measuring 788m² was opened. Full detailed descriptions of each trench and individual contexts can be found in Appendix 1 and Appendix 2. Results are summarised below.
- 4.1.2 The natural geology seen across both fields was yellowish silty clay [013] with extensive bands of outcropping bedrock. Occasional patches of coal rich natural deposits were also encountered. In places the bedrock had been broken by repeated ploughing across the area. In places this was overlain by 0.10 – 0.20m of subsoil or interface material – mid yellow brown clayey silt [031]. Topsoil [032] was between 0.20m and 0.50m deep and consisted of mid greyish brown clayey silt.
- 4.1.4 Furrows were identified in Trenches 3, 14 – 17, 19 – 20, and 22 – 24. These were all aligned roughly northeast to southwest and were from 0.9m to 3.3m in width. Generally they survived better in the north-western part of the land parcel but were less than 0.20m in depth. Furrows [034], [036] and [038] were excavated in Trench 3 and furrow [040] in Trench 17. All had shallow sloping sides and flattish bases and were filled with mid brownish grey silty clay: fills [033], [035], [037] and [039] respectively. The remaining furrows were not excavated and were recorded only in plan.
- 4.1.5 Archaeological features were seen in Trenches 5, 11, 12 and 31 (Illus 2). A single pit was seen in Trench 5 [001], which was oval in plan measuring 0.68 by 0.64m and 0.16m deep with a single sandy loam fill [002]. No finds were present within the feature and it is undated (Illus 3).

- 4.1.5 A linear ditch was identified running through Trenches 11 and 12 [003], a second ditch was identified running across Trench 31 [011/026].
- 4.1.6 Ditch [003] (Illus 4) ran roughly north-east to southwest across Trenches 11 and 12 where it terminated. It had moderately steep sides and a curved base and was filled with a mid greyish brown sandy loam [004]. Within the fill were a large number of medium sized stones which appeared to have tumbled in. The ditch was 1.30m wide and 0.30m deep. Ditch [011/026] is described in the next section.
- 4.2 *Excavation (Illus 5)*
- 4.2.1 Trench 31 contained two sections of shallow curvilinear gully [005/017, 009/015] with a possible post-hole [007/019] located between the possible terminals of the ditches (Illus 6); a larger ditch [011/026] ran E-W across the trench. After initial investigation within the evaluation trench a further area was stripped to identify the full extent of these features and any associated features. No further features were identified in the stripped area. Gully [005/017] was 1.30m long, 0.27m wide and 0.21m deep and was truncated to the west by a geotechnical trial hole. Gully [009/015] was 2.43m long, 0.43m wide and 0.24m deep; both of these features had steep sides and rounded bases. Post-hole [007/019] was circular in plan, measuring 0.33m in diameter and 0.07m deep. All three of these features were filled with homogenous mid greyish brown silty clay [006/018, 010/016, 008/020 respectively]. The similar character and fill of these three features raises the possibility that these were originally part of one, heavily truncated, continuous gully. No finds were present within any of these features and they are undated.
- 4.2.2 Ditch [011/026] ran from east to west across Trench 31 and continued across the entire of the larger stripped area. It had gently sloping sides with a step in its profile on its northern edge and a rounded base (Illus 7). Ditch [011/026] contained an upper fill of mid greyish brown silty clay [014/024/027/029] and a lower fill of light bluish grey silty clay [012/025/028/030]; within both fills were a number of stones that appeared to have tumbled in. The ditch varied between 2.30m and 3.30m wide and between 0.35m and 0.55m deep. No dating evidence was recovered from the fills of ditch [011/026], however one of the numerous ceramic field drains that crossed the excavation area terminated within the ditch implying that at one time it had drained into the partially silted up but still open ditch.

5 **Palaeoenvironmental Report**

Sarah-Jane Haston

5.1 *Plant Remains*

- 5.1.1 Two samples were taken from curvilinear ditches [009/015] and [005/017]; Sample 1 was taken from the fill of [009/015] and sample 2 was taken from the fill of [005/017]. The results of the sample processing are provided in Tables 1 (Retent finds, Appendix 7) and 2 (Floatation finds, Appendix 8). Suitable material for AMS dating is also identified within each table. All plant remains were preserved through charring.

5.1.2 The concentration of archaeological remains recovered from the samples was very low and only amounted to small quantities of wood charcoal and the occasional charred weed seed.

5.1.3 Wood charcoal was recovered from both of the samples; however, this was present only in very small quantities and all of the charcoal fragments were less than 0.5 cm in diameter. The quantity and size of the charcoal recovered is not suitable for identification and/or Accelerated Mass Spectrometry AMS dating. The small sizes of the fragments suggest that they may have been become incorporated in the sampled deposits by mechanisms such as windblow and surface run-off rather than being a result of deliberate or accidental deposition.

5.1.4 A single charred weed seed of chickweed (*Stellaria media*) was recovered in Sample 1 and is commonly found on arable field margins and disturbed ground. The origin of the single carbonised weed seed is uncertain and does not warrant further study.

5.2 *Other finds*

5.2.1 The only other find recovered from the processed samples was a single small fragment of burnt bone in Sample 1 too small to identify.

5.3 *Discussion*

5.3.1 The few palaeoenvironmental remains recovered from the processed samples do not provide conclusive evidence to suggest the function or date of the curvilinear features. The collective assemblage from the ditch deposits is indicative of the re-working and re-depositing of a low level of domestic material.

5.4 *Recommendations*

5.4.1 No further work on the palaeoenvironmental remains is recommended.

6 **Conclusions**

6.1 Two groups of archaeological features were identified within Land Parcel 6. Towards the south of the site in Trench 31 two curvilinear gullies and an associated pit or posthole were revealed. Trench 31 also contained a ditch. Towards the east of the site a ditch running between trenches 11 and 12 was exposed. An isolated pit was found in trench 5 at the north of the site.

6.2 The curvilinear gullies and associated pit or post-hole are undated with no possibility of these features being dated. A similar small solitary curvilinear feature was also recorded during evaluation and excavation at Land Parcel 19 that was dated to the post medieval period (Humble forthcoming a). It is hard to say what these features represent due to their shallow truncated nature however it is possible that these features formed a bedding slot trench for a small wall forming one side of an oval or circular structure possibly associated with agricultural activity evidenced by the furrows present on site.

Ditches [003 & 011], while undated are likely to be contemporary with the post-medieval field system recorded during evaluation and excavation of Land Parcels 4 and 5 to the north and north-west (Humble forthcoming b, Dingwall 2011). A late date for ditch [011] is implied by the presence of a field drain that drained into the partially silted up ditch further showing that it also had a drainage function. The presence of a number of furrows is further evidence of former agricultural activity on site.

- 6.3 Based on the results of the fieldwork and the post excavation assessment the archaeological archive is considered as having no potential and therefore no further works are recommended.

7 References

7.1 Bibliographic References

Cappers, R T J, Bekker, R M and Jans, J E A 2006 *Digital seed atlas of the Netherlands*. Barkhuis Publishing and Groningen University Library, Groningen.

Clapham, A R, Tutin, T G and Warburg, E F 1962 *Flora of the British Isles (2nd Edition)*. Cambridge University Press, Cambridge.

Dingwall, K (2011) *Results of an Archaeological Evaluation by Trial Trenching at Echline Fields, South Queensferry (Land Parcel 5)* 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.

Humble, J (forthcoming a) *The Results of an Archaeological Field Evaluation by Trial Trenching at Overton, near Kirkliston (Land Parcel 19)* Unpublished client report. Headland Archaeology (UK) Ltd.

Humble, J (forthcoming b) *Results of an Archaeological Excavation at Echline Fields, South Queensferry (Land Parcel 4)*. Unpublished client report. Headland Archaeology (UK) Ltd.

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.

Kenward, H K, Hall, A R and Jones, A K G 1980 'A tested set of techniques for the extraction of plant and animal macrofossils from waterlogged archaeological deposits', *Science and Archaeology* 22, 3-15.

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.

8 Appendices

Appendix 1: Trench Register

Trench No	Length (m)	Maximum Depth (m)	Description
1	50	0.55m	SE-NW. Ceramic drain N-S
2	50	0.55m	NW-SE.
3	50	0.60m	N-S. Furrows [034], [036], [038].
4	50	0.50m	NW-SE.
5	50	0.50m	N-S. Ceramic drain W-E, Pit [001].
6	50	0.70m	SW-NE. Ceramic drains (2) SW-NE and SE-NW.
7	50	0.70m	SE-NW.
8	50	0.40m	SW-NE.
9	50	0.30m	S-N. Rubble drains (3) SW-NE, bedrock outcrop
10	50	0.20m	SE-NW. Bedrock outcrop.
11	50	0.70m	E-W. Ditch [003], drain N-S, bedrock outcrop
12	50	0.90m	W-E. Ceramic drains (2) N-S and W-E, Ditch [003], bedrock outcrop
13	50	0.40m	SE-NW. Ceramic drains (5) SW-NE and E-W, rubble drains (2) S-N.
14	50	0.60m	N-S. Ceramic drains (6) E-W, furrow NW-SE.
15	50	0.30m	W-E. Ceramic drain (2) SW-NE, furrows (2) SW-NE.
16	50	0.40m	N-S. Rubble drains (2) NW-SE and NE-SW, ceramic drains (3) NE-SW, furrows (2) NE-SW.
17	50	0.50m	N-S. Ceramic drains (2) W-E, rubble drains (2) W-E, furrows (2), one excavated = [040], W-E.
18	50	0.30m	W-E. Ceramic drain W-E, rubble drain N-S.
19	50	0.45m	SE-NW. Ceramic drains (2) W-E, rubble drains (3) W-E, furrows (2) W-E.
20	50	0.35m	SW-NE. Rubble drains (4) S-N and W-E, furrows (4) W-E.

21	50	0.60m	SW-NE. Rubble drains (3) W-E and NW-SE, ditch
22	50	0.30m	NW-SE. Rubble drains (2) SW-NE and N-S, ceramic drains (4) N-S, furrows (4) W-E, ditch SW-NE.
23	50	0.50m	NE-SW. Rubble drain N-S, ceramic drains (2) E-W and N-S, furrow N-S.
24	50	0.75m	W-E. Rubble drain W-E.
25	50	0.35m	N-S. Rubble drains (4) NW- SE, E-W and NW-SE, ceramic drain NW-SE.
26	50	0.70m	NW-SE. Rubble drains (4) N-S, W-E and SE-NW, ceramic drains (3) N-S and W-E.
27	52	0.35m	W-E. Rubble drains (2) NW-SE, ceramic drains SW- NE and N-S
28	50	0.65m	NE-SW. Rubble drains (5) W-E, N-S and NE-SW, ceramic drain NW-SE.
29	50	0.45m	N-S. Ceramic drains (2) NE- SW.
30	50	0.35m	N-S. Ceramic drain NW-SE.
31	50	0.65m	N-S. Rubble drains (3) W-E and SW-NE, ceramic drains (3) W-E and N-S, Ditch W-E [011/026], Gullies SE-NW [005/017] and N-S [009/015], pit [007/019].
32	50	0.40m	N-S. Rubble drains (4) W-E and NW-SE, ceramic drains (3) NW-SE
33	50	0.45m	NE-SW. Rubble drains (2) NW-SE and W-E, ceramic drains (3) N-S.
34	50	0.35m	NE-SW. Rubble drain NE- SW, bedrock outcrop.
35	50	0.40m	NW-SE. Rubble drains (2) W-E and N-S.
36	13	0.10m	NW-SE. Bedrock outcrop.

Appendix 2: Context Register

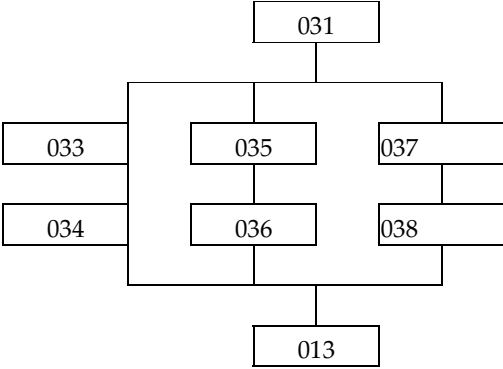
Context No.	Trench	Description
001	5	Cut of a circular pit with gently sloping sides and a rounded base, filled with [002]. L: 0.60m, W: 0.30m, D: 0.16m.
002	5	Fill within [001] cut, mid grayish brown slightly stony sandy loam with occasional small charcoal and stones.
003	11/12	Cut of a linear feature with steeply sloping sides and a rounded base, filled with [004]. L: 1.20m, W: 1.30m, D: 0.28m.
004	11/12	Fill of [003], mid grayish brown slightly stony sandy loam with many large stones.
005	31	Curvilinear ditch feature filled with [006]. L: 1.30m, W: 0.27m, D: 0.21m. Same as [017].
006	31	Fill of [005], mid grayish brown silty clay with rare small to medium stone inclusions. Same as [018].
007	31	Circular cut with sloping sides and curved base filled with [008]. L: 0.30m, W: 0.33m, D: 0.07m. Same as [019].
008	31	Fill of [007], mid grayish brown silty clay with rare small stone inclusions. Same as [020].
009	31	Curvilinear cut with steep sides and curved base, filled with [010]. L: 2.50m, W: 0.43m, D: 0.24m. Same as [015].
010	31	Fill of [009], mid grayish brown silty clay with rare small and large stones. Same as [016].
011	31	Linear cut with gently sloping/stepped sides with rounded base, filled with [012]. L: 2m, W: 3m, D: 0.55m. Same as [026].
012	31	Fill of [011], light bluish grey silty clay with rare large stone inclusions. Same as [025] and [028].
013	11	Natural soil. Mid yellowish brown slightly stony loamy sand.
014	31	Secondary fill of ditch [011]. Mid grayish brown silty clay with rare small and medium stone inclusions. Same as [024] and [027].
015		Cut of curvilinear feature = [009].
016		Fill of curvilinear feature [015] = [010].
017		Cut of curvilinear feature = [005].
018		Fill of curvilinear feature [017] = [006].
019		Cut of small pit = [007].
020		Fill of small pit [020] = [008].
021		Silty clay loam deposit - possible furrow
022		Fill of possible furrow [023]: stony clay
023		Cut of possible furrow
024		Upper fill of ditch [026] Slot # 2: silty clay = [014].
025		Lower fill of ditch [026] Slot # 2: silty clay = [012].
026		Cut of drainage/ boundary ditch = [011].
027		Upper fill of ditch [026] Slot # 3: slightly stony, silty clay = [014].
028		Lower fill of ditch [026] Slot # 3: silty clay = [012].
029		Upper fill of ditch [026] Slot # 1: silty clay loam = [014].
030		Lower fill of ditch [026] Slot # 1: silty clay loam = [012].

031		Topsoil. Greyish brown clayey silt loam, 0.2 – 0.5 m.
032		Subsoil. Mid yellowish brown clayey silt, 0.1 – 0.2 m.
033	3	Fill of [034]. Mid brownish grey silty clay.
034	3	Cut of furrow, with shallow sloping sides and flattish base. L: 2 m, W: 1.1 m, D: 0.12 m.
035	3	Fill of [036]. Mid brownish grey silty clay.
036	3	Cut of furrow, with shallow sloping sides and flattish base. L: 1.4 m, W: 1.12 m, D: 0.1 m.
037	3	Fill of [038]. Mid brownish grey silty clay.
038	3	Cut of furrow, with shallow sloping sides and flattish base. L: 2.3 m, W: 2.9 m, D: 0.12 m.
039	17	Fill of [040]. Mid brownish grey silty clay.
040	17	Cut of furrow, with shallow sloping sides and flattish base. L: 2 m, W: 2.8 m, D: 0.09 m.

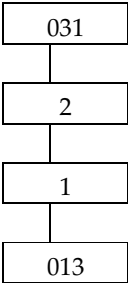
*** Furrows in Trench 3 are numbered from North to South**

Appendix 3: Trench Matrices

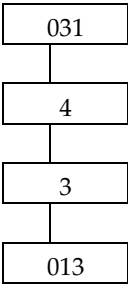
Trench 3



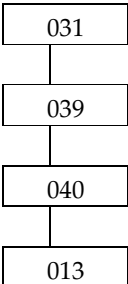
Trench 5



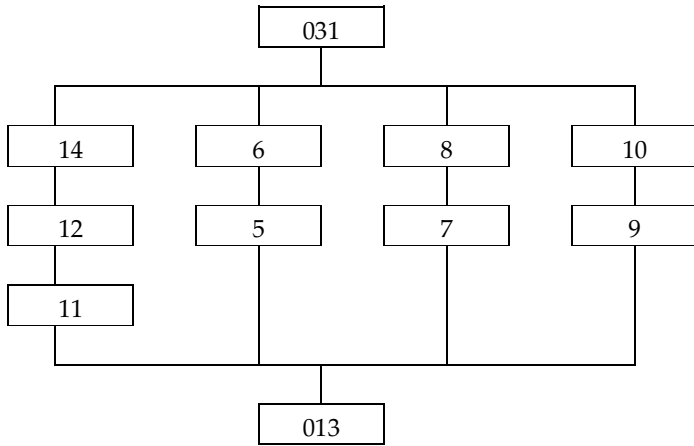
Trench 11



Trench 17



Trench 31



Appendix 4: Photographic Register

Photo No.	Direction	Description
143	W	General shot of Trench 2 (backfilled)
144	S	General shot of Trench 3 (backfilled)
146	SE	General shot of Trench 4
147	SW	General shot of Trench 18
148	S	General shot of Trench 5
149	SW	General shot of Trench 16
150	N	General shot of Trench 17
151	NW	General shot of Trench 19
152	S	General shot of Trench 20
153	NW	General shot of Trench 22
154	NE	General shot of Trench 23
155	W	General shot of Trench 24
156	SW	General shot of Trench 27
157	SW	General shot of Trench 26
158	N	General shot of Trench 25
159	S	General shot of Trench 29
160	N	General shot of Trench 28
161	E	General shot of Trench 21
162	E	General shot of Trench 15
163	S	General shot of Trench 30
164	SE	General shot of Trench 31
165	S	General shot of Trench 32
166	SW	General shot of Trench 33
167	NW	General shot of Trench 36
168	SW	General shot of Trench 34
169	NW	General shot of Trench 35
170	NE	General shot of Trench 14
171	E	General shot of Trench 13
172	W	General shot of Trench 12
173	S	General shot of Trench 10 (backfilled)
174	S	General shot of Trench 9 (backfilled)
175	N	General shot of Trench 8 (backfilled)
176	W	General shot of Trench 11 (backfilled)
177	NW	General shot of Trench 7
178	E	General shot of Trench 6 (backfilled)
180	N	Pre-excavation shot of end of [003] in Trench 12
182	W	Ditch feature [005/006] in Trench 31
183	W	Post hole/pit [007/008] in Trench 31
184	W	Ditch feature [009/010] in Trench 31
185	E	West facing section of [011] and [012]
186	W	South east facing section of [001] in Trench 5
187	E	West facing section of [011]

659	SW	NE facing section of [003]
660	SW	NE facing section of [003] –working shot
661	W	General shot [003]
662	S	General Shot of [003]
765	S	N-facing section of slot through curvilinear feature [015]
766	SW	General shot of slot through terminus of curvilinear feature [017]
767	SW	NE-facing section of pit [019]
768	N	General shot of slot through possible furrow [021]
769	NW	General shot of slot through possible furrow [023]/[022]
770	SW	NE-facing section of Slot #2 through ditch [026]
771	NW	NW-facing section of Slot #3 through ditch [026]
772	S	General shot of Slot #1 through ditch [026]
773	NE	W-facing section of Slot #1 through ditch [026]
774	S	Post-ex shot of curvilinear features [015] and [017] and pit [019]
775	S	Working shot
776	N	Working shot
777	NE	Working shot
778	NE	Working shot
779	S	Working shot
780	SE	Working shot
781	SW	General shot of ditch [026]

Appendix 5: Drawing Register

Drawing No.	Plan	Section	Description
1		1:10	LP 6, Trench 11. North east facing section through [003]
2		1:10	LP 6, Trench 31. West facing section through [011]
3		1:10	NE-facing section of Slot #2 through ditch [026]
4		1:10	E-facing section of Slot #3 through ditch [026]
5		1:20	SW-facing section of Slot #1 through ditch [026]

Appendix 6: Sample Register

Sample No.	Context No.	Description
001	016	Fill of curvilinear feature [015]
002	018	Fill of curvilinear feature [017]

Appendix 7: Retent sample results

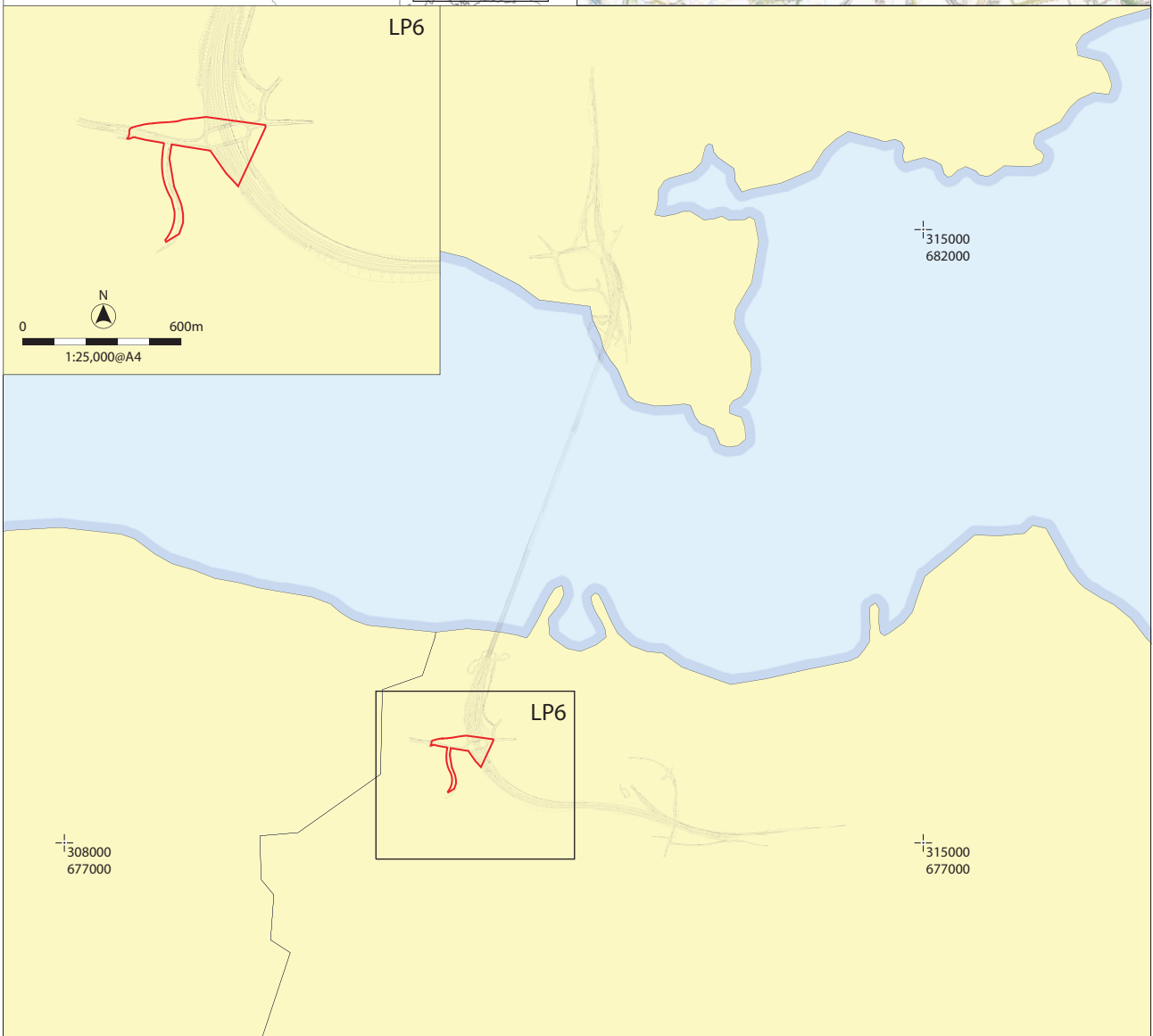
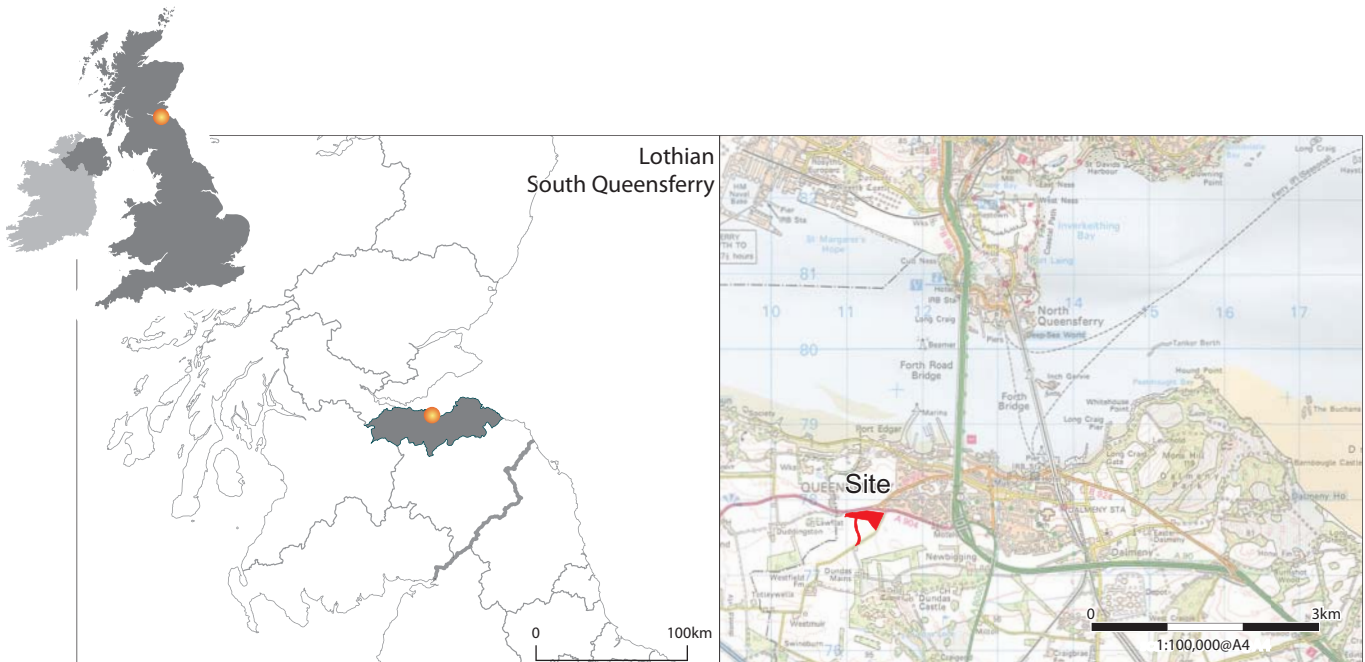
Table 1: FRCE10 LP06: Retent Sample Results

Context Number	Sample Number	Sample Vol (l)	Burnt bone	Material available for AMS Dating	Comments
			Mammal		
16	1	20	+		
18	2	20			Archaeologically sterile
Key: + = rare, ++ = occasional, +++ = common and ++++ = abundant NB charcoal over 1cm is suitable for identification and AMS dating					

Appendix 8: Flotation sample results

Table 2: FRCE10 - LP06 Flotation Sample Results

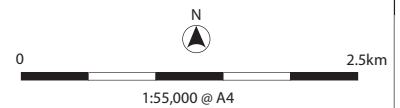
Context Number	Sample Number	Charred plant remains	Charcoal Quantity	Charcoal Max size (cm)	Material available for AMS	Comments
16	1	Stellaria media +	++	<0.5	-	
18	2		+	<0.5	-	
Key: + = rare, ++ = occasional, +++ = common and ++++ = abundant NB charcoal over 1cm is suitable for identification and AMS dating						



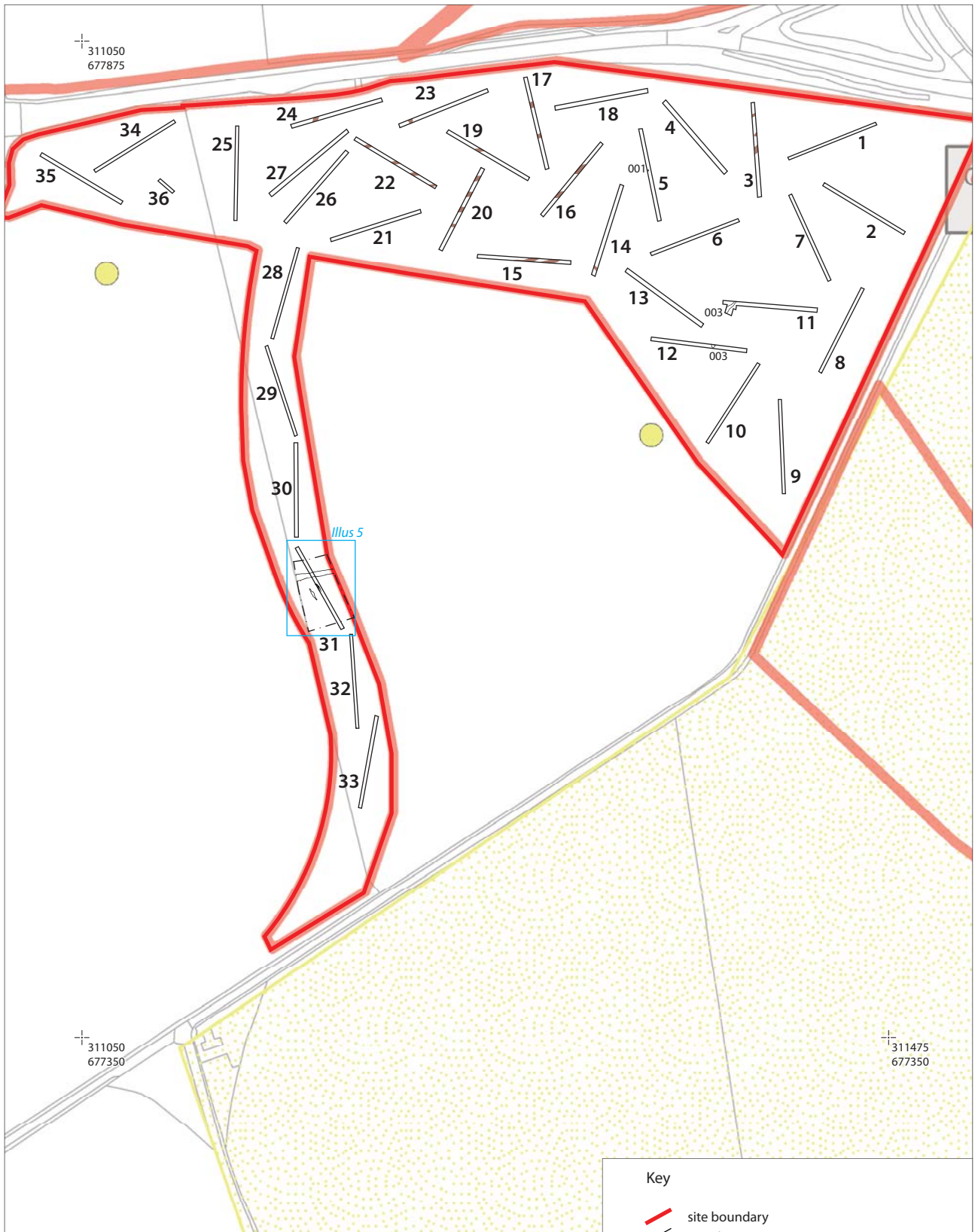
HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LAND PARCEL 6 (FRCE10)

Reproduced using 2007 OS 1:50,000 Landranger No. 65 and digital 1:10,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011. All rights reserved. Licence No. AL 100013329



Illus 1
Site location



© Headland Archaeology (UK) Ltd



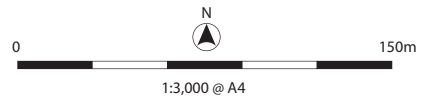
FORTH REPLACEMENT CROSSING, LAND PARCEL 6 (FRCE10)



Reproduced using digital 1:5,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011
All rights reserved. Licence No. AL 100013329

Key

- site boundary
- trenches
- excavated area
- furrows



Illus 2
Trench plan



Illus 3
Pit [001]

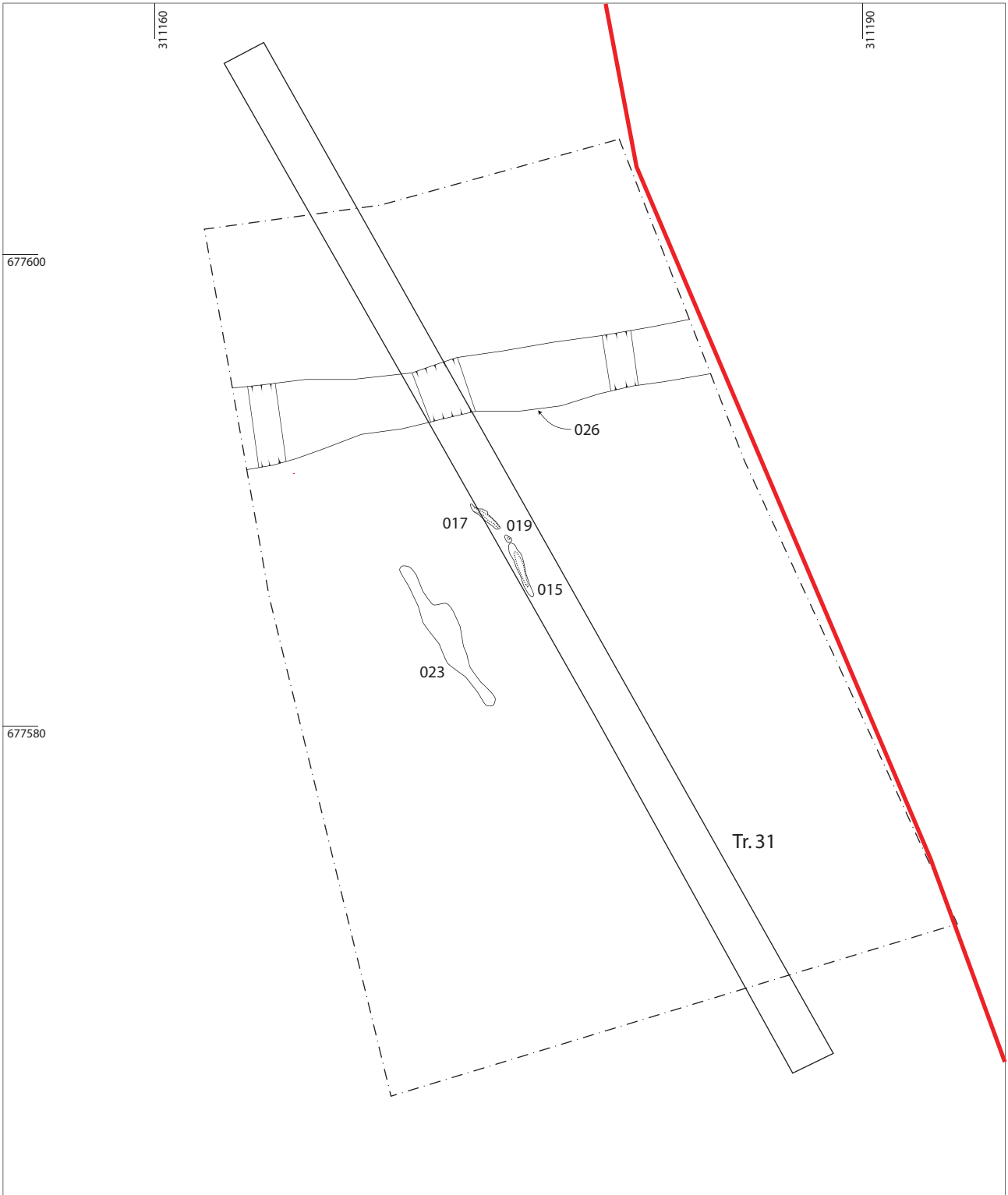


Illus 4
Ditch [004]



HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LP6 (FRCE10)



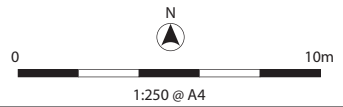
FORTH REPLACEMENT CROSSING, LAND PARCEL 6 (FRCE10)



Reproduced using digital 1:5,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011
All rights reserved. Licence No. AL 100013329

Key

- site boundary
- trench
- - - excavated area



Illus 5
Excavation area



Illus 6

Post excavation shot of post-hole [007] and gullies [005] & [009]



Illus 7

Ditch [011/025]



HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LP6 (FRCE10)

Project code: FRCE10
Client: Transport Scotland
Date: 20th April 2011

**The Results of an Archaeological Field Evaluation by Trial
Trenching near Builyeon Road, South Queensferry,
(Land Parcel 7)**

Archaeological Consultant: Jacobs Arup
Report Authors: Donald Wilson
Report Status: Approved



Executive Summary

Headland Archaeology conducted an archaeological evaluation by trial trenching on the Forth Replacement Crossing on land adjacent to Builyeon Road near South Queensferry (Land Parcel 7), NGR: NT 1163 7782 (centred), to assess the presence/absence of archaeological remains or deposits in an area identified in the Forth Replacement Crossing Environmental Statement (Jacobs Arup, 2009a) as having good archaeological potential for the presence of unknown archaeological remains. 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 3 trenches totalling 203 m² were excavated comprising a 5% sample of this land parcel. Trenches were sited to ensure good spatial coverage and to avoid existing areas of hard standing used by the farmer. No archaeological remains or deposits were identified during the evaluation.

ARCHAEOLOGICAL EVALUATION
Forth Replacement Crossing: Land Parcel 7, near Builyeon Road

PROJECT SUMMARY SHEET (FRCE10)

<i>Client</i>	Transport Scotland
<i>Consultant</i>	Jacobs Arup
<i>National Grid Reference</i>	NT 1163 7782
<i>Project Manager</i>	Edward Bailey
<i>Senior Archaeologist</i>	Kirsty Dingwall
<i>Text</i>	Donald Wilson
<i>Illustrations</i>	Julia Bastek
<i>Evaluation Team</i>	Donald Wilson Kirsty Dingwall Emma Searle
<i>Schedule</i>	
Fieldwork	15 th April 2011
Report	20 th April 2011

CONTENTS

1	Introduction	184
	1.1 <i>General</i>	184
	1.2 <i>Project Background</i>	184
	1.3 <i>Aims and Objectives of the Archaeological Works</i>	185
2	Site Background	185
	2.1 <i>Archaeological and Historical Background</i>	185
	2.2 <i>Site Topography and Land Use</i>	186
	2.3 <i>Site Geology</i>	186
3	Methodology	186
4	Results of Fieldwork	187
	4.1 <i>Trial Trenching</i>	187
5	Conclusions	187
6	References	188
	6.1 <i>Bibliographic References</i>	188
	6.2 <i>Cartographic References</i>	189
7	Appendices	189
	<i>Appendix 1: Trench Register</i>	189
	<i>Appendix 2: Context Register</i>	189
	<i>Appendix 3: Trench Matrices</i>	190
	<i>Appendix 4: Photographic Register</i>	190
	Illustrations	191

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 On the 15th April 2011, Headland Archaeology (UK) Ltd. undertook a programme of archaeological evaluation by trial trenching across Land Parcel 7 to the south of Builyeon Road, 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 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 The ES recommended that a programme of invasive and non-invasive archaeological works be undertaken, to include resistivity survey and 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 Land Parcel 7 lies near 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 2009a, 32).

2.1.4 Land Parcel 4 which is situated a short distance to the north-west contained evidence of human activity dating from the Mesolithic period onwards (approx 10,000 to 4,000 BC).

2.2 *Site Topography and Land Use*

2.2.1 The parcel comprised a long E-W aligned corridor along the northern edge of a large field. The area was bounded to the north by a stone wall aligned along the edge of Builyeon Road and was open to the south. A narrow unclassified road marked the western limit of the area and a small copse of trees formed the eastern boundary. The field was relatively flat and under a young crop at the time of evaluation. The site is under the ownership of The City of Edinburgh Council and the Trustees of S N M Bowlby.

2.3 *Site Geology*

2.3.1 The results of geotechnical investigations (Jacobs Arup 2009b) carried out demonstrate that the subsurface stratigraphy generally constitutes glacial till deposits of varying thickness; these are predominantly comprised 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 measured 4025 m², of which a 5% sample (203 m²) was investigated 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. At the request of the farmer it was ensured that no trenches were placed close to made ground that formed a vehicle track along the northern boundary of the field. As a result of the presence of this track the original locations of the trenches had to be altered.

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 Three trenches were excavated across Land Parcel 7 (Illus 2) with a combined total area of 203 m² 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 [004] seen in the trenches was largely yellowy grey clay with frequent stone inclusions, although outcropping of limestone bedrock was seen at the west end of Trench 2. In Trenches 1 and 2 this was overlain by between 0.10 m and 0.15 m of subsoil [003] – an orangey brown sandy silt. Topsoil [002] was between 0.30 m and 0.50 m deep and contained little in the way of recent ceramic material. A single rubble drain was recorded in Trench 2 with the topsoil becoming increasingly stone rich towards the east.
- 4.1.3 The overlying material in Trench 3 comprised made ground [001] with a mix of tarmac, fine gravel and stone to a maximum depth of 0.45 m. The base of the trench included a series of small stone filled hollows and a layer of dumped stone and gravel. These anomalies were thought to be associated with modern disturbance, such as road construction and/or repair, due to the made ground above and occasional fragments of red ceramic tile within the pits. The area surrounding this trench was also heavily disturbed, with undulating ground and rough grass predominating.

5 Conclusions

- 5.1 The evaluation has established that this area appears not have been used for human settlement. The only archaeological remains or deposits identified relate to either Post-medieval agricultural activity in the area, with a single field drain on a north-south alignment, or more modern disturbance.
- 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

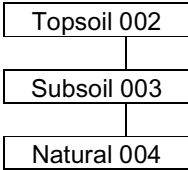
Trench No	Length (m)	Depth (m)	Description
1	20	0.45	Trench aligned E-W with a single field drain cutting the subsoil.
2	70	0.35	Trench aligned E-W close to the northern limit of the field. An area of bedrock outcropped at the W end with the natural becoming very stone rich towards the E end.
3	15	0.45	Trench was aligned E-W across an area of waste ground and comprised 0.40 m of made ground [001] with areas of stone filled pits and dumped material all of modern origin.

Appendix 2: Context Register

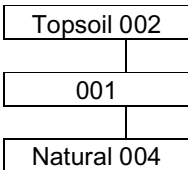
Context No.	Area	Description
001	Tr 2	Dumped material made up of tarmac and bricks, up to 0.45m deep
002	All	Topsoil. Greyish brown sandy silt loam, 0.3 – 0.5 m.
003	1 & 2	Subsoil. Orange brown sandy silt, 0.1 – 0.15 m.
004	All	Natural. Yellowish grey clay with limestone bedrock outcrops.

Appendix 3: Trench Matrices

**Trench
1 and 2**



**Trench
3**

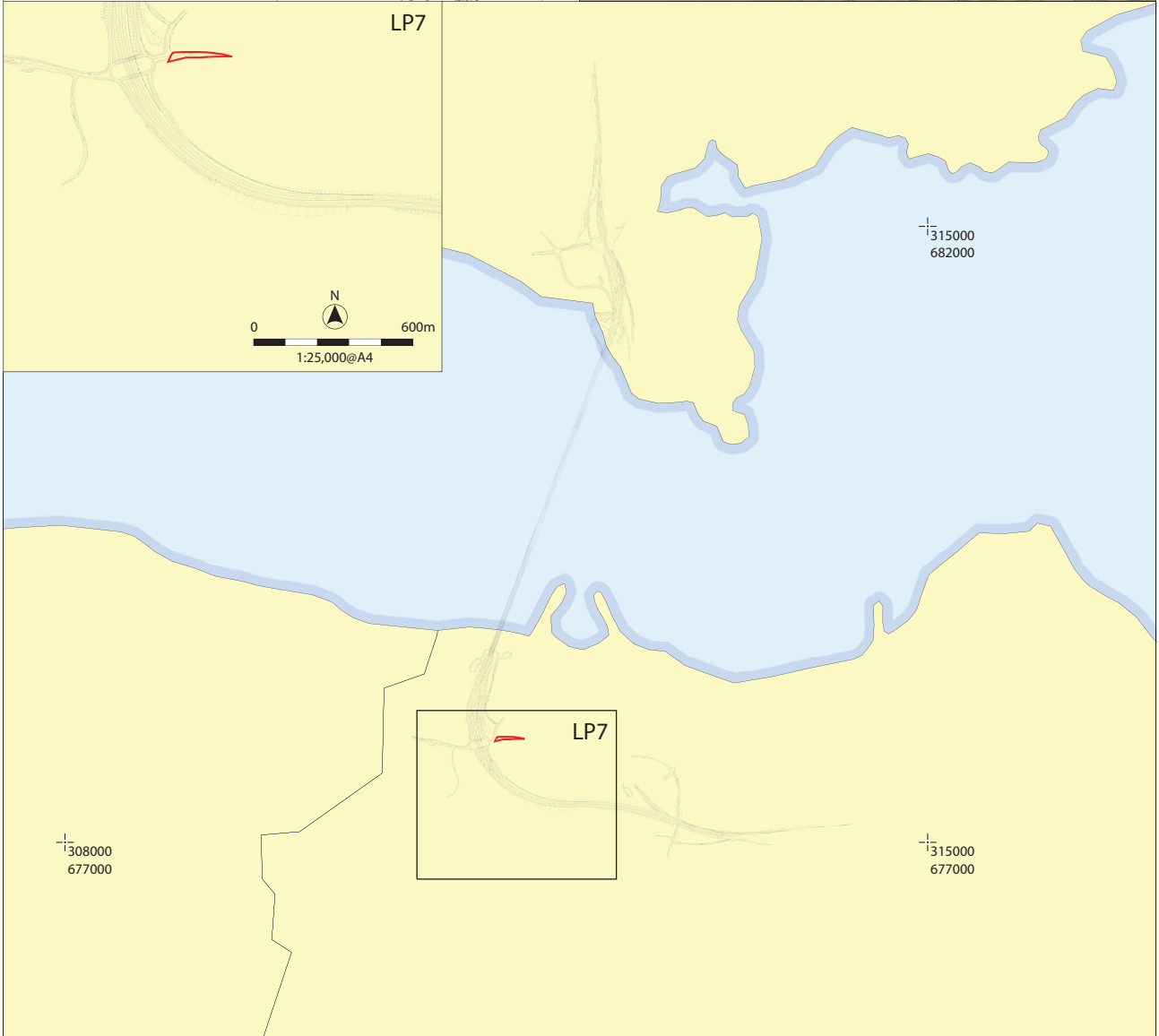
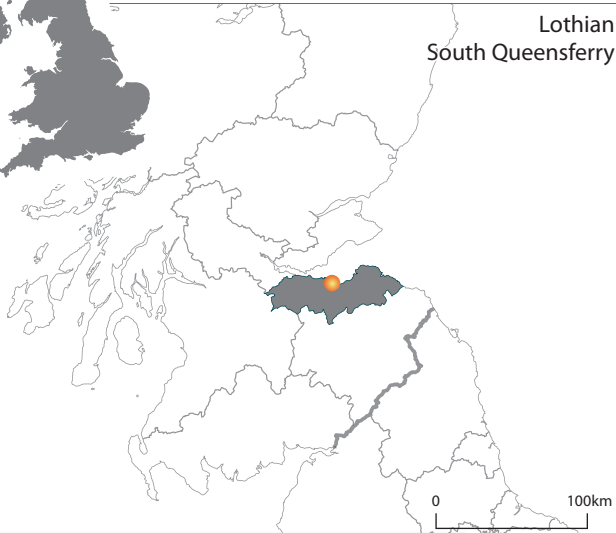


Appendix 4: Photographic Register

Photo No.	Direction	Description
01	-	ID shot
02	E	General view of Trench 1
03	E	General view of Trench 2
04	E	General view of Trench 3



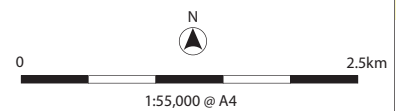
Lothian
South Queensferry



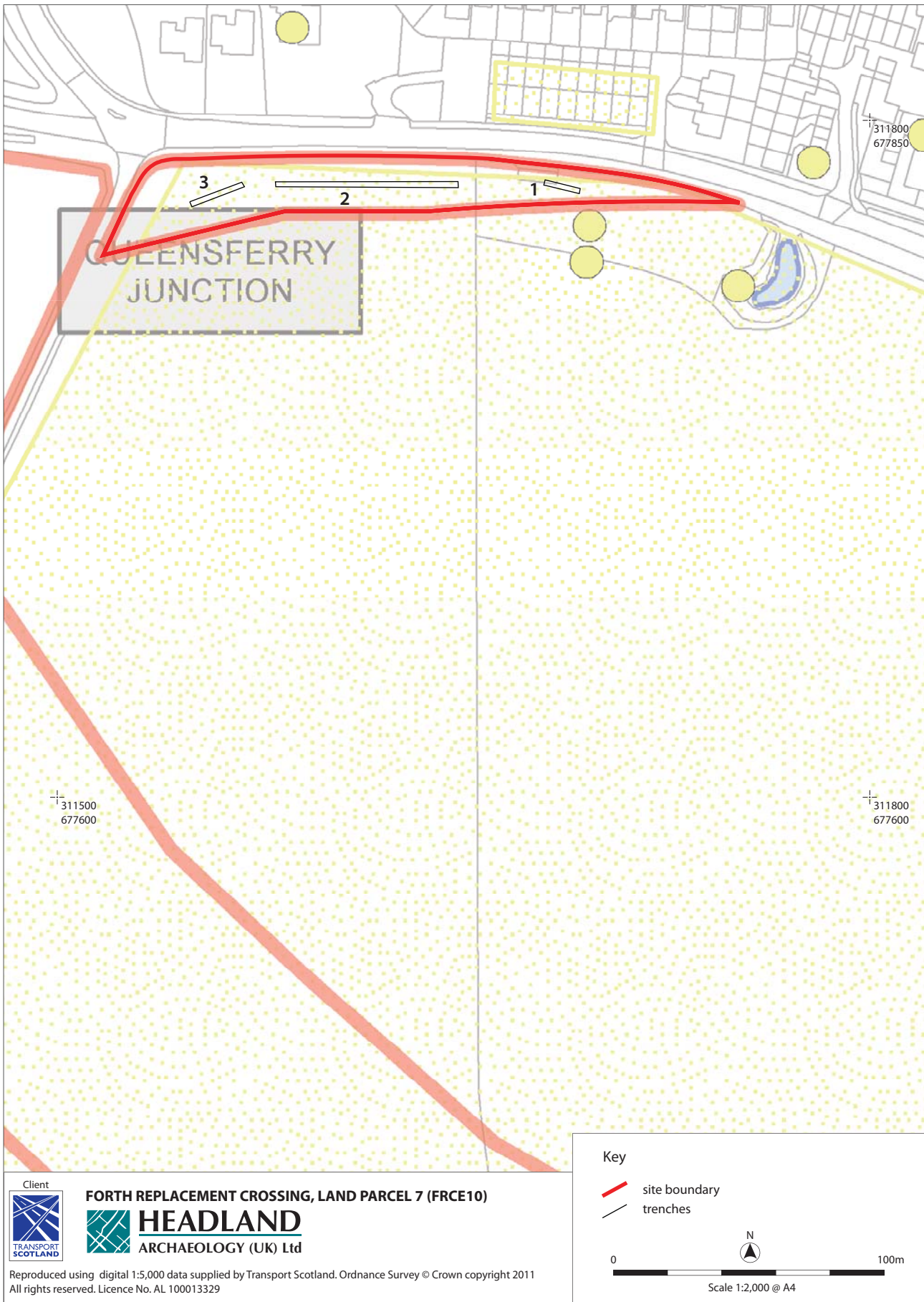
HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LAND PARCEL 7 (FRCE10)

Reproduced using 2007 OS 1:50,000 Landranger No. 65 and digital 1:10,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011. All rights reserved. Licence No. AL 100013329



Illus 1
Site location



© Headland Archaeology (UK) Ltd



Client
FORTH REPLACEMENT CROSSING, LAND PARCEL 7 (FRCE10)



Reproduced using digital 1:5,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011
 All rights reserved. Licence No. AL 100013329

Key

- site boundary
- trenches



Illus 2
 Trench plan

Project code: FRCE10
Client: Transport Scotland
Date: 20th April 2011

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

Archaeological Consultant: Jacobs Arup
Report Authors: Donald Wilson
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

Project Manager Edward Bailey

Senior Archaeologist Kirsty Dingwall

Text Donald Wilson

Illustrations Julia Bastek

Evaluation Team Donald Wilson
Kirsty Dingwall
Emma Searle

Schedule

Fieldwork 13th – 15th April 2011

Report 20th April 2011

CONTENTS

1	Introduction	197
	1.1 <i>General</i>	197
	1.2 <i>Project Background</i>	197
	1.3 <i>Aims and Objectives of the Archaeological Works</i>	198
2	Site Background	198
	2.1 <i>Archaeological and Historical Background</i>	198
	2.2 <i>Site Topography and Land Use</i>	199
	2.3 <i>Site Geology</i>	199
3	Methodology	199
4	Results of Fieldwork	200
	4.1 <i>Trial Trenching</i>	200
5	Conclusions	200
6	References	201
	6.1 <i>Bibliographic References</i>	201
	6.2 <i>Cartographic References</i>	201
7	Appendices	202
	<i>Appendix 1: Trench Register</i>	202
	<i>Appendix 2: Context Register</i>	205
	<i>Appendix 3: Trench Matrices</i>	208
	<i>Appendix 4: Photographic Register</i>	212
	Illustrations	213

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

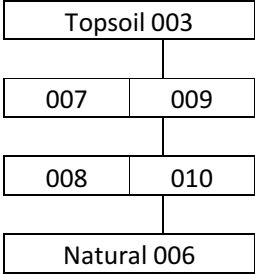
Context No.	Area	Description
001	Tr17	A poorly sorted area of 0.10m diameter cobbles to large (0.3 x 0.2 x 0.1m) sub-rounded stones within [002] below topsoil [003]. The full extent was not revealed as they continued into the E section of trench 17. The stones were 2.3m wide and 0.30m below the surface. 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].

