

GUARD ARCHAEOLOGY



**The Helix Canal Hub Access Road, Falkirk,
Archaeological Watching Brief
Project 3146**

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The Helix Canal Hub Access Road, Falkirk, Archaeological Watching Brief

On behalf of: The Helix Trust

NGR: NS 9053 8162

Project Number: 3146

Report by: Rowena Thomson and Christine Rennie

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Approved by:



Date:

01/10/2012

*This document has been prepared in accordance
with GUARD Archaeology Limited standard operating procedures.*

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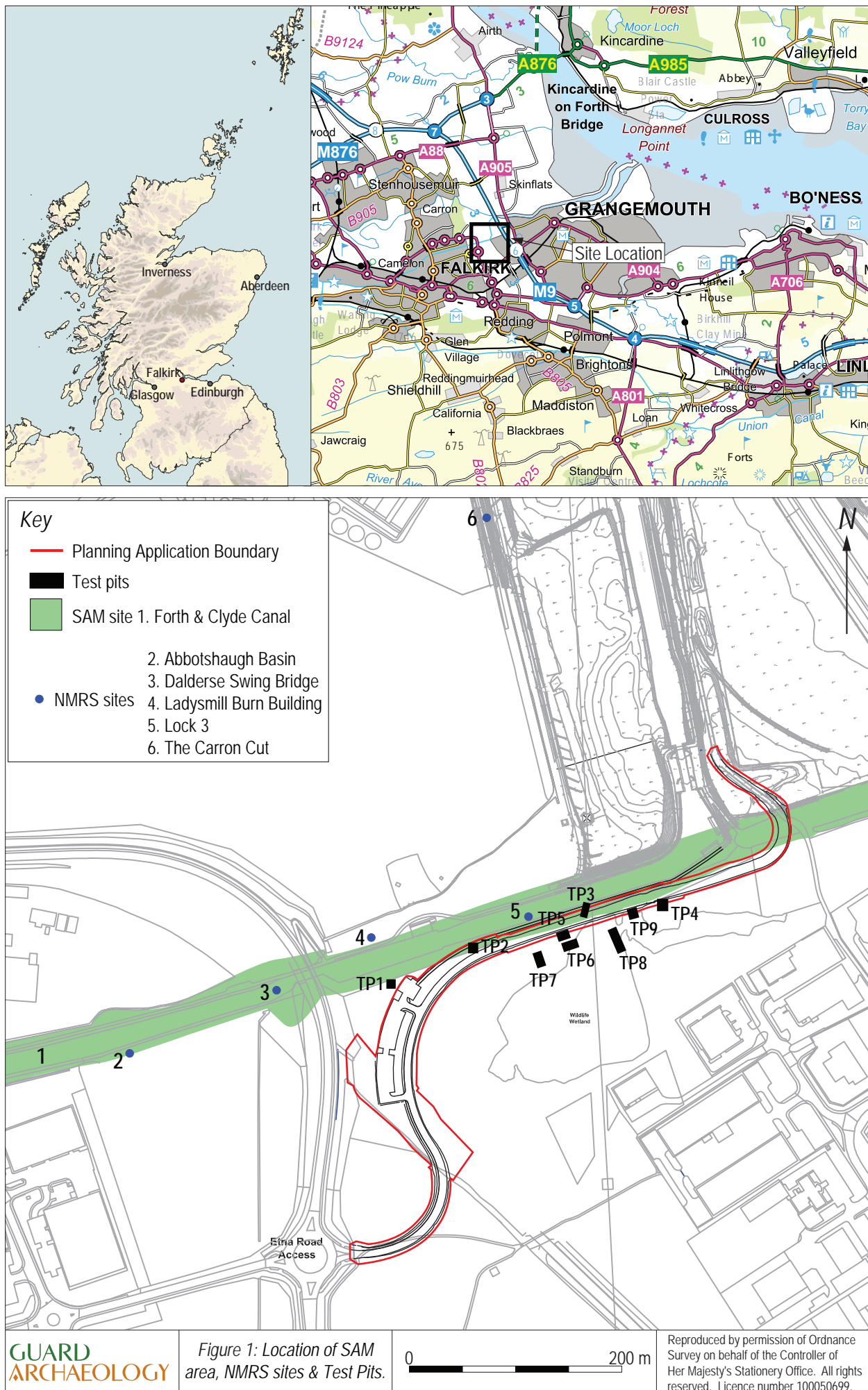
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Executive Summary

- 1.1 GUARD Archaeology Limited were commissioned to undertake an archaeological watching brief during the construction works for the Helix Canal Hub Access Road with the Forth & Clyde Canal Scheduled Ancient Monument at Falkirk, Stirlingshire. This work was undertaken between 2nd November and 7th December 2011 and but encountered no significant archaeological remains.

Introduction

- 2.1 This report sets out the results of an archaeological watching brief undertaken by GUARD Archaeology, commissioned by Ironside Farrar acting on behalf of the Helix Trust, during construction works for the Helix Canal Hub Access Road within the Forth and Clyde Canal Scheduled Monument Area (SAM No 6768).