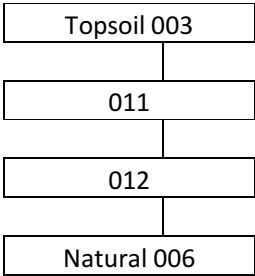
044	13	Furrow, NE-SW, L: 2m, W: 2.2m, not excavated.
045	24	Fill of [046].
046	24	Furrow, N-S, L: 2m, W: 1.8m, not excavated.
047	25	Fill of [048].
048	25	Furrow, N-S, L: 2m, W: 1.7m, not excavated.
049	25	Fill of [050].
050	25	Furrow, N-S, L: 2m, W: 1.7m, not excavated.
051	28	Fill of [052].
052	28	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

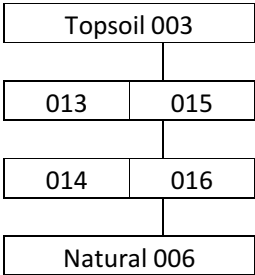
Trench 2



Trench 3



Trench 4

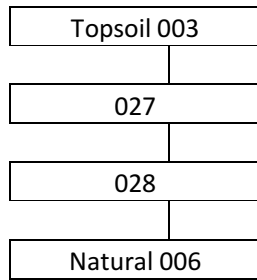


	Trench 6				
	Topsoil 003				
	053	055	057	059	

	054	056	058	060
	Natural 006			

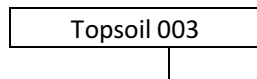
	Trench 7			
	Topsoil 003			
	017	019	021	023
	018	020	022	024
	Natural 006			

Trench 9



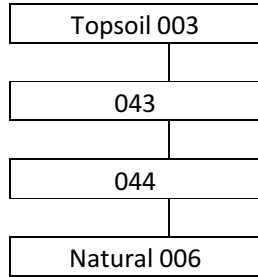
	Trench 10			
	Topsoil 003			
	029	031	033	035
	030	032	034	036
	Natural 006			

Trench 11

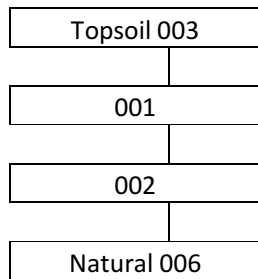




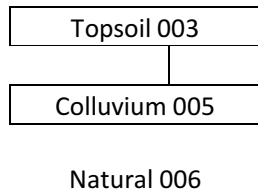
Trench 13



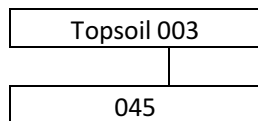
Trench 17

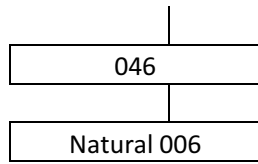


Trench 23

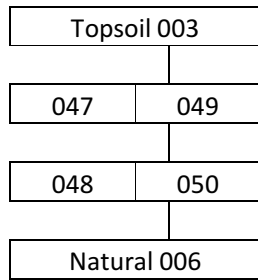


Trench 24

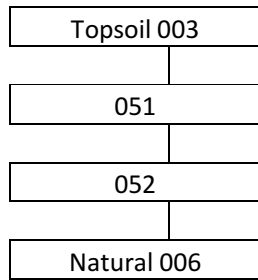




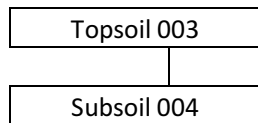
Trench 25



Trench 28



**Remaining
Trenches**



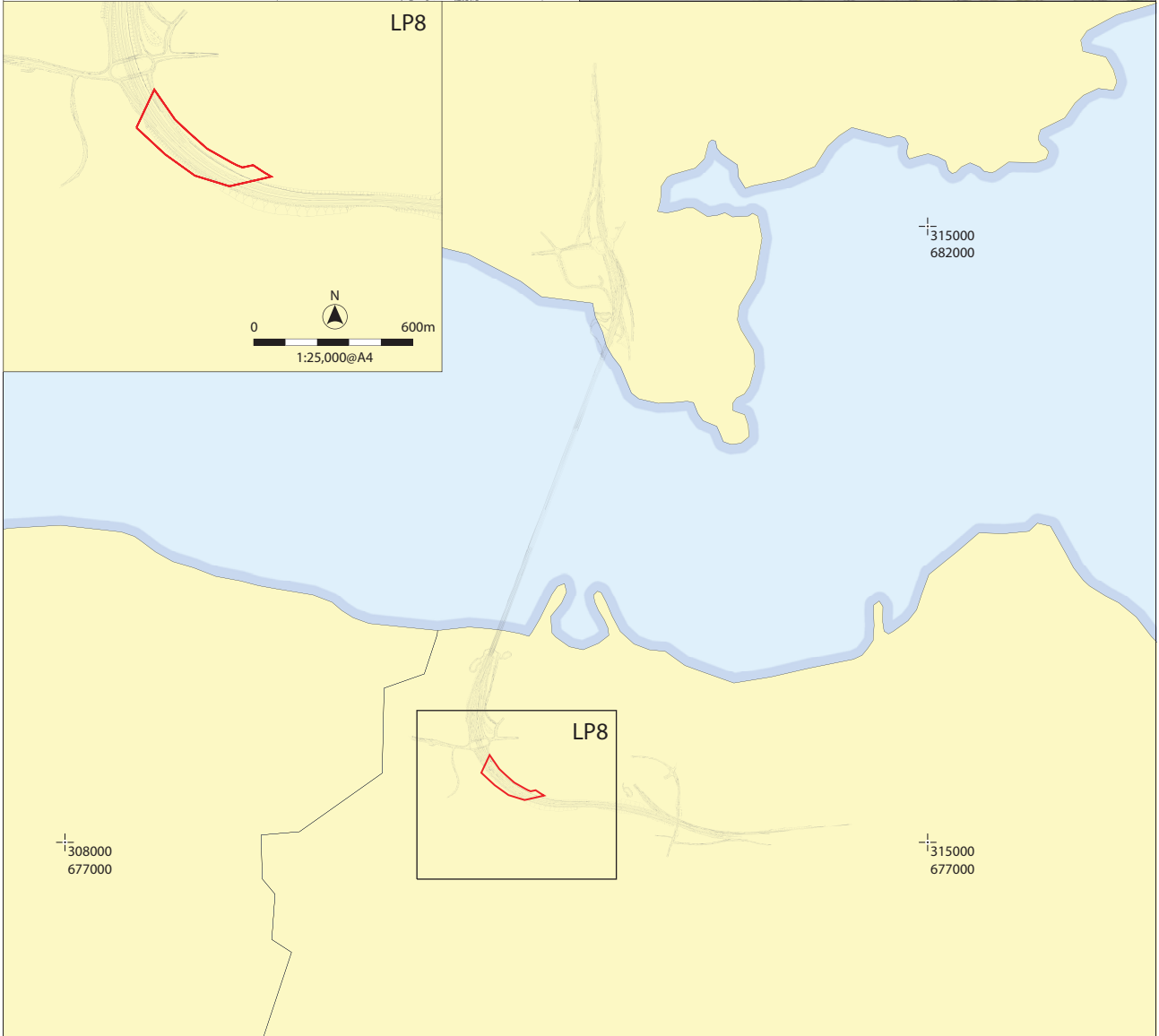
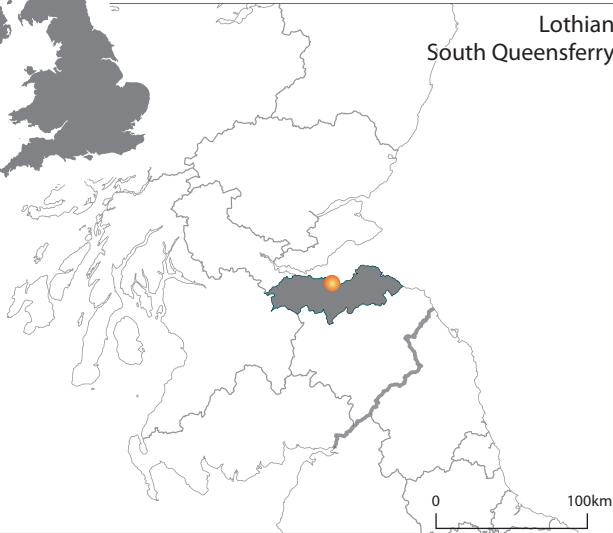
Natural 006

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



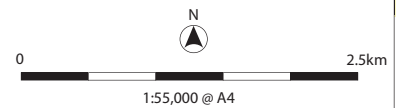
Lothian
South Queensferry



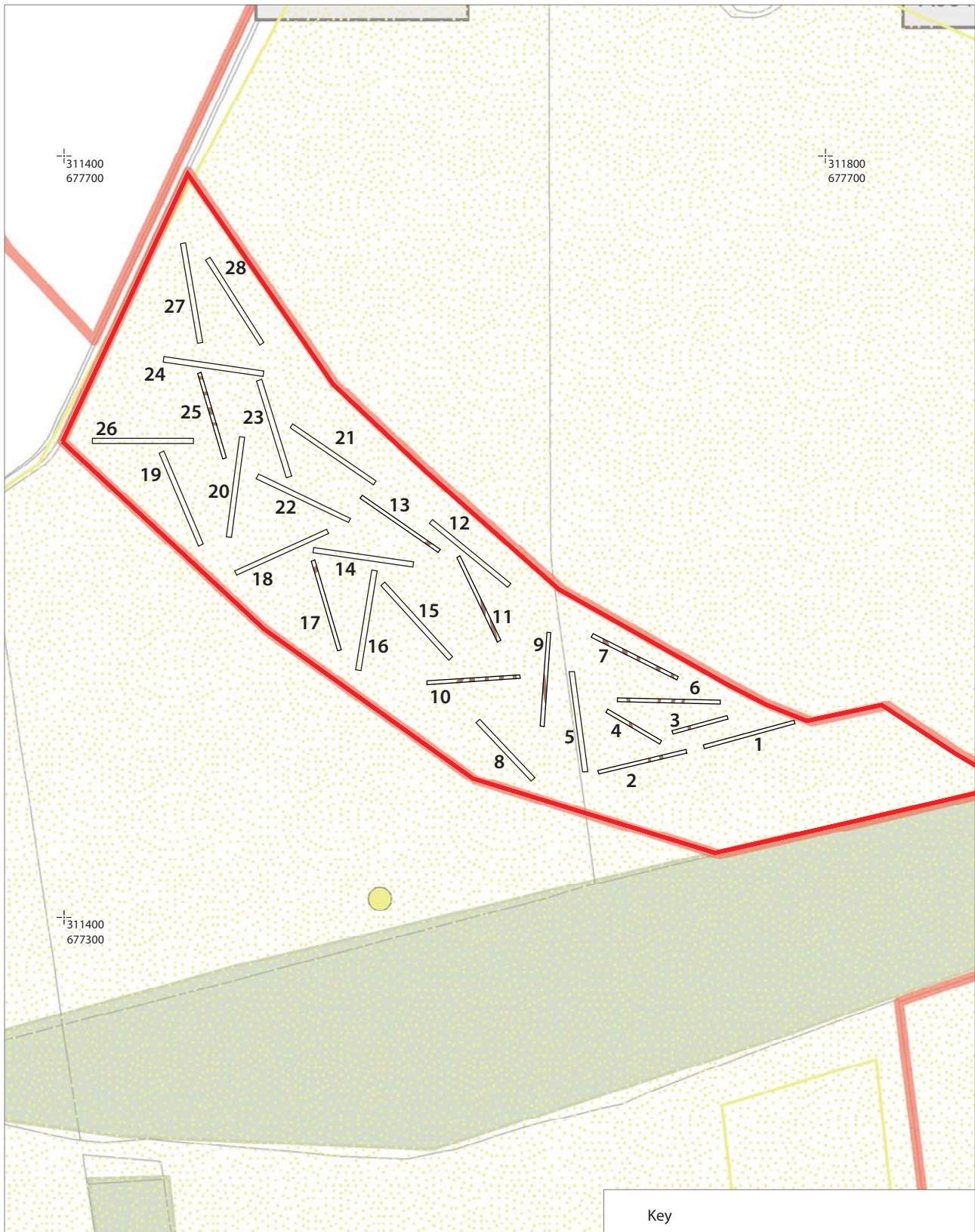
HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LAND PARCEL 8 (FRCE10)

Reproduced using 2007 OS 1:50,000 Landranger No. 65 and digital 1:10,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011. All rights reserved. Licence No. AL 100013329



Illus 1
Site location



© Headland Archaeology (UK) Ltd






FORTH REPLACEMENT CROSSING, LAND PARCEL 8 (FRCE10)



Reproduced using digital 1:5,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011
All rights reserved. Licence No. AL 100013329

Key

-  site boundary
-  trenches
-  furrows



Scale 1:3,000 @ A4

Illus 2
Trench plan

Project code: FRCE10
Client: Transport Scotland
Date: 11th April 2011

The Results of an Archaeological Field Evaluation by Trial Trenching on the Forth Replacement Crossing at Dundas Castle Farms (Land Parcel 9)

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 9), NGR: NT 11901 77124 (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.

Four trenches totalling 351m² were excavated comprising a 5% sample of the Parcel. Trenches were sited to ensure good spatial coverage. No archaeological remains or deposits were identified during the evaluation.

ARCHAEOLOGICAL EVALUATION
Forth Replacement Crossing: Land Parcel 9, Dundas Castle Farms

PROJECT SUMMARY SHEET (FRCE10)

<i>Client</i>	Transport Scotland
<i>Consultant</i>	Jacobs Arup
<i>National Grid Reference</i>	NT 11901 77124
<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
<i>Schedule</i>	
Fieldwork	4 th – 5 th April 2011
Report	April 2011

CONTENTS

1	Introduction	219
	1.1 <i>General</i>	219
	1.2 <i>Project Background</i>	219
	1.3 <i>Aims and Objectives of the Archaeological Works</i>	219
2	Site Background	220
	2.1 <i>Archaeological and Historical Background</i>	220
	2.2 <i>Site Topography and Land Use</i>	220
	2.3 <i>Site Geology</i>	220
3	Methodology	221
4	Results of Fieldwork	221
	4.1 <i>Trial Trenching</i>	221
5	Conclusions	222
6	References	222
	6.1 <i>Bibliographic References</i>	222
	6.2 <i>Cartographic References</i>	222
7	Appendices	223
	<i>Appendix 1: Trench Register</i>	223
	<i>Appendix 2: Context Register</i>	223
	<i>Appendix 3: Trench Matrices</i>	223
	<i>Appendix 4: Photographic Register</i>	223
	Illustrations	224

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 4th and the 5th April 2011, Headland Archaeology (UK) Ltd. undertook a programme of archaeological evaluation by trial trenching on Land Parcel 9 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. 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 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 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 Land Parcel 9 lies near 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 2009a, 32).

2.2 *Site Topography and Land Use*

2.2.1 The site comprised of the western end of an arable field. The field had been recently ploughed. 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 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.

- 2.3.2 The solid geology 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 6,638 m², of which a 5% sample (351 m²) was investigated 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. Two trenches were slightly adjusted during excavation; Trench 3 was extended and Trench 4 was shortened.
- 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 Four trenches were excavated across Land Parcel 9 (Illus 2) with a combined total area of 351 m² 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 [003] seen in the trenches was largely orange and red clay with stone inclusions. In general this was overlain by between 0.10 m and 0.20 m of subsoil [002] that varied from brownish-red clayey silt to blackish-grey clayey silt. Topsoil [001] was between 0.13 m and 0.25 m deep and contained little in the way of recent ceramic material.
- 4.1.3 A number of rubble and ceramic drains were encountered throughout the trenches. Any damaged ceramic drains were repaired prior to backfilling.
- 4.1.4 No archaeological remains or deposits were identified during the evaluation.

5 Conclusions

- 5.1 The evaluation established that no archaeological remains are present within the 5% sample of the land parcel investigated and only evidence of modern land use was present within the trial trenches.
- 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*

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

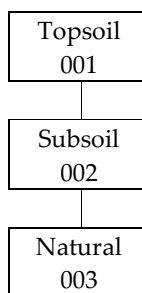
Trench No	Length (m)	Depth (m)	Description
1	12.2	0.64	N-S running. No features.
2	25.7	0.64	N-S running. No features.
3	20.5	0.66	SW-NE running. No features.
4	13.7	0.8	SW-NE running. No features.

Appendix 2: Context Register

Context no.	Trench no.	Description
001	All	Topsoil. Greyish brown silt loam, 0.13 – 0.25 m.
002	All	Subsoil. Brownish red to blackish grey clayey silt, 0.1 – 0.2 m.
003	All	Natural. Orange/Reddish clay.

Appendix 3: Trench Matrices

All Trenches

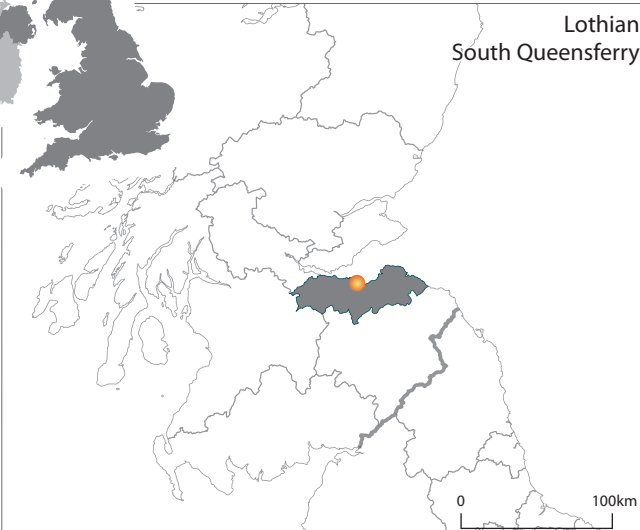


Appendix 4: Photographic Register

Photo No.	Direction	Description
559	S	General shot of Trench 1
560	SW	General shot of Trench 2
561	W	General shot of Trench 3
562	W	General shot of Trench 4



Lothian
South Queensferry

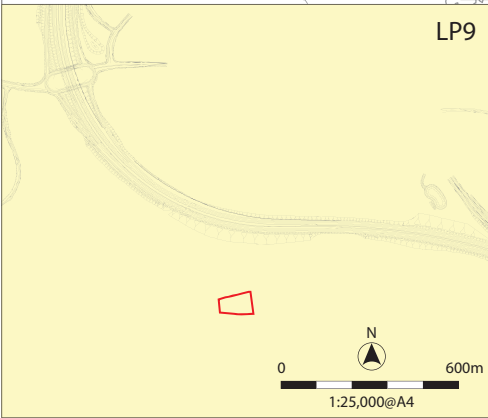


0 100km



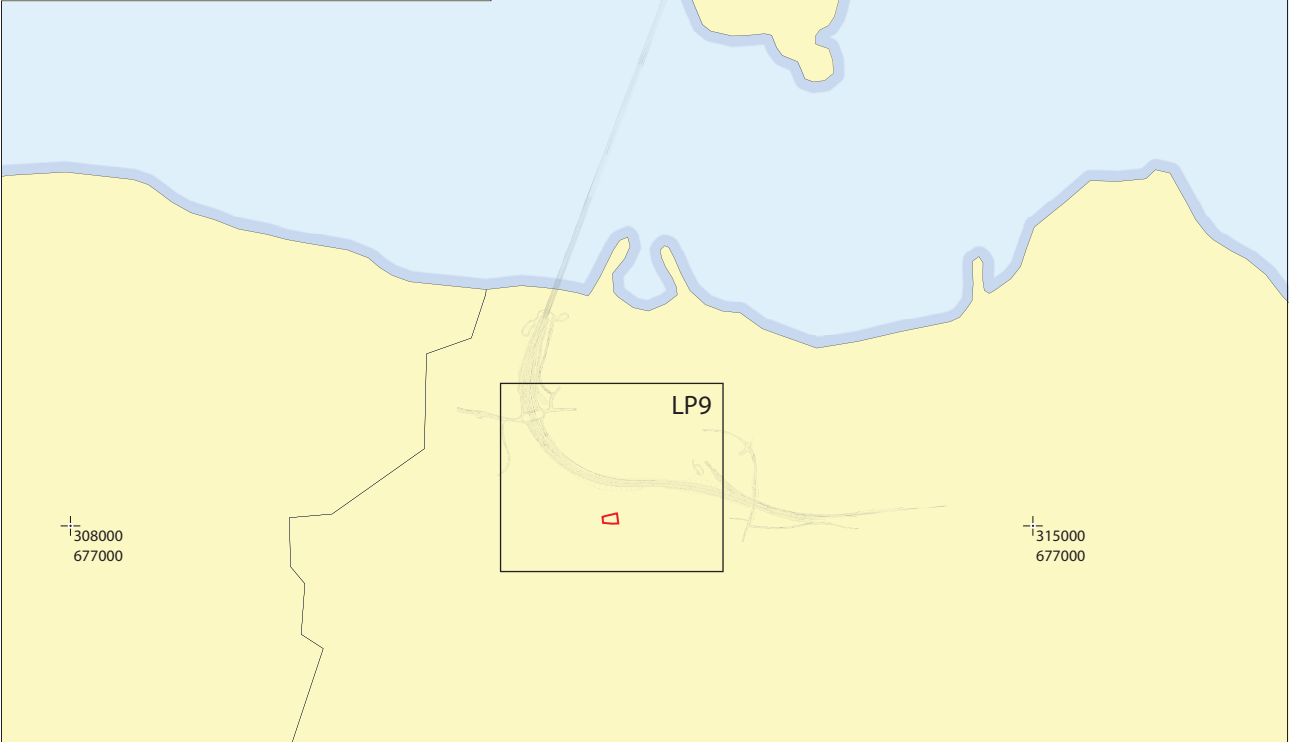
Site

0 3km
1:100,000@A4



LP9

0 600m
1:25,000@A4



LP9

308000
677000

315000
677000



HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LAND PARCEL 9 (FRCE10)

Reproduced using 2007 OS 1:50,000 Landranger No. 65 and digital 1:10,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011. All rights reserved. Licence No. AL 100013329

0 2.5km
1:55,000 @ A4

Illus 1
Site location



© Headland Archaeology (UK) Ltd





Client
FORTH REPLACEMENT CROSSING, LAND PARCEL 9 (FRCE10)



Reproduced using digital 1:5,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011
 All rights reserved. Licence No. AL 100013329

Key

-  site boundary
-  trenches



Scale 1:1,000 @ A4

Illus 2
 Trench plan

Project code: FRCE10
Client: Transport Scotland
Date: 11th 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 3360m² 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 th – 8 th April 2011
Report	April 2011

CONTENTS

1	Introduction	230
	1.1 <i>General</i>	230
	1.2 <i>Project Background</i>	230
	1.3 <i>Aims and Objectives of the Archaeological Works</i>	230
2	Site Background	231
	2.1 <i>Archaeological and Historical Background</i>	231
	2.2 <i>Site Topography and Land Use</i>	231
	2.3 <i>Site Geology</i>	231
3	Methodology	232
4	Results of Fieldwork	232
	4.1 <i>Trial Trenching</i>	232
5	Conclusions	233
6	References	234
	6.1 <i>Bibliographic References</i>	234
	6.2 <i>Cartographic References</i>	234
7	Appendices	235
	<i>Appendix 1: Trench Register</i>	235
	<i>Appendix 2: Context Register</i>	237
	<i>Appendix 3: Trench Matrices</i>	238
	<i>Appendix 4: Photographic Register</i>	240
	Illustrations	241

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 5th and the 8th 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 15th century, although the castle may originate as early as the 12th 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 m², of which a 5% sample (3360 m²) 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 m² 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.

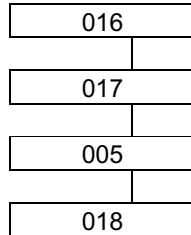
24	50	0.55	WNW-ESE running. No features.
25	50	0.5	NE-SW running. Contains one furrow [012].
26	50	0.5	ESE-WNW running. No features.
27	50	0.4	WSW-ENE running. Contains one furrow[014].
28	50	0.4	ENE-WSW running. No features.
29	50	0.4	NW-SE running. No features.
30	50	0.4	N-S running. No features.
31	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

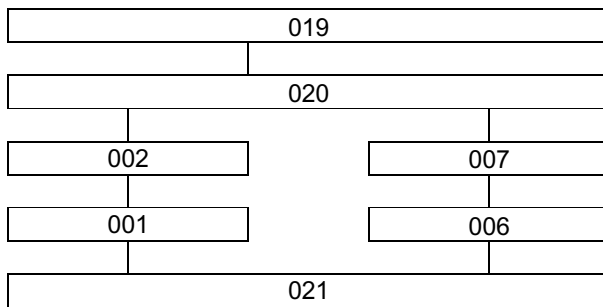
Context No.	Area	Description
001	Tr 13	Cut of Furrow. Measures 2m by 1.9m and 0.20 m deep. Orientated north-south
002	TR 13	Mid brown grey silty clay. Fill of [001]
003	Tr 15	Cut of Furrow. Measures 2.5m by 0.75m and 0.09m deep. Orientated north-south.
004	Tr 15	Mid brown grey silty clay. Fill of [003]
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

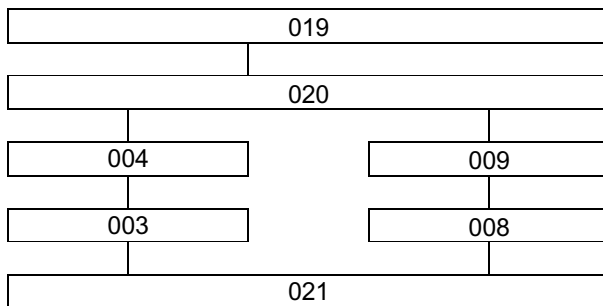
**Trench
9**



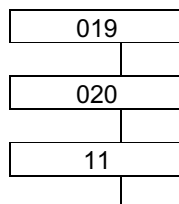
**Trench
13**

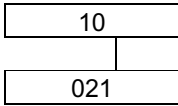


**Trench
15**

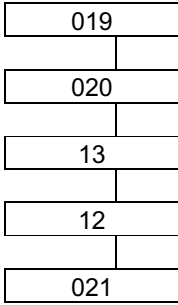


**Trench
22**

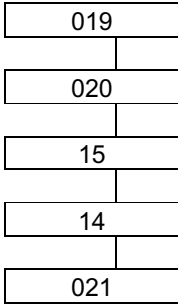




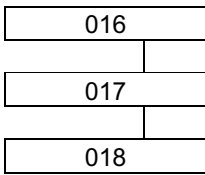
**Trench
25**



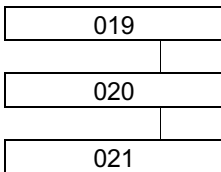
**Trench
27**



**Trenches
1- 8**

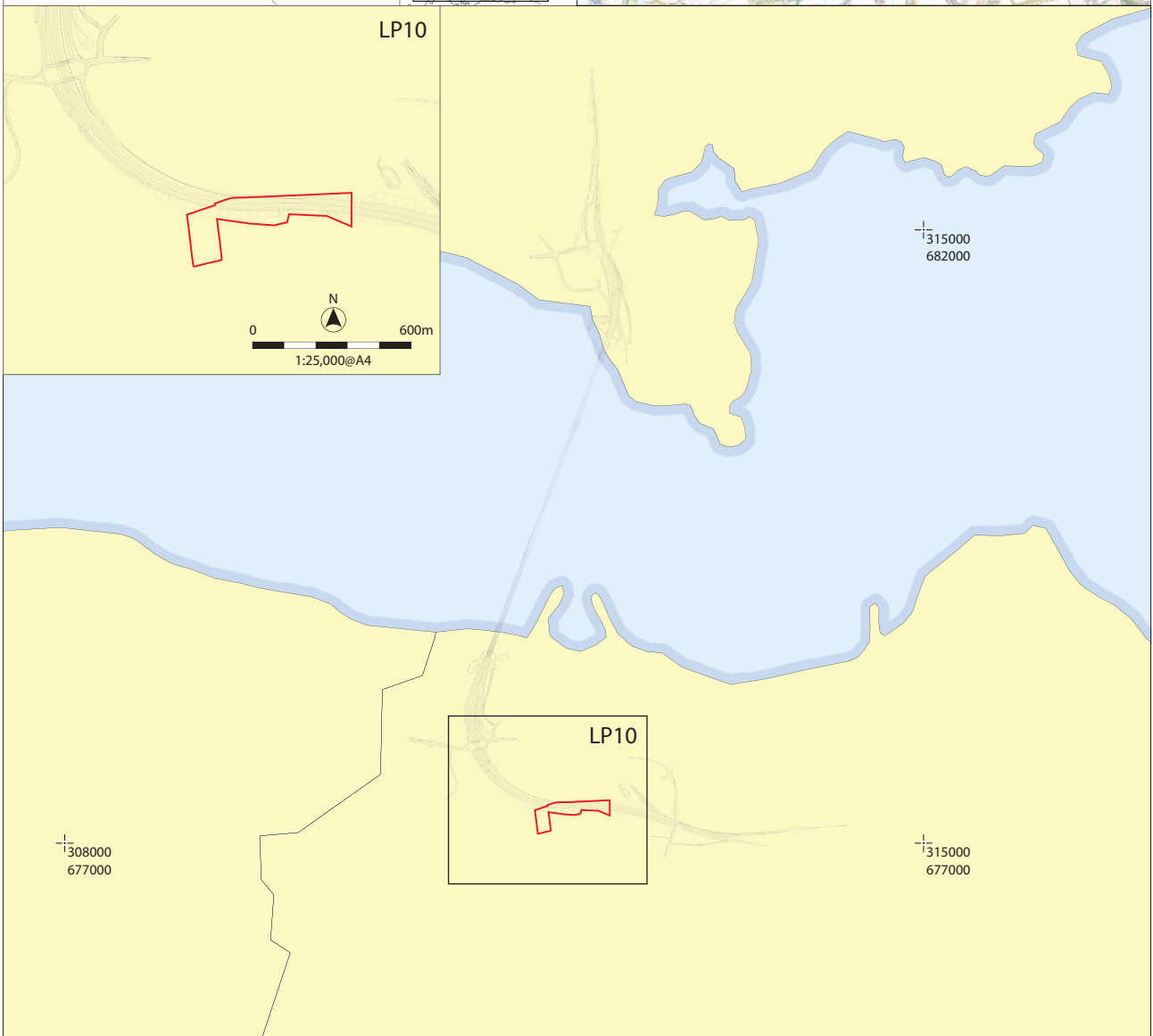
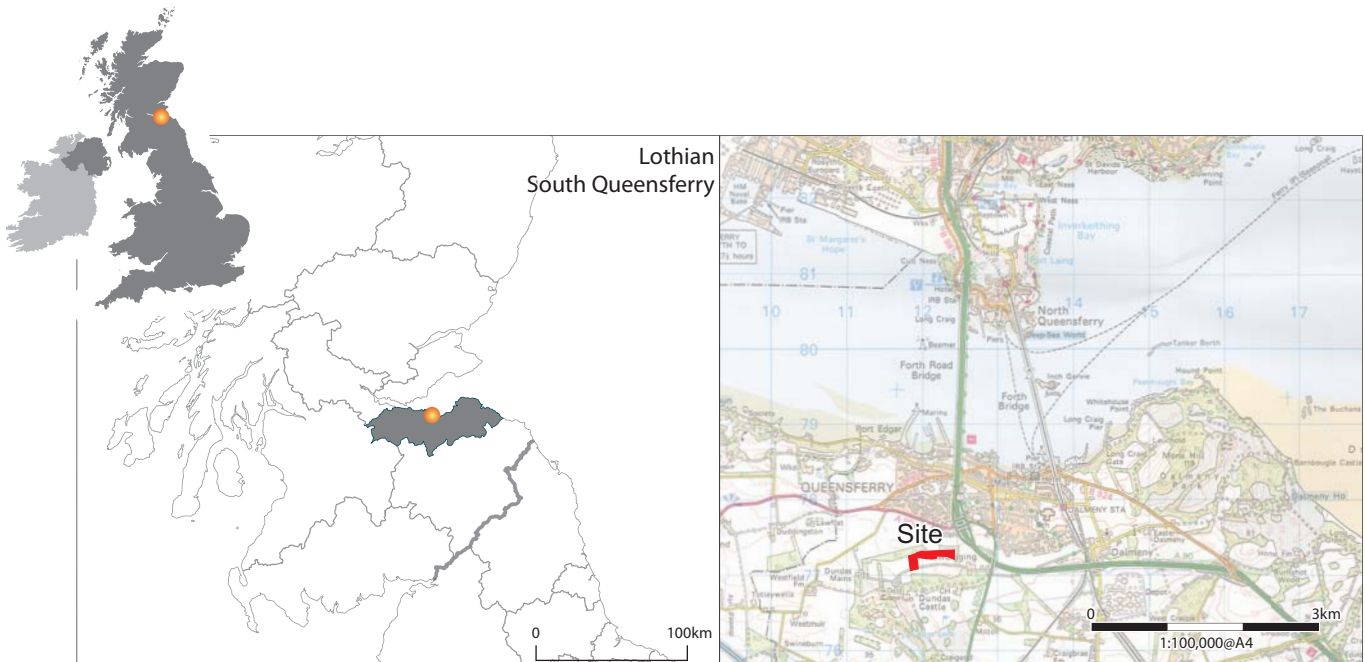


**Remaining
Trenches**





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



Client

HEADLAND ARCHAEOLOGY (UK) Ltd

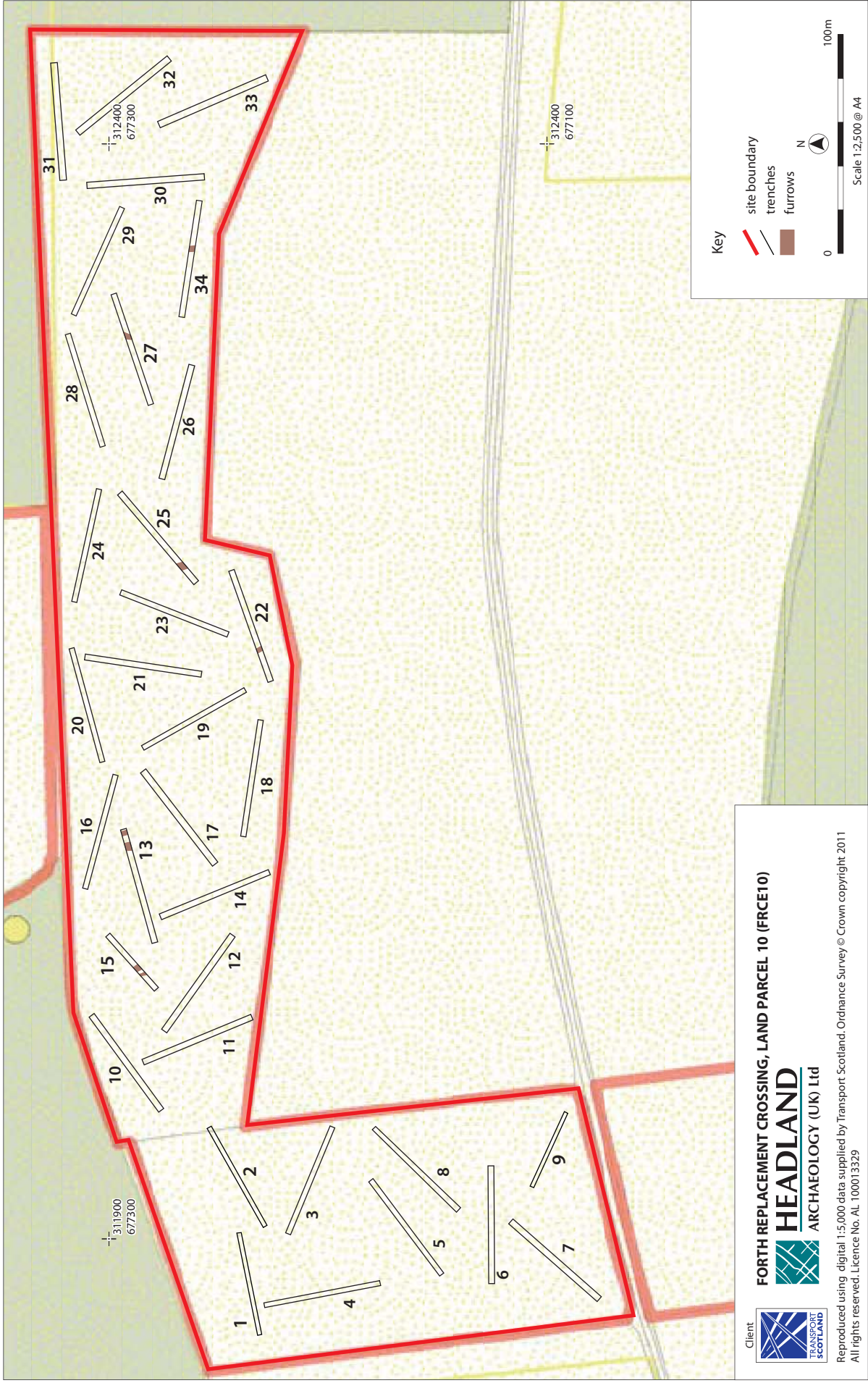
FORTH REPLACEMENT CROSSING, LAND PARCEL 10 (FRCE10)

Reproduced using 2007 OS 1:50,000 Landranger No. 65 and digital 1:10,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011. All rights reserved. Licence No. AL 100013329

0 2.5km

1:55,000 @ A4

Illus 1
Site location



Client  **TRANSPORT SCOTLAND**

FORTH REPLACEMENT CROSSING, LAND PARCEL 10 (FRCE10)
HEADLAND
 ARCHAEOLOGY (UK) Ltd

Reproduced using digital 1:5,000 data supplied by Transport Scotland, Ordnance Survey © Crown copyright 2011
 All rights reserved. Licence No. AL 100013329

Illus 2
Trench plan

Project code: FRCE10
Client: Transport Scotland
Date: 23rd May 2011

The Results of an Archaeological Field Evaluation by Trial Trenching and Archaeological Excavation on the Forth Replacement Crossing at Dundas Castle Farms (Land Parcel 11)

Archaeological Consultant: Jacobs Arup
Report Authors: Ian Hill & Elizabeth Jones
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 11), NGR: NT 12159 77315 (centred), to assess the presence/absence of archaeological features 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.

Five trenches with a total area of 472m² comprising a 5% sample of this parcel were excavated. Trenches were sited to ensure good spatial coverage. The trial trenching revealed a possible alignment of pits with an east-west orientation and an isolated pit to the western end of the site. No other features of archaeological significance were revealed.

Based on the results of the trial trenching an area measuring 10 m by 100 m centred on the possible pit alignment was excavated. Excavation of the features at the eastern end of the site demonstrated these to be natural hollows in the gravel, which had filled with natural clay. The features at the western end of the site were also revealed to be areas of variation in the natural clays and gravels. One of the features identified during the evaluation was found to be a geotechnical test pit. The excavation also revealed furrows running east to west and rubble drains crossed the site on the same alignment.

ARCHAEOLOGICAL EVALUATION
Forth Replacement Crossing: Land Parcel 11, Dundas Castle Farms

PROJECT SUMMARY SHEET (FRCE10)

<i>Client</i>	Transport Scotland
<i>Consultant</i>	Jacobs Arup
<i>National Grid Reference</i>	NT 12159 77315
<i>Project Manager</i>	Edward Bailey
<i>Text</i>	Ian Hill & Elizabeth Jones
<i>Illustrations</i>	Julia Bastek
<i>Evaluation Team</i>	Samira Ben Mohamed Kirsty Dingwall Ian Hill Richard Tuffin Donald Wilson
<i>Excavation Team</i>	Samira Ben Mohamed Ian Hill Elizabeth Jones Emma Searle
<i>Schedule</i>	
Evaluation	11 th – 15 th April 2011
Excavation	16 th – 20 th May 2011
Report	May 2011

CONTENTS

1	Introduction	247
	1.1 <i>General</i>	247
	1.2 <i>Project Background</i>	247
	1.3 <i>Aims and Objectives of the Archaeological Works</i>	248
2	Site Background	248
	2.1 <i>Archaeological and Historical Background</i>	248
	2.2 <i>Site Topography and Land Use</i>	249
	2.3 <i>Site Geology</i>	249
3	Methodology	249
	3.1 <i>Trial Trenching</i>	249
	3.2 <i>Excavation</i>	250
4	Results of Fieldwork	250
	4.1 <i>Trial Trenching</i>	250
	4.2 <i>Excavation</i>	251
5	Conclusions	252
6	References	253
	6.1 <i>Bibliographic References</i>	253
	6.2 <i>Cartographic References</i>	253
7	Appendices	254
	<i>Appendix 1: Trench Register</i>	254
	<i>Appendix 2: Context Register</i>	255
	<i>Appendix 3: Trench Matrices</i>	256
	<i>Appendix 4: Photographic Register</i>	258
	<i>Appendix 5: Drawing Register</i>	259
	<i>Appendix 6: Sample Register</i>	259
	Illustrations	260

1 Introduction

1.1 General

- 1.1.1 This Data Structure Report is submitted as a report on a programme of archaeological trial trenching and excavation 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 11th and the 15th April 2011, Headland Archaeology (UK) Ltd. undertook a programme of archaeological evaluation by trial trenching on Land Parcel 11 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.
- 1.1.3 Additional excavation works took place on Land Parcel 11 between the 16th and 20th May 2011 based on the results of the trial trenching. The project was managed by Edward Bailey (Project Manager), the fieldwork and reporting was undertaken by Elizabeth Jones. Three additional staff members were involved throughout the excavation.

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 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;
- 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.

1.3.2 Following the results of the evaluation the objectives of the excavations were to:

- Clarify the nature, character and extent of the features identified during the evaluation and obtain a plan of any additional features identified during the excavation.
- Identify any structures or activity areas and the date and duration of any settlement remains
- Obtain artefactual and environmental evidence for the purposes of dating and interpretation of the site

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.

2.1.4 The land parcel contains one possible site. This is a pit alignment (Site 1146) identified from aerial photographs (Jacobs Arup 2009a).

2.1.5 The land parcel lies near 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 2009a, 32).

2.2 *Site Topography and Land Use*

2.2.1 The site consisted of the southern end of an arable field that was under crop (Oilseed Rape) at the time of evaluation. The evaluation area was bounded by a hedgerow to the south and strips of protected woodland to the east and west (Echline strip). 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 2009a) carried out demonstrate that the subsurface stratigraphy generally constitutes glacial till deposits of varying thickness; these are predominantly comprised firm to very stiff boulder clay deposits with occasional granular till deposits.

2.3.1 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 *Evaluation*

3.1.1 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 8,277m², of which a sample of at least 5% was investigated by trial trenching; the total area excavated was 472m². 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. A BP pipeline was present on site and a 15 metre buffer zone for this was marked out, and the excavator remained outside of the marked area. It was also ensured that no trenches were placed close to overhead power lines running east-west across the site. As a result of the an 5 m increase in the stand off area required by the BP wayleaves team for the pipeline Trench 3 was moved slightly to the east. Trench 2 was also altered slightly due to the presence of protected woodland adjacent to the west of the site.

3.1.2 All trenches were individually numbered and a pole-mounted Trimble G6 differential GPS programmed with the relevant coordinates was utilised to identify and mark out the locations of trenches. The trenches were excavated using one 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 met 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.

- 3.1.3 Bulk soil samples were collected from secure archaeological contexts for processing and assessment. Where possible a minimum 30-litre sample was collected from each archaeological deposit and given a unique number (Transport Scotland 2010, 59). All finds were recorded by individual context and their cleaning, storage and conservation undertaken in accordance with the Institute for Archaeologists Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials (Transport Scotland 2010, 65-66).

3.2 *Excavation*

- 3.2.1 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 excavated was 1000m², comprising a trench measuring 10m wide by 100m east to west, focussing on the possible pit alignment.

- 3.2.2 The area was 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 met first. All 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 excavation area and archaeological contexts were recorded using a Total Station EDM linked to a field computer running *TheoLT* software. Photographs were taken using colour slide film, black and white film and digital.

4 **Results of Fieldwork**

4.1 *Trial Trenching (Illus 2 & 3)*

- 4.1.1 Five trenches were excavated across Land Parcel 11 (Illus 2) with a combined total area of 472m². Full detailed descriptions of each trench and individual contexts can be found in Appendix 1 and Appendix 2. Results are summarised below.

- 4.1.2 The natural geology seen in the trenches was largely a mixed and mottled, dark, stony orange and grey clay [020]. Sondages were excavated at various points to test the natural and all deposits encountered appeared to be well-sorted, natural stony clays, turning into stony gravels at a depth of 1.70m. In general this was overlain by between 0.10m and 0.20m of subsoil or interface material – greyish-brown clayey silt [019]. Topsoil [018] was between 0.30m and 0.50m deep and contained little in the way of recent ceramic material.

- 4.1.3 Possible Archaeological features were found in two trenches (Trenches 2 & 4).

- 4.1.4 Within Trench 2, two possible pits were identified. Pit [008] was not fully exposed within the limits of the trench, but was at least 2.25m long by 0.75m wide and 0.16m deep. It had steep sloping sides and a regular, flat base. The pit was filled with mid brown silt [007] and had been subsequently cut by a rubble field drain. The second possible pit was not excavated.
- 4.1.5 Pits [003] and [006] were identified in Trench 4 along with five other pits [015, 016, 17, 021 and 022] that were not excavated during the evaluation works (Illus 4). The pits revealed formed an alignment roughly orientated east to west. The south-western quadrant was excavated from both [003] and [006] with each pit containing two fills. The upper fills of both the pits, [001] and [004] respectively, consisted of stiff dark grey clay with sub-rounded stones, likely representing a natural infilling. The primary fill of both the pits, [002] and [005] respectively, consisted of mixed, compact, orange and grey stony clay. The consistency was similar to the natural in the trench but contained more stones; a number of the stones also appeared to be 'pressed' into the cut of the pits. The stones are likely to be re-deposited natural and may represent a backfilling event carried out shortly after the cutting of the pits. Both pits excavated had steep sloping sides and a concave base and continued beneath the edges of the trench. Pit [003] was revealed to be 1.80m long and at least 0.90m wide and 0.45m deep. Pit [006] was 1.4m long and at least 0.75m wide and 0.30m deep.