Site Location, Topography and Geology

- 3.1 The development area covers the eastern part of the Castlecary-M9 Motorway section of the Forth & Clyde Canal, located to the north of Falkirk and centred on NGR NS 9053 8162 (Figure 1). The precise area of groundworks subject to the archaeological watching brief is bounded to the north by the Forth & Clyde Canal, to the south by a wildlife wetland area and West Mains Industrial Estate, to the east by the M9 motorway and to the west by the A9.
- 3.2 The underlying superficial deposits consist of Raised Tidal Flat Deposits – silt and clay – of Flandrian Age, while the bedrock consists of Scottish Lower Coal Measures Formation of the Carboniferous Period (British Geological Survey 1982).

Archaeological Background

- 4.1 Examination of PASTMAP previously identified six sites of archaeological interest within the immediate environs of the development area (Figure 1). These sites include:

Site 1: Forth and Clyde Canal (NS98SW 57; SAM No 6768) centred at NGR NS 9044 8159;

Site 2: Abbotshaugh Basin (NMRS NS98SW 39) centred at NGR NS 6590 5910;

Site 3: Dalderse Swing Bridge (NMRS NS98SW 38) centred at NGR NS 9029 8155;

Site 4: Ladysmill Burn Building (NMRS NS98SW 33) centred at NGR NS 9038 8160;

Site 5: Forth and Clyde Canal Lock 3 (NMRS NS98SW 40) centred at NGR NS 9053 8162;

Site 6: The Carron Cut (NMRS NS98SW 58) centred at NS 9049 8200.

- 4.2 Designed by John Smeaton, construction of the Forth and Clyde Canal (Site 1) was started in 1768 and completed in 1790. The Union Canal, designed by Hugh Baird, was subsequently constructed between 1818 and 1822 to link the eastern end of the canal to Edinburgh. Between 1789 and 1803 the Forth and Clyde Canal was used for steamboat trials and consequently became a major route for 'Clyde Puffers'.
- 4.3 In 1842 the Caledonian Railway Company was authorised by an Act of Parliament to take over the Forth and Clyde Canal, though this did not take effect until 1853. The canal was nationalised in 1948, along with the railway companies, and control passed to the British Transport Commission, and subsequently when this was wound up in 1962, passed to the British Waterway Board.
- 4.4 Originally used for transporting coal, competition from the railways caused it to close to commercial use in the 1930s. The locks, connecting it to the Union Canal at Falkirk, were filled in and built over. In 1963 the canal was closed rather than construct a motorway crossing, and

so it became disused and semi-derelict. The canal is now largely restored, however, for both recreational boating and for walkers and cyclists on the towpath. A variety of local community groups promote the general use of the canal. The Millennium Link, a project to restore both the Union and Forth and Clyde Canals, saw the two canals joined once again at the Falkirk end of the Union Canal, in the year 2000, by means of the Falkirk Wheel.

- 4.5 The canal within the immediate environs of the development area also contains a number of other features of cultural heritage interest. Lock 3 (Site 5), located a short distance to the east of the Dalderse Railway Swing Bridge (Site 3), led to the original access to the River Carron, which has been infilled. Formerly 'The Carron Cut' (Site 6) ran from this lock. It had been constructed by the Carron Company in order that canal traffic could gain more immediate access to the River Carron, where their works were situated. Although this obviated the necessity of passing through any more locks before the Forth it did involve as long a journey up the Carron River. This lock was clearly marked as Lock 3 on the first edition map of Stirlingshire (Ordnance Survey 1865).
- 4.6 One small unroofed building (Site 4), annotated as a ruin to the immediate north of the canal, is depicted on the first edition map of Stirlingshire (Ordnance Survey 1865).
- 4.7 Prior to the proposed Falkirk Gateway Development, an archaeological evaluation was undertaken at the site of a small basin (Site 2) on the south side of the canal, which appeared on the first edition map of Stirlingshire (Ordnance Survey 1865, sheet xxiv), but no significant archaeological remains were encountered.

Aims and Objectives

5.1 The aims of the watching brief were:

- to ensure that any surviving archaeological remains associated with the Forth & Clyde Canal, encountered during ground-breaking works required for the construction of the Helix Canal Hub Access Road, were recorded to an appropriate level in order to document any changes proposed to the Scheduled Ancient Monument and to retrieve as much artefactual material as possible;
- to ensure that no other archaeologically significant features within the Scheduled Ancient Monument Area of the Forth & Clyde Canal were disturbed during the movement of machine plant during the development works.

5.2 The specific objectives were therefore to:

- prepare a photographic and written record of that part of the canal prior to the commencement of ground-breaking works;
- supervise the erection of temporary fencing either side of the affected bank of the canal, prior to the commencement of ground-breaking works;
- supervise the movement of heavy machine plant within the Scheduled Monument Area during the course of ground-breaking works;
- conduct an archaeological watching brief during the ground-breaking works within and immediately outwith the Scheduled Ancient Monument Area to establish the presence or absence of any archaeological remains, and their character, date and extent if surviving; determine the character, extent and significance of any archaeological deposits encountered; and excavate and salvage any information possible from any significant features encountered, and to
- produce a report to data structure level on completion of all works requiring monitoring.