4.2 *Excavation*

- 4.2.1 The excavation did not reveal any features further to those revealed in the trial trenching. The base of the evaluation trench 4 was cleaned in order to fully expose the features. Three clay patches, unexcavated during the evaluation were half-sectioned in order to determine their nature ([015], [016], [017]; Illus 5 and 6). The features were interpreted as natural depressions or hollows in the gravels. The gravels in this area of the site are overlain by a thin (<0.05 m) band of clay, which filled these hollows. The variation in the site geology between grey clays, lighter gravels and mixed clayey gravels is shown in Illus 7. Further inspection of features [003] and [006] excavated during the trial trenching showed that these were also natural hollows/depressions.
- 4.2.2 Excavation at the western end of site revealed that the feature identified in Trench 2 [008] was the edge of a change in the natural from stiff clay to a more silty deposit. The silty clay extended westwards from the edge of the feature and covered an area approximately 8m by 7m in a shallow depression. The unexcavated feature in Trench 2 was found to be a test pit.
- 4.2.3 Three furrows were found running from west to east across the western part of the excavation area [009, 011 and 013]. A section was excavated through each of them. They varied in width between 0.70m and 1m and were on average 0.07m in depth and 8m apart (centre to centre). The fills were dark brown clayey silt with occasional to frequent stones [010, 012 and 014] respectively. The furrows became very narrow and then became indistinct towards the eastern side of the site. Three rubble drains also crossed the site from west to east, parallel with the furrows.

5 **Conclusions**

- 5.1 The evaluation identified a concentration of undated features towards the centre of the Land Parcel, which were thought to represent a pit alignment identified from aerial photographs (Site 1146). The pits were described as of a constant size and evenly spread (Kirkdale Archaeology 1994). Interpretation of the pit alignment suggested it may represent an old tree line (Jacobs Arup 2009c). Further excavation of the features identified during the evaluation has demonstrated that the features are natural in origin. However, the variation in the size and depth of the features and the uniform, clean fills suggest they are natural depressions or hollows in the natural gravels rather than the remains of a tree line as previously suggested.
- 5.2 A further, unrelated feature [008] was revealed towards the western part of the site; however this was shown during the excavation to be the edge of a variation in natural deposits.
- 5.3 The spacing of the furrows found during the excavation is consistent with systems medieval rig and furrow; however no finds were recovered from any of the furrows to date them. The alignment of the furrows and rubble drains respected the existing southern field boundary, as shown on 19th-century maps (Ordnance Survey 1856a & b).
- 5.4 Based on the results of the fieldwork and the post excavation assessment the archaeological archive is considered as having no potential and therefore no further works are recommended. It is recommended that the single sample recovered during the archaeological works be discarded.

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.

Jacobs Arup 2009c *New Forth Crossing Cultural Heritage Interactive PDF*. Jacobs Arup 2009

Kirkdale Archaeology 1994 *Setting Forth, Stage 2a*. Unpublished report.

Parry, M L 1976 A typology of cultivation ridges in Southern Scotland. *Tools and Tillage* 3.1: 3-19.

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.

Ordnance Survey 1856a *Linlithgowshire, 2*, (surveyed 1854-5), 6 inch to 1 mile.

Ordnance Survey 1856b *Linlithgowshire, 6*, (surveyed 1854-5), 6 inch to 1 mile.

7 Appendices

Appendix 1: Trench Register

Trench No	Length (m)	Depth (m)	Description
1	45	0.55	E-W running. No features.
2	50	0.55	NE-SW running. Contains pit [008] and one un-excavated pit.
3	50	0.3	E-W running. No features.
4	40	0.4	E-W running. Contains pits [003], [006] and five un-excavated pits.
5	51	0.4	NW-SE running. No features.

Appendix 2: Context Register

Context No.	Area	Description
001	Tr 4	Upper fill of hollow [003]. Comprised stiff dark grey clay.
002	Tr 4	Lower fill of hollow [003]. Mixed compact orange and grey stony clay.
003	Tr 4	Natural hollow/depression in stony gravel.
004	Tr 4	Clay upper fill of natural hollow [006]. Comprised stiff dark grey clay.
005	Tr 4	Mixed basal fill natural hollow [006]. Mixed compact orange and grey stony clay.
006	Tr 4	Natural hollow/depression in stony gravel.
007	Tr 2	Voided number
008	Tr 2	Change in natural deposits
009	Exc	Cut of furrow runs NW-SE, gradual sloping sides, rounded base. W: 0.72m, D: 0.08m.
010	Exc	Fill of [009], dark brown clayey silt with occasional small stones.
011	Exc	Cut of furrow, runs NW-SE, gradual sloping sides and slightly rounded base. W: 0.93m, D: 0.07m.
012	Exc	Fill of [011], dark brown clayey silt with occasional small stones.
013	Exc	Cut of furrow, runs NW-SE, gradual sloping sides and flat base. W: 1.02m, D: 0.06m.
014	Exc	Fill of [013], dark brown clayey silt with frequent small stones.
015	Exc	Natural hollow/depression in stony gravel filled with clean bluish grey clay.
016	Exc	As [015]
017	Exc	As [015]
018	Exc	Topsoil. Dark greyish brown clayey silt loam, 0.3 – 0.5m.
019	Exc	Subsoil. Greyish brown clayey silt, 0.1 – 0.2m.
020	Exc	Natural. Mixed dark orange and grey stony clay.
021	Exc	As [015]
022	Exc	As [015]

Appendix 3: Trench Matrices

Trench 2

Topsoil
018

Subsoil
019

007

008

Natural
020

Trench 4

Topsoil
018

001

004

002

005

003

006

Natural
020

Open area

Topsoil
018

010

012

014

009

011

013

Natural
020

All Other Trenches

Topsoil
018

Subsoil

019

Natural
020

Appendix 4: Photographic Register

Photo No.	Direction facing	Description
evaluation		
625	NW	General shot of Trench 3
626	E	General shot of Trench 4
627	SE	General shot of Trench 5
628	E	Post-ex shot of SW quadrant of possible pit [003] Trench 4
642	SW	Post-ex shot of SW quadrant of possible pit [006] Trench 4
643	NW	NE and SE facing sections of quadrant through [008] Trench 2
647	W	Possible Pit [008] Trench 2
648	N	Possible Pit [003] Trench 4
649	N	Possible Pit [006] Trench 4
excavation		
300		ID shot
301	SW	Pre-ex shot of excavation trench
302	E	Pre-ex shot of excavation trench
303	SE	NW facing section through furrow [009]
304	W	E facing section through furrow [011]
305	NW	SE facing section through furrow [013]
306	NE	Working shot of east end of site
307	SE	General shot of clay patches
308	S	General post-ex shot of [015]
309	SE	General post-ex shot of [016]
310	S	General post-ex shot of [017]
311	SE	General shot of changing naturals around possible pits
312	NW	General shot of changing naturals around possible pits

Appendix 5: Drawing Register

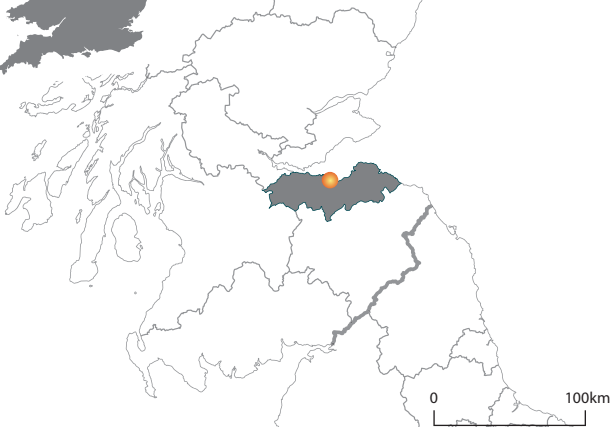
Drawing No.	Plan	Section	Description
1		1:10	W facing section of SW quad through possible pit [003]
2		1:10	S facing section of SW quad through possible pit [003]
3		1:10	S facing section of SW quad through possible pit [006]
4		1:10	W facing section of SW quad through possible pit [006]

Appendix 6: Sample Register

Sample No.	Context No.	Description
001	004	Stiff dark grey clay, upper fill of possible pit [006]



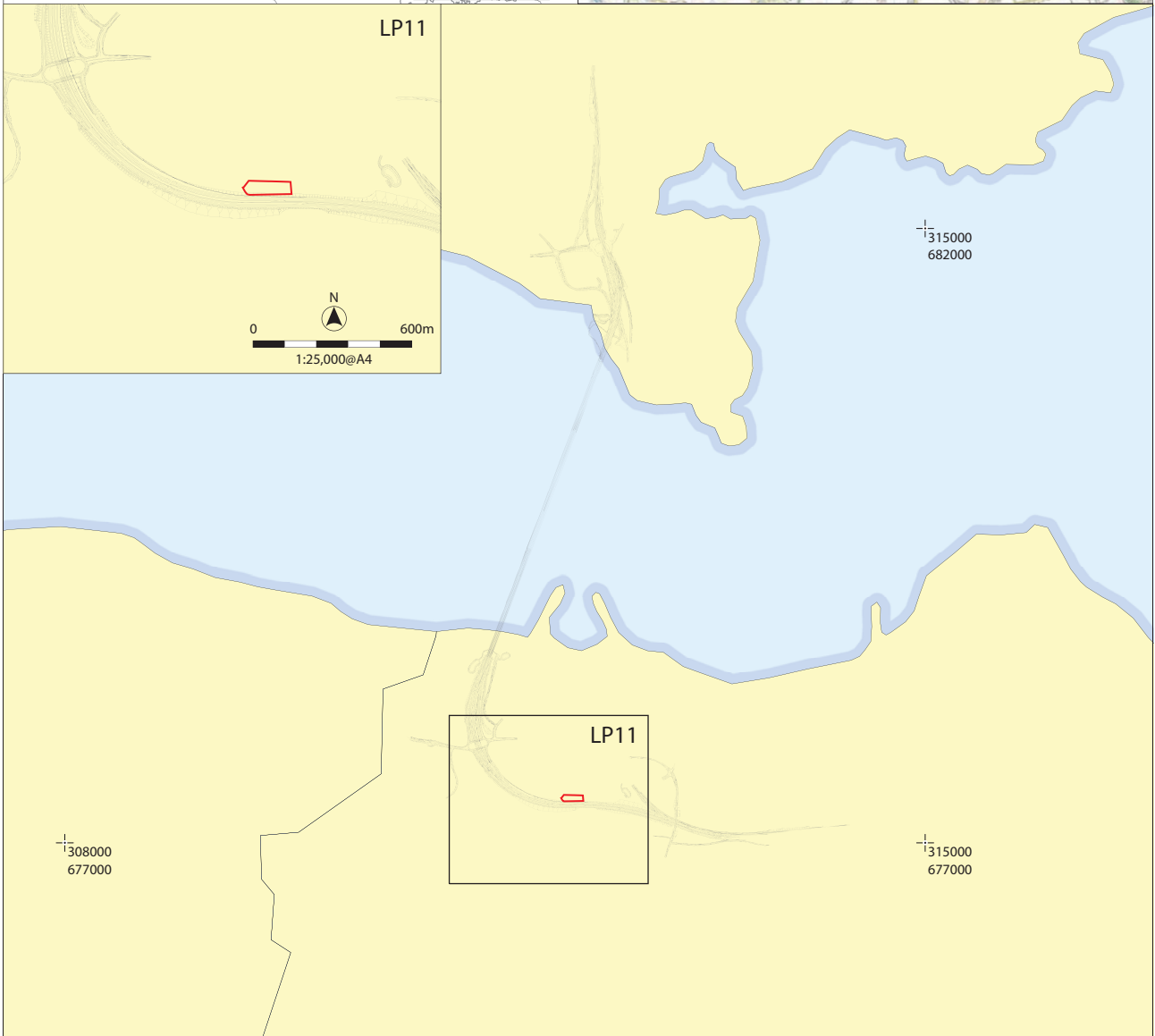
Dundas Castle Farms
Edinburgh
Lothian



0 100km



0 3km
1:100,000@A4



LP11

0 600m
1:25,000@A4

LP11

308000
677000

315000
677000



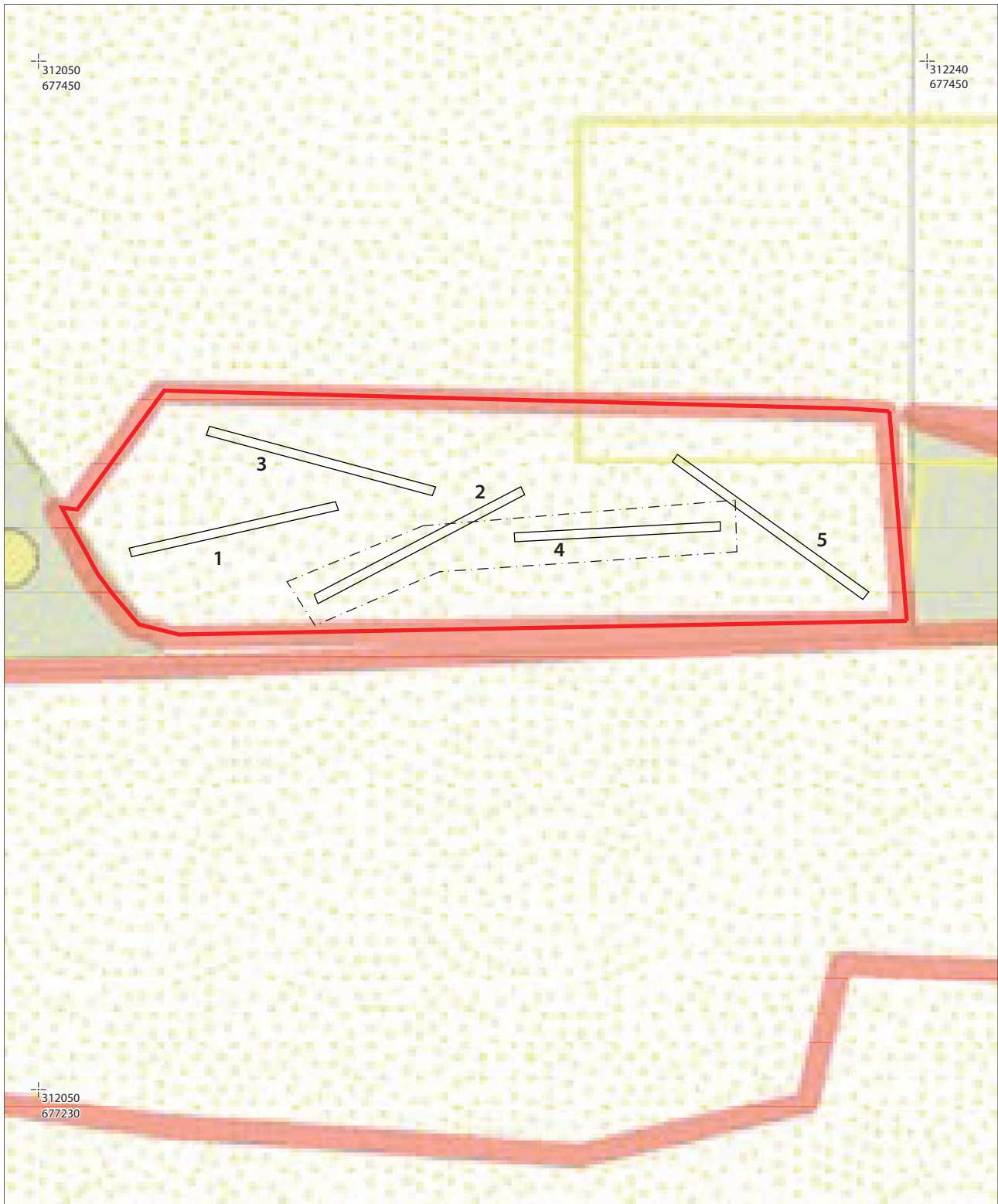
HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LAND PARCEL 11 (FRCE10)

Reproduced using 2007 OS 1:50,000 Landranger No. 65 and digital 1:10,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011. All rights reserved. Licence No. AL 100013329

0 2.5km
1:55,000 @ A4

Illus 1
Site location



© Headland Archaeology (UK) Ltd






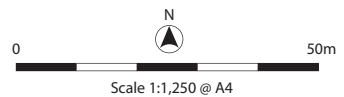
FORTH REPLACEMENT CROSSING, LAND PARCEL 11 (FRCE10)



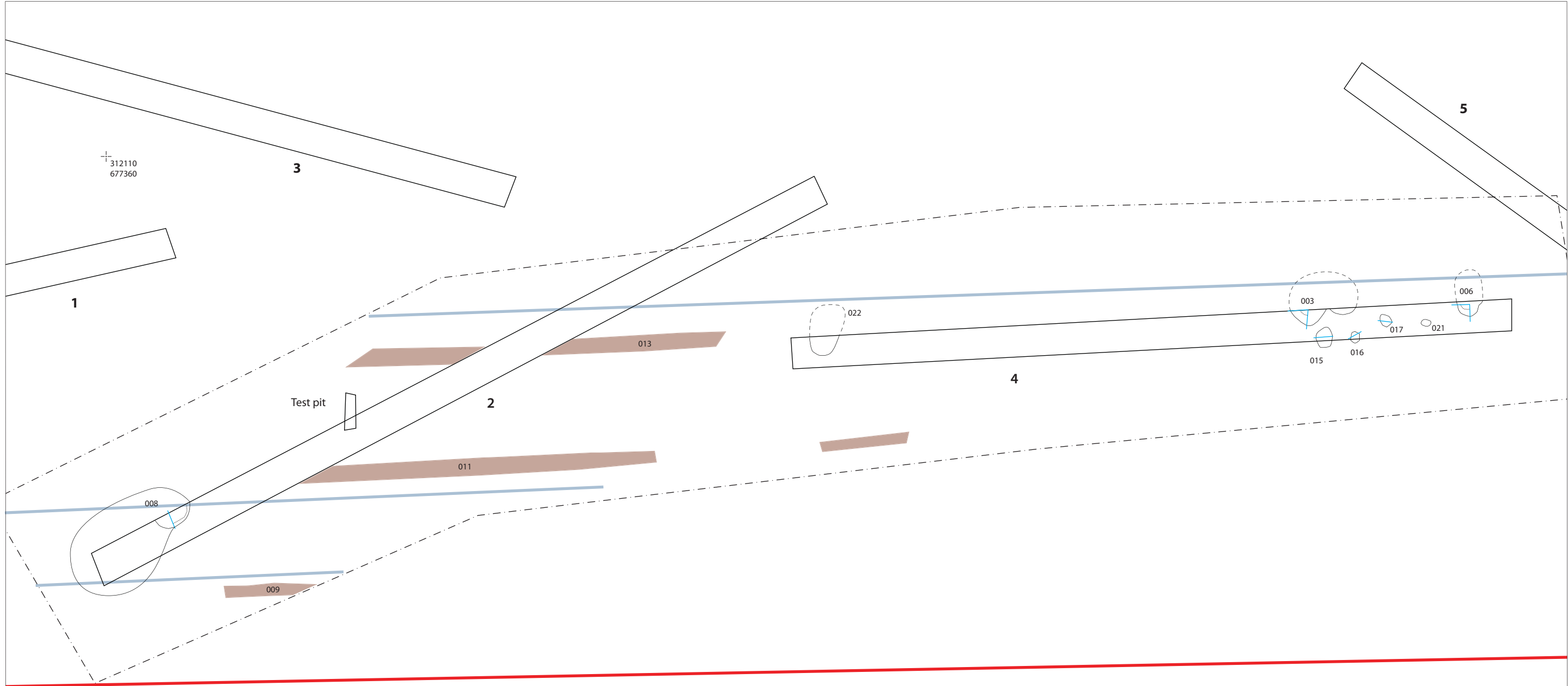
Reproduced using digital 1:5,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011
All rights reserved. Licence No. AL 100013329

Key

-  site boundary
-  trenches
-  excavated area



Illus 2
Trench plan



312110
677360

312110
677325

312190
677325









© Headland Archaeology (UK) Ltd


Client

FORTH REPLACEMENT CROSSING, LAND PARCEL 11 (FRCE10)

 Reproduced using digital 1:5,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011
 All rights reserved. Licence No. AL 100013329

Key

-  site boundary
-  excavated area
-  trenches
-  features
-  bottom of the features
-  section line
-  furrows
-  rubble drains

0  10m
 Scale 1:250 @ A3

Illus 3
Excavation area



Illus 4

Clay filled features looking south-east, with [003] in foreground



Illus 5

Section through [015] looking south



HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LP11 (FRCE10)



Illus 6
Section through [017] looking south



Illus 7
Variation in natural around possible features, looking south-east



HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LP11 (FRCE10)

Project code: FRCE10
Client: Transport Scotland
Date: 26th April 2011

The Results of an Archaeological Field Evaluation by Trial Trenching at Dundas Home Farm, South Queensferry (Land Parcel 12)

Archaeological Consultant: Jacobs Arup
Report Authors: Jamie Humble
Report Status: Approved



Executive Summary

Headland Archaeology conducted an archaeological evaluation by trial trenching at Dundas Home Farm, South Queensferry, NGR: NT 12600 77327 (centred), to assess the presence/absence of archaeological features in an area identified as having good archaeological potential and to target Newbigging Cobbled Surface (Site 150) revealed during previous works and noted 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 32 trenches totalling 3208m² were excavated comprising just under a 5% sample of Land Parcel 12. Trenches were sited to provide good spatial coverage while avoiding a BP pipeline that ran through the centre of the land parcel, and an overhead electricity cable to the north. The trenches were excavated between the 7th and 12th April 2011. The trial trenching revealed ditches and furrows relating to the post-medieval agricultural activity on site. The evaluation specifically targeted the area of Site 150, Newbigging Cobbled Surface that was identified during the archaeological evaluation works for the M9 extension & A90 upgrading. No evidence of a cobbled surface or any other features of archaeological significance were discovered during the works.

ARCHAEOLOGICAL EVALUATION
Forth Replacement Crossing: Land Parcel 12, Dundas Home Farm

PROJECT SUMMARY SHEET (FRCE10)

<i>Client</i>	Transport Scotland
<i>Consultant</i>	Jacobs Arup
<i>National Grid Reference</i>	NT 12600 77327
<i>Project Manager</i>	Edward Bailey
<i>Senior Archaeologist</i>	Kirsty Dingwall
<i>Text</i>	Jamie Humble
<i>Illustrations</i>	Julia Bastek
<i>Evaluation Team</i>	Samira Ben Mohammed Kirsty Dingwall Jamie Humble Emma Searle Jurgen van Wessel Don Wilson
<i>Schedule</i>	
Fieldwork	7 th – 12 th April 2011
Report	April 2011

CONTENTS

1	Introduction	269
	1.1 <i>General</i>	269
	1.2 <i>Project Background</i>	269
	1.3 <i>Aims and Objectives of the Archaeological Works</i>	270
2	Site Background	270
	2.1 <i>Archaeological and Historical Background</i>	270
	2.2 <i>Site Topography and Land Use</i>	271
	2.3 <i>Site Geology</i>	271
3	Methodology	271
4	Results of Fieldwork	272
	4.1 <i>Trial Trenching</i>	272
5	Conclusions	272
6	References	274
	6.1 <i>Bibliographic References</i>	274
	6.2 <i>Cartographic References</i>	274
7	Appendices	275
	<i>Appendix 1: Trench Register</i>	275
	<i>Appendix 2: Context Register</i>	276
	<i>Appendix 3: Trench Matrices</i>	277
	<i>Appendix 4: Photographic Register</i>	279
	Illustrations	280

1 Introduction

1.1 General

1.1.1 This draft 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 7th and the 12th April 2011, Headland Archaeology (UK) Ltd. undertook a programme of archaeological evaluation by trial trenching on Land Parcel 12 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 Jamie Humble (Project Officer). Three 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;
- 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 15th century, although the castle may originate as early as the 12th century (Jacobs Arup 2009a, 32). Previous evaluation works within the confines of Land Parcel 12 by CFA Archaeology Ltd in advance of the M9 extension and A90 upgrading revealed the presence of archaeological remains, most notably a possible cobbled surface bounded to the north by a ditch. A sherd of medieval pottery was recovered from the cobbled surface. Occasional areas of rig and furrow were also identified (CFA Archaeology 2003, Site 150 in EIA).

2.2 *Site Topography and Land Use*

- 2.2.1 Land Parcel 12 occupied the north western corner of a field under young crop at the time of the evaluation. The land parcel was divided in two by a BP pipeline orientated approximately east to west across the site, the route of the pipeline and a 15m buffer either side was marked out and this area was avoided. An overhead power line ran northwest to southeast along the northern boundary of the site from which a distance of 10 m was maintained for all trenches. The site was under the ownership of AWG Residential Ltd and Taylor Wimpy Developments 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. The trial trenching identified bands of bedrock protruding through the glacial till deposits.
- 2.3.1 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 66,864 m², of which a sample, just under 5% (3208m²) was investigated 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. It was ensured that no trenches were placed within 10m of the overhead power lines running along the north of the site or within 10m of the centreline of the BP pipeline. Following on-site instructions from the BP Wayleave team the exclusion area around the gas pipeline was increased from 10 m to 15 m. This meant that the total area excavated was reduced from 3343 m² to 3208 m². Where possible, trenches were relocated, although in some cases this was not possible.
- 3.2 All trenches were individually numbered and located using a pole-mounted Trimble G6 differential GPS programmed with the relevant 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 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 Thirty two trenches were excavated across Land Parcel 12 (Illus 2) with a combined total area of 3208 m² comprising just under a 5% sample of the Parcel. Full detailed descriptions of each trench and individual contexts can be found in Appendix 1 and Appendix 2. Results are summarised below.

4.1.2 The natural geology [021] seen in the trenches was largely yellowy grey clay. In areas this was overlain by up to 0.20 m of subsoil [020] – an orangey brown sandy silt. The dark brown humic sandy clay topsoil [019] was between 0.20 m and 0.40 m deep and contained frequent inclusions of modern ceramic material.

4.1.3 Archaeological features were found in five trenches (Trenches 9, 12 & 13, 23 & 25). These were found in two concentrations one at the north and one at the east of the land parcel.

4.1.4 A ditch [001/003] was identified in Trenches 9, 12 and 13 oriented approximately east to west it continued for over 70 m. In Trenches 9 & 12 sections were excavated across the feature. The ditch [001/003] measured between 0.56m and 1.89m wide and was between 0.31 m and 0.12 m in depth. Where the ditch was better preserved in Trench 12 it had steeply sloping sides, a concave base and sharp breaks of slope. The single fill [002/004] of the ditch was dark grey silty clay with frequent large water rounded stones, up to 0.15 m in diameter (Illus 3). To the south of the ditch in Trench 9 and at the northern end of Trench 10 concentrations of water rounded stones (maximum dimensions 0.3 m x 0.2 m x 0.1 m) were exposed. The concentrations of stones were however of natural origin with the stones being set in and in places overlain by the glacial till.

4.1.5 Furrows were identified in Trenches 9, 23 and 25. In Trench 9 only a single section of furrow [005] was exposed, while in Trenches 23 [007, 009, 011] and 25 [013, 015, 017] the furrows were staggered across the length of the trench. The furrows were between 0.60 m and 1.60 m wide. They had shallow sloping sides and were uniformly filled with compact brown silty clay (fills [006, 008, 010, 012, 014, 016, 018] respectively). Furrow [005] was excavated while those in trenches 23 and 25 were left unexcavated. The furrow in Trench 9 [005] ran approximately east to west while those in Trenches 23 and 25 [007, 009, 011 and 013, 015, 017 respectively] ran approximately north to south (illus 2).

5 Conclusions

5.1 The evaluation has established that this area appears not have been extensively used for human settlement activity. Towards the north of the land parcel ditch [001/003] ran approximately east to west across the site. Currently undated it is likely to be contemporary with the post-medieval field system recorded during evaluation and excavation of Land Parcel 4 to the north-west. The field system recorded on Land Parcel 4 matches that shown on Gordon's 1757 estate plan. This shows a field system extending east to encompass fields that are now part of Land Parcel 12.

- 5.2 The only other features identified during the course of the works relate to post-medieval agricultural activity in the area, with a few surviving furrows running across the site on a north-south or east-west alignment. 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.
- 5.3 Newbigging Cobbled Surface (Site 150) has been re-interpreted as a result of the evaluation. Concentrations of water-rounded stones were exposed in Trenches 9 and 10 in the location of Site 150. These stones are interpreted as being of natural origin due to their being part of and overlain by the natural glacial till. This concentration of stones was bounded to the north by a field boundary ditch [001/003].
- 5.4 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

Dingwall, K 2011 *Results of an Archaeological Evaluation by Trial Trenching at Echline Fields, South Queensferry (Land Parcel 5)* 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.

Humble, J (forthcoming) *Results of an Archaeological Excavation at Echline Fields, South Queensferry*. Unpublished client report. Headland Archaeology (UK) Ltd

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

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

CFA Archaeology, 2003, *M9 Extension & A90 Upgrading, Edinburgh, Archaeological Evaluation. (Data structure report 767)*. Unpublished Client Report.

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*.

Gordon L, 1757, *Plan of the Dundas Estate*.

7 Appendices

Appendix 1: Trench Register

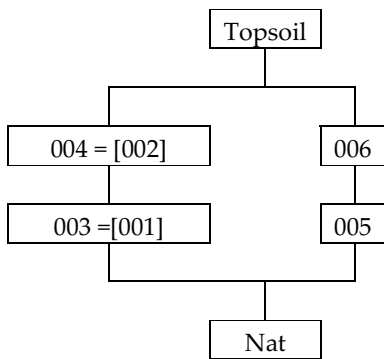
Trench No	Length (m)	Depth (m)	Description
1	50	0.3	Oriented E-W, no features.
2	50	0.4	Oriented NE-SW, no features.
3	50	0.3	Oriented NE-SW, no features.
4	45	0.5	Oriented NW-SE, no features.
5	50	0.4	Oriented NW-SE, no features.
6	50	0.4	Oriented NW-SE, no features.
7	50	0.35	Oriented E-W, no features
8	50	0.35	Oriented NE-SW, no features.
9	108	0.35	Oriented NW-SE, Furrow [005] runs E-W across trench. Ditch [003 same as 001] runs E-W across trench and continues into trenches 12 and 13.
10	31	0.4	Oriented N-S, no features.
11	50	0.4	Oriented E-W, no features.
12	50	0.4	Oriented SE-NW. Ditch [001 same as 003] runs E-W across the trench and continues in to trenches 9 and 13.
13	50	0.35	Oriented N-S. Ditch [001 same as 003] measuring 1.3m wide runs E-W across the trench and continues in trenches 9 and 12. Ditch [001 same as 003] was not excavated in trench 13.
14	50	0.4	Oriented E-W, no features.
15	50	0.5	Oriented NW-SE, no features.
16	50	0.5	Oriented E-W, no features.
17	50	0.4	Oriented NW-SE, no features.
18	50	0.4	Oriented NW-SE, no features.
19	50	0.4	Oriented N-S, no features.
20	50	0.5	Oriented NW-SE, no features.
21	50	0.7	Oriented N-S, no features.
22	50	0.5	Oriented NW-SE, no features.
23	50	0.5	Oriented NE-SW. Three furrows [007, 009 and 011] between run N-S across the trench.
24	50	0.45	Oriented E-W, no features.
25	50	0.5	Oriented NE-SW. Three furrows [013, 015 and 017] between 1.0m and 1.6m wide run N-S across the trench.
26	50	0.4	Oriented NW-SE, no features.
27	50	0.4	Oriented E-W, no features.
28	50	0.4	Oriented N-S, no features.
29	50	0.5	Oriented NE-SW, no features
30	20	0.4	Oriented E-W, no features.
31	45	0.4	Oriented NW-SE, no features.
32	55	0.5	Oriented N-S, no features.

Appendix 2: Context Register

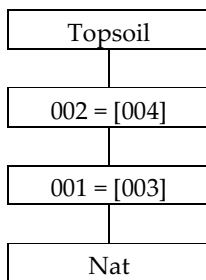
Context No.	Area	Description
001	Tr 12	Cut of linear ditch oriented E-W. Measures 9 m in length, 0.92 m wide by 0.3 m deep with steeply sloping sides, rounded base and sharp breaks of slope. This feature continues into trench 9 where it is recorded as 003 and trench 13 where it was unexcavated.
002	Tr 12	Fill of 001. Dark grey silty clay containing rare stones up to 0.15m diameter. Same as (004)
003	Tr 9	Cut of linear ditch oriented E-W. Measures 2 m in length, 0.56 m wide and 0.12 m deep with steeply sloping sides, rounded base and sharp breaks of slope. This feature continues into trench 12 where it is recorded as 001 and trench 13 where it was unexcavated.
004	Tr 9	Fill of 003. Dark grey silty clay. Same as (002)
005	Tr 9	Cut of furrow oriented E-W. Measures 2 m in length, 0.66 m wide by 0.06 m deep with gently sloping sides flat base and gentle breaks of slope.
006	Tr 9	Fill of 005. Mid brown silty clay.
007	Tr 23	Cut of Furrow oriented N-S, measures 2 m long, 1.1 m wide, unexcavated.
008	Tr 23	Fill of 007.
009	Tr 23	Cut of furrow oriented N-S, measures 2 m long, 1.0 m wide, unexcavated.
010	Tr 23	Fill of 009.
011	Tr 23	Cut of furrow oriented N-S, measures 2 m long, 1.3 m wide, unexcavated.
012	Tr 23	Fill of 011.
013	Tr 25	Cut of furrow oriented N-S, measures 2 m long, 1.1 m wide, unexcavated.
014	Tr 25	Fill of 013.
015	Tr 25	Cut of furrow oriented N-S, measures 2 m long, 1.6 m wide, unexcavated.
016	Tr 25	Fill of 015.
017	Tr 25	Cut of furrow oriented N-S, measures 2 m long, 1.0 m wide, unexcavated.
018	Tr 25	Fill of 017.
019	All	Topsoil. Greyish brown sandy silt loam. Depth: 0.20 – 0.40 m.
020	All	Subsoil. Orange brown sandy silt. Depth: 0 – 0.20 m.
021	All	Natural. Yellowish grey clay.

Appendix 3: Trench Matrices

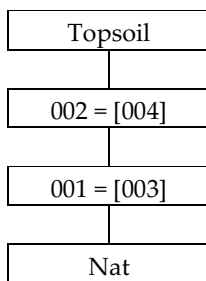
Trench 9



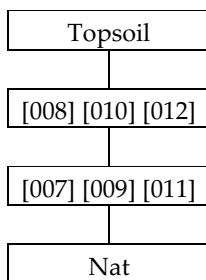
Trench 12



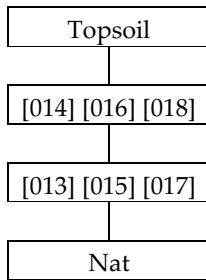
Trench 13



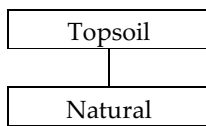
Trench 23



Trench 25

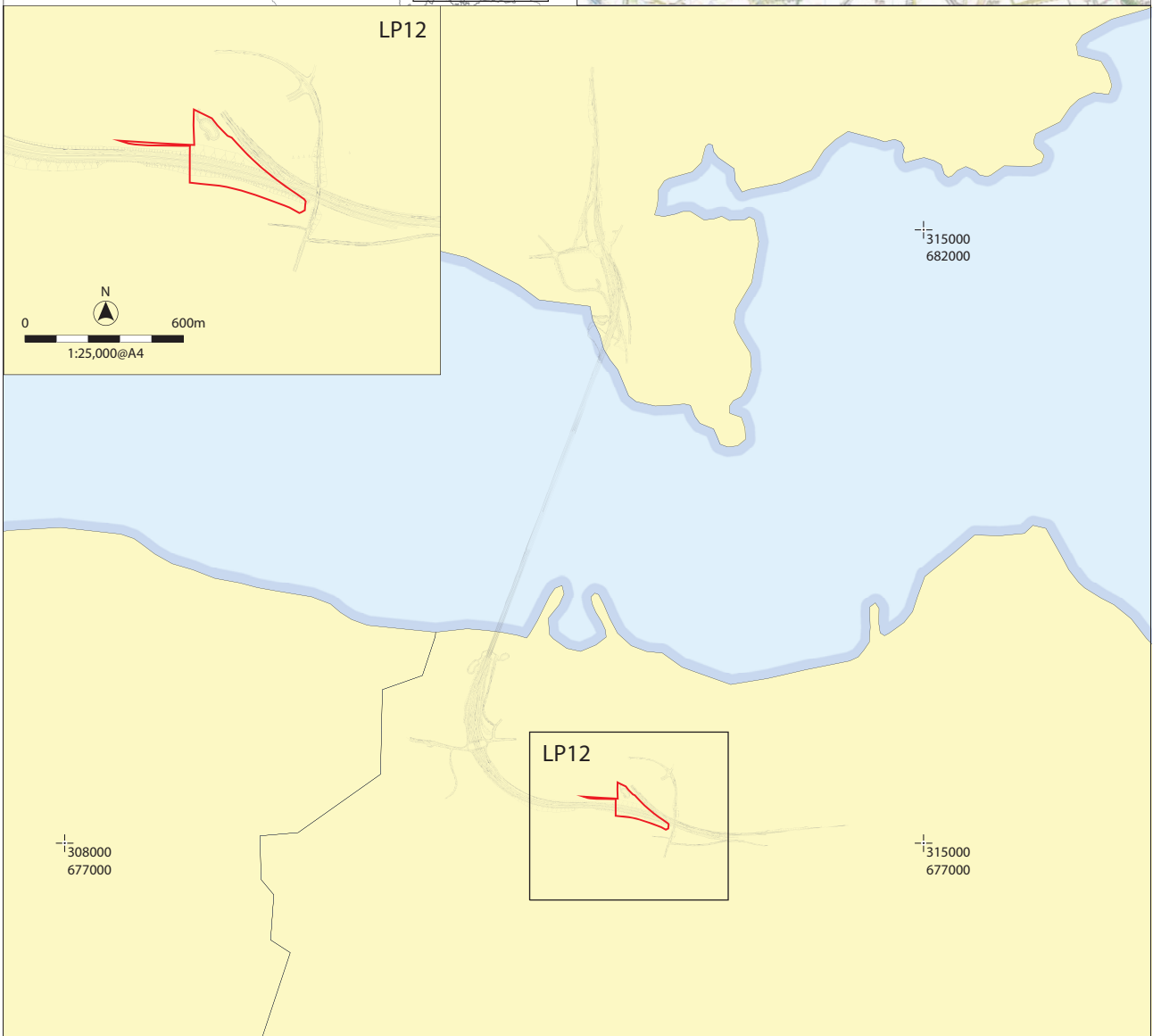
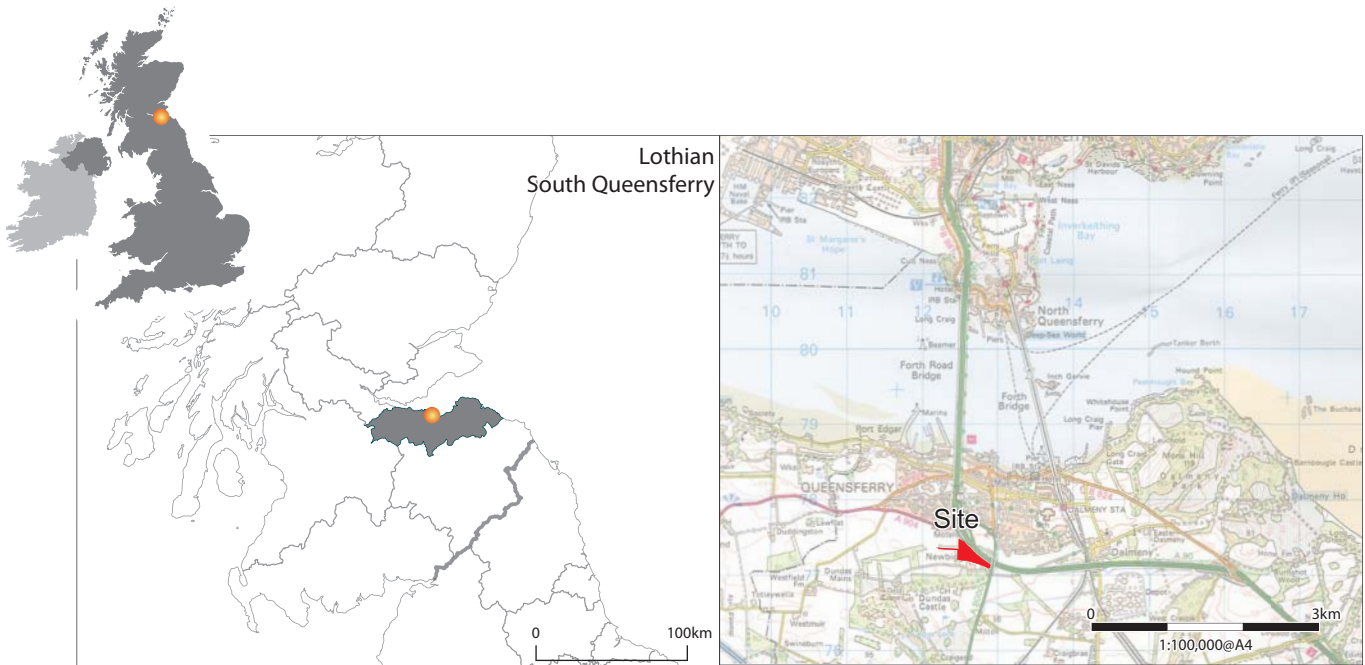


Other trenches



Appendix 4: Photographic Register

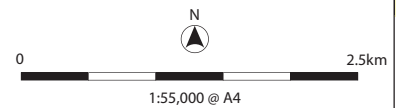
Photo No.	Direction facing	Description
001	W	Trench 1
002	NE	Trench 2
003	E	Trench 3
004	SE	Trench 4
005	E	Trench 5
006	NW	Trench 6
007	NE	Trench 7
008	SW	Trench 17
009		ID Shot
010	NE	Trench 8
011	W	Trench 9
012	S	Trench 10
013	SW	Linear feature in trench 9
014	E	Stony area in trench 9
015	W	Stony area in trench 9
016	W	Trench 11
017	NW	SE facing section of 001/002
018	NW	001/002 in trench 12
019	W	Trench 12
020	W	Trench 14
021	NNE	Trench 13
022	W	Trench 15
023	NE	Trench 16
024	NW	Trench 17
025	SE	Trench 18
026	SE	Trench 19
027	NW	Trench 20
028	N	Trench 21
029	N	Trench 22
030	E	Trench 23
031	NW	Trench 24
032	SE	Trench 25
033	NNW	Trench 26
034	NW	Trench 27
035	SW	Trench 28
036	SE	Trench 29
037	WNW	Trench 30
038	NW	Trench 31
039	NNE	Trench 32
040	S	Boundary ditch 001/002 with adjacent field drain
041	N	Boundary ditch 001/002 with adjacent field drain
042	NW	SE facing section through ditch in Trench 9
043	SE	NW facing section through ditch in Trench 9



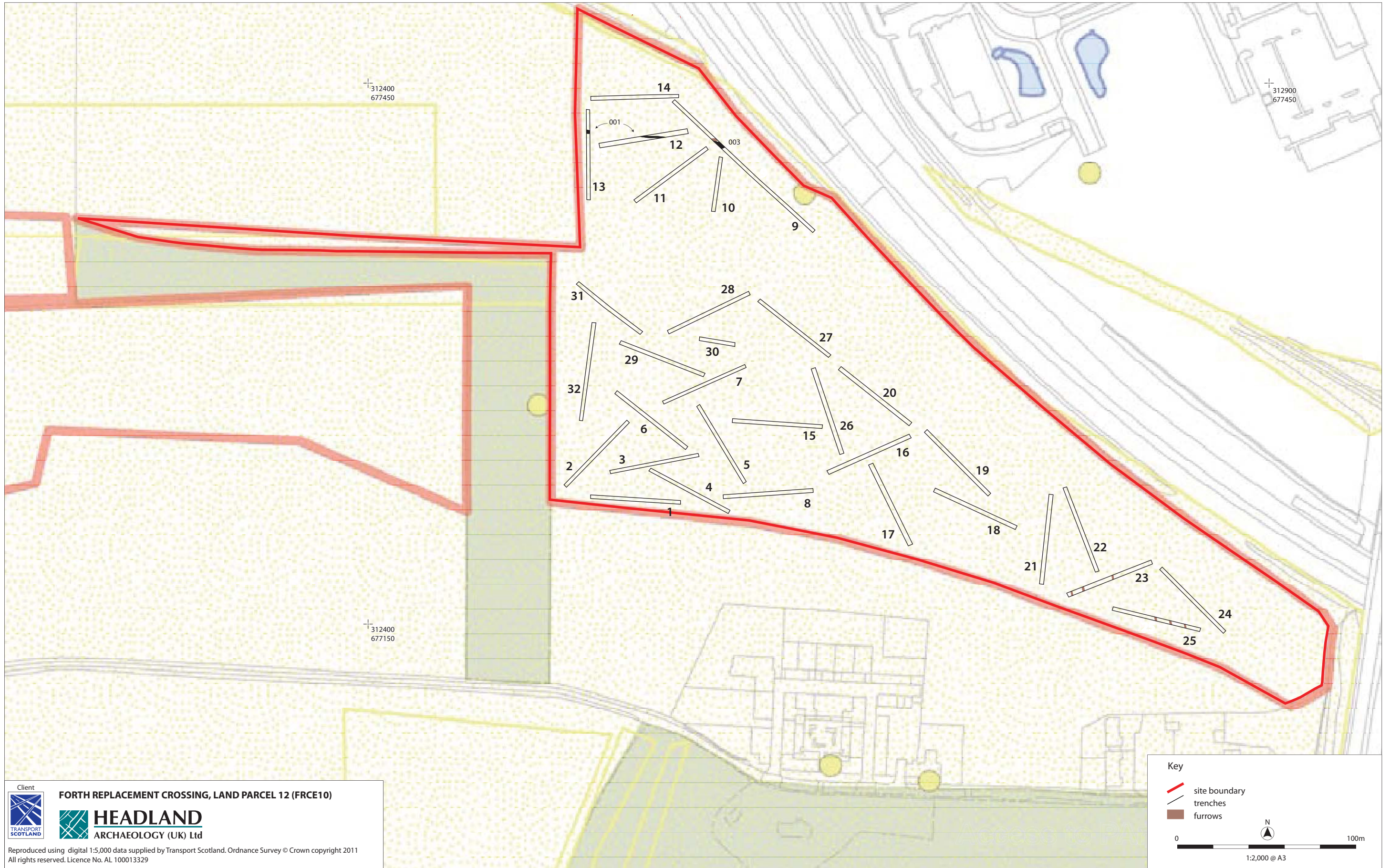
HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LAND PARCEL 12 (FRCE10)

Reproduced using 2007 OS 1:50,000 Landranger No. 65 and digital 1:10,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011. All rights reserved. Licence No. AL 100013329



Illus 1
Site location



© Headland Archaeology (UK) Ltd

Client
TRANSPORT SCOTLAND
FORTH REPLACEMENT CROSSING, LAND PARCEL 12 (FRCE10)
HEADLAND
 ARCHAEOLOGY (UK) Ltd
 Reproduced using digital 1:5,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011
 All rights reserved. Licence No. AL 100013329

Illus 2
Trench plan



Illus 3
Ditch [001], Trench 12



HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LP12 (FRCE10)

Project code: FRCE10
Client: Transport Scotland
Date: 19th April 2011

The Results of an Archaeological Field Evaluation by Trial Trenching at Dundas Castle Farms (Land Parcel 13)

Archaeological Consultant: Jacobs Arup
Report Authors: Elizabeth Jones
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 13), Dalmeny, NGR: NT 1297 7696 (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, 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. .

Three trenches totalling 216m² were excavated comprising a 5% sample across the field. With the exception of rubble field drains and a geotechnical pit from earlier investigations, no archaeological remains or deposits were identified during the evaluation.

ARCHAEOLOGICAL EVALUATION

Forth Replacement Crossing: Land Parcel 13, Dundas Castle Farms, Dalmeny

PROJECT SUMMARY SHEET (FRCE10)

Client Transport Scotland

Consultant Jacobs Arup

National Grid Reference NT 1297 7696

Project Manager Edward Bailey

Text Elizabeth Jones

Illustrations Julia Bastek

Evaluation Team Elizabeth Jones

Schedule

Fieldwork 18th April 2011

Report April 2011

CONTENTS

1	Introduction	287
	1.1 <i>General</i>	287
	1.2 <i>Project Background</i>	287
	1.3 <i>Aims and Objectives of the Archaeological Works</i>	287
2	Site Background	288
	2.1 <i>Archaeological and Historical Background</i>	288
	2.2 <i>Site Topography and Land Use</i>	288
	2.3 <i>Site Geology</i>	288
3	Methodology	289
4	Results of Fieldwork	289
	4.1 <i>Trial Trenching</i>	289
5	Conclusions	290
6	References	291
	6.1 <i>Bibliographic References</i>	291
	6.2 <i>Cartographic References</i>	291
7	Appendices	292
	<i>Appendix 1: Trench Register</i>	292
	<i>Appendix 2: Context Register</i>	292
	<i>Appendix 3: Trench Matrices</i>	292
	<i>Appendix3: Photographic Register</i>	292
	Illustrations	293

1 Introduction

1.1 General

1.1.1 This draft 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 On 18th April 2011, Headland Archaeology (UK) Ltd. undertook a programme of archaeological evaluation by trial trenching on Land Parcel 13 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 Liz Jones. One additional staff member was 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.

1.2.2 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).

1.2.3 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 lies near 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). It is bounded on its northern side by the old Newbigging to Dalmeny road.

2.2 *Site Topography and Land Use*

2.2.1 The site is located to the south of South Queensferry and is bounded by the B800 to the west and by the old Newbigging to Dalmeny road to the north. The ground was generally flat and at the time of the evaluation the field was under young crop. The site is under the ownership of the Trustees of Sir J Stewart-Clark and M J Floyd.

2.3 *Site Geology*

2.3.1 The results of geotechnical investigations (Jacobs Arup 2009b) 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. The trial

trenching (below) has identified small patches of free-draining sands and larger bands of bedrock.

- 2.3.1 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

- 3.1.1 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 to be evaluated was 4204 m², of which a 5% sample (216 m²) was evaluated through trial trenching. An indicative trench plan was agreed with the consultant archaeologists, Jacobs Arup. No trenches were excavated on the far western side of the site due to overhead power lines running parallel to the B800.
- 3.1.2 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 JCB back actor fitted with a 1.6 m wide 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 met 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 and black and white film and digital.

4 Results of Fieldwork (Illus 2)

4.1 Trial Trenching

- 4.1.1 Three trenches were excavated across Land Parcel 13 (Illus 2) with a combined total area of 216 m² 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 (001) seen in the trenches was greyish brown clay in Trenches 1 and 2 on the eastern side of the site, which changed to orange brown gravelly clay in Trench 3 on the western side of the site. This was overlain by 0.3 – 0.4 m of dark greyish brown clayey silt topsoil (002). The topsoil contained occasional recent ceramic material.
- 4.1.3 Trench 1 contained a rubble field drain running north to south across the field.

- 4.1.4 Trench 2 contained a machine-dug pit with vertical sides, filled with topsoil and modern ceramic.
- 4.1.5 Trench 3 contained one rubble drain running east to west and two running north-east to south-west across the field.

5 Conclusions

- 5.1.1 The pit in Trench 2 relates to the geotechnical investigations associated with the current works. The rubble drains are typical of those uncovered in many of the other land parcels subject to archaeological site investigations within the road corridor. The evaluation has demonstrated that there are no archaeological remains or deposits within the 5% sample evaluated.
- 5.1.2 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)	Maximum Depth (m)	Description
1	50	0.3	E-W, contains a rubble drain.
2	50	0.3	NW-SE, contains geotechnical pit.
3	35	0.4	NW-SE, contains 3 rubble drains.

Appendix 2: Context Register

Context No.	Area	Description
001	All	Natural Geology
002	All	Topsoil

Appendix 3: Trench Matrices

All Trenches

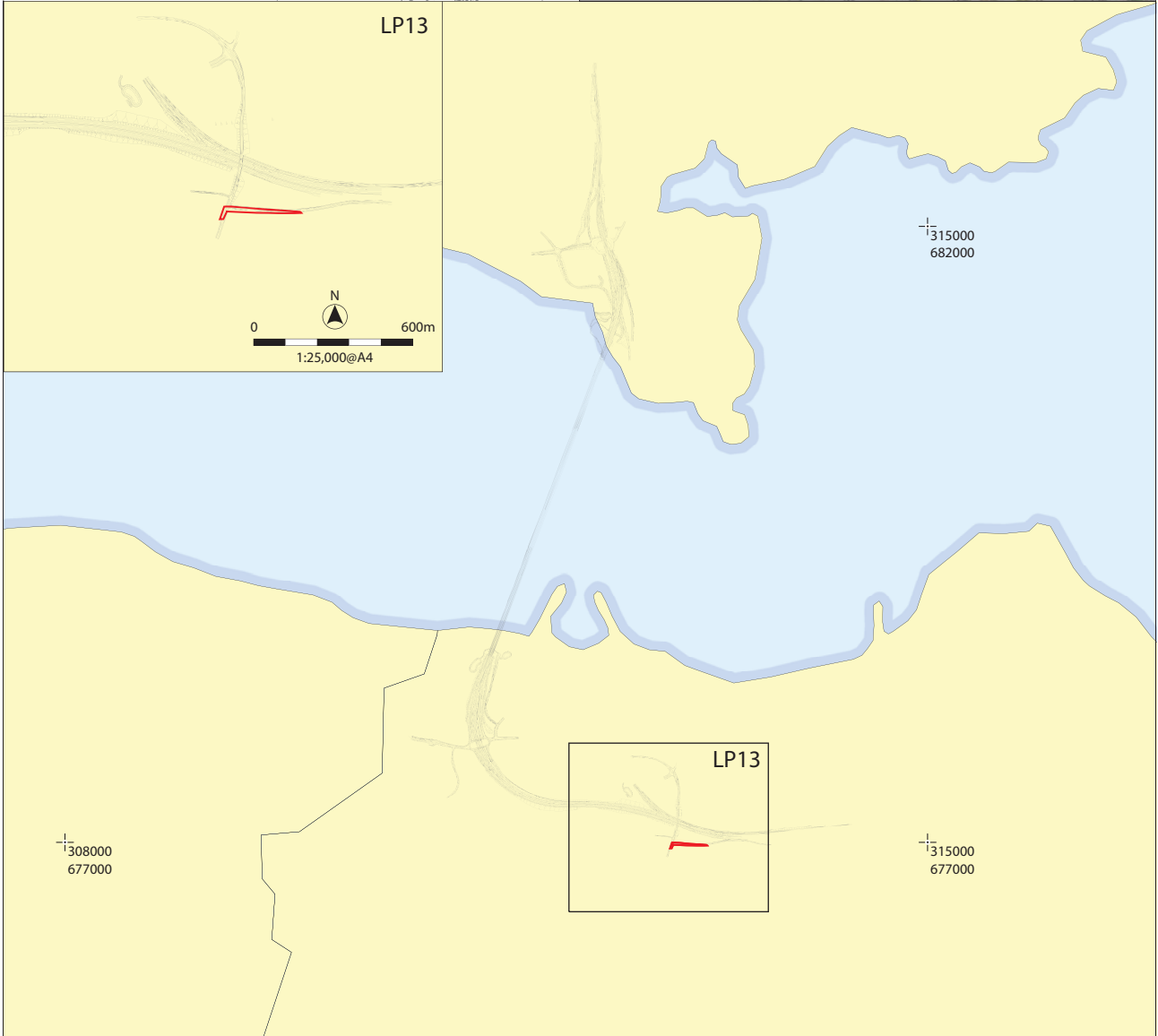
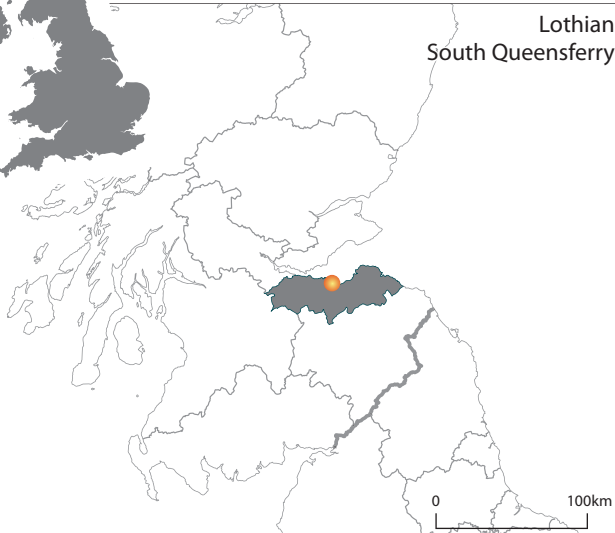
Topsoil	
Natural	

Appendix 4: Photographic Register

Photo No.	Direction	Description
656	W	LP13 General shot of Trench 1
657	SE	LP13 General shot of Trench 2
658	NW	LP13 General shot of Trench 3



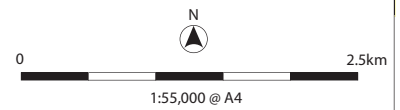
Lothian
South Queensferry



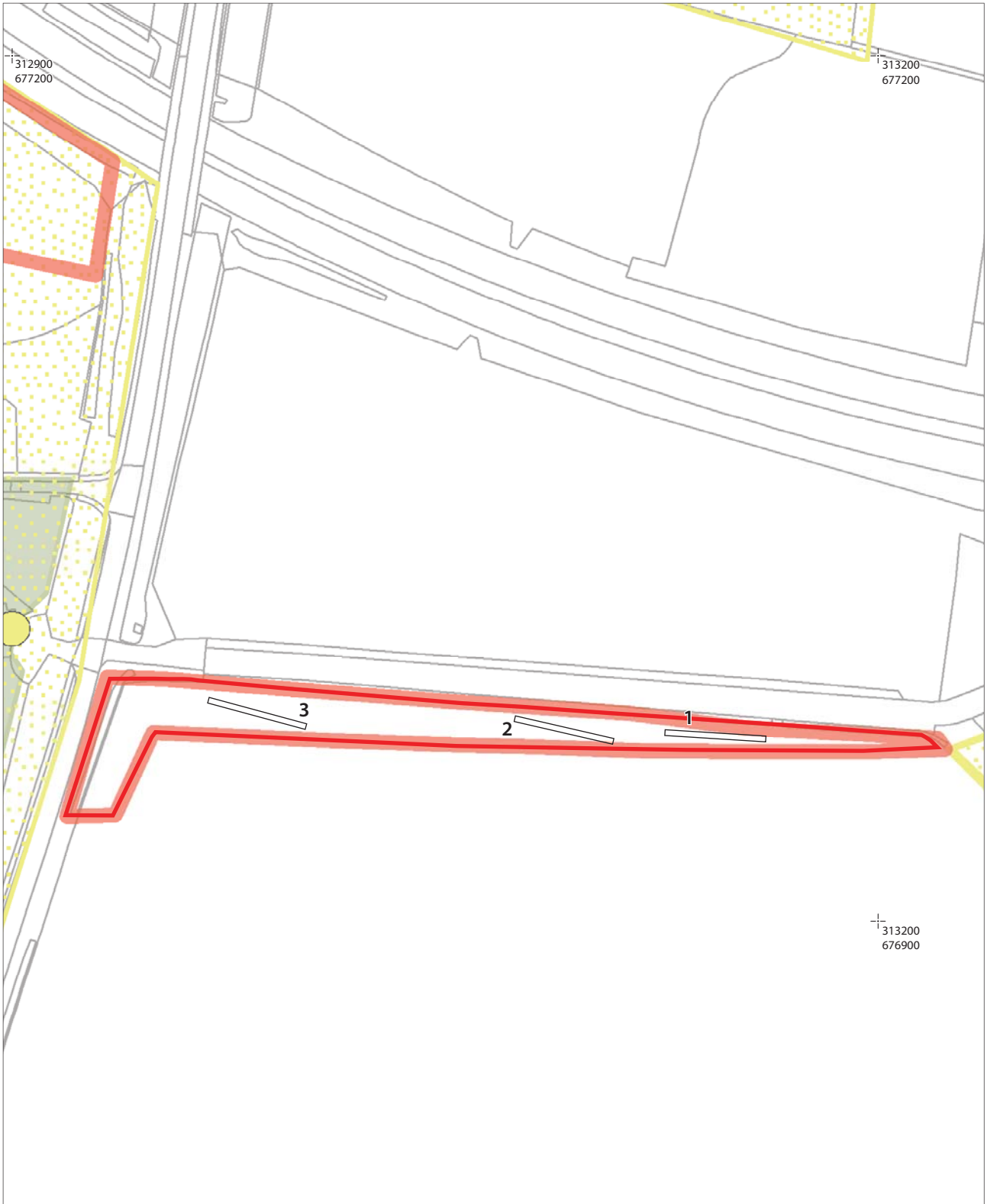
HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LAND PARCEL 13 (FRCE10)

Reproduced using 2007 OS 1:50,000 Landranger No. 65 and digital 1:10,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011. All rights reserved. Licence No. AL 100013329



Illus 1
Site location





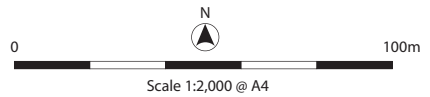
Client
FORTH REPLACEMENT CROSSING, LAND PARCEL 13 (FRCE10)



Reproduced using digital 1:5,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011
All rights reserved. Licence No. AL 100013329

Key

-  site boundary
-  trenches



Illus 2
Trench plan

Project code: FRCE10
Client: Transport Scotland
Date: 4th April; 2011

The Results of an Archaeological Field Evaluation by Trial Trenching at Dalmeny, South Queensferry (Land Parcel 14)

Archaeological Consultant: Jacobs Arup
Report Authors: Jamie Humble
Report Status: Approved



Executive Summary

Headland Archaeology conducted an archaeological evaluation by trial trenching on the Forth Replacement Crossing at Dalmeny, South Queensferry (Land Parcel 14), NGR: NT 13906 77155 (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 16 trenches totalling 1506m² were excavated comprising a 5% sample across two fields. The evaluation was conducted between 31st March and 1st April 2011. Trenches were sited to ensure good spatial coverage across all of Land Parcel 14. The trial trenching revealed furrows relating to the post-medieval agricultural activity on site. No other archaeological remains or deposits were identified during the evaluation.

ARCHAEOLOGICAL EVALUATION
Forth Replacement Crossing: Dalmeny, Land Parcel 14

PROJECT SUMMARY SHEET (FRCE10)

<i>Client</i>	Transport Scotland
<i>Consultant</i>	Jacobs Arup
<i>National Grid Reference</i>	NT 13906 77155
<i>Project Manager</i>	Edward Bailey
<i>Senior Archaeologist</i>	Kirsty Dingwall
<i>Text</i>	Jamie Humble
<i>Illustrations</i>	Julia Bastek
<i>Evaluation Team</i>	Samira Ben Mohammed Jamie Humble Emma Searle
<i>Schedule</i>	
Fieldwork	31 st March – 1 st April 2011
Report	April 2011

CONTENTS

1	Introduction	299
	1.1 <i>General</i>	299
	1.2 <i>Project Background</i>	299
	1.3 <i>Aims and Objectives of the Archaeological Works</i>	300
2	Site Background	300
	2.1 <i>Archaeological and Historical Background</i>	300
	2.2 <i>Site Topography and Land Use</i>	300
	2.3 <i>Site Geology</i>	301
3	Methodology	301
4	Results of Fieldwork	301
	4.1 <i>Trial Trenching</i>	301
5	Conclusions	302
6	References	303
	6.1 <i>Bibliographic References</i>	303
	6.2 <i>Cartographic References</i>	303
7	Appendices	304
	<i>Appendix 1: Trench Register</i>	304
	<i>Appendix 2: Context Register</i>	305
	<i>Appendix 3: Trench Matrices</i>	306
	<i>Appendix 4: Photographic Register</i>	307
	Illustrations	308

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 31st March and the 1st April 2011, Headland Archaeology (UK) Ltd. undertook a programme of archaeological evaluation by trial trenching on Land Parcel 14 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 Jamie Humble (Project Officer). 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 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 itself lies immediately to the west of the village of Dalmeny which is medieval in origin.

2.2 *Site Topography and Land Use*

2.2.1 Land Parcel 14 consisted of two fields, divided by an area of rough woodland orientated north-west to south-east. The northern boundary of the land parcel in the western field was a private road, formerly the Dalmeny to Newbigging road and in the eastern field the northern boundary was inside the northern edge of the field. The southern boundary of the land parcel comprised the current A90 and the eastern boundary was defined by the East Coast rail line. The eastern field of Land Parcel 14 was under young crop at the time of evaluation, while the western field comprised rough unutilised grassland. The site is under the ownership of N. A. Primrose.

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.
- 2.3.1 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 31,765m², of which a 5% sample (1588m²) was to be investigated by trial trenching, this was reduced during the works to 1506m² due to on site factors (see 4.1.1 below) . An indicative trench plan was agreed with the consultant archaeologists, Jacobs Arup. Trenches were sited to provide good spatial coverage of the entire site.
- 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 encountered 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 Sixteen trenches were excavated across Land Parcel 14 (Illus 2) with a combined total area of 1506m². Due to the presence of woodland and a large drain running across the western field the trenches were relocated, and in some cases shortened, from the agreed indicative trench plan. 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 [011] seen in the trenches was largely orange grey clay, although outcropping of sandstone bedrock was seen within trench six. This was overlain by

between 0.10m and 0.20m of subsoil [010] – an orangey brown silty clay. Topsoil [009] was between 0.35m and 0.40m deep and contained little in the way of recent ceramic material.

- 4.1.3 Archaeological features were found in three trenches (Trenches 2, 3 and 5). These were concentrated in the eastern half of the evaluation area.
- 4.1.4 Furrows [001, 003, 005 & 007] were identified in Trenches 2, 3 and 5. In each trench only one or two sections of furrow were seen, rather than them extending across the whole site. Aligned approximately north-south the furrows were between 1.50m and 2.20m wide, and up to 0.15m in depth. They had shallow sloping sides and were filled with compact grey silty clay [002, 004, 006 & 008].

5 **Conclusions**

- 5.1 The only archaeological remains or deposits identified during the evaluation relate to post-medieval agricultural activity in the area, with four surviving furrows running across the site on a north-south alignment. 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*. Jacobs Arup 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.’

6.1 Cartographic References

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

7 Appendices

Appendix 1: Trench Register

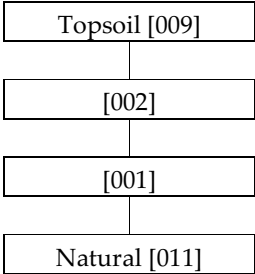
Trench No	Length (m)	Depth (m)	Description
1	50	0.5	Oriented NE-SW, no features.
2	50	0.45	Oriented NW-SE. Furrow [001] runs N-S across trench
3	50	0.45	Oriented NE-SW. Two furrows [003, 005] run N-S across trench
4	50	0.50	Oriented NW-SE, no features.
5	50	0.50	Oriented NE-SW. Furrow [007] runs N-S across trench,
6	38	0.45	Oriented NW-SE, no features.
7	50	0.50	Oriented NE-SW, no features.
8	50	0.50	Oriented NW-SE, no features.
9	50	0.45	Oriented E-W, no features.
10	50	0.50	Oriented NW-SE, no features.
11	50	0.40	Oriented E-W, no features.
12	45	0.45	Oriented NW-SE, no features.
13	50	0.50	Oriented E-W, no features.
14	50	0.45	Oriented E-W, no features.
15	50	0.40	Oriented E-W, no features.
16	20	0.80	Oriented NE-SW, no features.

Appendix 2: Context Register

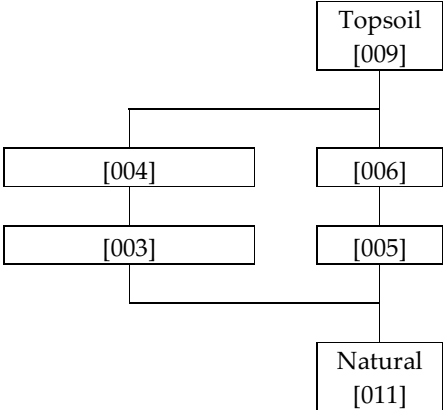
Context No.	Trench	Description
001	2	Cut of furrow, linear in plan with sloping sides, curved base and gentle break of slope. Measures 2.20m wide and 0.15m deep. Aligned north-south.
002	2	Fill of [001]. Compact grey silty clay with frequent small stones.
003	3	Cut of furrow, linear in plan with gently sloping sides, rounded base and gentle break of slope. Measures 1.50m wide by 0.12m deep. Aligned north-south.
004	3	Fill of [003]. Compact grey silty clay with frequent small stones.
005	3	Cut of furrow, linear in plan with gently sloping sides, rounded base and gentle break of slope. Measures 2.20m wide and 0.09m deep. Aligned north-south
006	3	Fill of [005]. Compact grey silty clay with frequent small stones.
007	5	Cut of furrow, linear in plan with gently sloping sides, rounded base and gentle break of slope. Measures 1.80m wide and 0.10m deep. Aligned north-south
008	5	Fill of [007]. Compact grey silty clay with frequent small stones.
009	All	Topsoil. Greyish brown silty clay loam. Depth: 0.35 – 0.40m.
010	All	Subsoil. Orange brown silty clay. Depth : 0.10 – 0.20m.
011	All	Natural. Orange grey clay.

Appendix 3: Trench Matrices

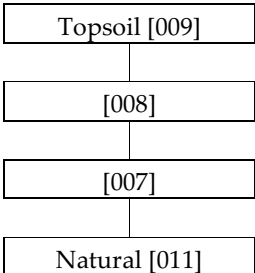
Trench 2



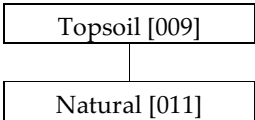
Trench 3



Trench 5

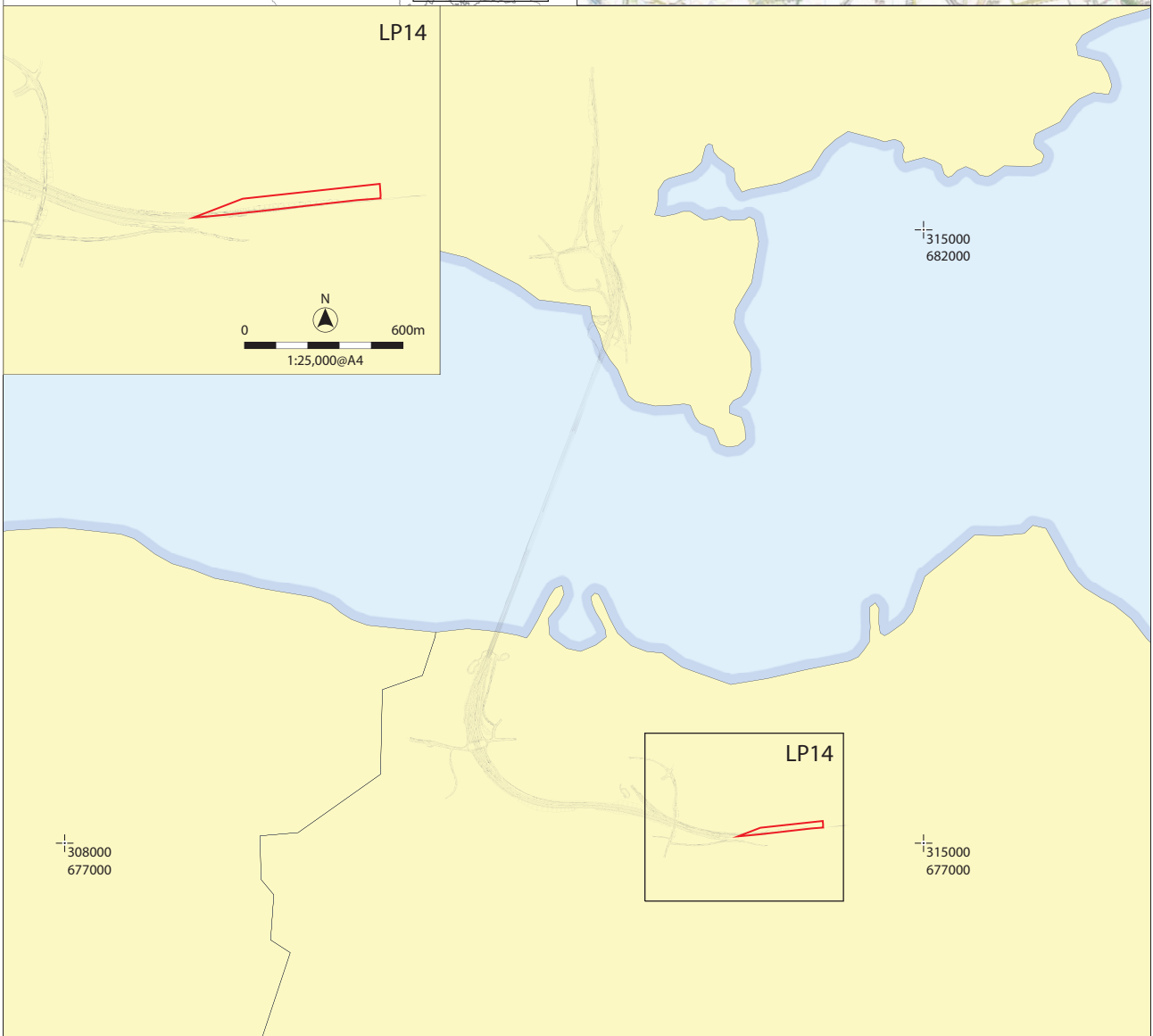
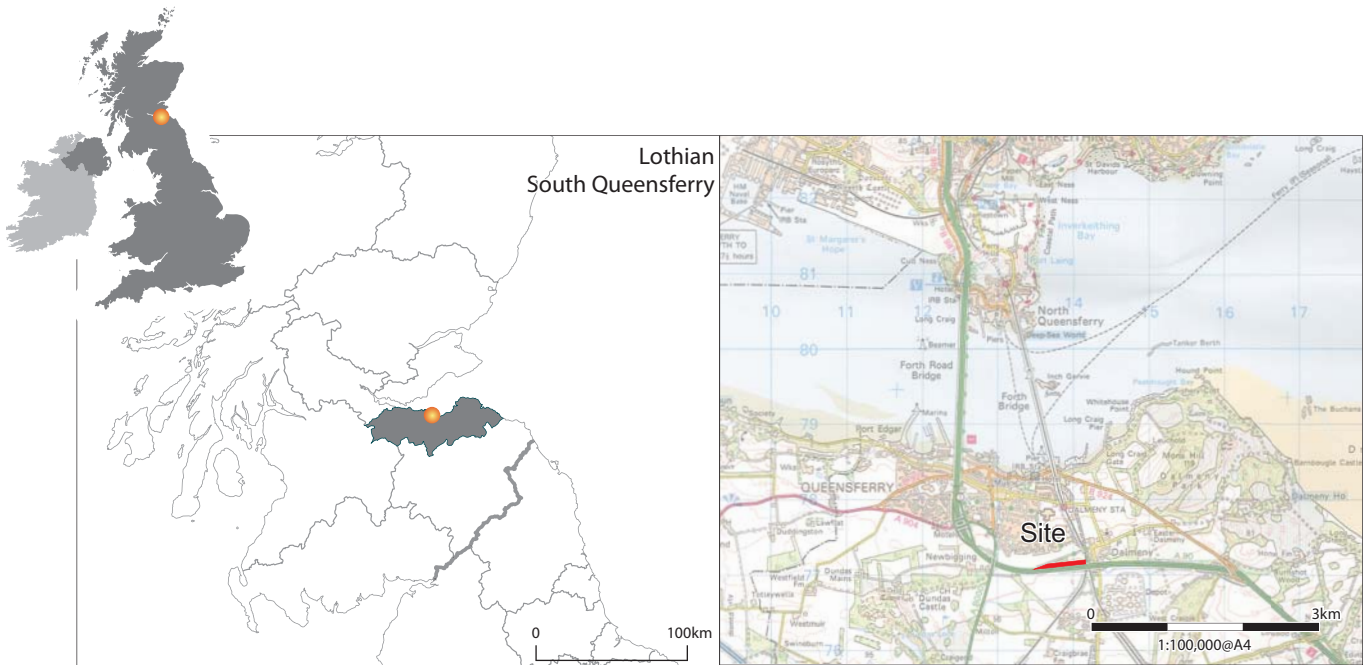


**Remaining
Trenches**



Appendix 4: Photographic Register

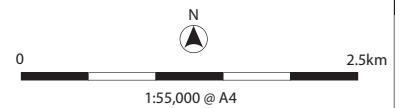
Photo No.	Direction facing	Description
1	SW	LP14 trench 1
2	NW	LP14 trench 2
3	SW	LP14 trench 3
4	W	LP14 trench 4
5	SW	LP14 trench 7
6	NW	LP14 trench 8
7	W	LP14 trench 9
8	NW	LP14 trench 10
9	W	LP14 trench 11
10	W	LP14 trench 12
11	E	LP14 trench 13
12	NW	LP14 trench 14
13	W	LP14 trench 15
14	W	LP14 trench 16



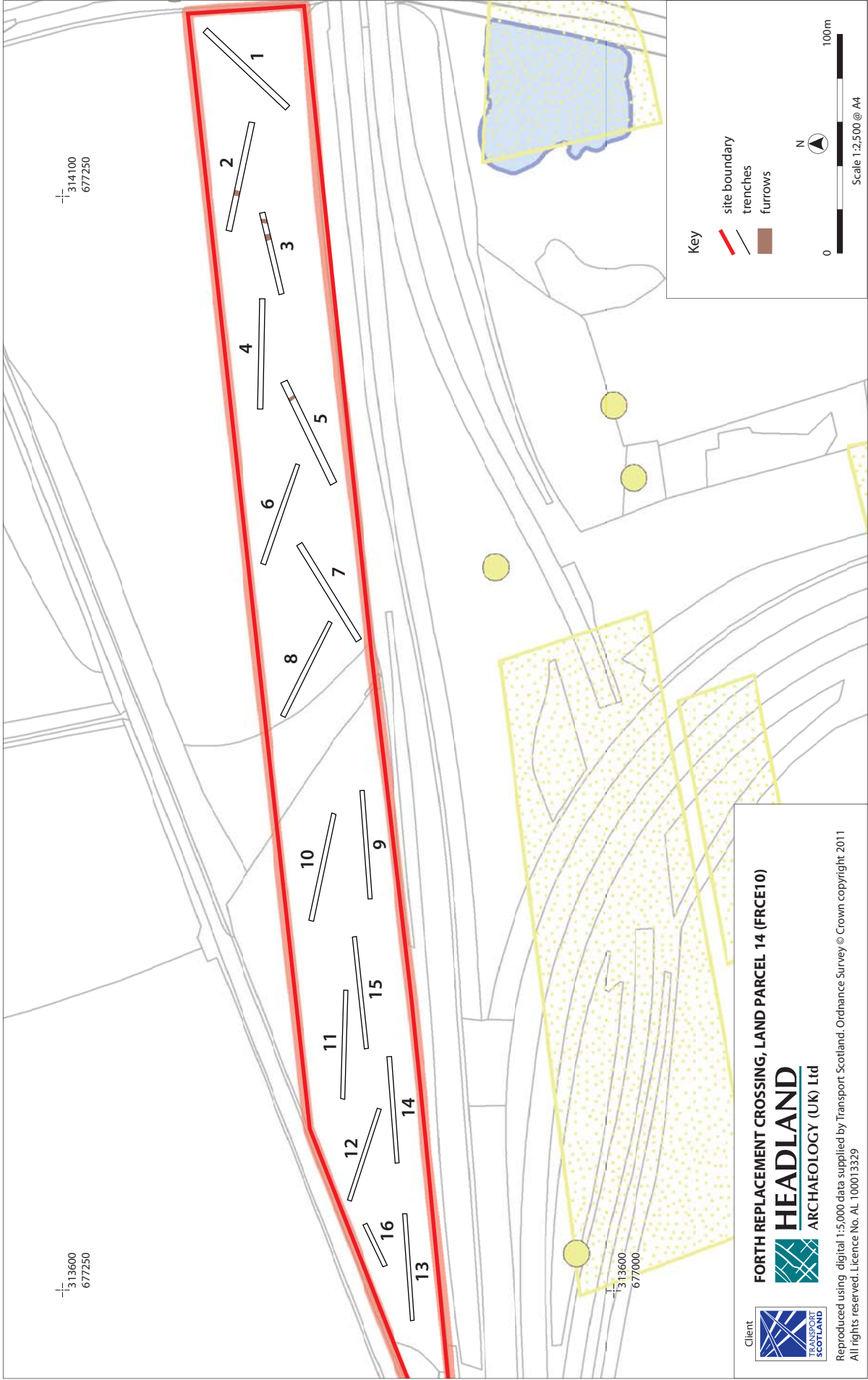
HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LAND PARCEL 14 (FRCE10)

Reproduced using 2007 OS 1:50,000 Landranger No. 65 and digital 1:10,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011 All rights reserved. Licence No. AL 100013329



Illus 1
Site location



Illus 2
Trench plan

Project code: FRCE10
Client: Transport Scotland
Date: 6th May 2011

The Results of an Archaeological Field Evaluation by Trial Trenching and Archaeological Excavation at Humbie Farm, Kirkliston (Land Parcel 15)

Archaeological Consultant: Jacobs Arup
Report Authors: Elizabeth Jones
Report Status: Approved



Executive Summary

Headland Archaeology conducted an archaeological evaluation by trial trenching at Humble Farm, Kirkliston (Land Parcel 15), NGR: NT 1134 7476 (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, 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 25 trenches with an overall area of 4300 m² were excavated comprising a 5% sample of Land Parcel 15. The trial trenching revealed a series of north to south orientated furrows relating to post medieval agricultural activity on site. At the north-east end of the site modern made ground deposits were encountered, these were presumed to relate to the construction of the motorway bridge.

The trial trenching also identified a kiln in the far south-western corner of the site. This comprised a large pit filled with burnt stones, charcoal and limestone, with finds dating to the 18th – 19th century. The trench was extended in order to reveal the extent of the kiln and revealed further deposits running downhill of the kiln to the east. This area was subject to further excavation and an area measuring 20 m by 20 m was excavated centred on the kiln. The remains of the kiln comprised a semi-circular stone structure set into a large pit, which had been truncated on its eastern side. At least two phases of use were evident within the pit, which contained a hard burnt clay floor with a small drain cut into it. The presence of a large lump of lime within the pit suggests it was used for making agricultural lime. The large cut truncating the pit probably represents an infilled quarry, which is depicted on the first edition Ordnance Survey map of 1856.

ARCHAEOLOGICAL EVALUATION
Forth Replacement Crossing: Land Parcel 15, Humble Farm, Kirkliston

PROJECT SUMMARY SHEET (FRCE10)

<i>Client</i>	Transport Scotland
<i>Consultant</i>	Jacobs Arup
<i>National Grid Reference</i>	NT 1134 7476 – site centre evaluation NT 1115 7469 – site centre excavation
<i>Project Manager</i>	Edward Bailey/Russel Coleman
<i>Text</i>	Elizabeth Jones
<i>Illustrations</i>	Julia Bastek
<i>Evaluation Team</i>	Samira Ben Mohammed Ian Hill Elizabeth Jones Jurgen van Wessel
<i>Excavation Team</i>	Elizabeth Jones Richard Tuffin
<i>Schedule</i>	
Evaluation	31 st March – 5 th April 2011
Excavation	26 th – 29 th April
Report	May 2011

CONTENTS

1	Introduction	314
	1.1 <i>General</i>	314
	1.2 <i>Project Background</i>	314
	1.3 <i>Aims and Objectives of the Archaeological Works</i>	315
2	Site Background	315
	2.1 <i>Archaeological and Historical Background</i>	315
	2.2 <i>Site Topography and Land Use</i>	316
	2.3 <i>Site Geology</i>	316
3	Methodology	317
4	Results of Fieldwork	317
	4.1 <i>Trial Trenching</i>	317
	4.2 <i>Kiln Excavation</i>	318
5	Palaeoenvironmental Assessment <i>by David Masson & Sarah-Jane Haston</i>	320
	5.1 <i>Plant Remains</i>	320
	5.2 <i>Other Finds</i>	320
	5.3 <i>Discussion</i>	320
	5.4 <i>Recommendations</i>	321
6	Conclusions	321
7	References	323
	7.1 <i>Bibliographic References</i>	323
	7.2 <i>Cartographic References</i>	323
8	Appendices	324
	<i>Appendix 1: Trench Register</i>	324
	<i>Appendix 2: Context Register</i>	326
	<i>Appendix 3: Trench Matrices</i>	329
	<i>Appendix 4: Photographic Register</i>	331
	<i>Appendix 5: Drawing Register</i>	334
	<i>Appendix 6: Sample Register</i>	335
	<i>Appendix 7: Retent sample results</i>	336
	<i>Appendix 8: Flotation sample results</i>	337
	Illustrations	338

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) wherein the requirement for a programme of trial trenching was identified (Jacobs Arup 2009a).
- 1.1.2 Between the 31st March and 5th April 2011, Headland Archaeology (UK) Ltd. undertook a programme of archaeological evaluation by trial trenching on Land Parcel 15 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 Elizabeth Jones (Senior Archaeologist). Four additional staff members were involved throughout the evaluation.
- 1.1.3 Between the 26th – 29th April Headland Archaeology (UK) Ltd. undertook a targeted excavation based on the results of the evaluation. This comprised excavation of an area 20 m by 20 m in the south-western corner of Land Parcel 15. The project was managed by Russel Coleman (Project Manager) and the fieldwork and reporting was undertaken by Elizabeth Jones (Senior Archaeologist) and one other archaeologist.

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).

1.2.3 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 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;
- 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.

1.3.2 Following the results of the evaluation the objectives of the excavations were to:

- Clarify the nature, character and extent of the features identified during the evaluation and obtain a plan of any additional features identified during the excavation.
- Identify any structures or activity areas and the date and duration of any settlement remains
- Obtain artefactual and environmental evidence for the purposes of dating and interpretation of the site

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 Within the vicinity of the of the M9 Junction 1a improvements (Illus 1) prehistoric activity has been recorded in the form of a Late Bronze Age socketed axe found near Kirkliston. Latterly there are written records from 1513 that refer to a Kirkliston House acquired by the Commandery of Torphichen although the exact location of the house is not recorded. Based on the coordinates provided by the Royal Commission

on the Ancient and Historic Monuments of Scotland both these sites are located within 1 km of Land Parcel 16 and indicate the potential for prehistoric and medieval settlement in the area.

2.2 *Site Topography and Land Use*

2.2.1 The site is located to the west of the village of Kirkliston and is bounded by the B9080 to the north, by woodland to the south and east and by the M9 slip road to the east. The ground is generally flat, but slopes downhill towards the south-west, where the ground is more undulating. At the time of the evaluation the field was under young crop. The site is under the ownership of J G Dudgeon and sons.

2.3 *Site Geology*

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

2.3.1 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 *Evaluation*

3.1.1 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 84,686 m², of which a 5% sample (or 4300 m²) was investigated by trial trenching. An indicative trench plan was agreed with the consultant archaeologists, Jacobs Arup.

3.1.2 All trenches were individually numbered and a pole-mounted Trimble G6 differential GPS programmed with the relevant coordinates was utilised to identify and mark out the locations of trenches. The trenches were excavated using one 13 ton 360° tracked mechanical excavator, fitted with a 2 m 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. 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.

3.1.3 Bulk soil samples were collected from secure archaeological contexts for processing and assessment. Where possible a minimum 30-litre sample was collected from each archaeological deposit and given a unique number (Transport Scotland 2010, 59). All finds were recorded by individual context and their cleaning, storage and conservation undertaken in accordance with the Institute for Archaeologists Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials (Institute for Archaeologists 2008).

3.2 *Excavation*

3.2.1 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 excavated was 400 m², comprising a trench measuring 20m by 20m centred on the kiln.

3.2.2 The area was 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. All 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 excavation area and archaeological contexts were recorded using a Total Station EDM linked to a field computer running *TheoLT* software. Photographs were taken using colour slide film, black and white film and digital.

3.2.3 Bulk soil samples were collected from secure archaeological contexts for processing and assessment. Where possible a minimum 30-litre sample was collected from each archaeological deposit and given a unique number (Transport Scotland 2010, 59). Samples were processed in laboratory conditions using a standard floatation method (cf Kenward *et al* 1980). All plant macrofossil samples were analysed using a stereomicroscope at magnifications of x10 and up to x100 where necessary to aid identification. Identifications were confirmed using modern reference material and seed atlases including Cappers *et al* (2006).

3.2.4 All finds were recorded by individual context and their cleaning, storage and conservation undertaken in accordance with the Institute for Archaeologists Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials (Institute for Archaeologists 2008).

4 **Results of Fieldwork (Illus 2)**

4.1 *Trial Trenching*

4.1.1 Twenty-five trenches were excavated across Land Parcel 15 (Illus 2) with a combined total area of 4300 m². Full detailed descriptions of each trench and individual contexts can be found in Appendix 1 and Appendix 2. Results are summarised below.

- 4.1.2 The natural geology seen in the trenches was largely orange and grey clays [011], with occasional shattered bedrock fragments or outcrops. This was generally overlain by 0.30 m of mid brown clayey silt topsoil [026], although this was deeper in the undulating trenches in the south-west of the site. The topsoil contained little recent ceramic material.
- 4.1.3 Colluvial deposits were identified in Trench 4, which ran across a sharp north to south dip in the field. These were up to 0.3m in depth and comprised greyish brown clayey silt [027].
- 4.1.4 Trench 1 contained a large pit [006], which appeared to be the remains of a kiln (Illus 3 & 4). The south-east quadrant of the kiln was excavated during the evaluation. The base of the kiln comprised bright red burnt clay natural [005], which had become baked through repeated firings and contained occasional coal flecks. Above this, the basal fill [004] comprised firm mid brown to black clay, coal and charcoal, containing vitrified material as well as fragments of bone and iron. A large lump of limestone [007] was found above this deposit. The pit had been backfilled with a deposit of clay and rubble [003], also containing coal and charcoal. The southern edge of the kiln was not clearly defined but the kiln measured approximately 2.90 m by 2.70 m in plan and was 0.40 m in depth.
- 4.1.5 Trench 1 was extended on three sides in order to fully expose the feature. The southern edge of the kiln appeared to have been truncated. To the south of the kiln further deposits were revealed (Illus 2), comprising dark grey clayey silts and containing coal and charcoal [010]. These were not investigated during the evaluation and it was unclear whether they related to the kiln.
- 4.1.6 Furrows were found in Trenches 4, 6, 7, 19, 20, 21, 22, 23, 24 and 25 (Illus 2). These ran in a north to south direction and were on average 2m wide and 5 – 8 m apart. The interface between the furrows and the natural subsoil was very unclear. Excavation of a furrow [001] in Trench 4 showed it to be 1.64 m in width and 0.18 m in depth, with shallow sloping sides and a concave base. It was filled with firm grey silt [002]. The remaining furrows were not subjected to excavation and were recorded in plan only.
- 4.1.7 Rubble drains were also found in a number of the trenches. These generally ran east to west across the field, with some drains running north-west to south-east.
- 4.1.8 At the eastern end of Trench 25 was a mixed spread of pinkish stone and grey clay; plastic bags were found within the deposit. The deposit was not excavated and is thought to represent made ground associated with the construction of the motorway bridge immediately to the east of the site.

4.2 *Excavation*

- 4.2.1 The kiln identified during the evaluation was fully excavated during the excavation. The excavation also revealed the extent of the deposits found in the eastern end of Trench 1 and the nature of the truncation of the kiln. A full description of the deposits and the kiln matrix are given in Appendices 2 and 3.

- 4.2.2 The Phase 1 kiln [006] was cut into natural clay [011], which sloped gently to the east. The bowl was roughly oval in plan and measured 2.10 m north to south and 2 m east to west. The kiln had been truncated on its eastern edge and so the full form and extent is unknown. The sides sloped fairly steeply to a flat base, 1.40 m wide (north to south) and it was 0.60 m in depth. At the base of the kiln was a layer of compact burnt red clay [005] 0.05 m thick (Illus 5, 6, 7 & 8).
- 4.2.3 There was a hiatus in the use of the kiln and some modifications were made. An L-shaped drain [023] was cut along the north and west sides of the kiln through the burnt clay base [005]. This was 0.30 m wide and 0.25 m deep and was filled with medium-sized angular stones within a damp greyish-brown silt matrix [021]. Overlying this and the burnt base was a thin layer of greyish brown clay [018] containing burnt clay fragments, clay and small stones.
- 4.2.4 The stone footings [019] forming the structure of the Phase 2 kiln were laid on top of [018]. These were large angular stones, up to 0.40 m wide, with occasional rounded stones and formed two rough courses inside the bowl. Once laid they formed a sub-square structure inside the cut. They were packed with mid brown silty clay [020] containing large lumps of coal and clean clay; bottle glass and iron objects were also found within this material. At the west end there was a small gap between the stones, which had been capped with slate (Illus 7). Behind this slate two small subsurface voids were found cut into the natural [025]. The clay around the entrance to these voids was baked red (Illus 8). The northern void was 0.20 m in diameter and extended for 0.30 m; the southern one was 0.10 m in diameter and was 0.20 m in length.
- 4.2.5 A second layer of burnt clay [017] represented the use of the Phase 2 kiln. This was 0.03 m in depth and was overlain by a layer of mixed coal, clay and charcoal [004] 0.05 m in depth (Illus 5 & 7).
- 4.2.6 The abandonment phase of the kiln comprised a series of backfill deposits (Illus 5). A layer of yellowish brown silty clay [016] with charcoal, burnt clay and stones overlay [004] and was in turn sealed by dark grey silty clay [003/022] with lenses of charcoal and patches of burnt clay (Illus 5 & 7). This material was also filling the gap between the stones capped by the slate. Above this slate and extending into the two voids at the west end was a localised deposit of dark grey silty clay [013/024] with frequent charcoal, ash, burnt clay and angular limestone fragments.
- 4.2.7 The kiln had been directly truncated on its eastern side by a large cut [012], which extended across the eastern and southern sides of the site (Illus 2). This had caused disturbance to the fill deposits at the eastern end as seen in section (Illus 5 & 7). Some disturbed structural stones [015] (Illus 4) and a large fragment of limestone [007] were overlain by a layer of yellowish brown silty clay [014] containing occasional stones and charcoal. This deposit was similar to the colluvium [009] described below.
- 4.2.8 Cut [012] was subsequently filled with a mixture of mixed clay, shale and sandstone deposits [010]. This was overlain by a colluvial deposit of yellowish brown sandy clay loam [009]. Overlying this were deposits of burnt shale and coal [008]. These were sealed by topsoil [026].

5 Palaeoenvironmental Assessment David Masson & Sarah-Jane Haston

5.1 *Plant Remains*

5.1.1 Four samples were taken from the kiln. The results of the sample processing are provided in Table 1 (Retent finds, Appendix 7) and Table 2 (Floatation finds, Appendix 8). Suitable material for AMS dating is also identified within each table. All plant remains were preserved through charring.

5.1.2 Charred cereal grain is present in only one sample (03), context [014], with a single grain of bread wheat (*Triticum aestivum*). Bread wheat is known to have been cultivated along with oat and hulled barley on the eastern coast of Scotland in the medieval period (Boyd 1988). Wild taxa were generally sparse throughout the samples (see Table 2). The only weed seeds recovered were goosefoots (*Chenopodium* sp.) present in two samples: sample (03) from context [014] and sample (05) from context [003]. Goosefoots are common elements of agricultural fields and waste places and it would seem likely that they originally became charred along with the cereal remains. The low concentration however, makes any detailed discussion of field ecology impossible.

5.1.3 Wood charcoal fragments were found in varying amounts from rare to abundant in all four samples. The large quantities of wood charcoal fragments present in a range of sizes up to 20 mm are suggestive of *in-situ* primary refuse from the kiln or deliberately dumped fire debris. The smaller sized fragments (less than 10 mm) may have been transported across the site by mechanisms such as windblow and surface run-off. Charcoal fragments of a size and condition suitable for identification and/or Accelerated Mass Spectrometry (AMS) dating were recovered in all four samples (see Tables 1 and 2).

5.2 *Other finds*

5.2.1 Together with the charred plant remains a small number of finds were recovered from the samples. These include two sherds of modern pottery found in sample (04), context [017] and a sherd of modern glass in sample (02), context [013]. Metallic objects were found in two samples (02), context [013] and (05), context [003] and included an iron nail in sample (05). Metallic waste, in the form of magnetic residue was found in abundance in sample (02) and could indicate metal-working activity in the vicinity of the site. A very small amount of unburnt mammal bone was recovered in sample (05). Coal and cinders were recovered in roughly equal abundant quantities from all of the samples processed.

5.3 *Discussion*

5.3.1 The small number of finds and few palaeoenvironmental remains recovered from the processed samples do not provide conclusive evidence to suggest the function of this feature. The low level domestic and industrial debris recovered from the deposits are unlikely to relate to the original function of the kiln. The samples did not contain burnt limestone to suggest the production of lime, abundant magnetic waste to suggest metalworking nor was any abundance of carbonised grain found to indicate

that the kiln was used for corn drying. The absence and relative absence of any of these materials could suggest that the kiln was cleaned out regularly with any rake-out material having been lost through the passage of time.

- 5.3.2 All samples did, however, contain high concentrations of coal and cinders. The quantity of coal recovered compared to the relatively high amount of large sized wood charcoal suggests that it was the predominant fuel used in the kiln feature. The use of coal for fuel, within the Forth area, did not commence until the medieval period and the presence of coal and cinders within the kiln features suggest that it is likely to be of medieval or post-medieval date.

5.4 *Recommendations*

- 5.4.1 Further detailed analysis of the finds or palaeoenvironmental remains would add little to that gained above. Therefore no further work is recommended.

6 **Conclusions**

- 6.1 The general picture of the site from the Trial Trenching and Excavation is one of medieval/post-medieval to 19th century agricultural use, with no evidence for activity on the site from earlier periods.
- 6.2 The spacing of the furrows found during the trial trenching suggests they conform to the category of 'Broad Rig', which originated in the high medieval period (Parry 1976), however no finds were recovered from any of the furrows to date them. The absence of furrows in the other trenches is probably due to the shallow topsoil, which has resulted in them being ploughed out. The alignment of the furrows respected the existing eastern and western field boundaries, as shown on 19th-century maps (Thomson 1832, Ordnance Survey 1856). The rubble drains generally respected the northern and southern field boundaries, with a number of drains running counter to this pattern probably feeding into the main drainage system.
- 6.3 The kiln excavated on the southern part of the site is interpreted as a Lime Kiln, due to the presence of a large lump of limestone within the fill, its date and a similarity to other early lime kilns. There were no environmental remains to suggest that it was used for drying grain or industrial use. The kiln may relate to the Improvement period, manufacturing lime for the fields in order to improve the drainage of the clay-rich agricultural soils; until the middle of the 18th-century most lime kilns were set up to burn lime on site (Smith 2011, 4). Lime kilns were usually sited close to outcropping limestone and geological maps of the area show there is an exposed crop of Burdiehouse limestone in the immediate vicinity of the kiln (British Geological Survey 2008). Limestone was quarried on an industrial scale in the area by the 18th century (Transport Scotland 2010, 33). The environmental remains, however did not reveal any conclusive evidence as to the function of the kiln and no lime fragments were found (see Section 5, above). The kiln may have been regularly cleaned out, leaving little in the way of debris, with the exception of the coal required to fire the kiln.