Methodology

- 6.1 The Written Scheme of Investigation, outlining the following methodology, agreed in advance with Historic Scotland, is presented in Appendix G. The area of the scheduled monument area subject to ground-breaking works associated with the construction of the Helix Canal Hub Access Road was photographed and a brief written description made prior to the commencement of ground-breaking works. Any other archaeological features within the affected part of the Scheduled Ancient Monument were to be recorded, photographed and planned using conventional proforma sheets and a digital camera.
- 6.2 The Watching Brief Archaeologist was to supervise the erection of temporary fencing either side of the affected part of the Scheduled Ancient Monument by the Main Contractor, prior to the commencement of ground-breaking works, to ensure that the specific area of the Scheduled Ancient Monument subject to ground-breaking works was first defined and to further ensure that no disturbance was made by subsequent movement of machine plant during the works.
- 6.3 All movement of heavy machine plant within the Scheduled Monument Area was to be supervised by the Watching Brief Archaeologist to ensure that no disturbance is made during the course of the ground-breaking works, beyond the proposed limits of ground-breaking works necessary for the construction of the access road.
- 6.4 A watching brief was to be carried out during the ground-breaking works to ensure that no significant archaeological remains were disturbed, without first being recorded. The watching brief was to include the monitoring of all topsoil and/ or over-burden stripping operations by machine and excavation and recording of any feature encountered.
- 6.5 The number of watching brief archaeologists required during stripping operations was to be dependent on the number of machines employed at any one time (one watching brief archaeologist per machine). All machines used for topsoil stripping were to be fitted with a c. 1.6 m wide flat-bladed (toothless) ditching bucket.
- 6.6 The topsoil was to be removed in spits to the first archaeological horizon or, where none was found, to the required depth of groundworks. Any archaeological features encountered were to be cleaned by hand by the Watching Brief Archaeologist to determine the date of the deposits, their character and extent. This was to include recording any part of the canal face, such as original facing stones, revealed during the ground-breaking works, in order to produce a section drawing from the canal face, through the towpath to the edge of the Scheduled Monument Area. Such features were to be recorded by written description on pro forma recording sheets, by photograph and by measured drawing.
- 6.7 Suitable down time was to be provided to the Watching Brief Archaeologist in order to fully recover any archaeological evidence encountered on a site. If any archaeology encountered was sufficiently significant or complex to require more than one day to excavate and record, an on-site meeting was to be arranged as soon as possible between the GUARD Project Manager, the client's agent and the relevant Historic Scotland Inspector to agree appropriate mitigation measures to both minimise the impact of further works on the scheduled monument and minimise the impact of any archaeological works upon the schedule of the development works.
- 6.8 All archaeological finds were to be dealt with by the on-site Archaeologist. The general practice was to be to bulk recovery of all artefacts by context.
- 6.9 All excavated feature fills and horizons were to be sampled, using bulk soil samples, for palaeo-environmental evidence. This might also include micromorphological sampling in order to address soil development at the site.
- 6.10 A representative section was to be recorded from the canal face, through the towpath to the edge of the Scheduled Monument Area, denoting depth of topsoil, any stratigraphy present and the nature of the soil. This information was to be logged in the day book together with a sketch drawn to scale and a photographic record of deposits.

- 6.11 In the event that human remains were encountered during the watching brief, the local police, the client and Historic Scotland were to be notified immediately and no further work would take place on site until agreement on how to proceed had been reached with all parties.

Results

- 7.1 GUARD Archaeology undertook this programme of work between 2nd November and 7th December 2011. The detailed results are presented in Appendices B-E and Figure 1.
- 7.2 A total area of 350.5 m² across nine test pits was stripped of topsoil, in November and December 2011, to reveal grey clay and silty clay subsoil. Over the majority of the area topsoil deposits were 0.18 m to 0.54 m deep, although made ground lay directly below the vegetation cover in Test Pits 3 and 4. Test pits 3, 6, 7 and 8 lay out with the boundaries of the Scheduled Monument Area but were deemed sufficiently close to warrant archaeological observation. An additional area was watched out with the watching brief area to the south-east of the Scheduled Monument where an organic subsoil was encountered in wetlands (Plate 1). During the course of the watching brief no features of archaeological significance were encountered.
- 7.3 During the watching brief a background scatter of modern artefacts were recovered from topsoil deposits across the area, a representative of which was retained. This included ceramics of eighteenth/nineteenth century date and glass, plastic, ceramic building material and metal of late nineteenth and twentieth century origin. No artefacts of archaeological significance were identified.



Plate 1: Working shot of western wetland area.

- 7.4 Following the archaeological watching brief works undertaken in November and December 2011, it was perceived by the Gleeds Project Manager that site excavation works that impacted on the Scheduled Ancient Monument Area were generally complete. Due to issues of flooding and underground services the road was generally built up in level as it passed through the rest of the Scheduled Ancient Monument boundary. Part of the building up included the installation of piled service protection slabs to protect INEOS Gas and Scottish Water services from being exposed. These slabs and piling were approved through variation to the Scheduled Monument Consent. Subsequently, in 2012, what Gleeds referred to as a soil strip was effectively vegetation clearance and a flattening out/ grading of the material deposited adjacent to the canal following the relatively recent millennium link construction works and INEOS maintenance/ initial pipelaying works. As a result of the above it was considered by Gleeds that there was no further requirement for archaeological watching brief works after December 2011.

Discussion

- 8.1 The watching brief identified the deposits used for backfill following the construction of the canal in test pits 3 and 4, identified as a mix of redeposited boulder clay and blaes (Plate 2). No structural elements of the canal were observed during the excavation of the test pits. No artefacts related to the construction of the canal were uncovered although evidence of contemporaneous and continued use was discovered with samples of eighteenth/nineteenth

century pottery retained. Test pits 3 and 4 revealed evidence of make up deposits containing modern inclusions. Other modern disturbances include the insertion of an INEOS gas main pipe. Two INEOS pipes were identified in test pits 5 and 6 the excavation of which required additional specialist observation. Further gas pipes were observed in test pits 2, 3, 7, 8 and 9 (Plate 3). In addition, an electricity cable and cast iron pipe, probably carrying water, were observed in test pit 1.



Plate 2: Post excavation view of test pit showing the top of service cable and gas pipe.



Plate 3: East facing section of test pit 8 showing layers of made ground.

Conclusions

- 9.1 The watching brief indicates that the Forth & Clyde Canal at this juncture was infilled with a mix of natural boulder clay and modern mixed blaes, and that subsurface deposits on the south bank of the canal have been disturbed by service trenches.
- 9.2 A summary of the results of the Watching Brief will be submitted to Discovery and Excavation in Scotland. A copy of the summary is included in Appendix F. The archive for the project, including a copy of the report, will be submitted to the National Monuments Record for Scotland within six months.
- 9.3 The online OASIS form at <http://ads.ahds.ac.uk/project/oasis/> (OASIS Reference: guardarc1-134087) will be completed within three months. Once the Data Structure Report has become a public document by submission or incorporation into the local Sites and Monuments Record, the Falkirk Museums Service will validate the OASIS form thus placing the information into the public domain on the OASIS website.
- 9.4 The laws relating to Treasure Trove and Bona Vacantia in Scotland apply to all finds where the original owner cannot be identified. This includes all material recovered during archaeological fieldwork. Accordingly, all assemblages recovered from archaeological fieldwork are claimed automatically by the Crown and must be reported to the Scottish Archaeological Finds Allocation Panel through its secretariat, the Treasure Trove Unit. In the event of the discovery of small finds, a filled-out copy of the form "Declaration of an Archaeological Assemblage from Fieldwork" and two copies of the pertinent Data Structure Report will be submitted to the Panel at the conclusion of the fieldwork. The Panel will then be responsible for recommending to the Queen's and Lord Treasurer's Remembrancer which museum should be allocated the finds. All artefacts will be temporarily stored by GUARD Archaeology until a decision has been made by the panel.

Acknowledgements

- 10.1 GUARD Archaeology would like to thank Raynesway, Gleeds and Ironside Farrar for their assistance during this work. Plant and drivers were supplied by Raynesway. Technical support was provided by Aileen Maule and John Keily. The watching brief was undertaken by Rowena Thomson. The illustration were produced by Gillian McSwan. The report was desk top published by Gillian McSwan. The project was managed for GUARD Archaeology by Ronan Toolis.

The Helix Canal Hub Access Road, Falkirk
Archaeological Watching Brief

Section 2: Appendices



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Appendices

Appendix A: Bibliography

British Geological Survey 1982 Geological Map of NS98SW; Bedrock and Superficial Deposits.

Ordnance Survey 1865 Stirlingshire sheet xxiv. 6-inch map.

Appendix B: Test Pit Details

TP No	Length (m)	Width (m)	Depth (m)	Topsoil/Overburden	Subsoil	Details
1	1	0.4	1	Heavily compacted dark grey silty clay with occasional pebbles to 0.18-0.54m	Heavily compacted light grey clay with frequent pebbles and cobbles. From 0.18m	Electricity cable and cast iron pipe found
2	1.6	0.3	1.4	Heavily compacted dark grey silty clay with occasional pebbles to 0.18m	Heavily compacted light grey clay with frequent pebbles and cobbles. From 0.18m	Gas pipe at 1.15m depth
3	1.6	0.5	0.9	Very heavily compacted black gritty gravel to 0.9 m	Not reached	Gas pipe at 0.90m depth
4	2.4	1.8	1.8	Very heavily compacted black/ dark grey clay with grit, ash, plastic and cobbles to 1.8m	Not reached	-
5	4	3	1.8	Heavily compacted dark grey/black clay with red blaes to 1.8m	-	INEOS pipe found
6	4	3.2	2.1	Heavily compacted dark grey/black clay with red blaes to 1.8m	Heavily compacted grey clay with occasional pebbles from 1.8m	INEOS pipe found
7	6	2.1	2	Heavily compacted dark grey silty clay with occasional pebbles to 0.18-0.54m	Very heavily compacted grey clay from 0.18m	Gas pipe found
8	6	4	2.5	Grey/black silty clay with pebbles to 0.22/0.5m. Onto red blaes	Very heavily compacted grey clay	Gas pipe found
9	-	-	-	Grey/black silty clay with pebbles to 0.12. Onto made ground	Very heavily compacted grey clay	Gas pipe at 3.6m

Appendix C: List of Contexts

Context No.	Area	Description	Interpretation
1001	S Canal;TP1	Dark grey silty clay	Topsoil
1002	S Canal;TP1	Light grey boulder clay	Subsoil
2001	S Canal;TP2	Dark grey silty clay	Topsoil
2002	S Canal;TP2	Light grey boulder clay	Subsoil
3001	S Canal;TP3	Dark grey gritty gravel	Made ground
4001	S Canal;TP4	Grey/black clay with modern inclusions	Made ground
5001	S Canal; TP5	Grey/black clay with inclusions of red blaes	Disturbed/made ground
6001	S Canal;TP6	Grey/black clay with inclusions of red blaes	Disturbed/made ground
6002	S Canal;TP6	Heavily compacted grey clay	Subsoil
7001	S Canal;TP7	Dark grey silty clay	Topsoil
7002	S Canal;TP7	Grey/black clay	Subsoil
8001	S Canal;TP8	Black/grey silty clay with pebbles	Topsoil
8002	S Canal;TP8	Heavily compacted red blaes	Levelling layer
8003	S Canal;TP8	Heavily compacted grey clay with pebbles	Subsoil