- 6.4 The very early types of lime kilns were clamp kilns and consisted of alternating layers of limestone and fuel covered in horseshoe shaped mounds of stone or turf, which were broken open in order to extract the lime (Brown 1996, 17). Later pre-industrial kilns were larger stone built structures with a hearth at the base, commonly dug into banks and designed for more than one use. These more permanent structures are known as 'flare kilns' or 'draw' kilns; the former would need to cool for the lime to be drawn off, while the latter could keep burning continuously (Williams 2004). The earliest phase of the excavated kiln comprised an unlined pit dug into a shallow slope, followed by the addition of a stone structure. The height of the original structure is unknown, however other excavated examples have survived up to 3m high, with the walls rising up from the sides of the hearth area (Williams 2004).. The roughly square shape is also similar to other flare kilns, which have a draw hole on one side to introduce air (Feachem 1957, 50; Smith 2011, 3). The gap in the stones at the west end of the kiln may have acted as a draw hole; this would have been towards the base of the kiln when the superstructure was still intact, with the limestone stacked above this (Smith 2011, 3). Poke holes were often located in the sides of the kilns to loosen the limestone material (Brown 1996, 17) and this may have been the function of the two voids located at the west end. The burnt lime was probably removed from the top, while the east side may have been the location of the stoke hole for introducing fuel and raking out the ash.
- 6.5 The function of the L-shaped drain in the base of the kiln is unclear as it was confined to the internal space of the kiln, rather than running off down slope as would be expected. This may have been enough to drain water from the base of the kiln, which may have collected due to the clayey nature of the subsoil. Alternatively it may have been designed to retain moisture to produce steam for some purpose associated with the function of the kiln. The burnt lime is known as quick lime when it is removed and has to be made safe for use by the addition of water (Brown 1996, 17), a process known as slaking. The drain may have acted as a small sump following this process.
- 6.6 The finds from the kiln included bottle glass, a cow/horse shoe and iron work and suggest a date of 18th to 19th century. The kiln was disturbed after it had gone out of use by a large cut across the eastern and southern sides of the site. Geological maps show that the limestone outcrop is overlain by the Hopetoun series of mudstone, siltstone, sandstone and shale measures and this mixture of deposits is the source of the backfill of the cut (British Geological Survey 2008). It is presumed to be an infilled quarry, possibly also for limestone, as depicted on the first edition Ordnance Survey map of the area (1856), but not later maps, suggesting the quarry went out of use by the late 19th century. The field presumably reverted to exclusive agricultural use, which continues to the present day.
- 6.7 Based on the results of the archaeological trial trenching and excavation and subsequent post-excavation assessment the archaeological archive is assessed as having no further potential and therefore no additional works are recommended.

7 References

7.1 Bibliographic References

Brown, N A 1996 *The ruins of Craibstone Limekilns, Deskford*. Scottish Vernacular Buildings Working Group, Regional & Thematic Studies no.4.

Feachem, R W 1957 'Appendix II: Limekilns, Stone-lined pits and Fox-conduits', *Proc. Soc. Antiq. Scot.*, 90, 50 – 51.

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.

Institute for Archaeologists 2008 *Standard and Guidance for the collection, documentation, conservation and research of archaeological materials, (2001, Revised 2008)*. IfA, Reading.

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.

Parry, M L 1976 A typology of cultivation ridges in Southern Scotland. *Tools and Tillage* 3.1: 3-19.

Smith, N 2011 *Pre-industrial Lime Kilns*. Introduction to Heritage assets, English Heritage.

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

Williams, R 2004 *Lime Kilns and Lime Burning, 2nd edition*. Shire Publications, Colchester.

7.2 Cartographic References

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

Ordnance Survey 1856 *Linlithgowshire, Sheet 6, 1:10560*. Surveyed 1854 – 5.

Thomson, J 1832 *Atlas of Scotland*.

8 Appendices

Appendix 1: Trench Register

Trench No	Length (m)	Maximum Depth (m)	Description
1	50	0.4	NW-SE. Contains pit/kiln [006].
2	50	0.5	N-S.
3	100	0.35	NE-SW. Rubble drains E-W, ceramic drains NW-SE.
4	100	0.6	NW-SE. Colluvium [027] 0.3m. Furrows NE-SW.
5	50	0.3	NW-SE. Rubble drains E-W, ceramic drains NW-SE.
6	100	0.35	NW-SE. Furrows N-S, rubble drains E-W and N-S.
7	100	0.3	NW-SE. Furrows N-S, rubble drains E-W.
8	50	0.3	N-S. Ceramic drain N-S.
9	100	0.4	NE-SW. Rubble drains.
10	100	0.35	N-S. Rubble drains.
11	100	0.3	NW-SE. Rubble drains E-W.
12	100	0.3	NW-SE. Rubble drain NE-SW.
13	50	0.3	NE-SW. Rubble drains E-W.
14	100	0.3	E-W. Rubble drains E-W and NW-SE.
15	100	0.3	E-W. Field drains N-S.
16	100	0.3	NW-SE.
17	50	0.3	NW-SE. Rubble drains N-S and E-W.
18	100	0.3	N-S. Rubble drains E-W.
19	100	0.3	NE-SW. Furrows N-S, rubble drains E-W and N-S.
20	100	0.3	NW-SE. Furrows N-S, rubble drains E-W, ceramic drains N-S.
21	100	0.3	NE-SW. Furrows N-S, rubble drains.
22	50	0.3	N-S. Furrows N-S, rubble drains E-W.
23	100	0.3	N-S. Furrows N-S, rubble drains E-W.

24	100	0.3	N-S. Furrows N-S, drains E-W.
25	100	0.3	Furrows N-S, rubble drains N-S. 20 m (wide) of made ground at E end of trench.

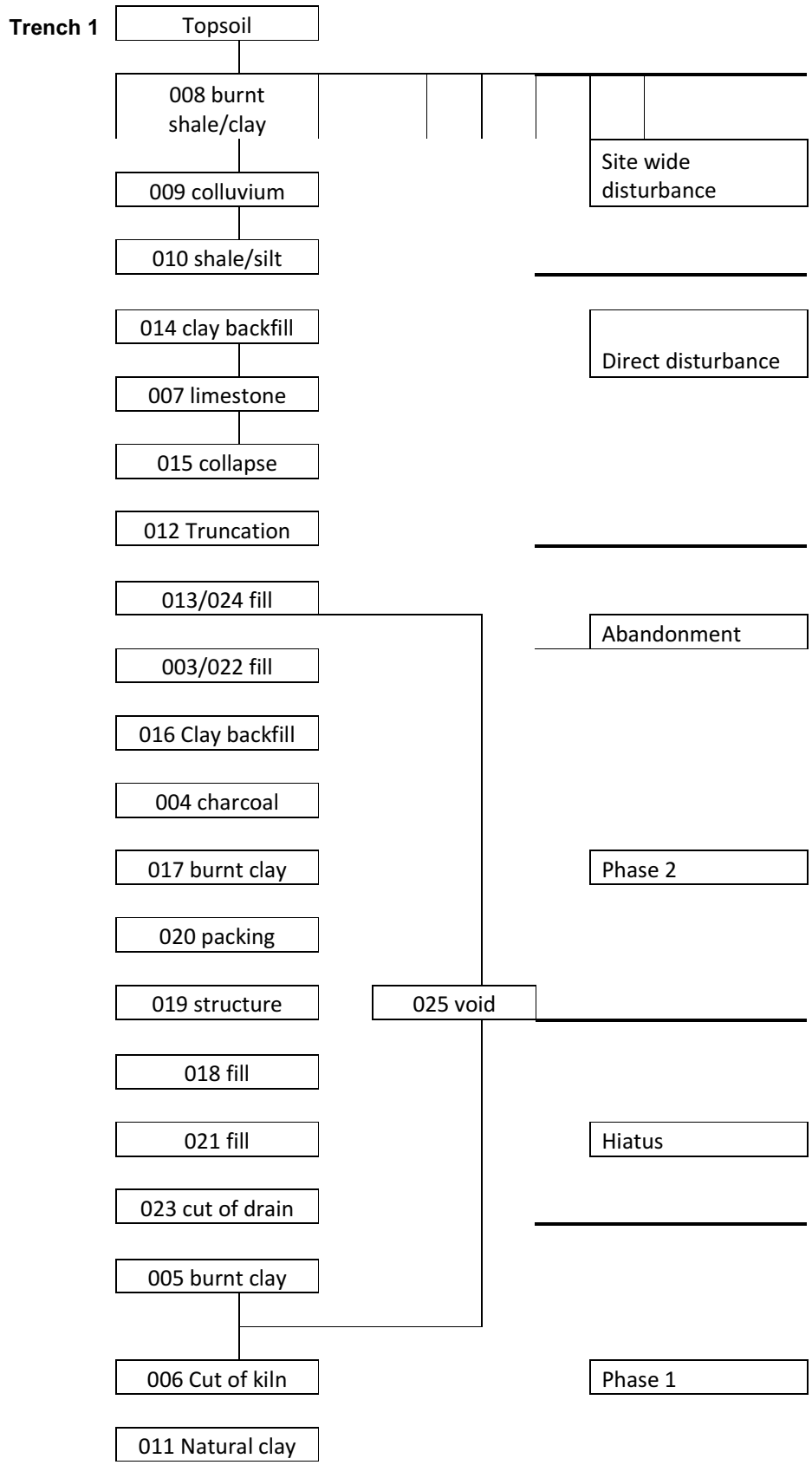
Appendix 2: Context Register

Context No.	Trench	Description
001	4	Cut of furrow, runs N-S, with shallow sloping sides and concave base. W: 1.64 m, D: 0.18 m.
002	4	Fill of [001], grey silt with diffuse interface.
003	1	Dark grey silty clay deposit with a frequent amount of charcoal and burnt clay inclusions, the former forming lenses in section. L: 1.3 m, W: 0.9 m, D: 0.1 m. Fill of [006]. The deposit relates to the abandonment phase.
004	1	Dark brown-to-black deposit formed from coal, clay and charcoal. W: 1.3 m, D: 0.01-0.08 m. Fill of [006], relates to the feature's second phase of use.
005	1	Bright orange/red compact clay with coal flecks located at the base of the kiln [006]. W: 1.2 - 1.6 m (N-S) and 1.4 - 1.6 m (E-W), thickness: 0.05m. Deposit has been created by the application of heat to a layer of clay (either imported or natural), which has resulted in it becoming baked hard.
006	1	Cut of kiln made into the natural clays (011). Roughly oval in plan with steep-sloping sides and a flat base. W: 2.1m (N-S) and 2m (E-W), though the eastern edge has been truncated by the later cut [012], D: 0.6 m (maximum width 1.4m [N-S] at base).
007	1	Large, friable piece of lime located at base of kiln, directly on (005) deposit.
008	1	Dark brownish red sandy clay loam containing a high level of bright orange/red clay. Inclusions of rounded stones and angular pieces of coal throughout, with larger lenses of coal and coal dust being located beneath the red deposit. Deposit is located in the south west quadrant of the 20 x 20 m excavation area and is related to the later use of the area which resulted in the truncation of the kiln feature. L: 3.8 m, W: 1.9m, D: 0.2 m+. Burnt shale/clay deposit within [012].
009	1	Yellowish brown sandy clay deposit with coal fragments scattered throughout. Also inclusions of stone and pure orange clay lenses. D: 0.6 m max. Appears to be colluvium deposited after infilling of [012], above [009].
010	1	Dark grey clayey silt deposit with a high level of shale throughout. Inclusions of red burnt clay lenses, crushed sandstone and yellow/grey clay lenses. Located in eastern extent of the 20 x 20 m excavation area and has a maximum depth of at least 1 m. Infill of cut [012].
011	1	Natural orange and grey clays.
012	1	Cut running north west - south east through the eastern extent of the 20 x 20 m excavation area, as well as south west through the site's south eastern corner. The cut truncates the kiln feature and is filled with (008)-(010) deposits, with a depth of at least 1m.
013	1	Dark grey silty clay, fill of [006]. Contains a very high level of charcoal fragments, lenses of fine light grey silt (ash), fragments of burnt orange clay and angular pieces of limestone. Measures 0.6m (N-S) x 0.4m, D: 0.06-0.18 m. It has been deposited over the in situ footings of (019).

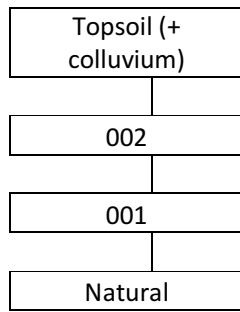
014	1	Yellowish brown silty clay containing fragments of angular limestone, charcoal, orange burnt clay, rounded and angular stones. Upper fill of kiln [006]. It extends at least 2.3m (E-W) and is 0.2-0.3m thick. The deposit overlies both the in situ footings (019) and the kiln deposits and is thought to relate to the disturbance caused by the later cut [012].
015	1	Large angular stones (max 0.4 m x 0.2 m x 0.1 m), not worked, no bonding. Overlies (003) and sealed by (014). L: 0.85 m, W: 0.45 m, D: 0.25 m. Collapsed structure of kiln [006].
016	1	Yellowish brown silty clay deposit with lenses of orange/red burnt clay and inclusions of charcoal and medium-sized stones. Fill of kiln [006]. Abuts the base of the in situ footings (019), extending 1.1m to the east, with a maximum width of 1.3m. Varies in thickness from 0.05-0.15m. Deposit most likely accrued after the abandonment of the kiln.
017	1	Deposit of bright orange/red compact clay, with inclusions of small fragments of charcoal and occasional small stones. Fill of kiln [006], below the charcoal-rich (004). Deposit abuts the base of the in situ footing (019) and extends 1m to the east, with a maximum width of 1.3m. The deposit's thickness varies from 0.02-0.04m. It is likely to be baked clay relating to the kilns' second phase of use.
018	1	Mid greyish brown silty clay with frequent fragments of burnt clay and occasional fragments of coal/charcoal and small stones. Fill of kiln [006]. The in situ footings (019) have been laid on top of the deposit. Extends for at least 1.8m from below (019) toward the later cut [012], with a thickness of 0.02-0.05m. Deposit most likely deposited between the two phases of use, possibly as preparation for the construction of the (019) footings.
019	1	Dolerite stones forming the in situ footings of kiln [006]. Stones are unworked and unmortared, having been packed with clay (020). They form a rectilinear structure at least 1.94m (external) 1.3m (internal) wide (N-S). The eastern extent of the structure has been truncated (by [012]), though at least 1.6m of the northern footing is present. There is a 0.4m gap in the western footing, over which has been placed a thin slate/shale capstone. The gap is filled with (022). The footings are at least 0.5m high and are formed from at least two randomly-laid courses. These in situ footings are thought to relate to the second phase of use.
020	1	Mid brown silty clay with inclusions of coal/charcoal, stones, fragments of orange/red burnt clay and artefacts (ferrous and glass). Deposit has been packed between the kiln cut [006] and the in situ footings (019). Inclusion of materials related to first phase of use (burnt clay and coal/charcoal) suggests that the clay packing used around the stones was sourced from the kiln itself, or a spot nearby.
021	1	Medium sized angular stones tightly packed within a greyish brown silt matrix. Fill of cut [023].
022	1	Dark grey silty clay with a very high level of charcoal fragments and fragments of burnt orange clay. Located below the slate/shale 'capstone' located centrally in the western footings of kiln [006]. Deposit measures 0.25m (N-S) x 0.3m and is 0.25m thick. It is identical to (003), suggesting that it is an extension of this deposit and

		is therefore likely to have been deposited after the kilns final abandonment
023	1	L'-shaped cut made into the natural clays (011) and the basal layer of burnt clay (005). Filled with (021), the cut is steep-sided with a concave base. It has a depth of 0.2-0.25m and a maximum width of 0.26m. The total linear length is 2.3m. The truncation of the burnt clay and the location of the cut below layers relating to the kilns' second phase of use, suggests that this cut and its associated deposit relates to an event or modification carried out between the two phases of use
024	1	Dark grey silty clay containing charcoal, fragments of burnt clay and limestone and artefacts (dark olive green bottle glass). Located within the two voids/burrows [025] excavated into the natural clays (011). Similar to [013]. Likely to have been deposited after the abandonment of the structure.
025	1	Two voids/burrows excavated into the natural clays (011). The voids are located on the western side of the kiln cut, adjacent to the location of the slate/shale 'capstone'. The southernmost void is 0.2m in length, with a diameter of 0.1m, the northern being 0.3m x 0.2m. The clay around the entrance to these voids has been baked, turning it a bright orange/red. These voids were potentially related to the kilns' use, though their phasing or purpose is unclear.
026		Topsoil. Mid brown clayey silt, 0.3 – 0.5 m.
027	4	Colluvium. Greyish brown clayey silt, 0 – 0.3 m.

Appendix 3: Trench Matrices



Trench 4



Appendix 4: Photographic Register

Photo No.	Direction	Description
29	SE	LP15 General shot of Trench 1
30	S	LP15 General shot of Trench 2
31	S	LP15 General shot of Trench 3
32	W	LP15 General shot of Trench 4
38	ESE	LP15 General shot of Trench 5
39	NW	LP15 General shot of Trench 6
40	NW	LP15 General shot of Trench 7
41	S	LP15 General shot of Trench 8
42	N	LP15 General shot of Trench 9
43	N	LP15 General shot of Trench 10
44	NE	LP15 General shot of Trench 11
45	SE	LP15 General shot of Trench 12
46	NE	LP15 General shot of Trench 13
47	E	LP15 General shot of Trench 14
48	E	LP15 General shot of Trench 15
49	SE	LP15 General shot of Trench 16
50	SW	LP15 Trench 1 working shot of feature [006]
51	SE	LP15 General shot of Trench 17
52	SW	LP15 General shot of Trench 18
53	NE	LP15 General shot of Trench 19
54	E	LP15 General shot of Trench 20
55	N	LP15 Trench 1 general shot of pit/kiln [006]
56	NW	LP15 Trench 1 SE facing section through [006]
57	NE	LP15 Trench 1 SW facing section through [006]
58	NE	LP15 Trench 4 S facing section through furrow [001]
59	S	LP15 General shot of Trench 24
60	NE	LP15 General shot of Trench 21
61	SE	LP15 General shot of Trench 22
62	S	LP15 General shot of Trench 23
63	E	LP15 General shot of Trench 25
64	N	LP15 Trench 1 extension showing [006] and deposits to south-east
65	W	LP15 Trench 1 extension showing [006] and deposits to south-east
		Photos of kiln excavation
687		ID shot
688	N	South facing section of circular cut [013]
689	S	General shot of T.21
690	N	General shot of T.20
691	N	General shot of T.19

692	W	East facing section of pit (017)
693	W	General shot of (019)
694	W	Shot of red baked clay and coal (008) and brown clay (009), west extent of trench
695	SW	Shot of red baked clay and coal (008) and brown clay (009), west extent of trench
696	E	Shot of red baked clay and coal (008) and brown clay (009), west extent of trench
697	N	Shot of red baked clay and coal (008) and brown clay (009), west extent of trench
698	N	Shale, coal fragments and clay (010), east extent of trench
699	S	Shale, coal fragments and clay (010), east extent of trench
700	S	Intermediate shot. Kiln (003-007) and surrounds
701	N	Shot looking north along line of disturbance, north east trench quadrant
702	N	South facing section slot through modern cut [012]
703	N	South facing section slot through modern cut [012] West to east
704	N	South facing section slot through modern cut [012] West to east
705	S	Sondage, south west quadrant of kiln. (003-007), (013)
706	N	Working shot kiln (006)
707	N	Kiln (006) mid-excavation showing stones (015) and (014)
708	E	Kiln (006) mid-excavation showing stones (015) and (014)
709	W	Kiln. Photo of (003) after removal of (015)
710	N	Kiln. Photo of (003) after removal of (016)
711	E	Kiln. Basal fill of pit (004)
712	W	Burnt clay (017) below (004) in kiln (006)
713	N	North section of kiln
714	N	North section of kiln
715	E	Burnt clay at kiln base (005)
716	E	Kiln excavated showing structure (019) and floor (005)
717	S	Kiln excavated showing structure (019) and floor (005)
718	N	Kiln excavated showing structure (019) and floor (005)
719	W	Close up rear wall (019) of kiln (006)
720	N	Close up of north wall (019) of kiln (006)
721	E	Plan view of stone (021) at base of kiln
722	N	Drain (023) section at base of kiln

723	W	Kiln after removal of stones (019) on south side
724	N	Extent of [023]
725	N	Extent of [023]

Appendix 5: Drawing Register

Drawing No.	Plan	Section	Description
1		1:20	LP 15 Trench 1 SW facing section through pit/kiln [006]
2		1:20	LP 15 Trench 1 SE facing section through pit/kiln [006]
3	1:20		LP 15 Trench 1 Plan of evaluation slot through [006]
004		01:20	South facing, sondage through modern cut [012] and fill (010)
005	1:20		Pre-excavation of south west quadrant of kiln, showing cut [006] and stones (015)
006		01:10	South facing section of kiln [006]
007	1:20		Plan of kiln showing cut [006], structure (019) and truncation [012]
008		01:10	Section through centre of kiln showing cut [006], structure (019), linear pit (021), [023] and burnt clay layer (005)
009	1:20		Post-excavation plan of kiln

Appendix 6: Sample Register

Sample No.	Context No.	Description
001	004	Primary fill of pit/kiln [006]
002	13	Charcoal deposit at west end of kiln (006)
003	14	Upper fill of kiln (006)
004	17	Burnt clay base below (004) in kiln (006)
005	3	Fill of kiln (006)

Appendix 7 Retent sample results

Table 1: FRCE10 LP15 Retent Sample Results

Context Number	Sample Number	Feature	Sample Vol (l)	Ceramic		Glass	Metal	MWD	Unburnt bone	Charcoal		Material available for AMS Dating	Cinders	Coal	Comments	
				Pottery	Modern					Quantity	Max Size (cm)					
						Glass	Fe object	Mag res	Mammal							
13	2	Deposit at the West end of the Kiln [006]	20			+	+	++++			+	1.5	Charcoal +	++++	++++	Cinders and Coal not retained.
14	3	Upper fill of kiln [006]	30											++	++	Cinders and Coal not retained.
17	4	Clay Base below (004) in Kiln [006]	30	+										++++	++++	Cinders and Coal not retained.
3	5	Fill of Kiln [006]	30				+		++		+	2	Charcoal +, Unburnt bone ++	++	++++	Cinders and Coal not retained.

Key: + = rare, ++ = occasional, +++ = common and ++++ = abundant
NB charcoal over 1cm is suitable for identification and AMS dating

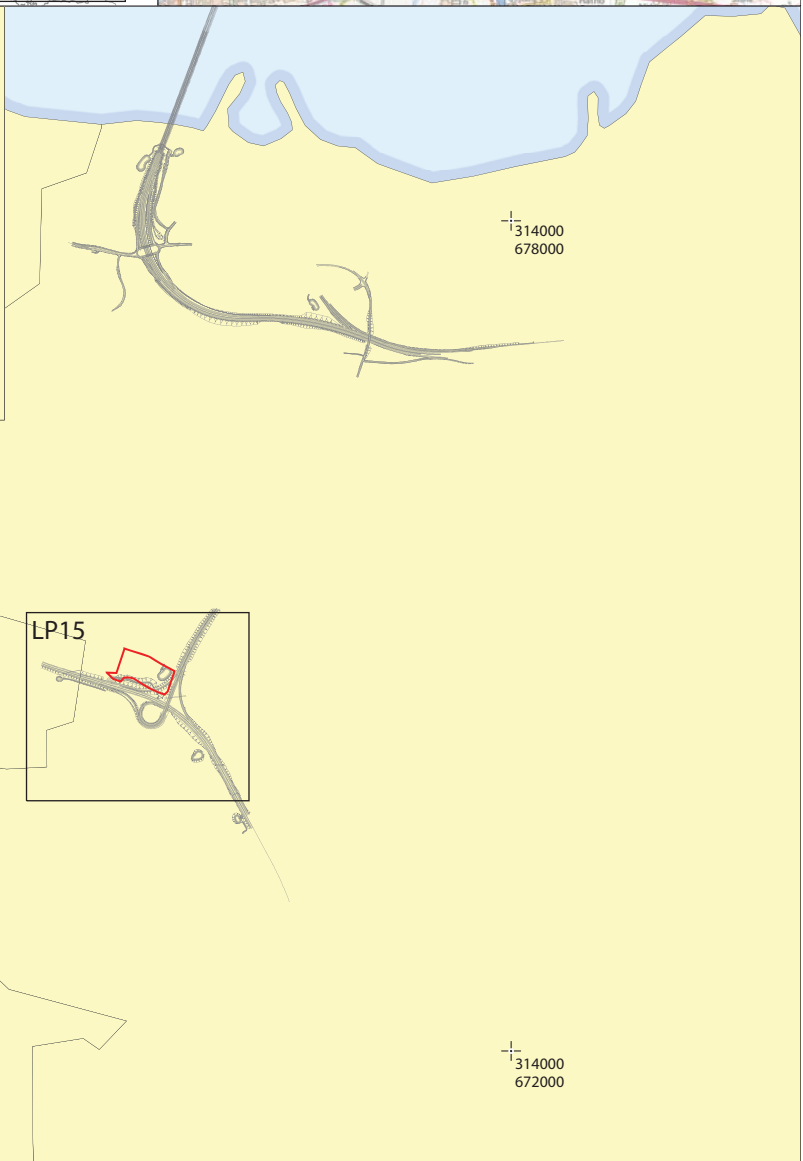
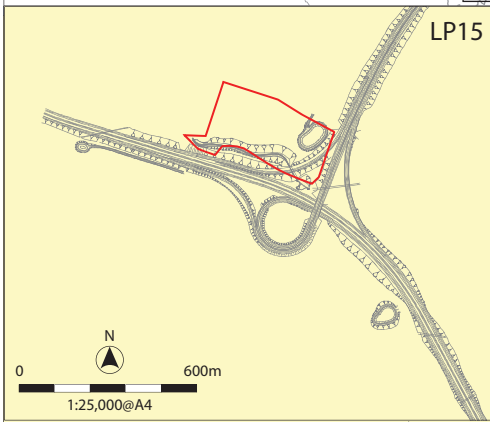
Appendix 8: Flotation sample results

Table 2:FRCE10 LP15 : Flotation Sample Results

Context Number	Sample Number	Feature	Total flot Vol (ml)	Cereal grain:	<i>Triticum aestivum</i>	Other charred plant	Charcoal Quantity	Charcoal Max size (cm)	Material available for AMS	Cinders	Comments
13	2	Deposit at the West end of the Kiln [006]	4000							++++	All of the sample is cinders
14	3	Upper fill of kiln [006]	50		+	<i>Chenopodium</i> sp.+	++++	1	Charcoal+++		
17	4	Clay Base below (004) in Kiln [006]	150				++++	1.5	Charcoal++	+++	
3	5	Fill of Kiln [006]	1000			<i>Chenopodium</i> sp.+	++++	1	Charcoal++	++++	
<p>Key: + = rare, ++ = occasional, +++ = common and ++++ = abundant NB charcoal over 1 cm is suitable for identification and AMS dating</p>											



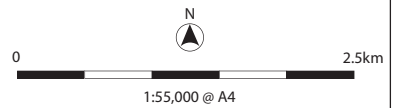
Kirkliston
Edinburgh
Lothian

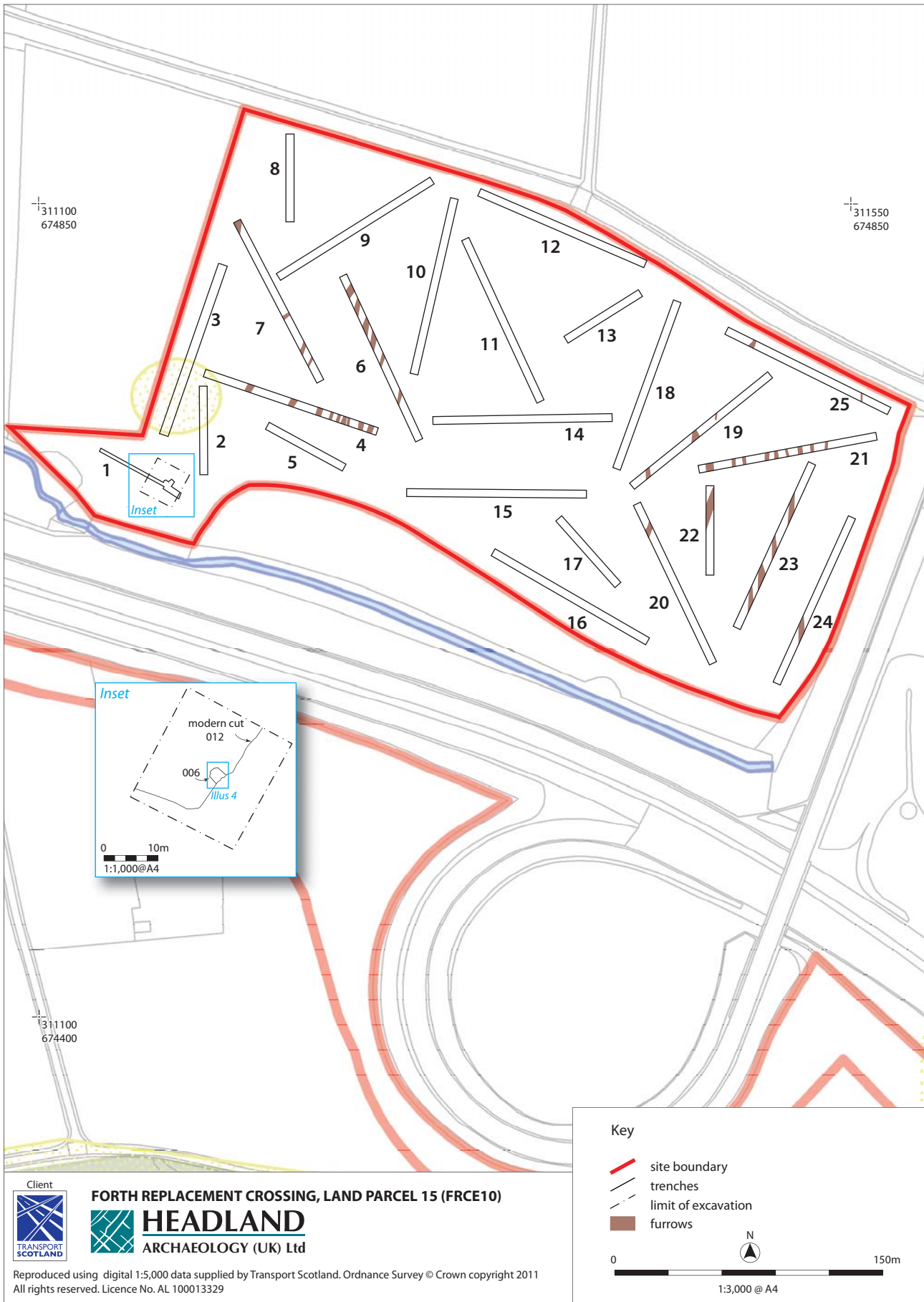


HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LAND PARCEL 15 (FRCE10)

Reproduced using 2007 OS 1:50,000 Landranger No. 65 and digital 1:10,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011 All rights reserved. Licence No. AL 100013329





© Headland Archaeology (UK) Ltd



FORTH REPLACEMENT CROSSING, LAND PARCEL 15 (FRCE10)



Reproduced using digital 1:5,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011
All rights reserved. Licence No. AL 100013329

Illus 2
Trench plan



Illus 3

Excavated slot through kiln [006] during evaluation looking north



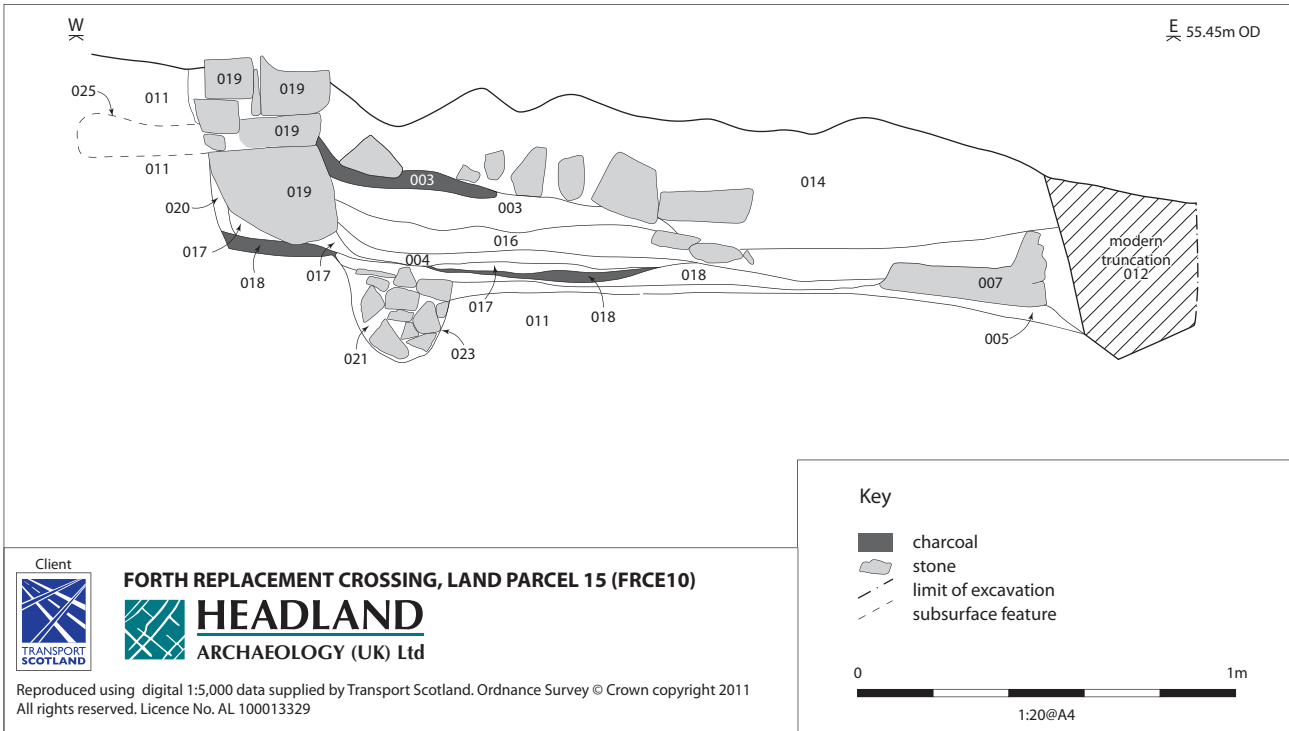
Illus 4

Collapsed stones [015] filling kiln [006] looking north

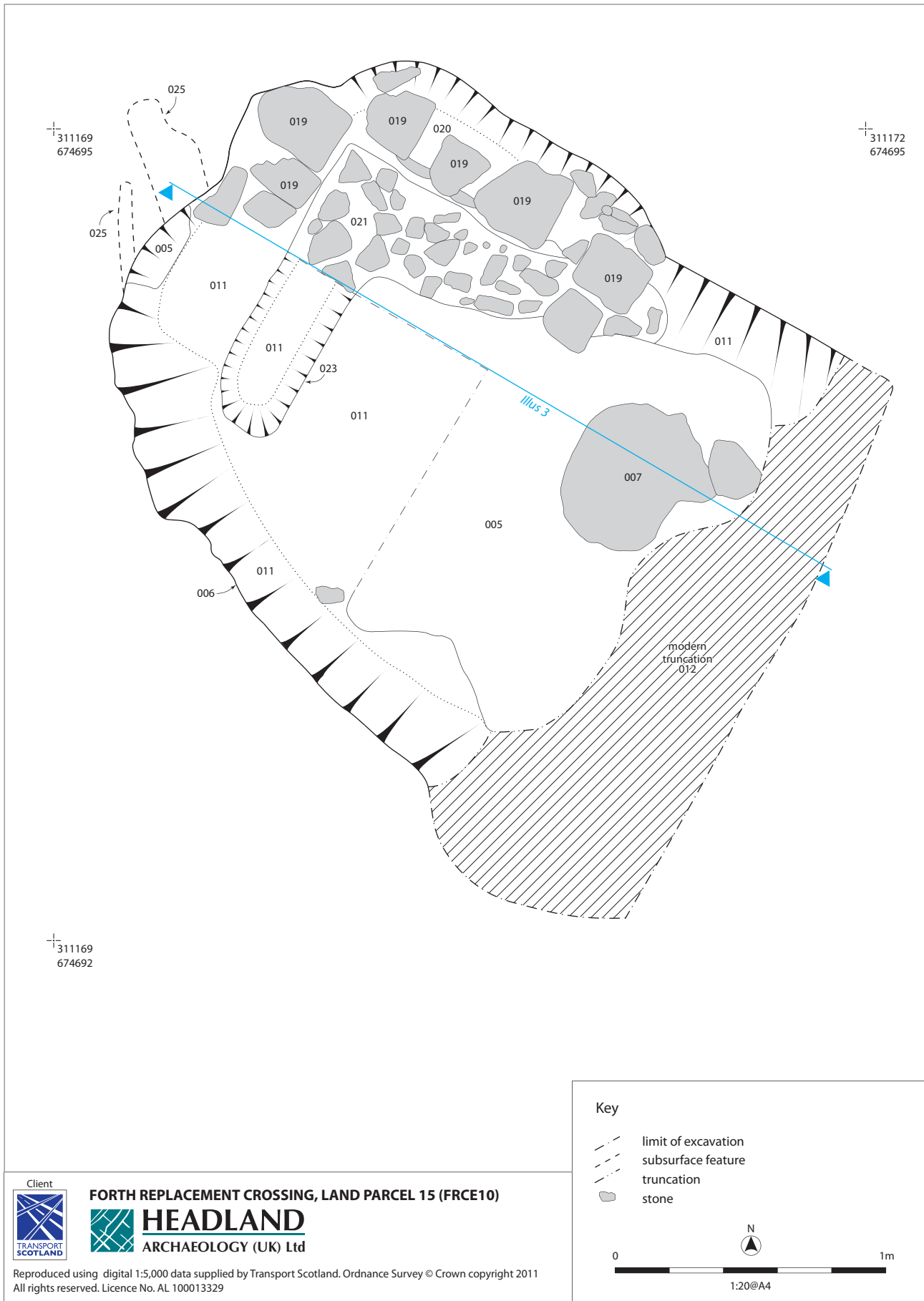


HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LP15 (FRCE10)



Illus 5
South facing section through kiln



© Headland Archaeology (UK) Ltd



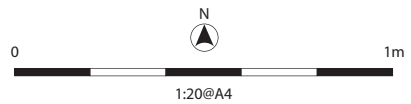
FORTH REPLACEMENT CROSSING, LAND PARCEL 15 (FRCE10)



Reproduced using digital 1:5,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011
All rights reserved. Licence No. AL 100013329

Key

- limit of excavation
- subsurface feature
- truncation
- stone



Illus 6
Post-ex plan of kiln [006]



Illus 7
Photo showing section through kiln [006], looking north



Illus 8
View of kiln looking west showing stone structure [019]



HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LP15 (FRCE10)

Project code: FRCE10
Client: Transport Scotland
Date: 1st April 2011

The Results of an Archaeological Field Evaluation by Trial Trenching at Land near Humbie Farm, Kirkliston (Land Parcel 16)

Archaeological Consultant: Jacobs Arup
Report Authors: Donald Wilson
Report Status: Approved



Executive Summary

Headland Archaeology conducted an archaeological evaluation by trial trenching on the Forth Replacement Crossing near Humbie Farm, Kirkliston (Land Parcel 16) NGR: NT 11037 74756 (centred), to assess the presence/absence of archaeological remains or deposits in an area identified as having 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 4 trenches totalling 256m² were excavated comprising a 5% sample of the land parcel. The trenches were excavated on 31st March 2011 and were sited to ensure good spatial coverage of the area under investigation, although constraints to the layout were imposed due to a gas main running through the middle of the area to be evaluated. The trial trenching revealed a number of rubble filled field drains relating to the post medieval agricultural activity on site. A modern ditch was also recorded but no other archaeological remains or deposits were identified during the evaluation.

ARCHAEOLOGICAL EVALUATION

Forth Replacement Crossing: Land Parcel 16, Land near Humbie Farm, Kirkliston

PROJECT SUMMARY SHEET (FRCE10)

<i>Client</i>	Transport Scotland
<i>Consultant</i>	Jacobs Arup
<i>National Grid Reference</i>	NT 10982 74620
<i>Project Manager</i>	Edward Bailey
<i>Senior Archaeologist</i>	Kirsty Dingwall
<i>Text</i>	Donald Wilson
<i>Illustrations</i>	Julia Bastek
<i>Evaluation Team</i>	Donald Wilson Kirsty Dingwall Emma Searle
<i>Schedule</i>	
Fieldwork	31st March 2011
Report	April 2011

CONTENTS

1	Introduction	348
	1.1 <i>General</i>	348
	1.2 <i>Project Background</i>	348
	1.3 <i>Aims and Objectives of the Archaeological Works</i>	348
2	Site Background	349
	2.1 <i>Archaeological and Historical Background</i>	349
	2.2 <i>Site Topography and Land Use</i>	349
	2.3 <i>Site Geology</i>	349
3	Methodology	350
4	Results of Fieldwork	350
	4.1 <i>Trial Trenching</i>	350
5	Conclusions	351
6	References	352
	6.1 <i>Bibliographic References</i>	352
	6.2 <i>Cartographic References</i>	352
7	Appendices	353
	<i>Appendix 1: Trench Register</i>	353
	<i>Appendix 2: Context Register</i>	353
	<i>Appendix 3: Trench Matrices</i>	353
	<i>Appendix 4: Photographic Register</i>	353
	Illustrations	354

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 On the 31st March 2011, Headland Archaeology (UK) Ltd. undertook a programme of archaeological evaluation by trial trenching on Land Parcel 16 at the location of the M9 Junction 1a improvements (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 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. This would 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 Within the vicinity of the of the M9 Junction 1a improvements (Illus 1) prehistoric activity has been recorded in the form of a Late Bronze Age socketed axe found near Kirkliston. Latterly there are written records from 1513 that refer to a Kirkliston House acquired by the Commandery of Torphichen although the exact location of the house is not recorded. Based on the coordinates provided by the Royal Commission on the Ancient and Historic Monuments of Scotland both these sites are located within 1 km of Land Parcel 16 and indicate the potential for prehistoric and medieval settlement in the area.

2.2 *Site Topography and Land Use*

2.2.1 The site comprised part of a large field defined by a large hedge along the eastern boundary and a copse of trees to the south. The field had recently been ploughed at the time of evaluation. The field sloped gradually to the south where the field was significantly wetter. The site is under the ownership of J.G Dudgeon and Sons and Scotia Gas Networks.

2.3 *Site Geology*

2.3.1 The results of geotechnical investigations (Jacobs Arup 2009b) carried out 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 that the boulder clays predominate in this area

- 2.3.1 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 3836 m², of which a 5% sample (256 m²) was investigated by trial trenching. An indicative trench plan was agreed with the consultant archaeologists, Jacobs Arup in order to provide good spatial coverage of the entire site. Due to the location of a gas pipeline running north to south through the middle of the site all the trenches had to be repositioned to ensure a minimum 6 m wayleave to either side of the gas pipe centreline.
- 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 JCB mechanical excavator, fitted with a back actor and a 1.6 m 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. A full photographic register can be found in Appendix 2.

4 Results of Fieldwork (Illus 2)

4.1 Trial Trenching

- 4.1.1 Four trenches were excavated across Land Parcel 16 (Illus 2) with a combined total area of 256 m² comprising just over 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 [002] seen in the trenches was largely yellow/grey mottled boulder clay with frequent small stone inclusions and occasional small areas of firm yellow clay. In general this was overlain by between 0.25 m and 0.35 m of topsoil [001] which contained little in the way of recent ceramic material.
- 4.1.3 Within Trench 1 a steep sided pit/ditch was recorded although this was considered to have been the result of modern disturbance as a large fragment of modern glass was

recovered from the fill at a depth of 0.70 m. This may have been the result of disturbance associated with the laying of the gas pipe that ran parallel to the trench 8 m to the west. The only other features of note in Trench 1 were a series of four north-south aligned rubble field drains cut into natural.

- 4.1.4 The three further trenches revealed no archaeological remains or deposits with Trench 2 being sterile and Trenches 3 and 4 containing further rubble field drains.

5 Conclusions

- 5.1 The evaluation has established that this area appears not to have been extensively used for human settlement activity. The only archaeological remains identified relate to post-medieval agricultural activity in the area and consist of field drains running across the site on a north-south alignment.
- 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

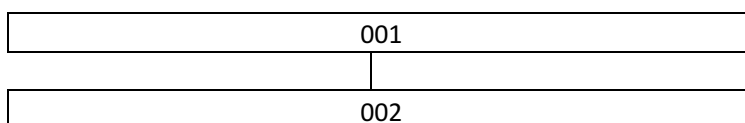
Trench No	Length (m)	Depth (m)	Description
1	47	0.40	NE-SW running. Included 4 rubble field drains all aligned N-S and a modern pit/ditch (not visible in the trenches to either side)
2	35	0.40	N-S running trench with no features recorded
3	50	0.35	NE-SW running. Included six rubble field drains all aligned N-S
4	28	0.35	NE-SW running. Included five rubble field drains all aligned N-S

Appendix 2: Context Register

Context	Location	Description
001	All	Topsoil. Dark brown clayey silt loam.
002	All	Yellow grey boulder clay-Natural geology.

Appendix 3: Trench Matrices

All trenches



Appendix 4: Photographic Register

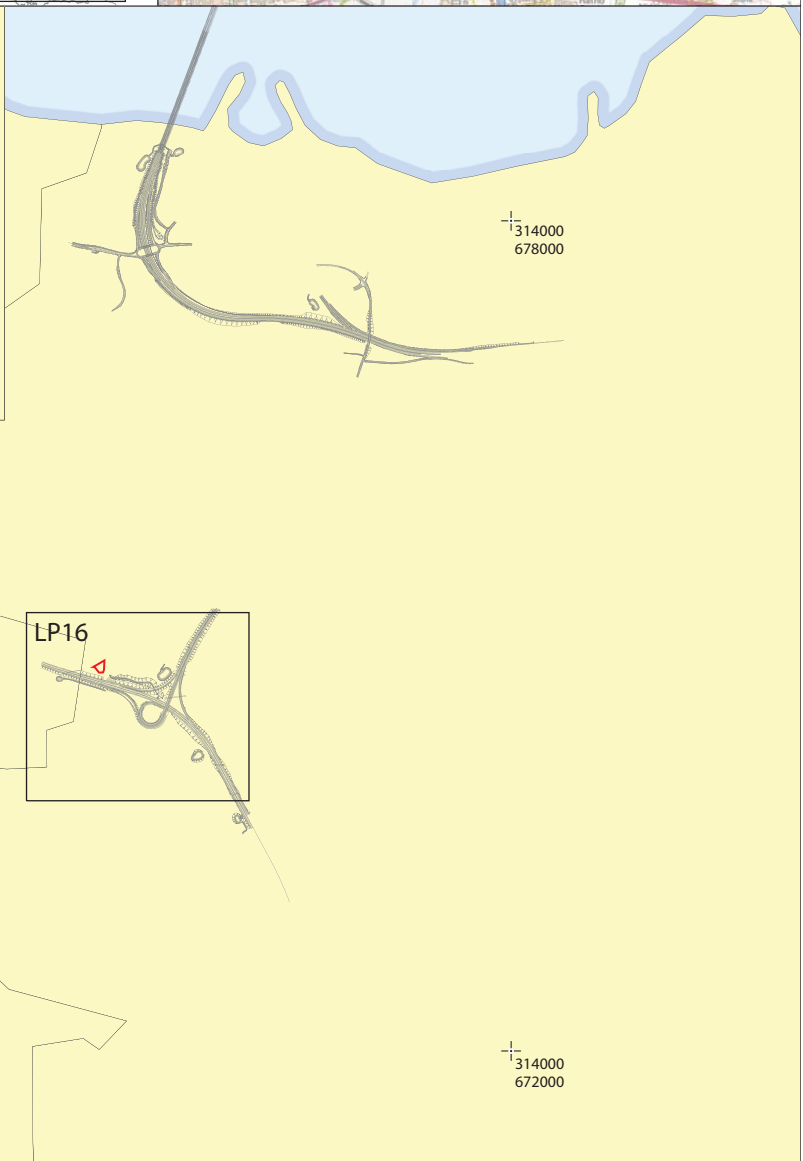
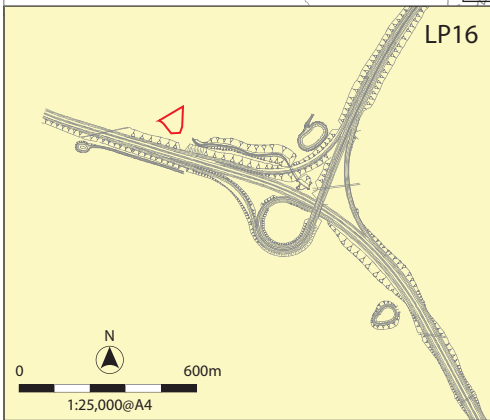
Photo No.	Direction	Description
01	SE	General shot of Trench 1
02	NW	Detail of the modern pit feature in Trench 1
03	S	General shot of Trench 2
04	SW	General shot of Trench 3
05	SW	General shot of Trench 4



Lothian
Kirkliston

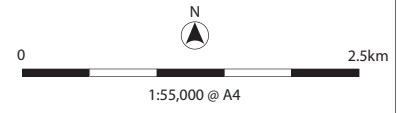


0 100km



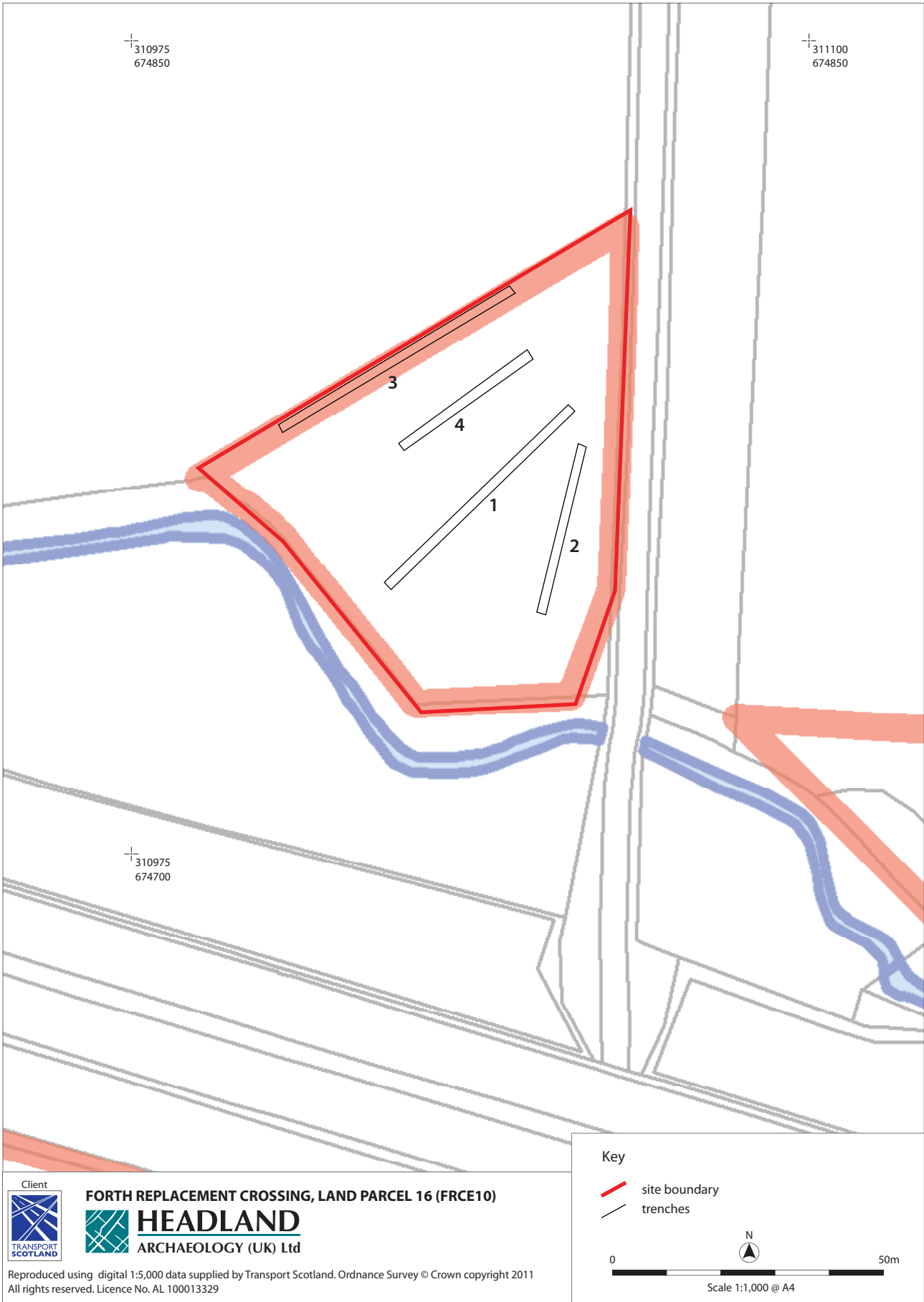
FORTH REPLACEMENT CROSSING, LAND PARCEL 16 (FRCE10)

Reproduced using 2007 OS 1:50,000 Landranger No. 65 and digital 1:10,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011 All rights reserved. Licence No. AL 100013329



310975
674850

311100
674850



© Headland Archaeology (UK) Ltd



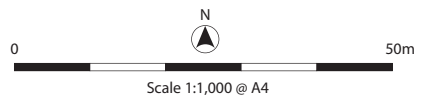
FORTH REPLACEMENT CROSSING, LAND PARCEL 16 (FRCE10)



Reproduced using digital 1:5,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011
All rights reserved. Licence No. AL 100013329

Key

- site boundary
- trenches



Illus 2
Trench plan

Project code: FRCE10
Client: Transport Scotland
Date: 1st April 2011

The Results of an Archaeological Field Evaluation by Trial Trenching at Milrig Farm, Kirkliston (Land Parcel 17)

Archaeological Consultant: Jacobs Arup
Report Authors: Donald Wilson
Report Status: Approved



Executive Summary

Headland Archaeology conducted an archaeological evaluation by trial trenching on the Forth Replacement Crossing at Milrig Farm, Kirkliston (Land Parcel 17), NGR: NT 11008 74636 (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 5 trenches totalling 357m² were excavated comprising a 5% sample across a single field. The trenches, excavated on 30th march 2011, were sited to ensure good spatial coverage of the area under investigation. The trial trenching revealed a small number of rubble filled field drains relating to the post-medieval agricultural activity on site. A modern test pit was also recorded but no other archaeological remains or deposits were identified during the evaluation.