Context No.	Area	Description	Interpretation
9001	S Canal;TP9	Medium compaction black/dark grey silty clay with pebbles	Topsoil
9002	S Canal;TP9	Dark grey gritty gravel with concrete and ceramic drain pieces	Made ground
9003	S Canal;TP9	Heavily compacted grey clay with cobbles and pebbles	Subsoil

Appendix D: List of Finds

Find No.	Area	Context No.	No. of Pieces	Material	Type	Description
1	TP1	001	1	ceramic	18th/19th century	blue transfer decoration
2	TP2	001	11	ceramic	18th/19th century	blue transfer decoration
3	TP2	001	1	glass	18th/19th century	vessel
4	TP2	001	3	cbm	drain or tile	Drain or Tile Fragment
5	TP3	003	3	ceramic	Late 19th/20 century	white slip ceramic shards. Includes a broken figurine
6	TP3	003	1	plastic	Modern	comb
7	TP4	004	14	ceramic	Late 19th/20 century	transfer printed and plain white slip ceramics. Also includes unrefined kiln waste and a piece of clay pipe bowl.
8	TP4	004	1	metal	metal	copper alloy battery

Appendix E: List of Digital Photographs

File 001

Frame	Area	Context No.	Subject	Taken from
1	S Canal	TP1	Pre-excavation view of Test Pit 1	W
2	S Canal	TP1	Pre-excavation view of Test Pit 1	N
3	S Canal	TP1	Post-excavation view of Test Pit 1	W
4	S Canal	TP2	Pre-excavation view of Test Pit 2	N
5	S Canal	TP2	Post-excavation view of Test Pit 2	W
6	S Canal	TP3	Pre-excavation view of Test Pit 3	S
7	S Canal	TP3	Working shot	E
8	S Canal	TP3	View of spoil removed from test pit	E
9	S Canal	TP3	Post-excavation view of Test Pit 3	E
10	S Canal	TP4	Modern finds in Test Pit 4	S
11	S Canal	TP4	Modern finds in Test Pit 4	S
12	S Canal	TP4	Post-excavation view of deposit 4001	W
13	S Canal	TP5	Pre-excavation view of Test Pit 5	W
14	S Canal	TP5	Working shot	W
15	S Canal	TP5	Post-excavation view of Test Pit 5	W
16	S Canal	TP6	Pre-excavation view of Test Pit 6	N
17	S Canal	TP6	Post-excavation view of Test Pit 6	N
18	S Canal	TP6	Post-excavation view of deposit 6001	N

File 002

Frame	Area	Context No.	Subject	Taken from
1	S Canal	TP6	Pre-excavation view of extension to test pit	N
2	S Canal	TP6	Pre-excavation view of extension to test pit	N
3	S Canal	TP6	Pre-excavation view of extension to test pit	N
4	S Canal	TP7	Working shot; start of test pit excavation	N
5	S Canal	TP7	West facing section of Test Pit 7	W
6	S Canal	TP7	Post-excavation view of Test Pit 7	N
7	S Canal	TP8	Pre-excavation view of Test Pit 8	N

Frame	Area	Context No.	Subject	Taken from
8	S Canal	TP8	Red ash deposit 8002 in Test Pit 8	NE
9	S Canal	TP8	South facing section of Test Pit 8	S
10	S Canal	TP8	East facing section of Test Pit 8	SE
11	S Canal	TP8	Pumping out water in Test Pit 8 sump	NW
12	S Canal	TP8	Pumping out water in Test Pit 8 sump	N
13	S Canal	TP8	Post-excavation view of Test Pit 8	N
14	S Canal	TP9	Pre-excavation view of Test Pit 9	N
15	S Canal	TP9	Post-excavation view of Test Pit 9	N
16	S Canal	-	Working shot of topsoil stripping; east area	N
17	S Canal	-	Working shot of topsoil stripping; east area	N
18	S Canal	-	East area after removal of topsoil	E
19	S Canal	-	East area after removal of topsoil	S
20	S Canal	-	East area after removal of topsoil	E
21	S Canal	-	Working shot of topsoil stripping; west area	E
22	S Canal	-	Working shot of topsoil stripping; west area	E

Appendix F: Discovery and Excavation Scotland Report

LOCAL AUTHORITY:	Falkirk
PROJECT TITLE/SITE NAME:	The Helix Canal Hub Access Road
PROJECT CODE:	3146
PARISH:	Grangemouth
NAME OF CONTRIBUTOR(S):	Rowena Thomson and Christine Rennie
NAME OF ORGANISATION:	GUARD Archaeology Ltd
TYPE(S) OF PROJECT:	Watching brief
NMRS NO(S):	NS98SW 57
SITE/MONUMENT TYPE(S):	Forth & Clyde Canal
SIGNIFICANT FINDS:	None
NGR (2 letters, 6 figures)	NS 905 816
START DATE (this season)	2 nd November 2011
END DATE (this season)	7 th December 2011
PREVIOUS WORK (incl. DES ref.)	None known
MAIN (NARRATIVE) DESCRIPTION: (May include information from other fields)	GUARD Archaeology Ltd were commissioned to undertake an archaeological watching brief during the construction works for the Helix Canal Hub Access Road within the Forth & Clyde Canal Scheduled Ancient Monument Area between Falkirk and Grangemouth. This work revealed only made ground, modern service trenches and early modern artefacts.
PROPOSED FUTURE WORK:	None known
SPONSOR OR FUNDING BODY:	The Helix Trust
CAPTION(S) FOR ILLUSTRS:	--
ADDRESS OF MAIN CONTRIBUTOR:	GUARD Archaeology Limited, 52 Elderpark Workspace, 100 Elderpark Street, Glasgow, G51 3TR
EMAIL ADDRESS:	bob.will@guard-archaeology.co.uk
ARCHIVE LOCATION (intended/deposited)	The project archive will be deposited with the NMRS.

Appendix G: Written Scheme of Investigation

GUARD 3146: The Helix Canal Hub Access Road

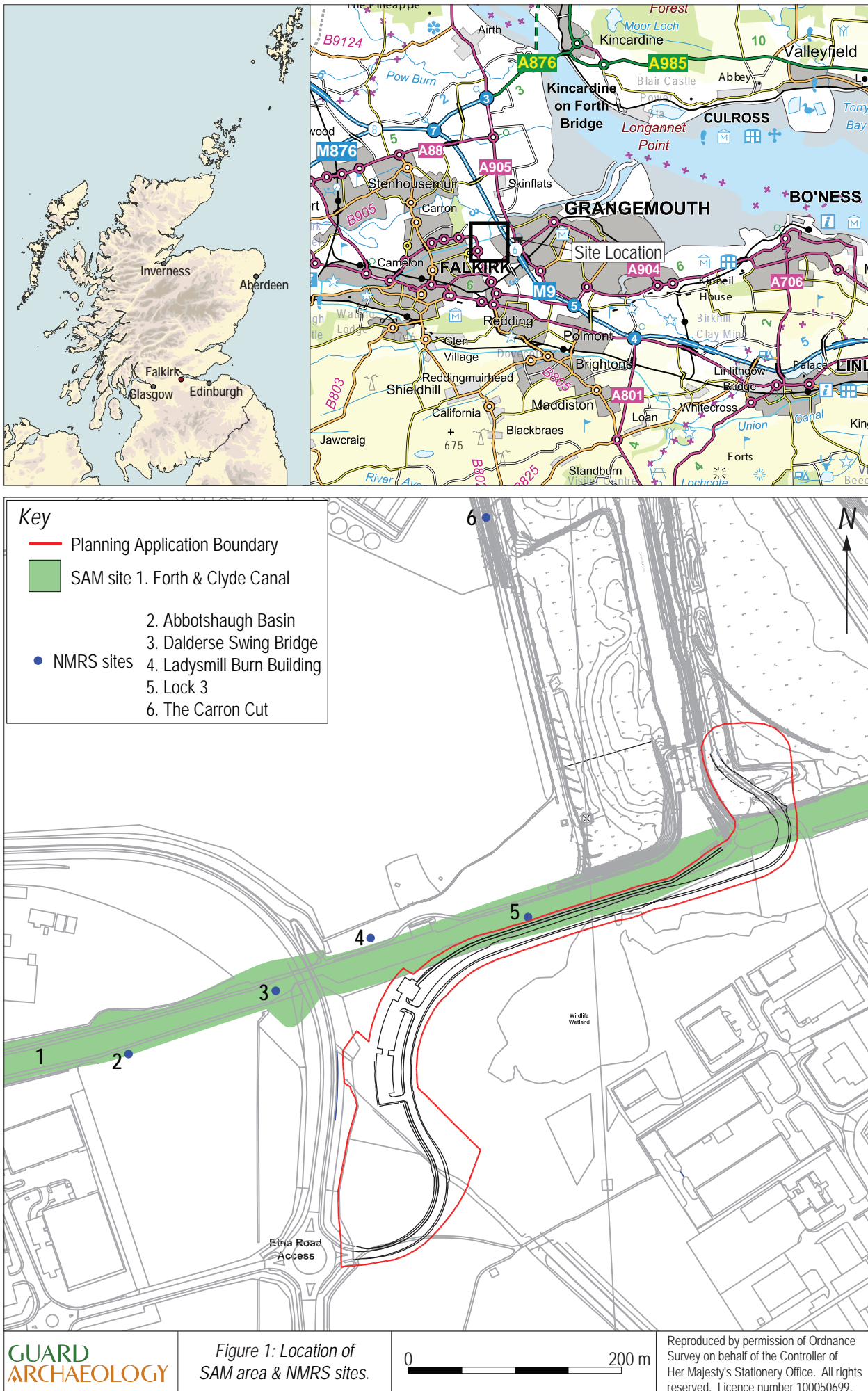
Written Scheme of Investigation

1.0 Introduction

- 1.1 This document sets out a Written Scheme of Investigation (WSI) for a phased programme of archaeological works associated with construction works for the Helix Canal Hub Access Road within the Forth and Clyde Canal Scheduled Monument Area (SAM No 6768). In the first instance, a watching brief during all proposed groundworks within the Scheduled Monument Area will be undertaken to establish whether any significant archaeological remains will be impacted by the groundworks associated with the Helix Canal Hub Access Road. Should significant remains be identified and it is not possible to preserve them *in situ* a further requirement for archaeological works to ensure their preservation through record is likely to be pursued.
- 1.2 This WSI outlines the entirety of the programme of archaeological works that may be needed to mitigate the effects of the proposed development. It details the methodology to be employed in implementing the Stage 1 archaeological works. The mitigation methodology to be employed during Stage 2 excavation and Stage 3 post excavation analysis and publication, will be specified in *addenda* to this document. These *addenda*, if required, will be submitted for agreement of Historic Scotland, prior to the commencement of any archaeological work. All phases of work will be funded by the developer.