ARCHAEOLOGICAL EVALUATION

Forth Replacement Crossing: Land Parcel 17, Land near Milrig Farm, Kirkliston

PROJECT SUMMARY SHEET (FRCE10)

Client Transport Scotland

Consultant Jacobs Arup

National Grid Reference NT 11008 74636

Project Manager Edward Bailey

Senior Archaeologist Kirsty Dingwall

Text Donald Wilson

Illustrations Julia Bastek

Evaluation Team Donald Wilson
Kirsty Dingwall
Emma Searle

Schedule

Fieldwork 30th March 2011

Report April 2011

CONTENTS

1	Introduction	360
	1.1 <i>General</i>	360
	1.2 <i>Project Background</i>	360
	1.3 <i>Aims and Objectives of the Archaeological Works</i>	360
2	Site Background	361
	2.1 <i>Archaeological and Historical Background</i>	361
	2.2 <i>Site Topography and Land Use</i>	361
	2.3 <i>Site Geology</i>	361
3	Methodology	362
4	Results of Fieldwork	362
	4.1 <i>Trial Trenching</i>	362
5	Conclusions	363
6	References	364
	6.1 <i>Bibliographic References</i>	364
	6.2 <i>Cartographic References</i>	364
7	Appendices	365
	<i>Appendix 1: Trench Register</i>	365
	<i>Appendix 2: Context Register</i>	365
	<i>Appendix 3: Trench Matrices</i>	366
	<i>Appendix 4: Photographic Register</i>	366
	Illustrations	367

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 On the 30th March 2011, Headland Archaeology (UK) Ltd. undertook a programme of archaeological evaluation by trial trenching on Land Parcel 17 in advance of the M9 Junction 1a improvements 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 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 Within the vicinity of the of the M9 Junction 1a improvements (Illus 1) prehistoric activity has been recorded in the form of a Late Bronze Age socketed axe found near Kirkliston. Latterly there are written records from 1513 that refer to a Kirkliston House acquired by the Commandery of Torphichen although the exact location of the house is not recorded. Based on the coordinates provided by the Royal Commission on the Ancient and Historic Monuments of Scotland both these sites are located within 1 km of Land Parcel 17 and indicate the potential for prehistoric and medieval settlement in the area.

2.1.3 Previous archaeological work on site has been limited to the archaeological monitoring of the Broxburn to Humbie Farm Reinforcement Pipeline that runs NW-SE across the field. The monitoring did not identify any archaeological remains or deposits within the limited area of the land parcel subject to the works (Moore 2009).

2.2 *Site Topography and Land Use*

2.2.1 The site comprised the northern end of a large field defined by the M9 to the north, a copse of trees to the west and a farm road to the east. The field gradually sloped to the north with the area under investigation being the lowest point. The field was under a young crop at the time of evaluation. The site is under the ownership of the Trustees of the firm J & D Wood, Geo Networks Limited and the Scottish Ministers.

2.3 *Site Geology*

- 2.3.1 The results of geotechnical investigations (Jacobs Arup 2009b) carried out 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 that the boulder clays predominate in this area.
- 2.3.1 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 7081 m², of which a 5% sample (357 m²) was investigated by trial trenching. An indicative trench plan was agreed with the consultant archaeologists, Jacobs Arup. Trenches were sited in order to provide good spatial coverage of the entire site. As a result of the presence of a modern service pipe, one trench was halted and moved slightly to the north at the request of the landowner. A further trench was shortened in order to avoid a main gas pipe. An additional short trench was excavated in order to ensure the full sample area was excavated.
- 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 JCB mechanical excavator, fitted with a back actor and a 1.6 m 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. A full list of the photographic register can be found in Appendix 4.

4 Results of Fieldwork (Illus 2)

4.1 Trial Trenching

- 4.1.1 Five trenches were excavated across Land Parcel 17 (Illus 2) with a combined total area of 357 m² 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 [003] seen in the majority of trenches was largely yellow/grey mottled clay with frequent small stone inclusions. In Trench 1 and 5 this was overlain

by between 0.30 m and 0.35 m of topsoil [001] which contained little in the way of recent ceramic material. In Trench 2, located at the western limit of the land parcel, the natural geology [003] was a blue grey clay with large stone inclusions overlain by a 0.35 m layer of greyish brown clayey silt subsoil [004] and 0.35 m of topsoil [001]. A shallow layer of yellowish brown sandy clay subsoil [002] no more than 0.15 m thick was recorded in Trench 3. The natural geology [003] was not reached in Trench 4 due to a modern service pipe preventing excavation.

- 4.1.3 Within Trenches 1, 2 and 5 a series of rubble field drains were recorded on various alignments. A single ceramic field drain was also recorded in Trench 2. In Trench 3 a back-filled geotechnical test pit was recorded and in Trench 4 a modern service pipe led to the abandonment of the trench. No archaeological remains or deposits were identified during the evaluation.

5 Conclusions

- 5.1 The evaluation confirms the earlier work undertaken during the archaeological monitoring of the gas pipeline and 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 field drains running across the site.
- 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.

Moore, P 2009 *Broxburn to Humbie Farm Reinforcement Pipeline (Phase 2) Broxburn, West Lothian*. CFA Archaeology Ltd Unpublished client report.

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

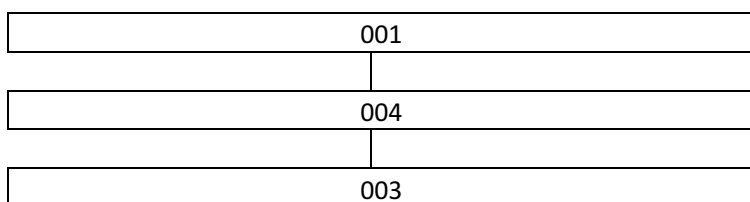
Trench No	Length (m)	Depth (m)	Description
1	80	0.35	Running E-W. A single N-S aligned rubble field drain.
2	25	0.70	Running E-W. The trench included two NE-SW aligned rubble drains and a single ceramic drain 0.70 m below the surface.
3	20	0.50	Running E-W. No features of archaeological significance.
4	13	0.30	Running E-W the trench had a large modern service pipe running E-W down the middle of the trench
5	85	0.40	Running E-W. The trench included a single NW-SE aligned rubble drain comprising of large boulders

Appendix 2: Context Register

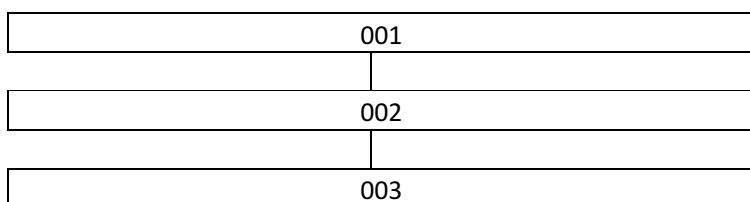
Context	Location	Description
001	All	Topsoil. Dark brown clayey silt loam.
002	3	Yellowish brown silty clay subsoil. D: 0.15 m.
003	All	Natural.
004	2	Greyish brown clayey silt subsoil. D: 0.35 m.

Appendix 3: Trench Matrices

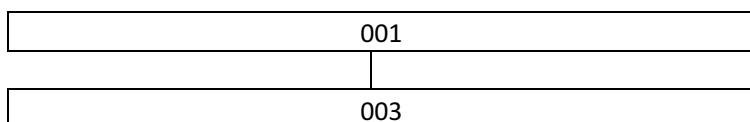
Trench 2



Trench 3



Remaining trenches

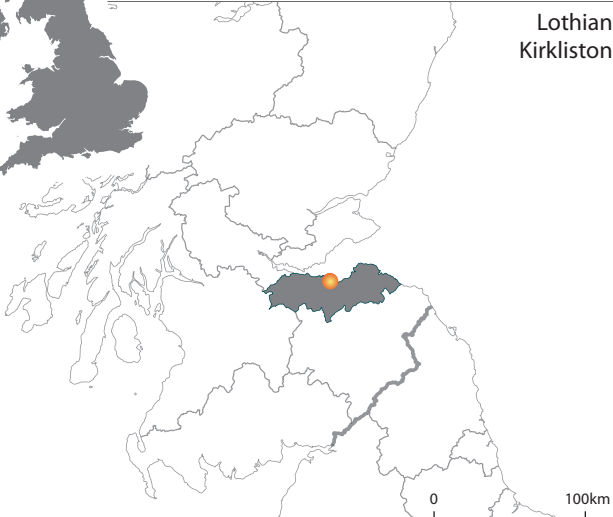


Appendix 4: Photographic Register

Photo No.	Direction	Description
01	W	General shot of Trench 1
02	W	General shot of Trench 2
03	S	Repaired ceramic drain in Trench 2
04	W	General shot of Trench 4
05	W	General shot of Trench 5



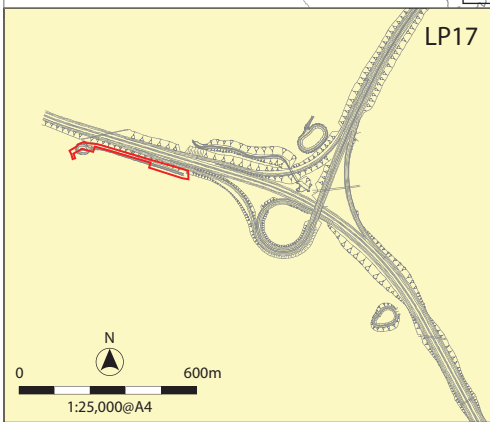
Lothian
Kirkliston



0 100km

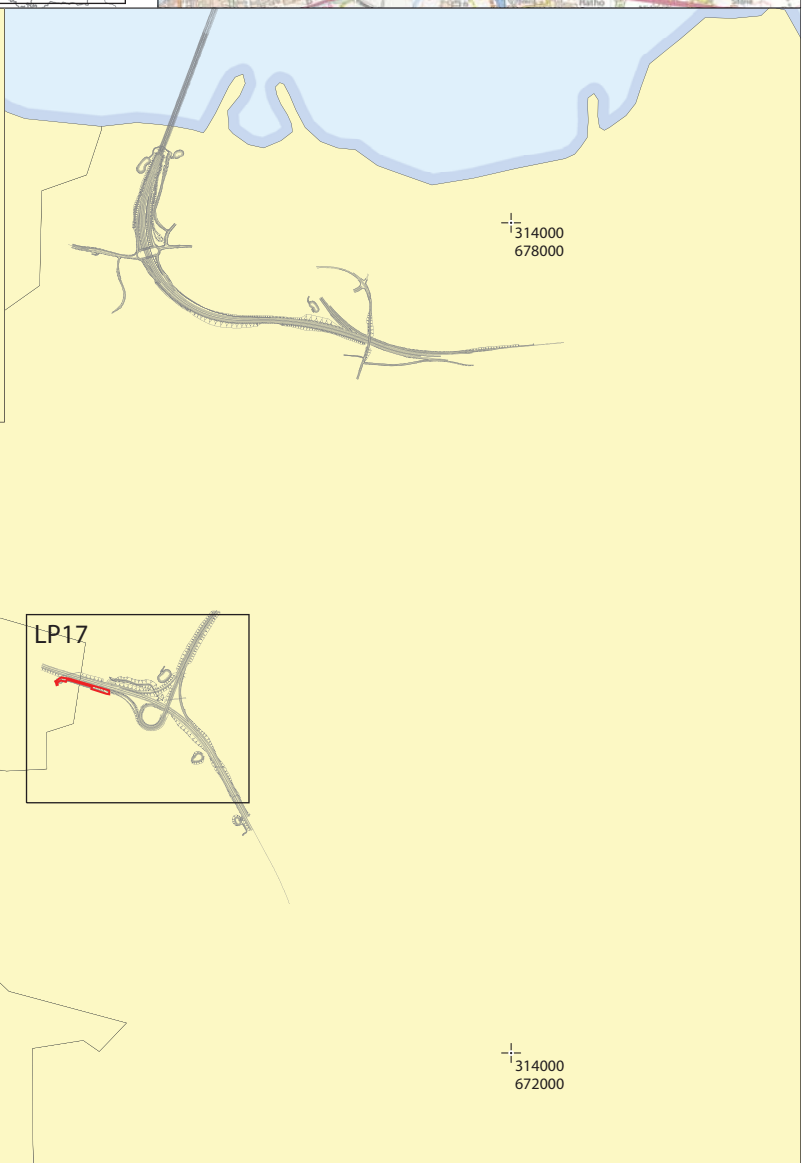


0 3km
1:100,000@A4

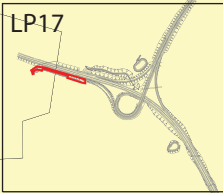


LP17

0 600m
1:25,000@A4



314000
678000



LP17

309000
672000

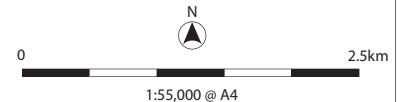
314000
672000



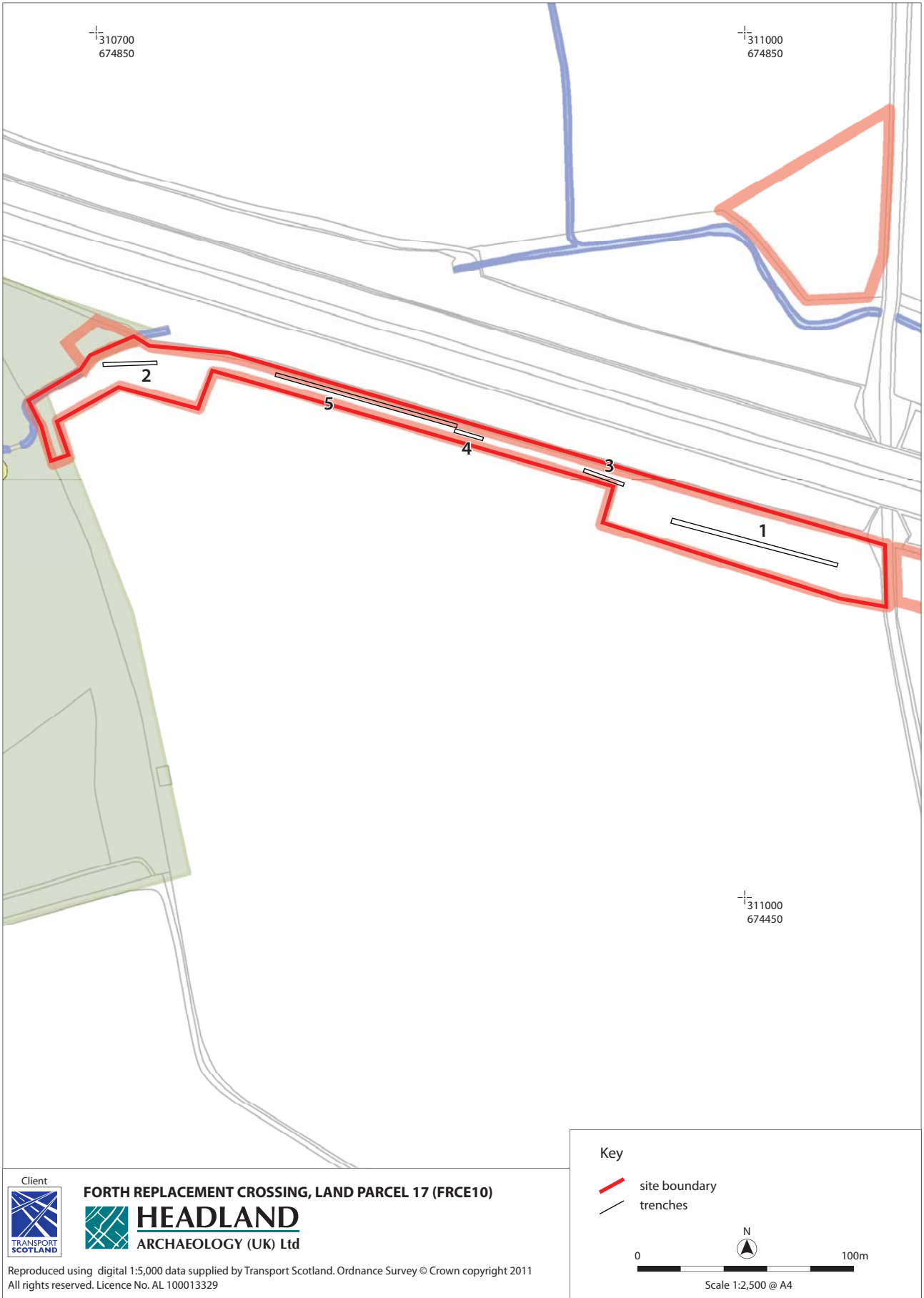
HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LAND PARCEL 17 (FRCE10)

Reproduced using 2007 OS 1:50,000 Landranger No. 65 and digital 1:10,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011 All rights reserved. Licence No. AL 100013329



1:55,000 @ A4



FORTH REPLACEMENT CROSSING, LAND PARCEL 17 (FRCE10)

HEADLAND
ARCHAEOLOGY (UK) Ltd

Reproduced using digital 1:5,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011
All rights reserved. Licence No. AL 100013329

Illus 2
Trench plan

Project code: FRCE10
Client: Transport Scotland
Date: 27th May 2011

The Results of an Archaeological Field Evaluation by Trial Trenching near Overton Farm, Kirkliston (Land Parcel 18)

Archaeological Consultant: Jacobs Arup
Report Authors: Kirsty Dingwall
Report Status: Approved



Executive Summary

Headland Archaeology conducted an archaeological evaluation by trial trenching on the Forth Replacement Crossing near Overton Farm, Kirkliston (Land Parcel 18) NGR: NT 11134 74585 (centred), to assess the presence/absence of archaeological remains or deposits in an area identified as having good 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 5 trenches totalling 181 m² were excavated comprising a 5% sample across two fields. The trenches were excavated on 26th May 2011 and were sited to ensure good spatial coverage of the area under investigation. The trial trenching identified evidence of large scale infilling relating to the construction of the M9 to the north, along with a number of agricultural furrows. No other remains or deposits of archaeological significance were identified during the evaluation.

ARCHAEOLOGICAL EVALUATION
Forth Replacement Crossing: Land Parcel 18, Kirkliston

PROJECT SUMMARY SHEET (FRCE10)

<i>Client</i>	Transport Scotland
<i>Consultant</i>	Jacobs Arup
<i>National Grid Reference</i>	NT 11008 74636
<i>Project Manager</i>	Edward Bailey
<i>Senior Archaeologist</i>	Kirsty Dingwall
<i>Text</i>	Kirsty Dingwall
<i>Illustrations</i>	Julia Bastek
<i>Evaluation Team</i>	Kirsty Dingwall Richard Tuffin
<i>Schedule</i>	
Fieldwork	26 th May 2011
Report	May 2011

CONTENTS

1	Introduction	373
	1.1 <i>General</i>	373
	1.2 <i>Project Background</i>	373
	1.3 <i>Aims and Objectives of the Archaeological Works</i>	374
2	Site Background	374
	2.1 <i>Archaeological and Historical Background</i>	374
	2.2 <i>Site Topography and Land Use</i>	375
	2.3 <i>Site Geology</i>	375
3	Methodology	375
4	Results of Fieldwork	375
	4.1 <i>Trial Trenching</i>	375
5	Conclusions	376
6	References	377
	6.1 <i>Bibliographic References</i>	377
	6.2 <i>Cartographic References</i>	377
7	Appendices	378
	<i>Appendix 1: Trench Register</i>	378
	<i>Appendix 2: Context Register</i>	378
	<i>Appendix 3: Trench Matrices</i>	379
	<i>Appendix 4: Photographic Register</i>	380
	Illustrations	381

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 On the 26th May 2011, Headland Archaeology (UK) Ltd. undertook a programme of archaeological evaluation by trial trenching on Land Parcel 18 in advance of the M9 Junction 1a improvements for the FRC (Illus 1). The project was managed by Edward Bailey (Project Manager), the fieldwork and reporting was overseen by Kirsty Dingwall. One additional staff member was involved during 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.

1.2.2 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).

1.2.3 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 (Illus 1)**

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 Within the vicinity of the of the M9 Junction 1a improvements (Illus 1) prehistoric activity has been recorded in the form of a Late Bronze Age socketed axe found near Kirkliston. Latterly there are written records from 1513 that refer to a Kirkliston House acquired by the Commandery of Torphichen although the exact location of the house is not recorded. Based on the coordinates provided by the Royal Commission on the Ancient and Historic Monuments of Scotland both these sites are located within 1 km of Land Parcel 18 and indicate the potential for prehistoric and medieval settlement in the area.

2.1.3 Previous archaeological work took place in the fields to the west of the site during the archaeological monitoring of the Broxburn to Humbie Farm Reinforcement Pipeline. The monitoring did not identify any archaeological remains or deposits. (Moore 2009).

2.2 *Site Topography and Land Use*

2.2.1 The land parcel comprised the northern end of two small fields defined by the M9 embankment to the north, an unclassified road to the west and arable fields to the south and east. Both fields were under pasture for sheep at the time of evaluation. The site is under the ownership of M R Arbuckle and S Meikle.

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 of firm to very stiff boulder clay deposits with occasional granular till deposits. The trial trenching (below) has identified that the boulder clays predominate in this area.

2.3.1 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**

3.1.1 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 3460 m², of which a 5% sample (181 m²) was investigated by trial trenching. An indicative trench plan, designed to provide good spatial coverage of the entire site, was agreed with the consultant archaeologists, Jacobs Arup prior to the trial trenching.

3.1.2 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 JCB mechanical excavator, fitted with a back actor and a 1.6 m 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 encountered 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. A full list of the photographs can be found in Appendix 3.

4 **Results of Fieldwork (Illus 2)**

4.1 *Trial Trenching*

- 4.1.1 Five trenches were excavated across Land Parcel 18 (Illus 2) with a combined total area of 181 m² 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 (002) seen in the majority of trenches was a very firm yellow slightly sandy clay, becoming slightly browner to the west. In Trenches 1, 2 and 5 this was overlain by 0.40 m of topsoil (001). The western end of Trench 3 and eastern end of Trench 4 contained a large amount of dumped modern debris, including brick, glass, china, shale, gravel and plastic within a dark silty matrix. This deposit (003) was 1.6 m in depth in Trench 4 and was excavated by means of a sondage. The dumped material had been used to level out low ground within the field in the last few decades (Mr Arbuckle, pers comm).
- 4.1.3 Furrows [004, 006, 008, 010 & 012] were seen in Trenches 2 and 3. Aligned roughly north to south in trench 3 and north-west to south-east in trench 2, the furrows were up to 1.5 m wide. One furrow [006] was sample excavated; it had maximum depth of 0.20 m and was filled by a deposit of brown silty clay (007). Rubble field drains were recorded across the Parcel. No other remains or deposits of archaeological significance were identified during the evaluation.

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 archaeological remains or deposits identified during the evaluation relate to agricultural activity in the area and to landscaping as a result of the construction of the M9 to the north.
- 5.1.2 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.

Moore, P. 2009 *Broxburn to Humbie Farm Reinforcement Pipeline (Phase 2) Broxburn, West Lothian*. CFA Archaeology Ltd Unpublished client report.

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

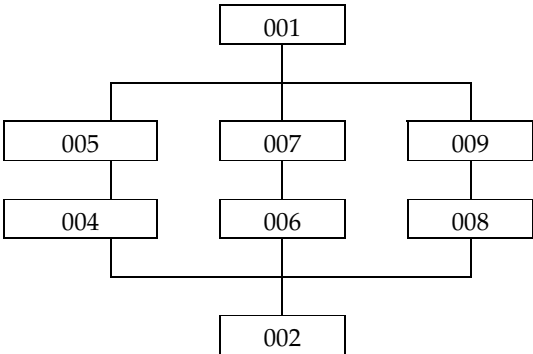
Trench No	Length (m)	Depth (m)	Description
1	10.2	0.4	SE-NW. Rubble drain N-S NE-SW. Rubble drains (3)
2	26.3	0.5	SE-NW. Furrows [004, 006 & 008] (3) SE-NW NW-SE. Furrows [010 & 011] N-S. Modern dumping in NW extent of trench. Trench shortened by 2.5m due to presence of sleep
3	25	0.5	slope (motorway cut) NE-SW. Rubble drain N-S. Modern rubbish dump
4	25	1.6	located in NE end of trench
5	26.8	0.5	NW-SE

Appendix 2: Context Register

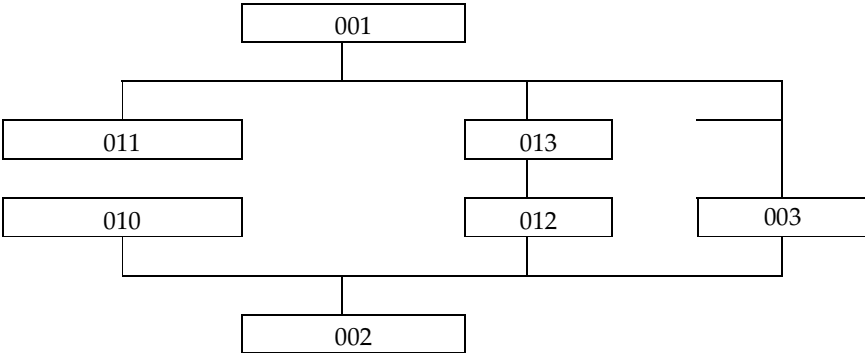
Context	Location	Description
001	All	Topsoil. Dark brown clayey silt loam.
002	All	Natural. Yellow sandy clay
003	3 & 4	Modern debris, including brick, glass, china, shale, gravel and plastic within a dark silty matrix
004	2	Cut of furrow aligned north-west to south-east. Measures 1.6 m in length and 1.5 m wide. Not excavated.
005	2	Fill of furrow [004]
006	2	Cut of furrow aligned north-west to south-east. Measures 1.6 m in length and 1 m wide. Depth was 0.20 m.
007	2	Brown grey silty clay. Fill of furrow [006]
008	2	Cut of furrow aligned north-west to south-east.
009	2	Fill of furrow [008].
010	3	Cut of furrow aligned north to south. Measures 1.60 m in length by 1.50 m wide. Not excavated
011	3	Fill of furrow [010]
012	3	Cut of furrow aligned north to south. Measures 1.60 m in length by 1.50 m wide. Not excavated
013	3	Fill of furrow [012]

Appendix 3: Trench Matrices

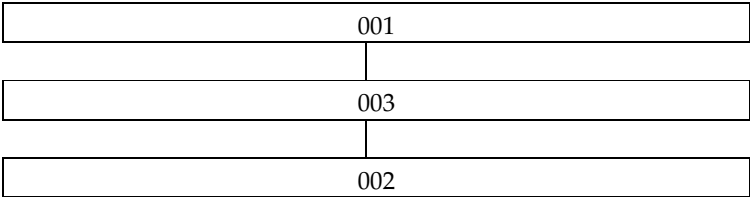
Trench 2



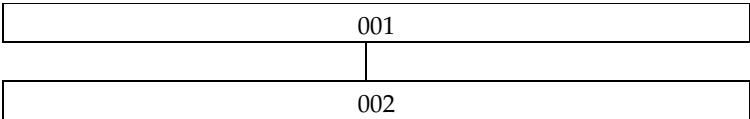
Trench 3



Trench 4



Remaining trenches

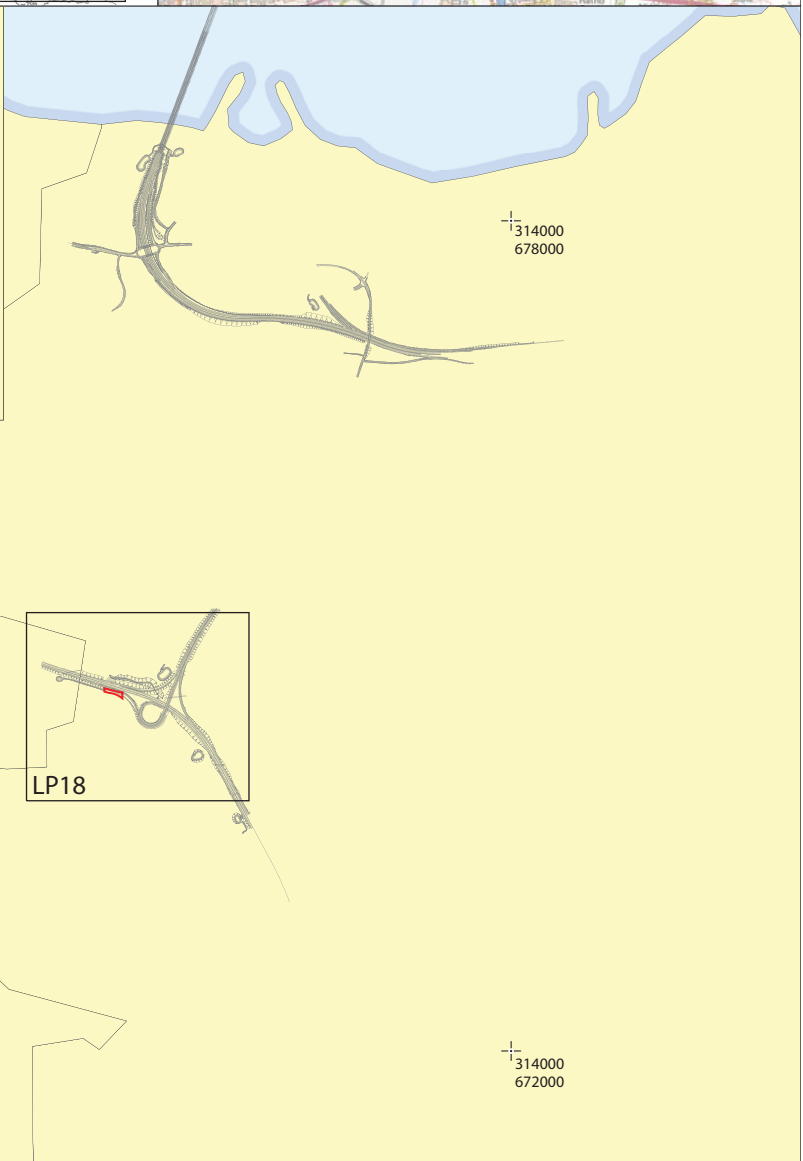
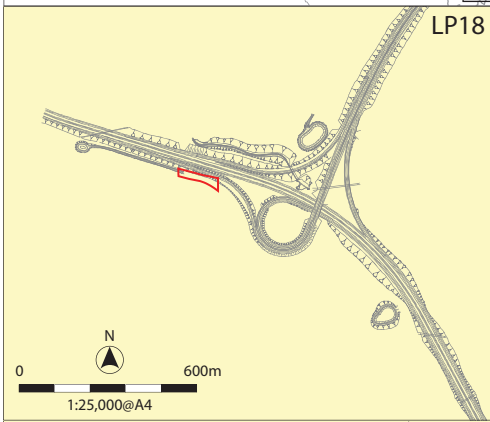


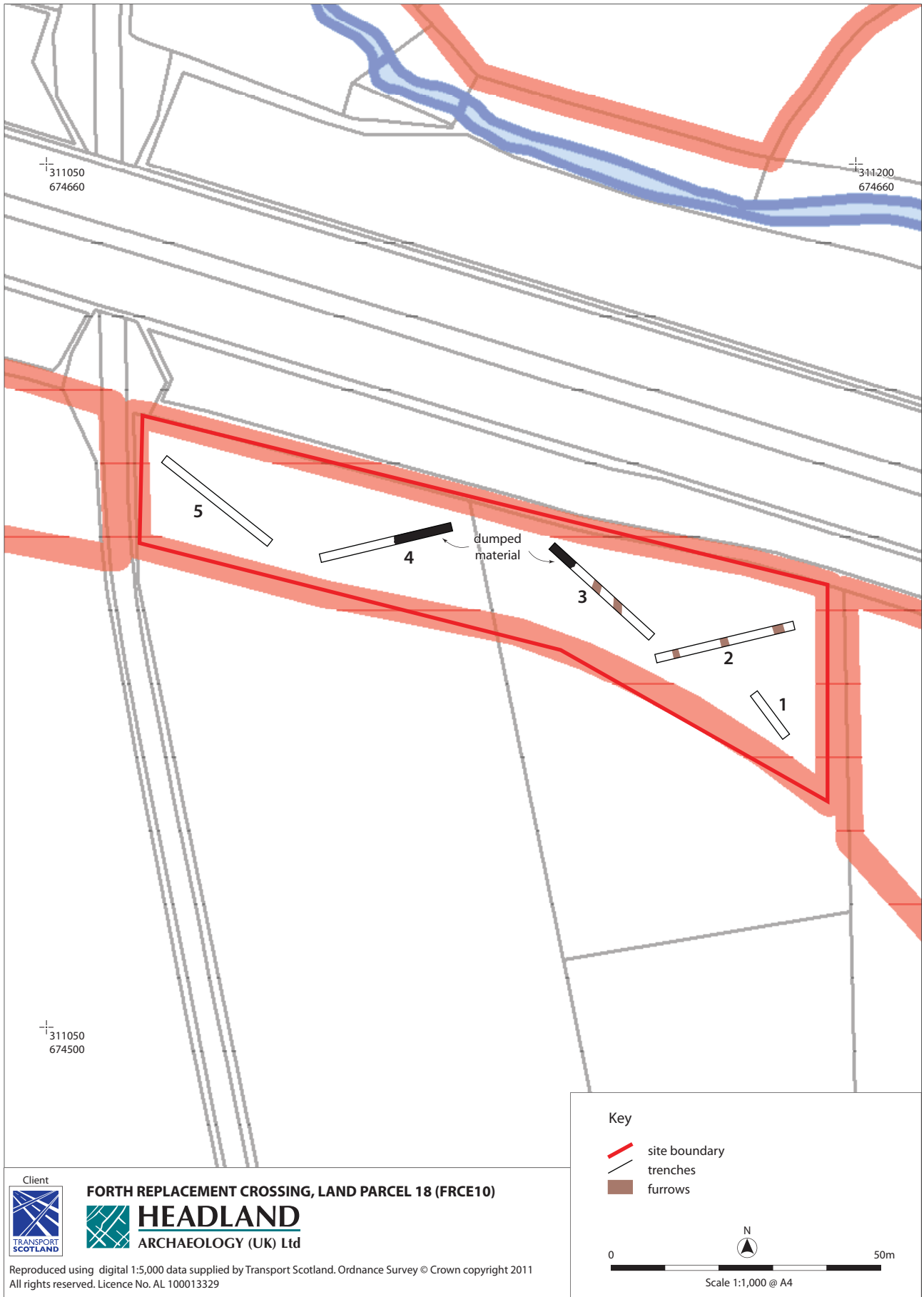
Appendix 4: Photographic Register

Photo No.	Direction facing	Description
314	SE	Trench 1. General
315		ID SHOT
316	NE	Trench 2. General
317	S	Trench 2. Drain (rubble, west end of trench
318	N	Trench 2. Furrow and section, centre of trench
319	S	Trench 2. Furrow and rubble drain, east end of trench
320	SE	Trench 3. General
321	N	Trench 3. Furrow/rubbish pit, south-facing section
322	W	Trench 4. General
323	S	Trench 4. Pit, north-facing section
324	SE	Trench 4. Pit, north-facing section
325	NW	Trench 5. General



Kirkliston
Edinburgh
Lothian





© Headland Archaeology (UK) Ltd



FORTH REPLACEMENT CROSSING, LAND PARCEL 18 (FRCE10)

HEADLAND
ARCHAEOLOGY (UK) Ltd

Reproduced using digital 1:5,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011
All rights reserved. Licence No. AL 100013329

Illus 2
Trench plan

Project code: FRCE10
Client: Transport Scotland
Date: May 2011

The Results of an Archaeological Field Evaluation by Trial Trenching and Archaeological Excavation near Overton Farm, Kirkliston (Land Parcel 19)

Archaeological Consultant: Jacobs Arup
Report Authors: Jamie Humble
Report Status: Approved



Executive Summary

Headland Archaeology conducted an archaeological evaluation by trial trenching near Overton Farm, Kirkliston (Land Parcel 19), NGR: NT 13345 74322 (centred), to assess the presence/absence of archaeological features 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.

Eleven trenches with a total area of 1700 m² were excavated between the 28th March and the 13th of April 2011 comprising a 5% sample of Land Parcel 19. The trial trenching revealed a curvilinear ditch around which a larger area (311 m²) was opened to reveal its full extent. This was revealed to be small feature is of post-medieval date and may reflect small-scale agricultural or industrial activity. Evidence of post-medieval agricultural activity on site was revealed in the form of furrows and a drainage ditch. No other features of archaeological interest were encountered.

ARCHAEOLOGICAL EVALUATION
Forth Replacement Crossing: Land Parcel 19, Overton near Kirkliston

PROJECT SUMMARY SHEET (FRCE10)

<i>Client</i>	Transport Scotland
<i>Consultant</i>	Jacobs Arup
<i>National Grid Reference</i>	NT 13345 74322
<i>Project Manager</i>	Edward Bailey
<i>Text</i>	Jamie Humble
<i>Illustrations</i>	Julia Bastek
<i>Evaluation Team</i>	Samira Ben Mohammed Clare Delahunty Kirsty Dingwall Jamie Humble Emma Searle Don Wilson
<i>Schedule</i>	
Fieldwork	29 th March to 13 th April 2011
Report	June 2011

CONTENTS

1	Introduction	387
	1.1 <i>General</i>	387
	1.2 <i>Project Background</i>	387
	1.3 <i>Aims and Objectives of the Archaeological Works</i>	387
2	Site Background	388
	2.1 <i>Archaeological and Historical Background</i>	388
	2.2 <i>Site Topography and Land Use</i>	389
	2.3 <i>Site Geology</i>	389
3	Methodology	389
4	Results of Fieldwork	390
	4.1 <i>Trial Trenching</i>	390
5	Palaeoenvironmental report	391
	5.1 <i>Plant Remains</i>	391
	5.2 <i>Other Finds</i>	391
	5.3 <i>Discussion</i>	391
	5.4 <i>Recommendations</i>	391
6	Conclusions	392
7	References	393
	7.1 <i>Bibliographic References</i>	393
	7.2 <i>Cartographic references</i>	393
8	Appendices	394
	<i>Appendix 1: Trench Register</i>	394
	<i>Appendix 2: Context Register</i>	395
	<i>Appendix 3: Trench Matrices</i>	397
	<i>Appendix 4: Photographic Register</i>	399
	<i>Appendix 5: Sample Register</i>	400
	<i>Appendix 6: Retent sample results</i>	401
	<i>Appendix 7: Flotation sample results</i>	401
	Illustrations	402

1 Introduction

1.1 General

1.1.1 This Data Structure Report is submitted as a report on a programme of archaeological trial trenching and excavation 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 8th and the 14th March 2011, Headland Archaeology (UK) Ltd. undertook a programme of archaeological evaluation by trial trenching and excavation on Land Parcel 19 in advance of the M9 Junction 1a improvements for the FRC (Illus 1). The project was managed by Edward Bailey (Project Manager), the fieldwork and reporting was overseen by Jamie Humble (Project Officer). Five additional staff assisted during the fieldwork.

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;
- 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.

1.3.2 Following the results of the evaluation the objectives of the excavations were to:

- Clarify the nature, character and extent of the features identified during the evaluation and obtain a plan of any additional features identified during the excavation.
- Identify any structures or activity areas and the date and duration of any settlement remains
- Obtain artefactual and environmental evidence for the purposes of dating and interpretation of the site

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 Within the vicinity of the of the M9 Junction 1a improvements (Illus 1) prehistoric activity has been recorded in the form of a Late Bronze Age socketed axe found near Kirkliston. Latterly there are written records from 1513 that refer to a Kirliston House acquired by the Commandery of Torphichen although the exact location of the house is not recorded. Based on the coordinates provided by the Royal Commission on the Ancient and Historic Monuments of Scotland both these sites are located within 1 km of Land Parcel 21 (approximately 250 m south-east of Land Parcel 19) and indicate the potential for prehistoric and medieval settlement in the area.

2.2 *Site Topography and Land Use*

2.2.1 Land Parcel 19 comprised the northern edge of a field that sloped gently from the southeast to the north-west. The northern edge of the land parcel was defined by the M9 with the large loop of Junction 1a projecting southwards into the land parcel. The southern edge of Land Parcel 19 was defined by the limit of the land take. The field was under young crop at the time of the evaluation. The site is under the ownership of C E MacLachlan.

2.3 *Site Geology*

2.3.1 The results of geotechnical investigations (Jacobs Arup 2009b) carried out demonstrate that the subsurface stratigraphy generally constitutes glacial till deposits of varying thickness; these are predominantly comprised firm to very stiff boulder clay deposits with occasional granular till deposits. The trial trenching (below) identified a band of bedrock within Trench 4.

2.3.1 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 33,161 m², of which a 5% sample (1700 m²) was investigated 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. Following the discovery of features within Trench 11 a further area totalling 311 m² was stripped to expose the full extent of these features.

3.2 All trenches were individually numbered and a pole-mounted Trimble G6 differential GPS programmed with the relevant coordinates was utilised to identify and mark out the locations of trenches. The trenches were excavated using a single 13 ton 360° tracked mechanical excavator, fitted with a 2 m wide flat-bladed ditching bucket, with the additional area excavated by a JCB fitted with a 1.6 m wide flat-bladed ditching bucket. Both machines 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. 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.

3.3 Bulk soil samples were collected from secure archaeological contexts for processing and assessment. Where possible a minimum 30-litre sample was collected from each

archaeological deposit and given a unique number (Transport Scotland 2010, 59). Samples were processed in laboratory conditions using a standard floatation method (cf. Kenward *et al* 1980). All plant macrofossil samples were analysed using a stereomicroscope at magnifications of x10 and up to x100 where necessary to aid identification. Identifications were confirmed using modern reference material and seed atlases including Cappers *et al* (2006).

- 3.4 All finds were recorded by individual context and their cleaning, storage and conservation undertaken in accordance with the Institute for Archaeologists Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials (Transport Scotland 2010, 65-66).

4 Results of Fieldwork (Illus 2 & 3)

4.1 Trial Trenching and Excavation

- 4.1.1 Eleven trenches were excavated across Land Parcel 19 (Illus 2) with a combined total area of 1700 m². Full detailed descriptions of each trench and individual contexts can be found in the Appendix 1 and Appendix 2. Results are summarised below.

- 4.1.2 The natural geology seen in the trenches was largely orange grey clay [022], although outcropping of limestone bedrocks was seen within Trench 4. In general this was overlain by between 0.10 m and 0.20 m of subsoil or interface material – orangey brown sandy silt [020]. Topsoil [019] was between 0.30 m and 0.50 m deep and contained frequent recent ceramic material.

- 4.1.3 Colluvial deposits were identified in two trenches (Trenches 4 & 5) and were up to 0.90 m in depth, comprising mid brown silty clay [021]. This material appeared to have filled in a slight hollow on gently sloping ground, and was removed to ensure that no possible features were masked by the material.

- 4.1.4 Archaeological features were found in four trenches (Trenches 5, 7, 10 & 11).

- 4.1.5 Along the western edge of Trench 10 a section of shallow curvilinear ditch was identified [017]. After initial investigation within the evaluation trench a larger area around this feature was stripped to reveal its full extent and any associated features. No further features were identified within the stripped area. Curvilinear ditch [017] was 4.52 m long by 0.34 m wide and up to 0.06 m deep with gently sloping sides and a concave base. It was filled with a homogenous brownish grey compact silty clay [018] within which were occasional large stones that may have been post packing; however the heavily truncated nature of the feature made this difficult to be certain. The shallow truncated nature of the feature also meant it was not possible to establish whether the terminals of the feature were real or an artefact of the truncation. If this was the case then it is possible the feature represented one side of a circular structure with a possible diameter of between 4.50 m and 5.00 m.

- 4.1.6 Furrows [001, 003, 005, 007, 009, 011 & 013] were identified in Trenches 5, 7 and 11. In Trenches 5 and 7 only one or two furrows were seen, rather than the furrows extending across the whole area. Within Trench 11 furrows were present across the

entire length of the trench. The furrows were between 0.80m and 2.00 m wide, and up to 0.27 m in depth. They had shallow sloping sides and were filled with compact brown grey silty clay [002, 004, 006, 008, 010, 012 & 014] respectively. The furrows seen in Trenches 5 and 11 ran approximately north-west to south-east while the furrow in Trench 7 ran north-east to south-west. Within Trench 11 a section of ditch [015] on the same north-west to south-east alignment as the furrows was identified. Ditch [015] was 1.12 m wide and 0.21 m deep with shallow sloping sides and a rounded base. The fill [016] was dark grey silty clay containing frequent large stones within which pieces of modern pottery and glass were found.

5 Palaeoenvironmental Report

Sarah-Jane Haston

5.1 *Plant remains*

5.1.1 Two samples were taken from Ditch [017]. The results of the sample processing are provided in Tables 1 (Retent finds, Appendix 6) and 2 (Flootation finds, Appendix 7). Suitable material for AMS dating is also identified within each table. All plant remains were preserved through charring.

5.1.2 The concentration of archaeological remains recovered from the samples was very low and only amounted to small quantities of wood charcoal and the occasional charred weed seed.

5.1.3 Wood charcoal was recovered from both of the samples; however, this was present only in very small quantities and all of the charcoal fragments were less than 1 cm in diameter. The quantity and size of the charcoal recovered is not suitable for identification and/or Accelerated Mass Spectrometry AMS dating. The small sizes of the fragments suggest that they may have been become incorporated in the sampled deposits by mechanisms such as windblow and surface run-off rather than being a result of deliberate or accidental deposition.

5.1.4 A single charred weed seed of downy-hemp nettle (*Galeopsis segetum*) was recovered in Sample 1 and is commonly found on arable field margins and disturbed ground. The origin of the single carbonised weed seed is uncertain and does not warrant further study.

5.2 *Other finds*

5.2.1 Other finds present include a sherd of post-medieval pottery (late 18th to 20th century, Julie Framnklin pers comm.), a fragment of brick and a small amount of magnetic residue in Sample 1. The small amount of magnetic residue may offer evidence for small scale industrial activities taking place within the immediate area. Two small fragments of burnt mammal bone were also recovered in Sample 1. Low concentrations of coal and cinders were recovered from both of the samples indicating that coal was being utilised in the area as a source of fuel. This was not retained for further analysis.

5.3 *Discussion*

5.3.1 The collective assemblage from the ditch deposit is indicative of the re-working and re-depositing of domestic/industrial material.

5.4 *Recommendations*

5.4.1 No further work on the palaeoenvironmental remains is recommended.

6 **Conclusions**

6.1 The evaluation has established that this area appears not to have been extensively used for human activity. At the very north-west of the land parcel a single feature [017] was identified containing finds evidence dating to the post-medieval period. It is hard to say what the ditch represents due to its shallow truncated nature however it is likely that it is a bedding slot trench for a small wall forming one side of an oval or circular structure. This feature probably represents small-scale agricultural or industrial activity on the site and is may be associated with other post-medieval activity identified on site.

6.2.1 The only other features identified relate to post-medieval agricultural activity in the area, with a few surviving agricultural furrows running across the site on a north-west to south-east or north-east to south-west alignment. The rubble filled ditch [015] was on a similar alignment to the furrows in Trench 11 suggesting that these features are probably contemporary. 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.

6.2.2 Based on the results of the archaeological trial trenching and excavation and subsequent post-excavation assessment the archaeological archive is assessed as having no further potential and therefore no additional works are recommended.

7 References

7.1 Bibliographic References

Cappers, R T J, Bekker, R M and Jans, J E A 2006 *Digital seed atlas of the Netherlands*. Barkhuis Publishing and Groningen University Library, Groningen.

Clapham, A R, Tutin, T G and Warburg, E F 1962 *Flora of the British Isles (2nd Edition)*. Cambridge University Press, Cambridge.

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.

Kenward, H K, Hall, A R and Jones, A K G 1980 'A tested set of techniques for the extraction of plant and animal macrofossils from waterlogged archaeological deposits', *Science and Archaeology* 22, 3-15.

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*.

8 Appendices

Appendix 1: Trench Register

Trench No	Length (m)	Depth (m)	Description
1	30	0.3	Oriented E-W, no features.
2	100	0.4	Oriented NW-SE, no features.
3	20	0.4	Oriented SW-NE, no features.
4	100	0.4	Oriented SE-NW, no features.
5	100	0.8	Oriented NE-SW, furrows [001 & 003] run NW-SE across trench.
6	100	0.4	Oriented E-W, no features.
7	100	0.4	Oriented NW-SE, furrow [005] runs N-S across trench.
8	100	0.35	Oriented NE-SW, no features.
9	50	0.5	Oriented N-S, no features.
10	100	0.5	Oriented N-S, curvilinear feature [017] runs for 5.5m along western edge of trench. Where [017] runs into trench edge the trench was extended E-W for 2m.
11	50	0.4	Oriented E-W, furrows [007, 009, 011 & 013] run NW-SE across trench. Drainage ditch [015] runs for 1.9m NW-SE across trench before terminating.

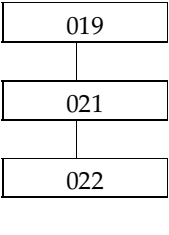
Appendix 2: Context Register

Context No.	Trench	Description
1	5	Cut of furrow. Linear in plan, oriented NW-SE, with gently sloping sides flat base and gradual breaks of slope. Measures 2.00 m by 0.78 m and 0.12 m deep.
2	5	Fill of [001]. Mid brown compact silty clay with frequent small stones.
3	5	Cut of furrow. Linear in plan, oriented NW-SE, with gently sloping sides, rounded base and gradual break of slope. Measures 2 m by 1.26 m and 0.27 m deep.
4	5	Fill of [003]. Dark brown grey compact silty clay with occasional small stones.
5	7	Cut of furrow. Linear in plan, oriented N-S, with gently sloping sides, flat base and gradual break of slope. Measures 0.96 m wide and 0.09 m deep.
6	7	Fill of [005]. Yellow brown compact silty clay with occasional small stones.
7	11	Cut of furrow. Linear in plan, oriented NW-SE, with gently sloping sides rounded base and gradual break of slope. Measures 1.22 m wide by 0.06 m deep.
8	11	Fill of [007]. Brownish grey compact silty clay with occasional small stones.
9	11	Cut of furrow, linear in plan oriented NW-SE, with gently sloping sides rounded base and gradual break of slope. Measures 1.58 m wide by 0.11 m deep.
10	11	Fill of [009]. Brownish grey compact silty clay with occasional small stones.
11	11	Cut of furrow. Linear in plan, oriented NW-SE with gently sloping sides flat base and gradual breaks of slope. Measures 2.04 m wide by 0.13 m deep.
12	11	Fill of [011]. Dark brownish grey compact silty clay with occasional small stones.
13	11	Cut of furrow. Linear in plan, oriented NW-SE with gently sloping sides rounded base and gradual breaks of slope. Measures 1.22 m wide and 0.06m deep.
14	11	Fill of [013]. Dark grey compact silty clay with occasional small stones.
15	11	Cut of drainage ditch. Linear in plan, oriented NW-SE with gently sloping sides rounded base and gradual breaks of slope. Ran for 1.9 m from N of trench before terminating, 1.12 m wide and 0.21 m deep.
16	11	Fill of [015]. Dark grey compact clayey silt with frequent large stone.
17	10	Cut of curvilinear ditch. Curvilinear in plan with gently sloping sides rounded base and sharp breaks of slope. Extends for 4.52 m along western edge of trench, 0.34 m wide and 0.06 m deep.

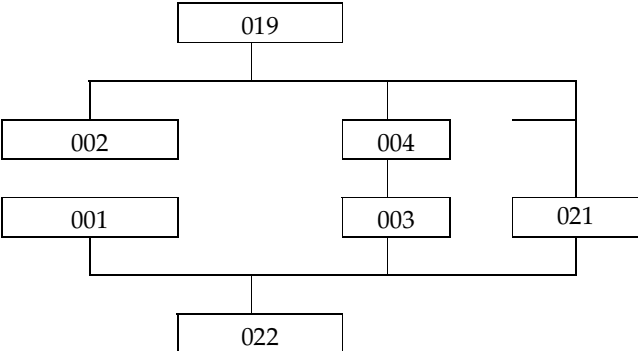
18	10	Fill of [017]. Brownish grey compact silty clay with occasional small stones and rare large stones that may represent post packing within the feature.
19	All	Topsoil. Dark greyish brown sandy silt loam, 0.3 – 0.5 m.
20	All	Subsoil. Orange brown sandy silt, 0.1 – 0.2 m.
21	4 & 5	Colluvium. Mid brown sandy silt, 0 – 0.9 m.
22	All	Natural. Orange – grey clay.

Appendix 3: Trench Matrices

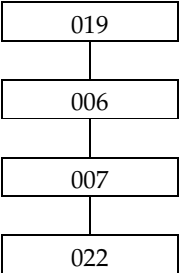
Trench 4



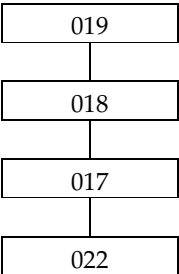
Trench 5



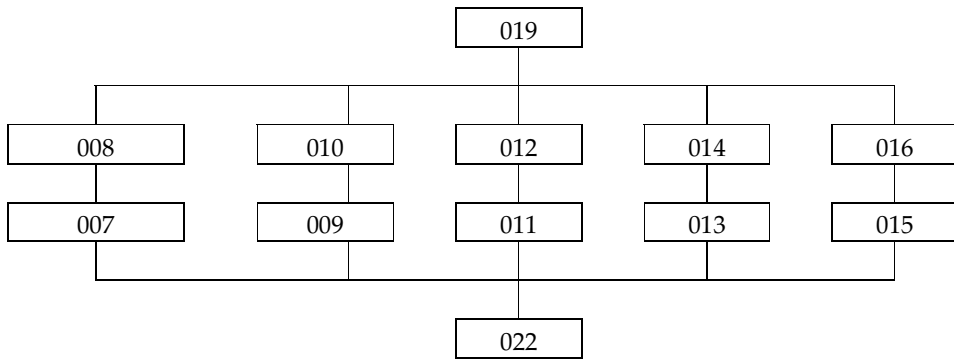
Trench 7



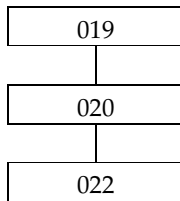
Trench 10



Trench 11



**Other
trenches**



Appendix 4: Photographic Register

Photo No.	Direction facing	Description
1	E	LP19 trench 1
2	E	LP19 trench 2
3	NE	LP19 trench 3
4	SE	LP19 trench 4
5	NW	Furrow [001] trench 5
6	SE	W facing section through [001]
7	W	E facing section of furrow [003] trench 5
8	NE	LP19 trench 5
9	W	LP19 trench 6
10	NW	LP19 trench 7
11	SW	NE facing section through furrow [005] trench 7
12	SW	Detail of furrow [005]
13	W	LP19 trench 8
14	NW	E facing section through furrow [003]
15	SE	W facing section through furrow [003]
16	S	General view of [003]
17	N	LP19 trench 9
18	W	General view of [017] trench 10
19	W	S facing section of [007]
20	N	S facing section of ditch [015]
21		Registration
22	S	N facing section of [009]
23	NE	SW facing section of [017]
24	NW	SE facing section of [017]
25	N	S facing section of furrow [013]
26	E	LP19 trench 11
27	SE	LP19 trench 10
28	S	N facing section of furrow [011]
29	NW	Pre-ex shot of curvilinear ditch [017] - wide view
30	NW	Pre-ex shot of curvilinear ditch [017] - detail
31	S	Pre-ex shot of curvilinear ditch [017] - wide view
32	S	Pre-ex shot of curvilinear ditch [017] - wide view
33	SW	Pre-ex shot of curvilinear ditch [017] - wide view
34	N	Post-hole with curvilinear ditch [017]
35	W	E-facing section through S terminus of curvilinear ditch [017]
36	S	N-facing section through N terminus of curvilinear ditch [017]
37	NW	W-facing half-section of stone-hole
38	NW	Post-ex shot of curvilinear ditch [017]
39	W	Post-ex shot of curvilinear ditch [017]

Appendix 5: Sample Register

Sample No.	Context No.	Description
001	018	Fill of curvilinear feature [017]
002	018	Fill of Curvilinear feature [017]

Appendix 6: Retent sample results

Table 1: FRCE10 LP19: Retent Sample Results

Context Number	Sample Number	Sample Vol (l)	Ceramic		Industrial Waste	Burnt bone	Material available for AMS Dating	Cinders	Coal
			Pottery	CBM					
			Medi-PM	Brick	Mag res	Mammal			
18	1	20	+	+	+	+	-	+	
18	2	30					-		+

Key: + = rare, ++ = occasional, +++ = common and ++++ = abundant
NB charcoal over 1cm is suitable for identification and AMS dating

Appendix 7: Flotation sample results

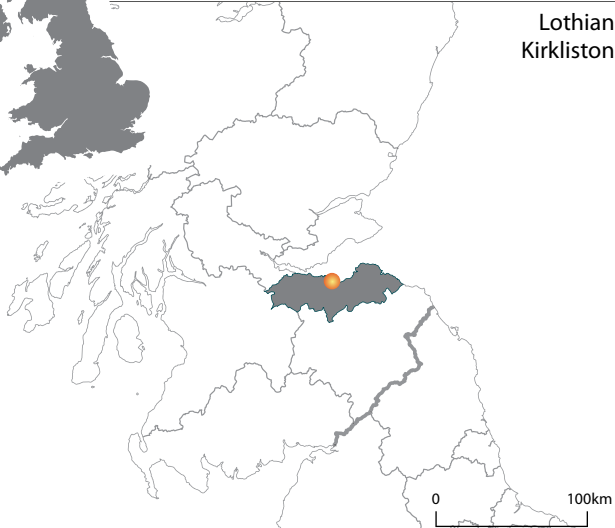
Table 2: FRCE10 LP19 Flotation Sample Results

Context Number	Sample Number	Feature	Total flot Vol (ml)	Charred plant remains	Charcoal Quantity	Charcoal Max size (cm)	Material available for AMS
18	1		10	<i>Galaeopsis segetum</i> +	+	<0.5	-
18	2		20		++	0.6	-

Key: + = rare, ++ = occasional, +++ = common and ++++ = abundant
NB charcoal over 1cm is suitable for identification and AMS dating



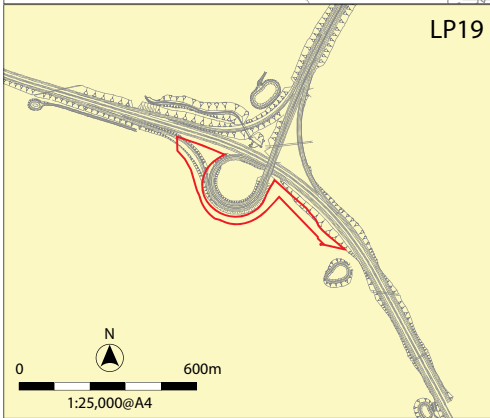
Lothian
Kirkliston



0 100km

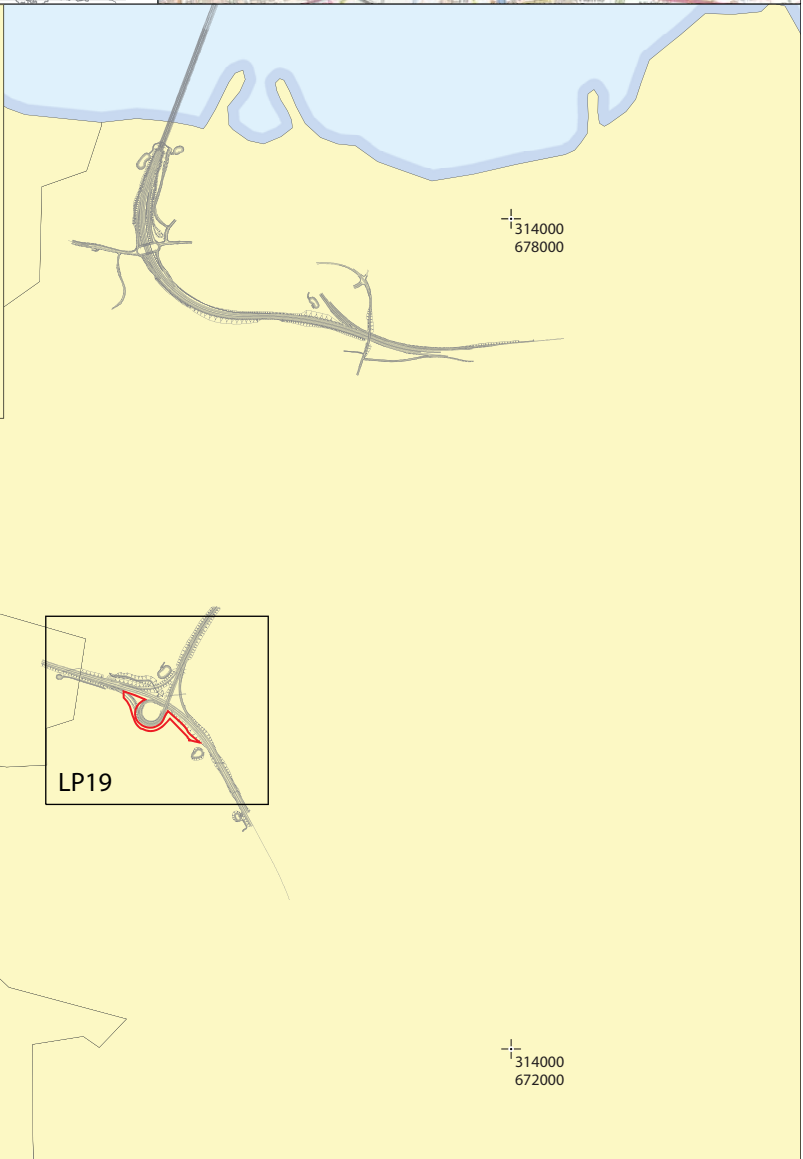


0 3km
1:100,000@A4

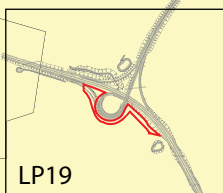


LP19

0 600m
1:25,000@A4



314000
678000



LP19

309000
672000

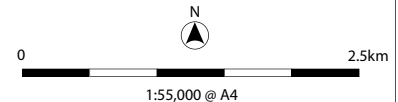
314000
672000



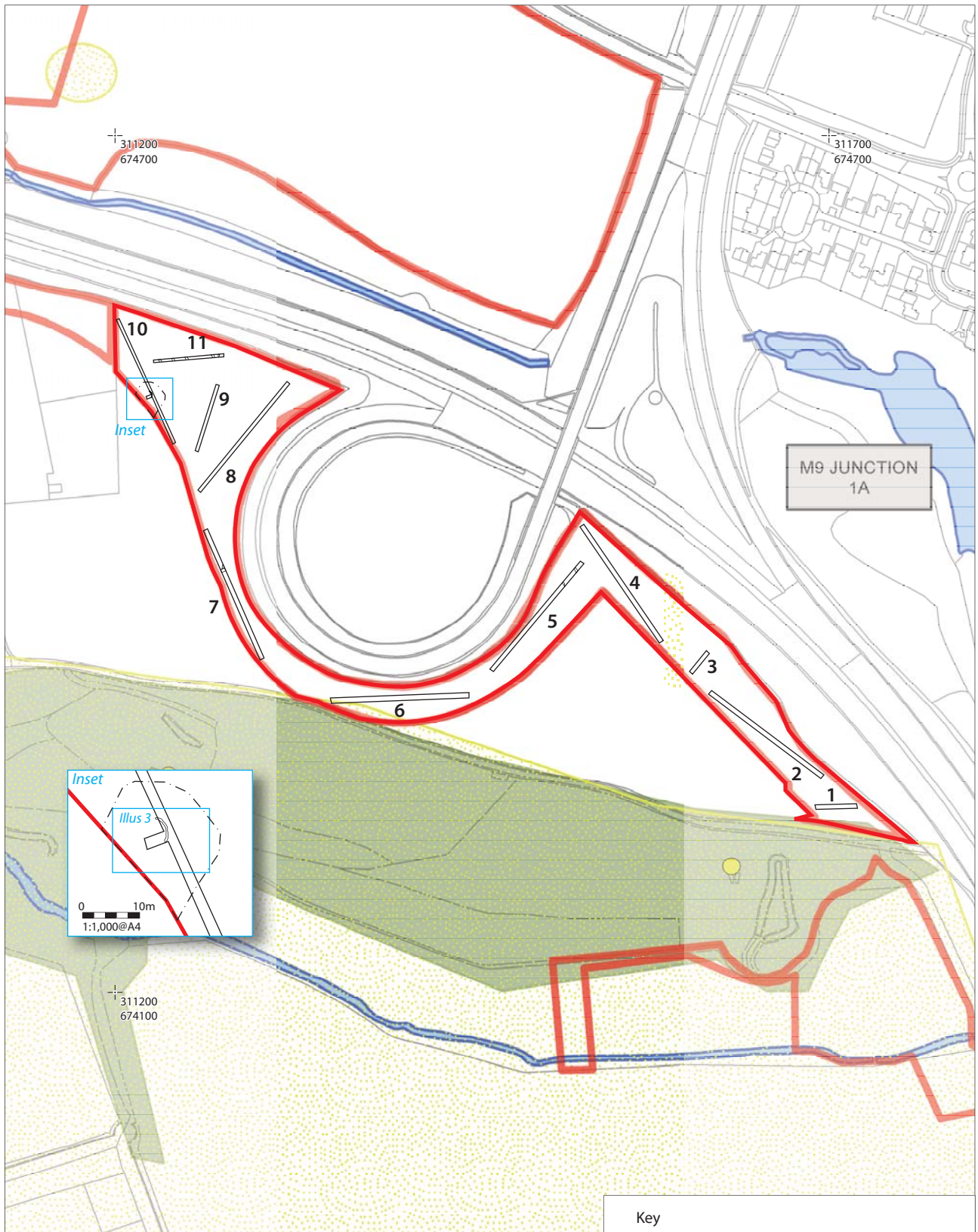
HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LAND PARCEL 19 (FRCE10)

Reproduced using 2007 OS 1:50,000 Landranger No. 65 and digital 1:10,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011 All rights reserved. Licence No. AL 100013329



1:55,000 @ A4



© Headland Archaeology (UK) Ltd



Client
FORTH REPLACEMENT CROSSING, LAND PARCEL 19 (FRCE10)



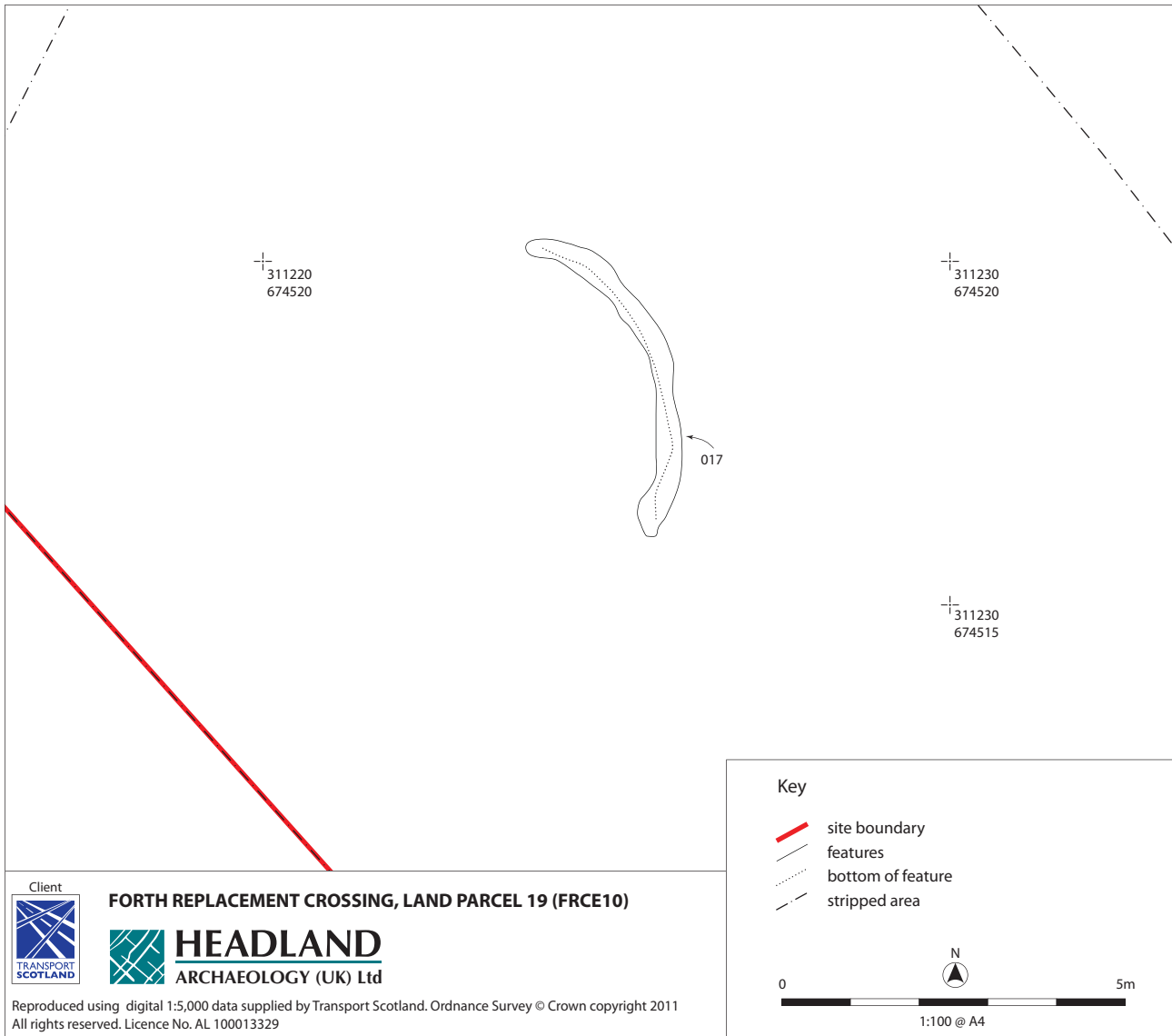
Reproduced using digital 1:5,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011
All rights reserved. Licence No. AL 100013329

Key

- site boundary
- trenches
- stripped area



Illus 2
Trench plan



Illus 3

Detail of curvilinear ditch within trench 10

Project code: FRCE10
Client: Transport Scotland
Date: 29th March 2011

The Results of an Archaeological Field Evaluation by Trial Trenching at Milrig Farm (Land Parcel 20), near Kirkliston

Archaeological Consultant: Jacobs Arup
Report Authors: Elizabeth Jones
Report Status: Approved



Executive Summary

Headland Archaeology conducted an archaeological evaluation by trial trenching on the Forth Replacement Crossing at Milrig Farm (Land Parcel 20), NGR: NT 11739 74106 (centred). The aim of the evaluation was to establish the presence or absence of archaeological remains or deposits and to record the nature, character and extent of any remains or deposits encountered. The work was commissioned by Transport Scotland, managed by Jacobs Arup and undertaken in advance of the proposed commencement of construction works.

Twelve trenches totalling 940m² comprising a 5% sample were excavated across two fields either side of Niddry Burn. The field to the south of the burn had been recently ploughed; to the north of the burn was rough pasture, sloping downhill from woodland at Lindsay's Crag. A line of large rounded stones was found in one of the trenches towards the base of the slope, running east to west. This corresponds with the line of a former bank of the burn, which is clearly visible as a landscape feature further to the east. No walls are shown on any of the early Ordnance Survey maps of the area in this location and it is concluded that the stones represent the edge of the former course of the burn and have been naturally deposited. With the exception of field drains, no archaeological remains or deposits were identified during the evaluation.

ARCHAEOLOGICAL EVALUATION
Forth Replacement Crossing: Land Parcel 20, near Kirkliston

PROJECT SUMMARY SHEET (FRCE10)

<i>Client</i>	Transport Scotland
<i>Consultant</i>	Jacobs Arup
<i>National Grid Reference</i>	NT 1171 7409
<i>Project Manager</i>	Edward Bailey
<i>Senior Archaeologist</i>	Kirsty Dingwall
<i>Text</i>	Elizabeth Jones
<i>Illustrations</i>	Julia Bastek
<i>Evaluation Team</i>	Don Wilson Elizabeth Jones Emma Searle
<i>Schedule</i>	
Fieldwork	25 th – 29 th March 2011
Report	April 2011

CONTENTS

1	Introduction	409
	1.1 <i>General</i>	409
	1.2 <i>Project Background</i>	409
	1.3 <i>Aims and Objectives of the Archaeological Works</i>	409
2	Site Background	410
	2.1 <i>Archaeological and Historical Background</i>	410
	2.2 <i>Site Topography and Land Use</i>	410
	2.3 <i>Site Geology</i>	410
3	Methodology	411
4	Results of Fieldwork	411
	4.1 <i>Trial Trenching</i>	411
5	Conclusions	412
6	References	413
	6.1 <i>Bibliographic References</i>	413
	6.2 <i>Cartographic references</i>	413
7	Appendices	414
	<i>Appendix 1: Trench Register</i>	414
	<i>Appendix 2: Context Register</i>	414
	<i>Appendix 3: Trench Matrices</i>	415
	<i>Appendix 4: Photographic Register</i>	415
	Illustrations	416

1 Introduction

1.1 General

1.1.1 This Draft Data Structure Report reports on a programme of archaeological investigation 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 2009a) wherein a programme of trial trenching was recommended. The report was initially submitted to Jacobs Arup and Transport Scotland.

1.1.2 Between the 25th and 29th March 2011, Headland Archaeology (UK) Ltd. undertook a programme of archaeological evaluation by trial trenching on Land Parcel 22 in advance of the M9 Junction 1a improvements for the FRC (Illus 1). The project was managed by Edward Bailey (Project Manager), the fieldwork and reporting was overseen by Elizabeth Jones. Three further staff assisted during the fieldwork.

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 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 Within the vicinity of the of the M9 Junction 1a improvements (Illus 1) prehistoric activity has been recorded in the form of a Late Bronze Age socketed axe found near Kirkliston. Latterly there are written records from 1513 that refer to a Kirkliston House acquired by the Commandery of Torphichen although the exact location of the house is not recorded. Based on the coordinates provided by the Royal Commission on the Ancient and Historic Monuments of Scotland both these sites are located within 1 km of Land Parcel 21 (approximately 100 m south-east of Land Parcel 20) and indicate the potential for prehistoric and medieval settlement in the area.

2.2 *Site Topography and Land Use (Illus 1)*

2.2.1 The site was located to the south-west of the village of Kirkliston, to the west of the M9. It was bounded by the woodland of Lindsay's Craggs to the north and a farm track to the east. The Niddry Burn ran across the southern part of the site. The majority of the site was on south facing sloping grassland, with an area of flatter ground at the base of the slope. On the south side of the burn was a recently ploughed field; only two trenches were located in this field. The site is under the ownership of C E Maclachlan.

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.

- 2.3.1 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 18,916 m², of which a 5% sample (940 m²) was investigated 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.

- 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 JCB back actor fitted with a 1.6 m 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 encountered 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 Twelve trenches were excavated across Land Parcel 20 (Illus 2) with a combined total area of 940 m² 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 In general the natural geology [004] comprised an orange brown – grey sandy clay and gravel, with occasional outcrops of bedrock however at the base of the slope the natural geology [004] comprised greyish brown clayey silt, derived from flooding of the Niddry Burn to the south. The deposits in trenches 1, 2, 9 and 12 comprised 0.30 – 0.60m of topsoil [001], overlying 0.00 – 0.40m of subsoil [002] a reddish brown silty clay, overlying natural [004]. The deposits in the remaining trenches comprised an average of 0.30m of topsoil [001], overlying natural [004]. The topsoil [001] contained occasional fragments of recent ceramic material, which was not collected.

- 4.1.3 At the south end of Trench 12 was a deposit of poorly sorted large angular stones [003], 1.50 m wide set into the natural. The stones lay 0.40 m below the surface in a rough line running east to west across the trench, around 20 m from the burn (Illus 3).
- 4.1.4 No archaeological remains or deposits were identified during the evaluation.
- 4.1.5 Rubble and ceramic field drains were encountered in Trenches 3, 6 and 8. These ran on both north-east to south-west and north-west to south-east alignments. A plastic drain was found in Trench 4 running north to south.

5 Conclusions

- 5.1 The line of large rounded stones in Trench 12 corresponds with the line of a former bank of the burn, which is clearly visible as a landscape feature further to the east. No walls are shown on the six-inch first edition Ordnance Survey map (1856) of the area in this location and it is concluded that the stones represent the edge of the former course of the burn and have been naturally deposited. With the exception of field drains, no archaeological remains or deposits were identified within the area evaluated.
- 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.

Ordnance Survey 1856 *Linlithgowshire*, Sheet 6, 1:10560. Surveyed 1854 – 5.

7 Appendices

Appendix 1: Trench Register

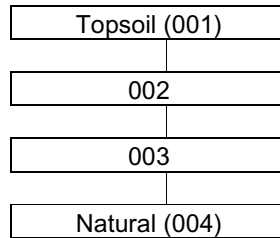
Trench	Dimensions (m)	Maximum depth (m)	Description
1	1.6 x 100	0.75	Excavated alongside eastern boundary of land parcel, running roughly north to south down slope. Accumulation of colluvium deposits towards base of slope.
2	1.6 x 50	0.90	Excavated alongside eastern edge of woodland, runs NE-SW. Deepest part at centre of trench.
3	1.6 x 50	0.55	Parallel to Trench 2, runs roughly NE-SW.
4	1.6 x 45	0.50	Excavated in ploughed field on S side of burn, runs NE-SW.
5	1.6 x 35	0.55	Excavated in ploughed field on S side of burn, runs NW-SE.
6	1.6 x 30	0.50	Excavated in centre of field, runs N-S, deepest at N end.
7	1.6 x 50	0.80	Runs E-W along base of slope, deepest at W end.
8	1.6 x 37	0.80	L-shaped trench, runs roughly NE-SW towards burn, deeper at base of slope.
9	1.6 x 60	0.95	Runs NE-SW towards base of slope on N side of burn. Bluish grey clayey silt natural at base of slope.
10	1.6 x 65	0.40	Runs E-W at top of slope alongside wall to woodland.
11	1.6 x 20	0.60	Runs NW-SE from western corner of land parcel.
12	1.6 x 45	0.90	Runs NE-SW towards burn, bluish grey clayey silt natural. Contains [001].

Appendix 2: Context Register

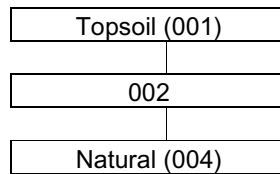
Context	Trench	Description
001	12	Dark greyish brown clayey silt. Topsoil, 0.3m deep.
002	12	Dark reddish brown silty clay. Subsoil, 0.3m deep.
003	12	Line of large angular stones, E-W across trench. Remains of former river bank.
004	12	Greyish brown clay – orange brown clay. Natural geology.

Appendix 3: Trench Matrices

Trench 12



Remaining Trenches

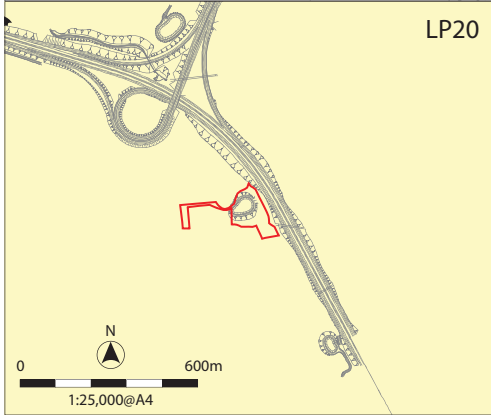
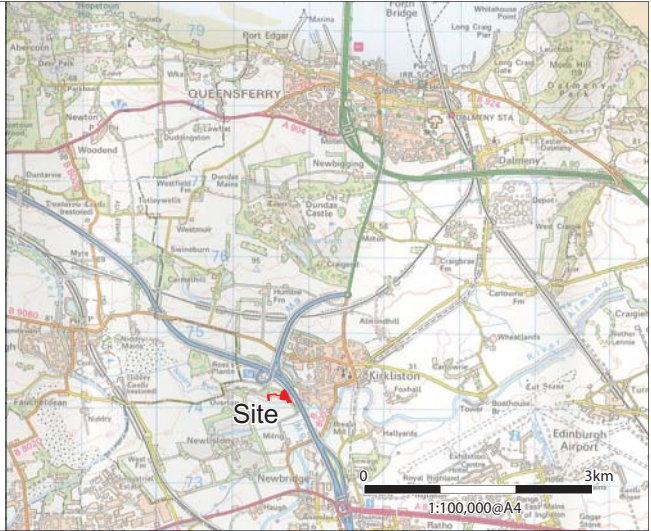
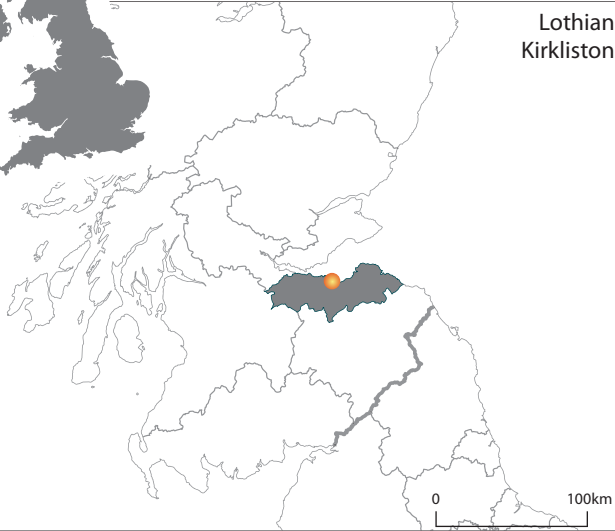


Appendix 4: Photographic Register

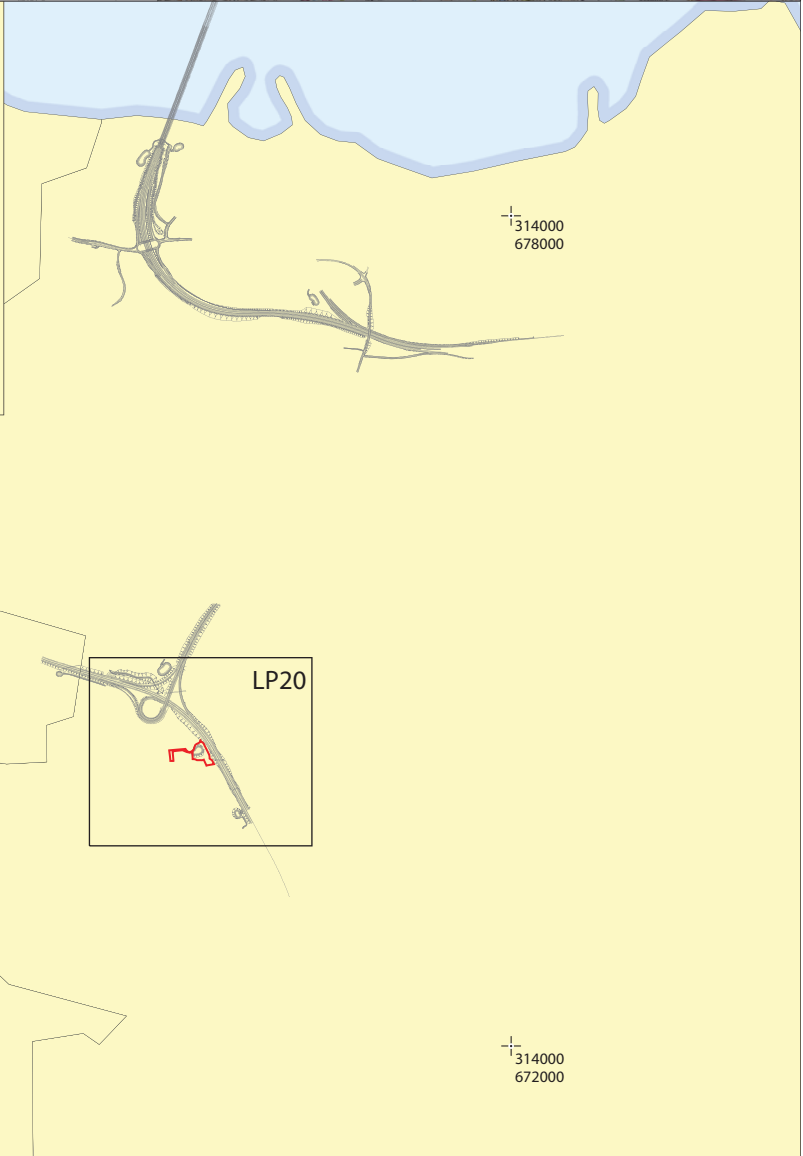
Photo	Direction	Description
7	SE	LP20 General shot of Trench 1
8	SW	LP20 General shot of Trench 2
9	SW	LP20 General shot of Trench 3
10	SW	LP20 General shot of Trench 4
11	E	LP20 Trench 4 – fixed field drain
12	SE	LP20 General shot of Trench 5
13	S	LP20 General shot of Trench 6
14	W	LP20 General shot of Trench 7
15	S	LP20 General shot of Trench 8 (30m stretch)
16	SW	LP20 General shot of Trench 8 (from 7m stretch)
17	NE	LP20 General shot of Trench 9
18	W	LP20 General shot of Trench 10
19	NNW	LP20 General shot of Trench 11
20	S	LP20 General shot of Trench 12
21	N	LP20 Trench 12 - Possible base of wall [003]
26	-	LP20 Trench 8 – repaired field drain



Lothian
Kirkliston



LP20



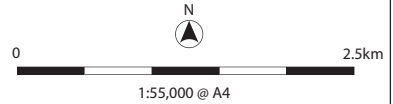
LP20

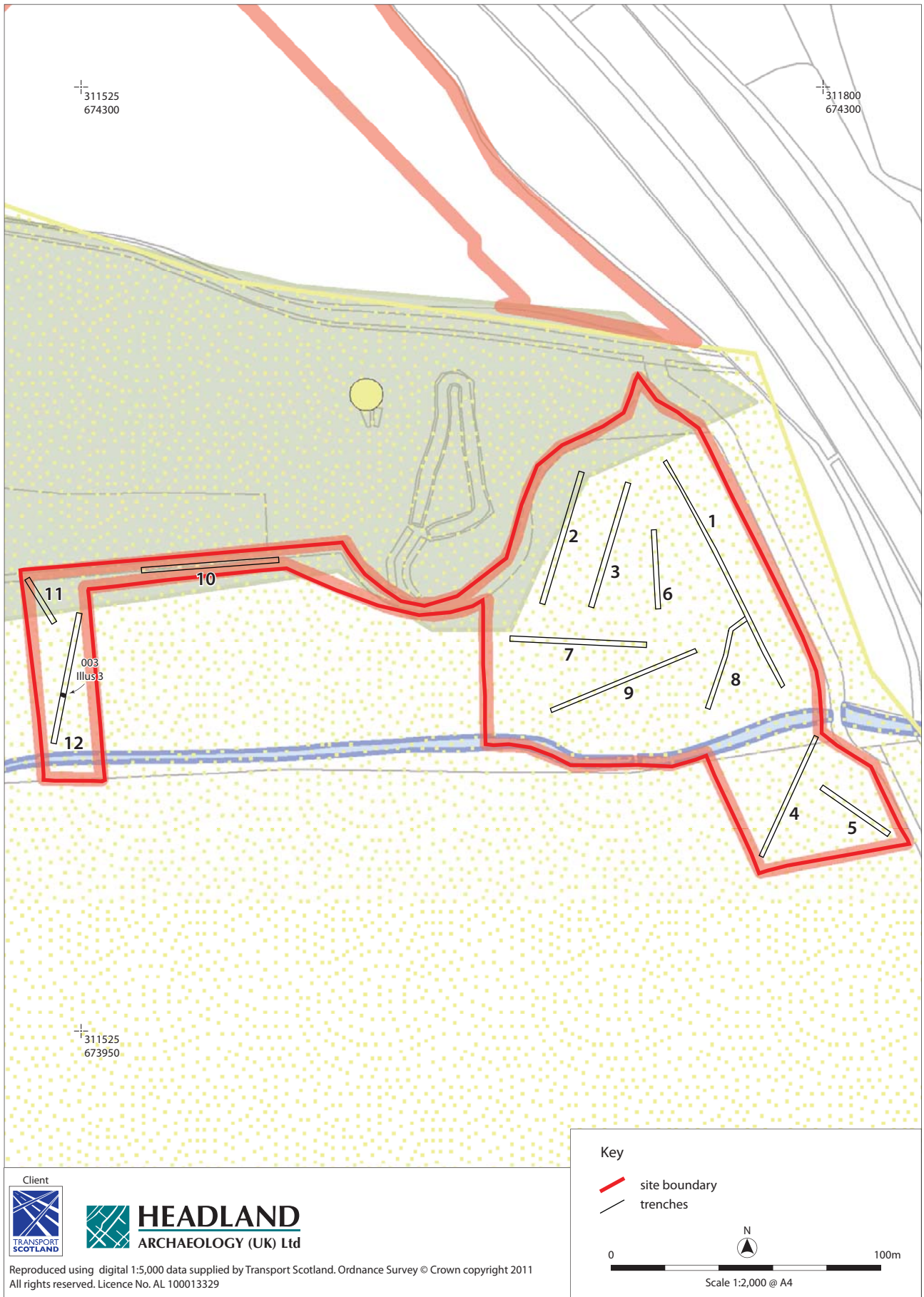


HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LAND PARCEL 20 (FRCE10)

Reproduced using 2007 OS 1:50,000 Landranger No. 65 and digital 1:10,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011 All rights reserved. Licence No. AL 100013329





© Headland Archaeology (UK) Ltd

Illus 2
Trench plan



Illus 3

Photo of stones [003] in Trench 12

Client



HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LP20 (FRCE10)

Project code: FRCE10
Client: Transport Scotland
Date: 5th April 2011

The Results of an Archaeological Field Evaluation by Trial Trenching at Land Parcel 21, near Kirkliston

Archaeological Consultant: Jacobs Arup
Report Authors: Elizabeth Jones
Report Status: Approved



Executive Summary

Headland Archaeology conducted an archaeological evaluation by trial trenching on the Forth Replacement Crossing at Land Parcel 21, near Kirkliston NGR: NT 11983 74026 (centred). The aim of the evaluation was to determine the presence or absence of archaeological remains or deposits and to record the nature, character and extent of any remains or deposits encountered. The work was commissioned by Transport Scotland, managed by Jacobs Arup and undertaken in advance of the proposed commencement of construction works.

Five trenches totalling 304m² comprising a 5% sample were excavated across the field, which had been recently ploughed. No archaeological remains or deposits were identified within the area evaluated.

ARCHAEOLOGICAL EVALUATION
Forth Replacement Crossing: Land Parcel 21, near Kirkliston

PROJECT SUMMARY SHEET (FRCE10)

<i>Client</i>	Transport Scotland
<i>Consultant</i>	Jacobs Arup
<i>National Grid Reference</i>	NT 1200 7398
<i>Project Manager</i>	Edward Bailey
<i>Senior Archaeologist</i>	Kirsty Dingwall
<i>Text</i>	Elizabeth Jones
<i>Illustrations</i>	Julia Bastek
<i>Evaluation Team</i>	Samira Ben Mohammed Jamie Humble Elizabeth Jones
<i>Schedule</i>	
Fieldwork	24 th – 25 th March 2011
Report	April 2011

CONTENTS

1	Introduction	423
	1.1 <i>General</i>	423
	1.2 <i>Project Background</i>	423
	1.3 <i>Aims and Objectives of the Archaeological Works</i>	423
2	Site Background	424
	2.1 <i>Archaeological and Historical Background</i>	424
	2.2 <i>Site Topography and Land Use</i>	424
	2.3 <i>Site Geology</i>	424
3	Methodology	425
4	Results of Fieldwork	425
	4.1 <i>Trial Trenching</i>	425
5	Conclusions	426
6	References	427
	6.1 <i>Bibliographic References</i>	427
	6.2 <i>Cartographic References</i>	427
7	Appendices	428
	<i>Appendix 1: Trench Register</i>	428
	<i>Appendix 2: Context Register</i>	428
	<i>Appendix 3: Trench Matrices</i>	428
	<i>Appendix 4: Photographic Register</i>	428
	Illustrations	429

1 Introduction

1.1 General

1.1.1 This draft Data Structure Report reports on a programme of archaeological investigation 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 a programme of trial trenching was recommended. The report was initially submitted to Jacobs Arup and Transport Scotland.

1.1.2 Between the 24th and 25th March 2011, Headland Archaeology (UK) Ltd. undertook a programme of archaeological evaluation by trial trenching on Land Parcel 21 in advance of the M9 Junction 1a improvements for the FRC (Illus 1). The project was managed by Edward Bailey (Project Manager), the fieldwork and reporting was overseen Elizabeth Jones. Three further staff assisted during the fieldwork.

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 cultural heritage component of the FRC EIA was largely completed in 2008. The purpose of the assessment 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. This would 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 Within the vicinity of the of the M9 Junction 1a improvements (Illus 1) prehistoric activity has been recorded in the form of a Late Bronze Age socketed axe found near Kirkliston. Latterly there are written records from 1513 that refer to a Kirliston House acquired by the Commandery of Torphichen although the exact location of the house is not recorded. Based on the coordinates provided by the Royal Commission on the Ancient and Historic Monuments of Scotland both these sites are located within 1 km of Land Parcel 21 and indicate the potential for prehistoric and medieval settlement in the area.

2.2 *Site Topography and Land Use (Illus 1)*

2.2.1 The site was located south of the village of Kirkliston and was bounded by Niddry Burn to the north-east, the M9 motorway to the north-west and fields to the south. At the time of the trial trenching the field had recently been ploughed. The site is under the ownership of C E Maclachlan.

2.3 *Site Geology*

2.3.1 The results of geotechnical investigations (Jacobs Arup 2009b) carried out demonstrate that the subsurface stratigraphy generally constitutes glacial till deposits of varying thickness; these are predominantly comprised firm to very stiff boulder clay deposits with occasional granular till deposits.

- 2.3.1 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 6013 m², of which a 5% sample (304 m²) was investigated by trial trenching. An indicative trench plan was agreed with the consultant archaeologists, Jacobs Arup. It was ensured that no trenches were placed close to overhead power lines running along the north-west of the site, parallel to the M9. As a result of the presence of the power lines and the location of Niddry Burn the locations of some of the trenches were moved from the original trench plan and an additional trench was excavated to complete the required area of trenching.
- 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 JCB back actor fitted with a 1.6 m 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 Five trenches were excavated across Land Parcel 21 (Illus 2) with a combined total area of 304 m² 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 the trenches was orange brown – grey clay and gravel [003], with outcrops of broken bedrock in places. The deposits in Trench 1 consisted of 0.30 – 0.40m of topsoil [001], overlying 0.20 – 0.30m of subsoil [002] a dark greyish brown clayey silt, overlying natural [003]. The deposits in Trenches 2 – 5 consisted of 0.30 – 0.40m of topsoil [001], overlying 0.10 – 0.20m of subsoil [002], overlying natural [003]. The topsoil [001] contained occasional fragments of modern ceramic material, which was not collected.
- 4.1.3 No archaeological remains or deposits were identified during the evaluation.

4.1.4 Ceramic field drains were encountered in Trenches 2 and 5.

5 Conclusions

5.1 The evaluation has established that there are no archaeological remains or deposits within the 5% sample evaluated of Land Parcel 21.

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	Dimensions (m)	Maximum depth (m)	Description
1	1.6 x 40	0.7	Runs E –W along S side of land parcel. Shortened at W end due to overhead lines.
2	1.6 x 50	0.6	Runs NW-SE along E edge of land parcel.
3	1.6 x 30	0.6	Runs NE-SW. Shortened at W end due to overhead lines.
4	1.6 x 50	0.5	Runs N-S along W edge of land parcel. Shortened at N end due to burn.
5	1.6 x 20	0.9	Runs parallel to Trench 2, additional trench added to compensate for shortfall due to shortening of other trenches.

Appendix 2: Context Register

Context	Location	Description
001	All	Topsoil. Dark brown clayey silt loam.
002	All	Subsoil. Reddish brown silty clay.
003	All	Natural.