2.0 Site Location and Cultural Significance of the Monument

- 2.1 The proposed development area covers the eastern part of the Castlecary-M9 Motorway section of the Forth and Clyde Canal, located to the north of Falkirk and centered on NGR NS 9053 8162 (Figure 1). The precise area of groundworks subject to the archaeological watching brief is bounded to the north by the Forth and Clyde Canal, to the south by a wildlife wetland area and West Mains Industrial Estate, to the east by the M9 Motorway and to the west by the A9.
- 2.2 Examination of PASTMAP has identified six sites of archaeological interest within the immediate environs of the development area (Figure 1). These sites include:
 - Site 1: Forth and Clyde Canal (NS98SW 57; SAM No 6768) centred at NGR NS 9044 8159;
 - Site 2: Abbotshaugh Basin (NMRS NS98SW 39) centred at NGR NS 6590 5910;
 - Site 3: Dalderse Swing Bridge (NMRS NS98SW 38) centred at NGR NS 9029 8155;
 - Site 4: Ladysmill Burn Building (NMRS NS98SW 33) centred at NGR NS 9038 8160;
 - Site 5: Forth and Clyde Canal Lock 3 (NMRS NS98SW 40) centred at NGR NS 9053 8162;
 - Site 6: The Carron Cut (NMRS NS98SW 58) centred at NS 9049 8200.
- 2.3 Designed by John Smeaton, construction of the Forth and Clyde Canal (**Site 1**) was started in 1768 and completed in 1790. The Union Canal, designed by Hugh Baird, was subsequently constructed between 1818 and 1822 to link the eastern end of the canal to Edinburgh. Between 1789 and 1803 the Forth and Clyde Canal was used for steamboat trials and consequently became a major route for 'Clyde Puffers'.
- 2.4 In 1842 the Caledonian Railway Company was authorised by an Act of Parliament to take over the Forth and Clyde Canal, though this did not take effect until 1853. The canal was nationalised in 1948, along with the railway companies, and control passed to the British Transport Commission, and subsequently when this was wound up in 1962, passed to the British Waterway Board.
- 2.5 Originally used for transporting coal, competition from the railways caused it to close to commercial use in the 1930s. The locks, connecting it to the Union Canal at Falkirk, were filled in and built over. In 1963 the canal was closed rather than construct a motorway crossing, and so it became disused and semi-derelict. The canal is



now largely restored, however, for both recreational boating and for walkers and cyclists on the towpath. A variety of local community groups promote the general use of the canal. The Millennium Link, a project to restore both the Union and Forth and Clyde Canals, saw the two canals joined once again at the Falkirk end of the Union Canal, in the year 2000, by means of the Falkirk Wheel.

- 2.6 The canal within the immediate environs of the development area also contains a number of other features of cultural heritage interest.
- 2.7 Lock 3 (**Site 5**), located a short distance to the east of the Dalderse Railway Swing Bridge (**Site 3**), led to the original access to the River Carron, which has been infilled. Formerly 'The Carron Cut' (**Site 6**) ran from this lock. It had been constructed by the Carron Company in order that canal traffic could gain more immediate access to the River Carron, where their works were situated. Although this obviated the necessity of passing through any more locks before the Forth it did involve as long a journey up the Carron River. This lock was clearly marked as Lock 3 on the first edition of the Ordnance Survey 6-inch map (Stirlingshire 1865, sheet xxiv).
- 2.8 One small unroofed building (**Site 4**), annotated as a ruin to the immediate north of the canal, is depicted on the first edition of the Ordnance Survey 6-inch map (Stirlingshire 1865, sheet xxiv).
- 2.9 Prior to the proposed Falkirk Gateway Development, an archaeological evaluation was undertaken at the site of a small basin (**Site 2**) on the south side of the canal, which appeared on the first edition of the Ordnance Survey 6-inch map (Stirlingshire 1865, sheet xxiv), but no significant archaeological remains were encountered.

3.0 *Planning Background*

- 3.1 This WSI has been drafted in response to Condition 3 of Scheduled Monument Consent set by Historic Scotland, requiring a Written Scheme of Investigation for an archaeological watching brief to ensure that archaeological information, impacted by the proposed groundworks, is recovered and recorded to a satisfactory standard.

4.0 *Aims and Objectives*

- 4.1 The aim of this mitigation strategy is:

- to ensure that any surviving archaeological remains associated with the Forth and Clyde Canal, encountered during ground-breaking works required for the construction of the Helix Canal Hub Access Road, are recorded to an appropriate level in order to document any changes proposed to the Scheduled Monument and to retrieve as much artefactual material as possible;
- to ensure that no other archaeologically significant features within the Scheduled Monument Area of the Forth and Clyde Canal are disturbed during the movement of machine plant during the development works.