Appendix 3: Trench Matrices

All trenches

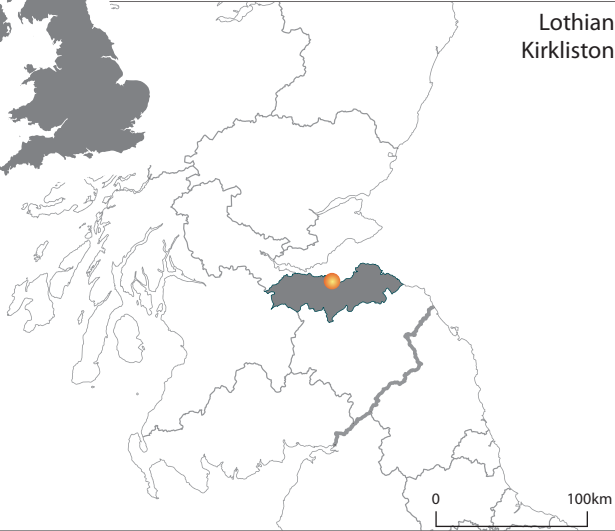
001
002
003

Appendix 4: Photographic Register

Photo	Direction	Description
1	-	ID shot film 1
2	W	LP 21 General shot of Trench 1
3	W	LP 21 General shot of Trench 2
4	S	LP 21 General shot of Trench 3
5	S	LP 21 General shot of Trench 4
6	S	LP 21 General shot of Trench 5



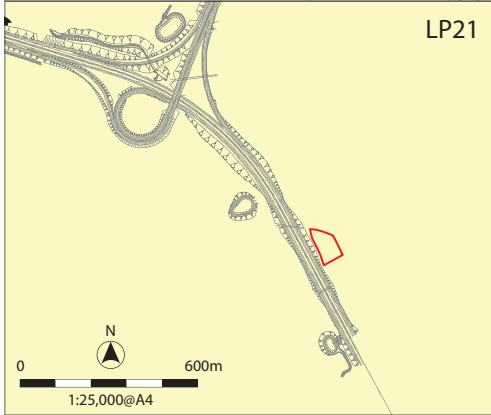
Lothian
Kirkliston



0 100km

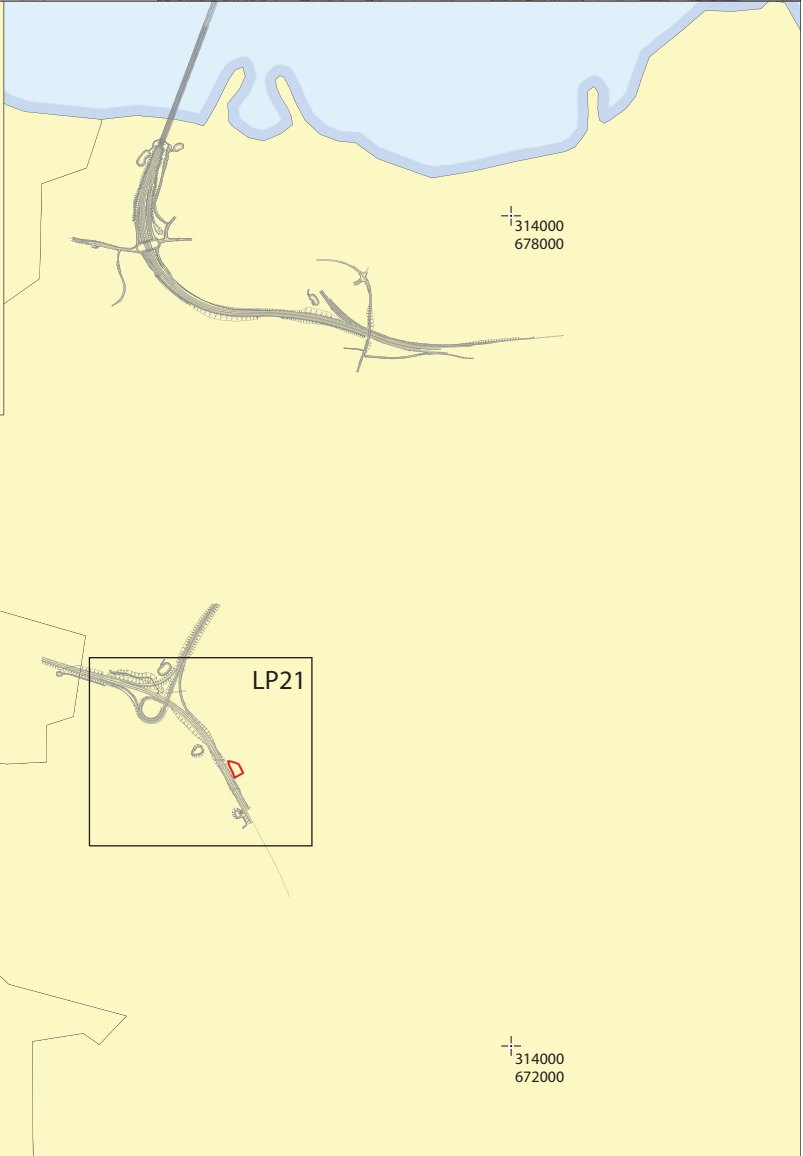


0 3km
1:100,000@A4



LP21

0 600m
1:25,000@A4



314000
678000

LP21

309000
672000

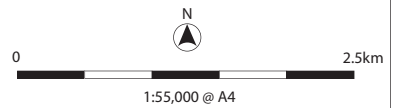
314000
672000



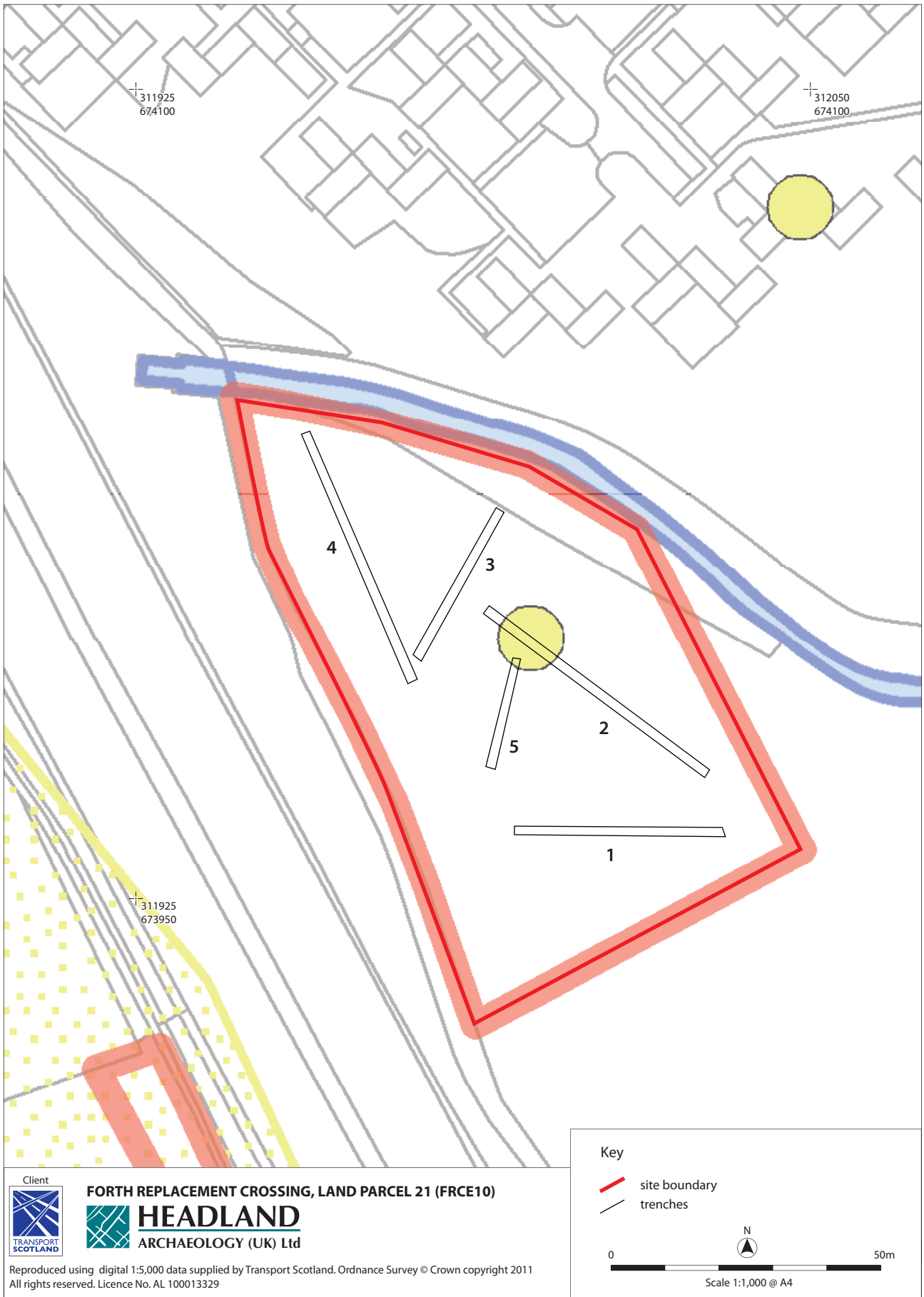
HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LAND PARCEL 21 (FRCE10)

Reproduced using 2007 OS 1:50,000 Landranger No. 65 and digital 1:10,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011 All rights reserved. Licence No. AL 100013329



1:55,000 @ A4



© Headland Archaeology (UK) Ltd



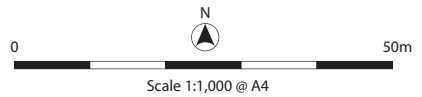
FORTH REPLACEMENT CROSSING, LAND PARCEL 21 (FRCE10)

HEADLAND
ARCHAEOLOGY (UK) Ltd

Reproduced using digital 1:5,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011
All rights reserved. Licence No. AL 100013329

Key

- site boundary
- trenches



Illus 2
Trench plan

Project code: FRCE10
Client: Transport Scotland
Date: 6th April 2011

The Results of an Archaeological Field Evaluation by Trial Trenching at Milrig Farm, Kirkliston (Land Parcel 22)

Archaeological Consultant: Jacobs Arup
Report Authors: Ian Hill
Report Status: Approved



Executive Summary

Headland Archaeology conducted an archaeological evaluation by trial trenching at Milrig Farm, Kirkliston (Land Parcel 22), NGR: NT 11904 73694 (centred), to establish the presence/absence of archaeological remains or deposits in an area identified as having 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.

Thirteen trenches totalling 1490m² were excavated comprising a 5% sample across the Land Parcel.. Trenches were sited to ensure good spatial coverage. No archaeological remains or deposits were identified during the evaluation.

ARCHAEOLOGICAL EVALUATION
Forth Replacement Crossing: Land Parcel 22

PROJECT SUMMARY SHEET (FRCE10)

<i>Client</i>	Transport Scotland
<i>Consultant</i>	Jacobs Arup
<i>National Grid Reference</i>	NT 11904 73694
<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>	Ian Hill Jamie Humble Emma Searle Donald Wilson
<i>Schedule</i>	
Fieldwork	24 th – 28 th March 2011
Report	April 2011

CONTENTS

1	Introduction	435
	1.1 <i>General</i>	435
	1.2 <i>Project Background</i>	435
	1.3 <i>Aims and Objectives of the Archaeological Works</i>	435
2	Site Background	436
	2.1 <i>Archaeological and Historical Background</i>	436
	2.2 <i>Site Topography and Land Use</i>	437
	2.3 <i>Site Geology</i>	437
3	Methodology	437
4	Results of Fieldwork	437
	4.1 <i>Trial Trenching</i>	437
5	Conclusions	438
6	References	439
	6.1 <i>Bibliographic References</i>	439
	6.2 <i>Cartographic References</i>	439
7	Appendices	440
	<i>Appendix 1: Trench Register</i>	440
	<i>Appendix 2: Context Register</i>	440
	<i>Appendix 3: Trench Matrices</i>	441
	<i>Appendix 4: Photographic Register</i>	441

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 24th and the 28th March 2011, Headland Archaeology (UK) Ltd. undertook a programme of archaeological evaluation by trial trenching on Land Parcel 22 in advance of the M9 Junction 1a improvements for the FRC (Illus 1). The project was managed by Edward Bailey (Project Manager), the fieldwork and reporting was overseen by Ian Hill. Three 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.

1.2.2 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).

1.2.3 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 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 The ES identified a total of 356 sites (within a study area ranging from 500m from the development corridor to 6km from the proposed main crossing), whilst an archaeological desk-based assessment of a wider study area undertaken at route corridor selection stage of the proposed scheme, identified a total of 1200 cultural heritage sites (Transport Scotland, 2010, 30). The results from these studies show that the proposed development corridor and the wider study area collectively constitute 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 Within the vicinity of the of the M9 Junction 1a improvements (Illus 1) prehistoric activity has been recorded in the form of a Late Bronze Age socketed axe found near Kirkliston. Latterly there are written records from 1513 that refer to a Kirkliston House acquired by the Commandery of Torphichen although the exact location of the house is not recorded. Based on the coordinates provided by the Royal Commission on the Ancient and Historic Monuments of Scotland both these sites are located within 1 km of Land Parcel 21 (50 m to the east of Land Parcel 22) and indicate the potential for prehistoric and medieval settlement in the area.

2.1.3 No known sites were identified within Land Parcel 22; however two sites were identified immediately to the west of the site. These are a quarry pit (site no 1247) present on the 1st edition OS map and a cropmark of unknown date (site no 1248; Jacobs Arup, 2009a).

2.2 *Site Topography and Land Use*

2.2.1 The site consisted of the eastern part of an arable field that was under crop at the time of the evaluation. The site was split by a small burn running east to west towards the northern part of the site. The southern part of the site consisted of a small hill with a flat plateau and steep slopes running away to the south and the north. The site is under the ownership of C E Maclachlan.

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. The trial trenching (below) has identified small patches of free-draining sands and bands of shale outcrops.

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 28,572 m², of which a 5% sample (1490 m²) 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. It was ensured that no trenches were placed close to overhead power lines running approximately east to west at the northern end of the site.

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 Thirteen trenches were excavated across Land Parcel 22 (Illus 2) with a combined total area of 1490 m² 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 the trenches was largely yellowy grey clay [003/006], with occasional bands of sands and gravels [004], and occasional shale outcrops [005]. In general this was overlain by up to 0.10 m of subsoil [002] – an orangey brown sandy silt, however the depth of this deposit increased to up to 1.55 m in trenches 1-4. This likely represents a build up of colluvium at the southern end of the site. Topsoil [001] was between 0.30 m and 0.50 m deep and contained little in the way of recent ceramic material.
- 4.1.3 Seven of the trenches contained rubble and ceramic field drains. Locations of these were noted on trench record sheets, and any damaged drains were repaired before the trenches were back-filled.
- 4.1.4 Of the thirteen trenches, only Trench 11 contained archaeological remains. A deposit of loose shale (007) was revealed within a vertically sided pit towards the western end of the trench measuring 7 m in width. A sondage was excavated into the feature by machine. It was excavated to a depth of 2 m, removing very loose, wet shale. The sondage began to rapidly fill with water and the edges began to collapse in on themselves so the sondage was immediately backfilled for health and safety reasons. The deposit may represent a backfilling event of either a modern dump, or coal pit.

5 Conclusions

- 5.1 The evaluation has established that the only archaeological remains discovered in Land Parcel 22 was a large, shale filled pit, likely a modern dump, or possible coal pit.
- 5.2 No other archaeological remains or deposits were revealed during the evaluation, and it is taken that the large pit is an isolated feature and is not deemed to be archaeologically significant.
- 5.3 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

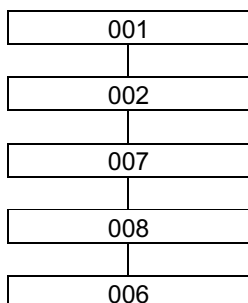
Trench No	Length (m)	Depth (m)	Description
1	50	1.35	ENE-WSE orientated. No features
2	50	1.6	NE-SW orientated. No features
3	85	2	NNW-SSE orientated. No features
4	100	1.2	NNE-SSW orientated. No features
5	50	0.4	ENE-WSW orientated. No features
6	50	0.4	ENE-WSW orientated. No features
7	100	0.4	NW-SE orientated. No features
8	50	0.35	E-W orientated. No features
9	30	0.4	NW-SE orientated. No features
10	50	0.4	NE-SW orientated. No features
11	45	0.35	NE-SW orientated. Possible coal pit
12	65	0.43	NW-SE orientated. No features
13	20	0.75	N-S Orientated. No features

Appendix 2: Context Register

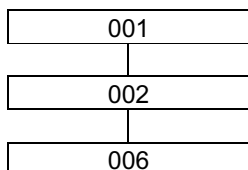
Context No.	Area	Description
001	Across Site	Topsoil
002	Across Site	Subsoil/Colluvium
003	Tr. 1-13	Natural, sterile glacial till
004	Tr. 3-4	Natural, sterile gravels
005	Tr. 4	Natural shale outcrops
006	Tr. 4	Natural sterile, brownish-grey clays
007	Tr. 11	Loose shale fill of possible coal pit. Fill of 008
008	Tr. 11	Cut of backfilled modern pit. Measures 7 m by 2 m (to LOE). Measures at least 2 m deep. Not bottomed for health and safety reasons

Appendix 3: Trench Matrices

Trench 11



Remaining Trenches

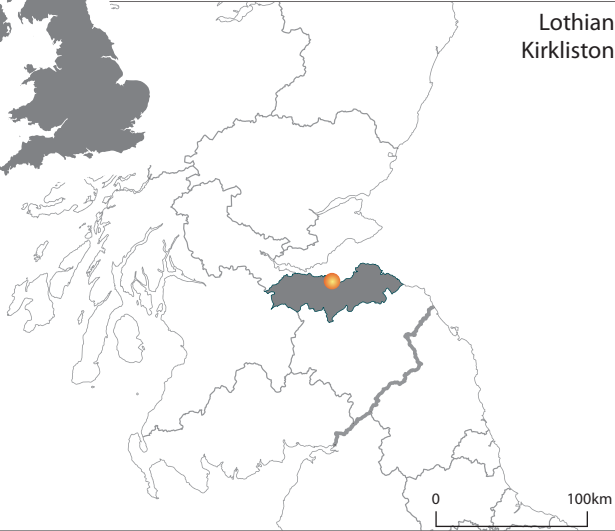


Appendix 4: Photographic Register

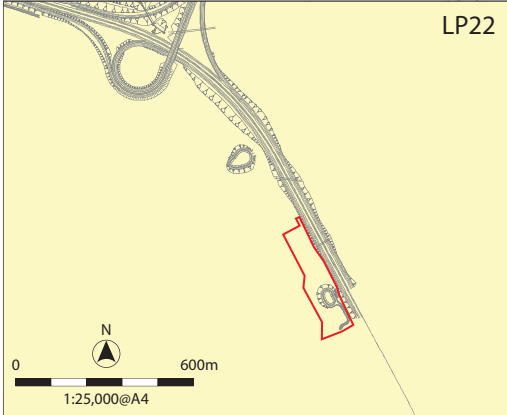
Photo No.	Direction facing	Description
01	-	Registration Shot
02	NE	General Shot of Trench 1
03	NE	General Shot of Trench 2
04	NW	General Shot of Trench 3 (0-60m)
05	NW	General Shot of Trench 3 (60-70m)
06	NW	General Shot of Trench 3 (70-85m)
07	SW	General Shot of Trench 4
08	WSW	General Shot of Trench 5
09	ENE	General Shot of Trench 6
10	SE	General Shot of Trench 7
11	ENE	General Shot of Trench 8
12	SE	General Shot of Trench 9
13	SW	General Shot of Trench 10
14	WSW	General Shot of Trench 11
15	NW	General Shot of Trench 12
16	SW	General Shot of Trench 13



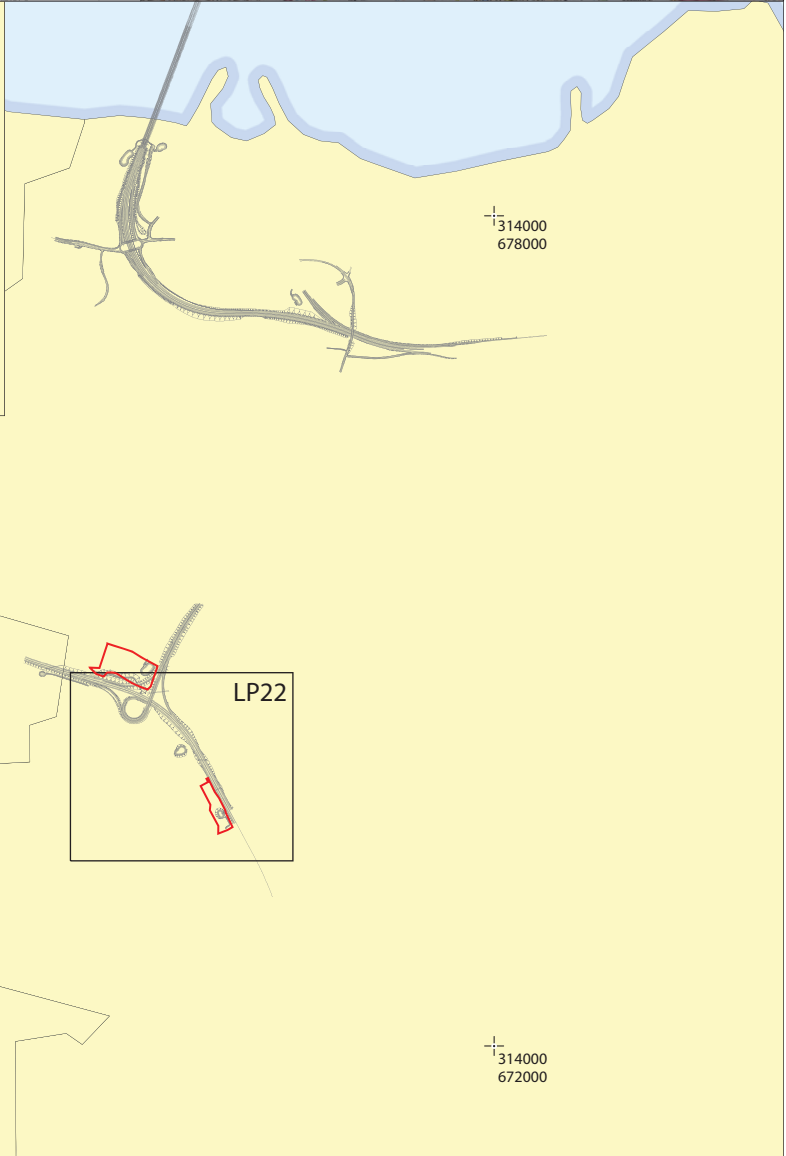
Lothian
Kirkliston



0 100km



LP22



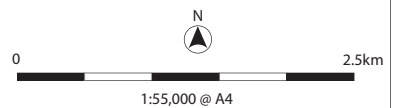
LP22

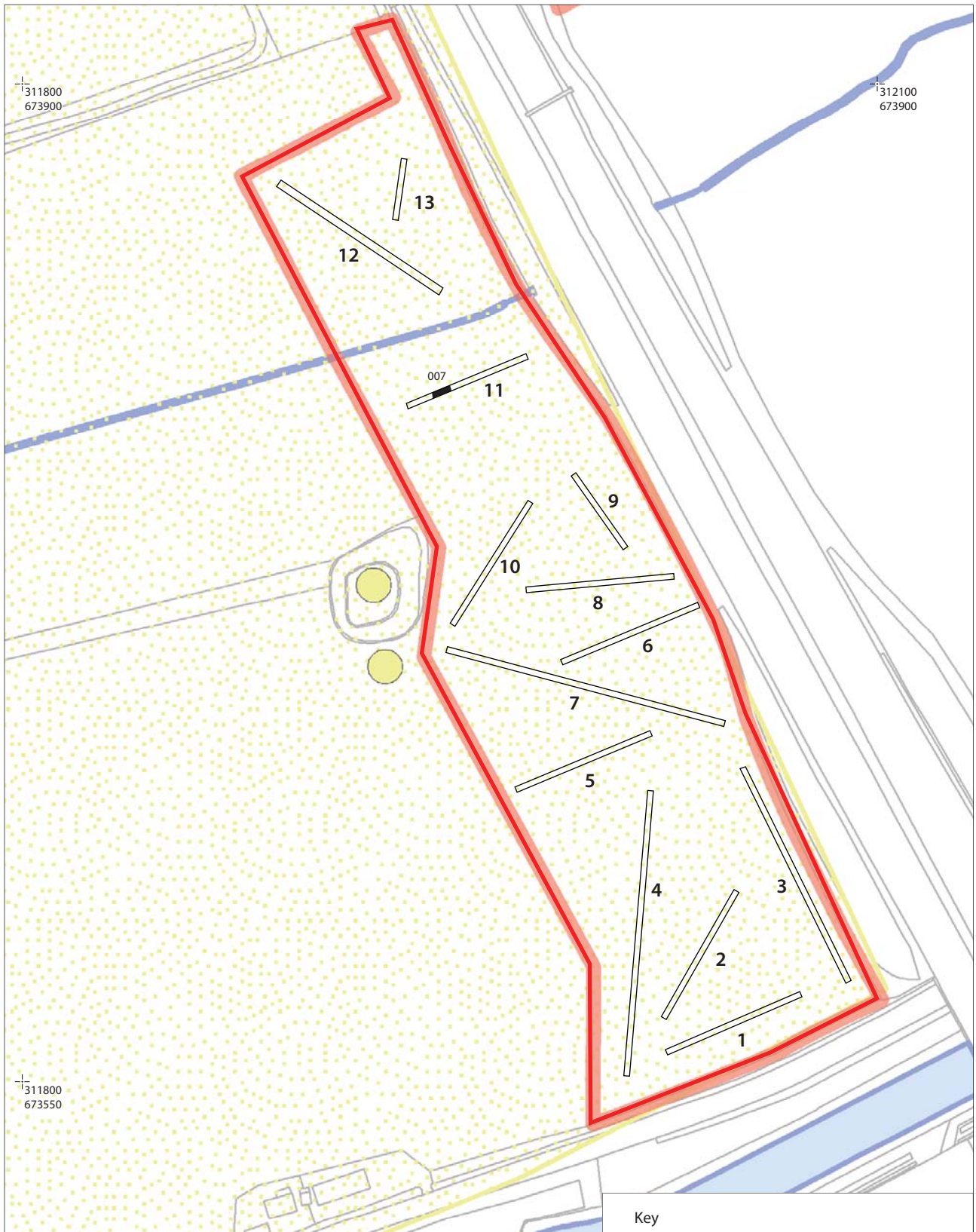


HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, LAND PARCEL 22 (FRCE10)

Reproduced using 2007 OS 1:50,000 Landranger No. 65 and digital 1:10,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011 All rights reserved. Licence No. AL 100013329





© Headland Archaeology (UK) Ltd



Client
FORTH REPLACEMENT CROSSING, LAND PARCEL 22 (FRCE10)



Reproduced using digital 1:5,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011
 All rights reserved. Licence No. AL 100013329

Key

- site boundary
- trenches



Illus 2
 Trench plan

Project code: FRCE10
Client: Transport Scotland
Date: 25th April 2011

The Results of an Archaeological Excavation of Six Clearance Cairns on the Echline Strip, South Queensferry

Archaeological Consultant: Jacobs Arup
Report Authors: Dave McNicol
Report Status: Approved



Executive Summary

Headland Archaeology conducted an archaeological excavation on the Forth Replacement Crossing within the Echline Strip, South Queensferry, NGR: NT 312045 677344 (centred), to assess the nature and date of six cairns identified during a previous walkover survey (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.

The six clearance cairns were cleaned back and half sectioned down to the natural geology between the 11th and 15th of April 2011. Modern material was identified within and underneath a number of the cairns. The cairns are of modern date and most likely relate to recent field clearance from the adjacent fields. No other archaeological remains or deposits were identified by the excavation.

ARCHAEOLOGICAL EXCAVATION
Forth Replacement Crossing: Echline Strip Clearance Cairns

PROJECT SUMMARY SHEET (FRCE10)

<i>Client</i>	Transport Scotland
<i>Consultant</i>	Jacobs Arup
<i>National Grid Reference</i>	NT 312045 677344
<i>Project Manager</i>	Edward Bailey
<i>Senior Archaeologist</i>	Kirsty Dingwall
<i>Text</i>	Dave McNicol
<i>Illustrations</i>	Julia Bastek
<i>Evaluation Team</i>	Samira Ben Mohammed Dave McNicol Richard Tuffin
<i>Schedule</i>	
Fieldwork	11 th – 15 th April 2011
Report	April 2011

CONTENTS

1	Introduction	448
	1.1 <i>General</i>	448
	1.2 <i>Project Background</i>	448
	1.3 <i>Aims and Objectives of the Archaeological Works</i>	448
2	Site Background	449
	2.1 <i>Archaeological and Historical Background</i>	449
	2.2 <i>Site Topography and Land Use</i>	449
	2.3 <i>Site Geology</i>	449
3	Methodology	450
4	Results of Fieldwork	450
	4.1 <i>Cairns</i>	450
5	Conclusions	451
6	References	452
	6.1 <i>Bibliographic References</i>	452
7	Appendices	453
	<i>Appendix 1: Context Register</i>	453
	<i>Appendix 2: Photographic Register</i>	454
	<i>Appendix 3: Drawing Register</i>	455
	Illustrations	456

1 Introduction

1.1 General

1.1.1 This draft Data Structure Report is submitted as a report on the results of a programme of archaeological excavation 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 excavation was identified.

1.1.2 Between the 11th and the 15th of April 2011, Headland Archaeology (UK) Ltd. undertook a programme of archaeological excavation on six clearance cairns located along the eastern edge of the Echline Strip (Illus 1). The project was managed by Edward Bailey (Project Manager), the fieldwork and reporting was overseen by Dave McNicol (Project Officer). Two additional staff members were involved throughout the excavation.

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 resistivity survey and 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 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 lies near 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 A number of small cairns (Site 1147) along the edge of Land Parcel 11 were identified during the EIA process,

2.2 *Site Topography and Land Use*

2.2.1 The site was located on flat ground along the edge of a small area of woodland, which continued to the west. A field of oilseed rape bounded the site to the north and east, with a field of wheat to the south. 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 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.

- 2.3.1 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

- 3.1.1 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 six clearance cairns (Site 1147) were half sectioned, by hand, down to the natural geology. Branches and roots were cut away so as to provide easier access to the cairns.
- 3.1.2 All cairns were individually numbered and a pole-mounted Trimble G6 differential GPS programmed with the relevant coordinates was utilised to identify and mark out the locations of the cairns. 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 cairns and any archaeological contexts were recorded using an EDM linked to a computer running CAD software, 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 Cairns

- 4.1.1 Six cairns were excavated along the eastern edge of the Echline Strip (Illus 2). Full detailed descriptions of individual contexts can be found in Appendix 1. The results of the excavation are summarised below.
- 4.1.2 All the cairns (01, 02, 03, 04, 05 and 06) were located within a layer of topsoil comprised of a dark blackish grey clayey silt (07) measuring between 0.15 m and 0.25 m in depth. The natural geology was visible underlying the topsoil in all of the excavated areas and was a mottled orangey brown and greenish brown silty clay (08) (illus 3a and 3b)
- 4.1.3 Cairn [01] measured 2.35 by 1.75m with a visible height of 0.23m and was roughly oval in shape. The stones which made up this cairn were sub-rounded in shape and had a maximum size of 0.38 x 0.57 x 0.23m. A large amount of metal fencing wire was located running underneath the majority of the stones within this cairn, and excavation of the cairn was curtailed due to its presence (illus 3a).
- 4.1.4 Cairn [02] was roughly oval in shape and measured 2.45 m by 1.3 m, with a maximum height of 0.39 m. Metal fencing wire and clothing fabric were located underneath and in-between sub-rounded stones, which measured between 0.25 m x 0.18 m x 0.11 m and 0.48 m x 0.32 m x 0.16 m (illus 3a & 4).

- 4.1.5 Cairn [03] measured 2 m by 1.60 m and had a maximum height of 0.30 m. It was roughly circular in shape and comprised of sub-rounded stones ranging in size from 0.20 m x 0.15 m x 0.15 m to 0.45 m x 0.40 m x 0.30 m (illus 3a). Metal fencing wire was located underneath and in-between a number of the stones.
- 4.1.6 Cairn [04] was located to the northwest of Cairn [03]. It measured 4.50 m by 2.50 m with a height of 0.45 m and was roughly oval in shape. The stones which made up this cairn were sub-rounded in shape and had a maximum size of 0.67 m x 0.49 m x 0.34 m (illus 3a & 5)
- 4.1.7 Cairn [05] was roughly oval in shape and measured 2.90 m by 1.70 m, with a maximum height of 0.46 m. Metal fencing wire was located underneath and in-between the stones, which measured between 0.22 m x 0.15 m x 0.12 m and 0.48 m x 0.32 m x 0.18 m (illus 3b)
- 4.1.8 Cairn [06] measured 10 m by 2 m and had a maximum height of 0.50 m. It was roughly rectangular in shape and comprised of sub-rounded stones ranging in size from 0.30 m x 0.20 m x 0.15 m to 0.70 m x 0.50 x 0.30 m. Metal fencing wire was located underneath and in-between a number of the stones (illus 3b)

5 Conclusions

- 5.1.1 The presence of metal fencing wire and clothing fabric in-between and underneath a number of the stones within clearance cairns [01], [02], [03], [04], [05], and [06] has established that these cairns are of a modern date. It is likely that they were formed as a result of field clearance from the adjacent ploughed fields. No archaeological features were uncovered underneath the cairns.
- 5.1.2 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

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.

Old Statistical Account: Vol 1, 238, 1791-9

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: Context Register

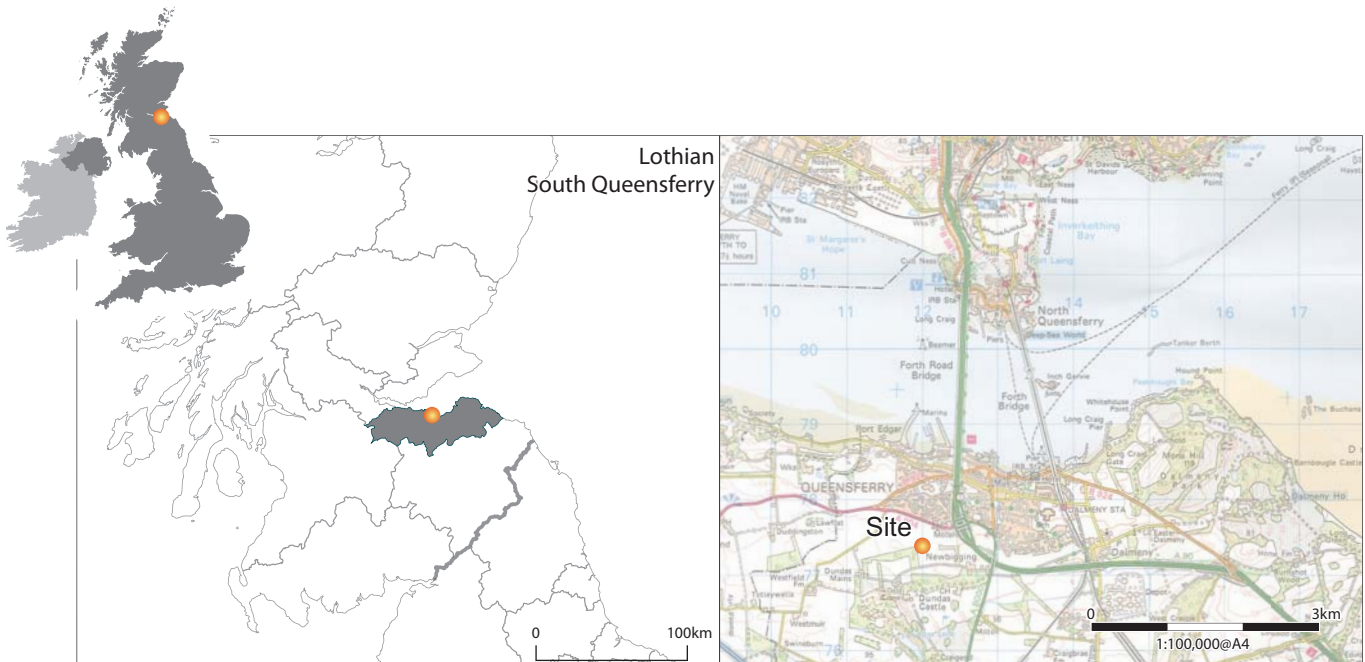
Context No.	Description
01	Oval shaped cairn measuring 2.35 m by 1.75 m and a maximum height of 0.23. Comprised of sub-rounded stones measuring up to 0.38 m x 0.57 m x 0.23 m
02	Oval shaped cairn measuring 2.45 m by 1.30m with a maximum height of 0.39 m. Comprised of sub-rounded stones up to 0.48 m x 0.32 m x 0.16 m.
03	Oval shaped cairn measuring 2 m by 1.60 m with a maximum height of 0.30 m. Comprised of sub-rounded stones up to 0.45 m x 0.40 m x 0.30m.
04	Oval shaped cairn measuring 4.50 m by 2.50m with a maximum height of 0.45m. Comprised sub-rounded stones up to 0.67 m x 0.49 m x 0.34 m
05	Oval shaped cairn measuring 2.90 m by 1.70 m with a maximum height of 0.46 m. Comprised sub-rounded stones up to 0.48 m x 0.32 m x 0.18 m.
06	Rectangular shaped cairn measuring 10 m by 2 m with a maximum height of 0.50 m. Comprised sub-rounded stones up to 0.70 m x 0.50 m x 0.30 m.
07	Dark blackish grey clay silt topsoil
08	Natural

Appendix 2: Photographic Register

Photo No.	Direction	Description
600	NE	Pre-ex Cairn 01
601	E	Pre-ex Cairn 02
602	N	Pre-ex Cairn 02
603	N	Pre-ex Cairn 03
604	E	Pre-ex Cairn 04
605	N	Pre-ex Cairn 04
606	NW	Pre-ex Cairn 05
607	N	Pre-ex Cairn 06
608	SE	Pre-ex Cairn 06
609	E	Cairn 01 cleaned up
610	E	Cairn 01 cleaned up
611	S	Cairn 01 cleaned up
612	-	Working shot
613	-	ID shot
614	S	Cairn 02 cleaned up
615	SE	Clothing fabric within cairn 02
616	S	Clothing fabric within cairn 02
617	E	Cairn 04 cleaned up
618	N	Cairn 03 cleaned up
619	NE	Cairn 05 cleaned up
620	-	Cairn 06 cleaned up
621	-	Cairn 06 cleaned up
624	E	Post-ex Cairn 01
640	E	West facing section of Cairn 02
641	E	Section of Cairn 03
644	S	North facing section of Cairn 05
645	E	West facing section of Cairn 04 (S. end)
646	E	West facing section of Cairn 04 (S. end)
651	-	Post-ex Cairn 06
652	-	Post-ex Cairn 06
653	-	Post-ex Cairn 06
654	-	Post-ex Cairn 06
655	-	Post-ex Cairn 06

Appendix 3: Drawing Register

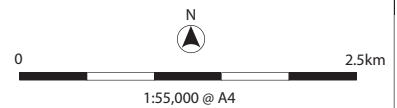
Drawing No.	Plan	Section	Description
1	1:20		Cairns 01 and 02
2	1:20		Cairns 03 and 04
3	1:20		Cairn 05
4	1:20		Cairn 06
5		1:20	Cairns 01 – 04
6		1:20	Cairns 05 and 06



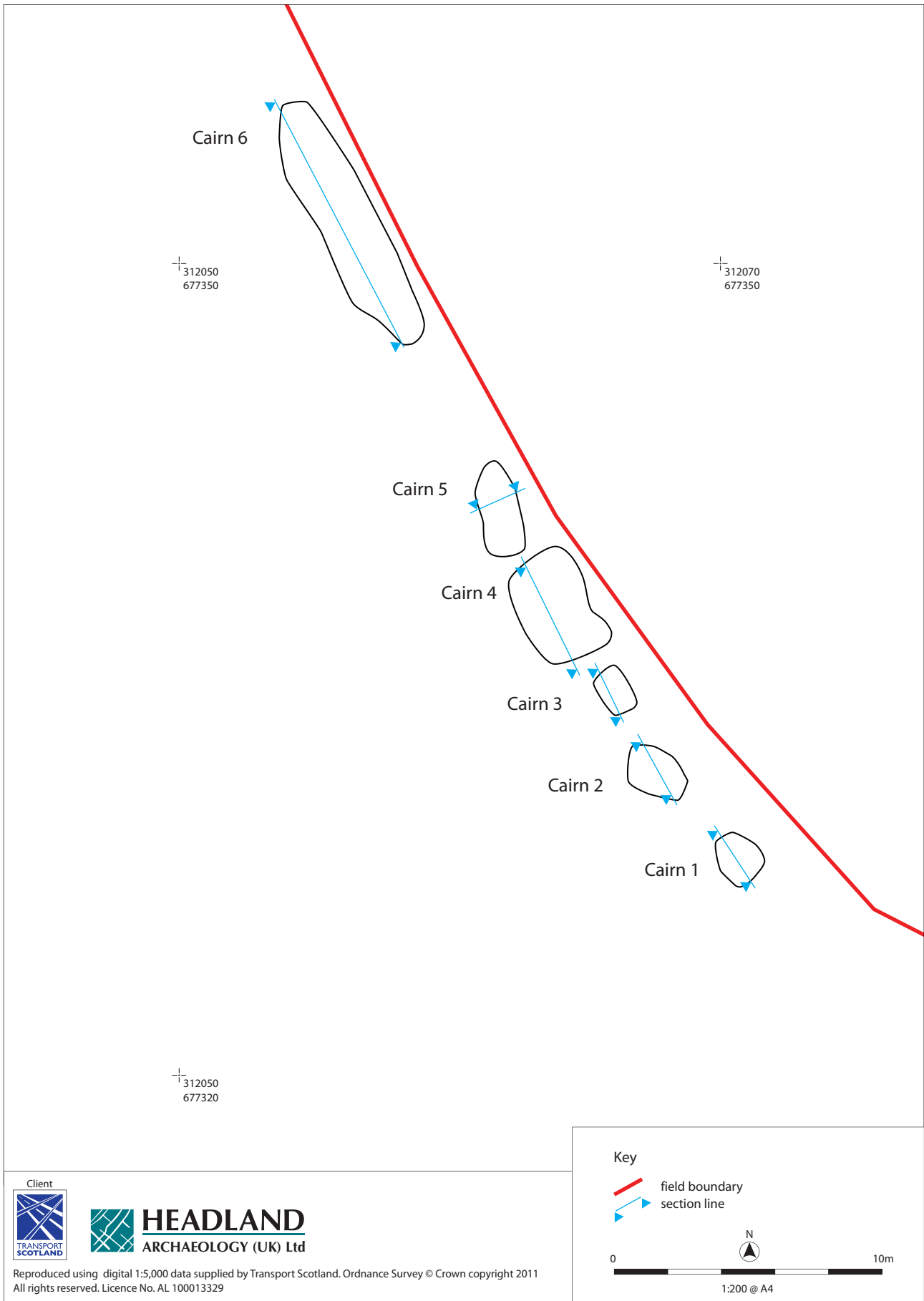
HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, Echline Cairns (FRCE10)

Reproduced using 2007 OS 1:50,000 Landranger No. 65 and digital 1:10,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011. All rights reserved. Licence No. AL 100013329

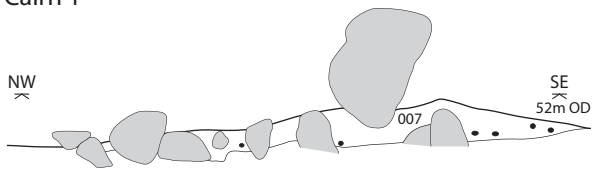


Illus 1
Site location

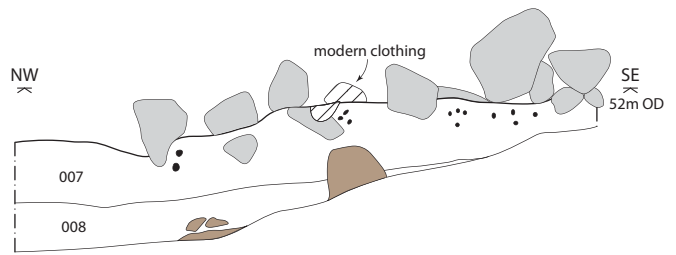


Illus 2
Plan

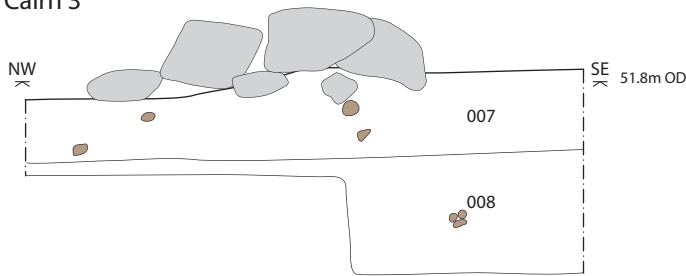
Cairn 1



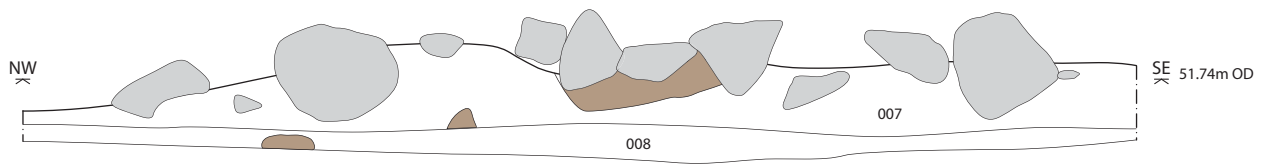
Cairn 2



Cairn 3



Cairn 4






© Headland Archaeology (UK) Ltd



Reproduced using digital 1:5,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011
All rights reserved. Licence No. AL 100013329

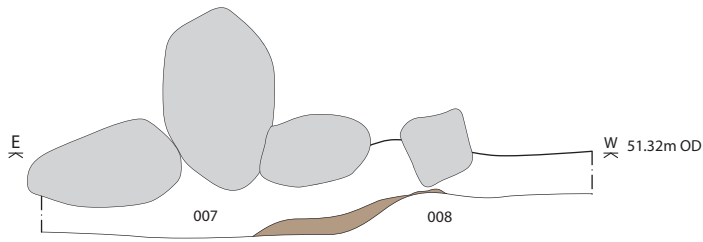
Key

-  stones
-  roots
-  metal wire

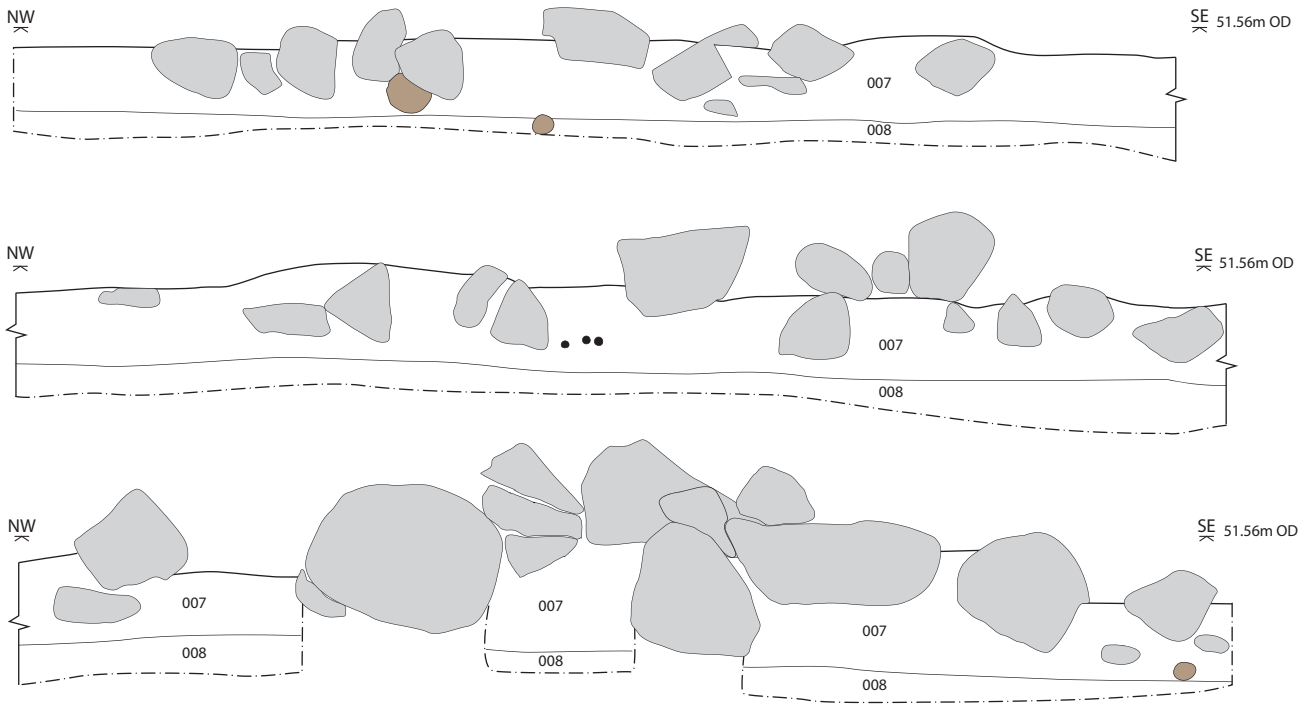


Illus 3a
Sections through cairns

Cairn 5



Cairn 6



© Headland Archaeology (UK) Ltd

Client




Reproduced using digital 1:5,000 data supplied by Transport Scotland. Ordnance Survey © Crown copyright 2011
All rights reserved. Licence No. AL 100013329

Key

- stones
- roots
- metal wire

0 1m

1:20@A4

Illus 3b
Sections through cairns



Illus 4
Cairn 2 cleaned back - looking SE



Illus 5
Cairn 4 cleaned back - looking NE

Client



HEADLAND
ARCHAEOLOGY (UK) Ltd

FORTH REPLACEMENT CROSSING, Echline Cairns (FRCE10)