- 4.2 The objectives are therefore to:

- Prepare a photographic and written record of that part of the canal prior to the commencement of ground-breaking works;
- Supervise the erection of temporary fencing either side of the affected bank of the canal, prior to the commencement of ground-breaking works;
- Supervise the movement of heavy machine plant within the Scheduled Monument Area during the course of ground-breaking works;
- Conduct an archaeological watching brief during the ground-breaking works within and immediately outwith the Scheduled Monument Area to establish the presence or absence of any archaeological remains, and their character, date and extent if surviving; determine the character, extent and significance of any archaeological deposits encountered; and excavate and salvage any information possible from any significant features encountered;

- On completion of all excavation works a report to data structure level and an accompanying post-excavation research design (PERD) and costing will be submitted for agreement with the client, if required. The PERD will also outline arrangements for final publication of the site.

5.0 Methodology

- 5.1 The area of the scheduled monument area subject to ground-breaking works associated with the construction of the Helix Canal Hub Access Road will be photographed and a brief written description made prior to the commencement of ground-breaking works. Any other archaeological features within the affected part of the Scheduled Ancient Monument will be recorded, photographed and planned using conventional proforma sheets and a digital camera.
- 5.2 The Watching Brief Archaeologist will supervise the erection of temporary fencing either side of the affected part of the Scheduled Ancient Monument by the Main Contractor, prior to the commencement of ground-breaking works, to ensure that the specific area of the Scheduled Ancient Monument subject to ground-breaking works is first defined and to further ensure that no disturbance is made by subsequent movement of machine plant during the works.
- 5.3 All movement of heavy machine plant within the Scheduled Monument Area will be supervised by the Watching Brief Archaeologist to ensure that no disturbance is made during the course of the ground-breaking works, beyond the proposed limits of ground-breaking works necessary for the construction of the access road.
- 5.4 A watching brief will be carried out during the ground-breaking works to ensure that no significant archaeological remains are disturbed, without first being recorded. The watching brief will include the monitoring of all topsoil and/ or over-burden stripping operations by machine and excavation and recording of any feature encountered.
- 5.5 The number of watching brief archaeologists required during stripping operations will be dependent on the number of machines employed at any one time (one watching brief archaeologist per machine). All machines used for topsoil stripping will be fitted with a c. 1.6 m wide flat-bladed (toothless) ditching bucket.
- 5.6 The topsoil will be removed in spits to the first archaeological horizon or, where none was found, to the required depth of groundworks. Any archaeological features encountered will be cleaned by hand by the Watching Brief Archaeologist to determine the date of the deposits, their character and extent. This will include recording any part of the canal face, such as original facing stones, revealed during the ground-breaking works, in order to produce a section drawing from the canal face, through the towpath to the edge of the Scheduled Monument Area. Such features will be recorded by written description on *pro forma* recording sheets, by photograph and by measured drawing.
- 5.7 Suitable down time will be provided to the Watching Brief Archaeologist in order to fully recover any archaeological evidence encountered on a site. If any archaeology encountered is sufficiently significant or complex to require more than one day to excavate and record, an on-site meeting would be arranged as soon as possible between the GUARD Project Manager, the client's agent and Candice Hatherley, the relevant Historic Scotland Inspector to agree appropriate mitigation measures to both minimise the impact of further works on the scheduled monument and minimise the impact of any archaeological works upon the schedule of the development works.
- 5.8 All archaeological finds will be dealt with by the on-site Archaeologist. The general practice will be to bulk recover all artefacts by context.
- 5.9 All excavated feature fills and horizons will be sampled, using bulk soil samples, for palaeo-environmental evidence. This may also include micromorphological sampling in order to address soil development at the site.
- 5.10 A representative section will be recorded from the canal face, through the towpath to the edge of the Scheduled Monument Area, denoting depth of topsoil, any stratigraphy present and the nature of the soil. This information will be logged in the day book together with a sketch drawn to scale and a photographic record of deposits.
- 5.11 In the event that human remains are encountered during the watching brief, the local police, the client and Historic Scotland will be notified immediately and no further work will take place on site until agreement on how to proceed has been reached with all parties.

6.0 *Reporting*

- 6.1 On completion of the watching brief phase of work, a report suitable for submission to Historic Scotland and the Falkirk Council Keeper of Archaeology and Local History will be produced. This report, detailing the results of the fieldwork, will be submitted to the client within four weeks of completion of fieldwork and, subject to client approval, submitted to Historic Scotland and the Falkirk Council Keeper of Archaeology within six weeks of the completion of fieldwork. The report will take the form of a Data Structure Report as specified by Historic Scotland and will contain an interim analysis of the results of the watching brief. The report will include a full descriptive text that will characterise the date and extent of any archaeological deposits. It will also include plans at an appropriate scale showing the area subjected to ground-breaking works and archiving lists of all finds, samples, field drawings and photographs.
- 6.2 Subject to the watching brief encountering significant archaeology, the report will be accompanied by a costed PERD for material recovered during the watching brief, in order to bring the results forward for analysis and publication should this be required.
- 6.3 GUARD will also implement the standards and requirements of the Archaeological Standard Protocol for the Integrated Reporting of Events (ASPIRE), Online Access to the Index of Archaeological Investigations (OASIS) and *Discovery and Excavation in Scotland*. In the event of minor archaeological remains being encountered during the watching brief, it is proposed that a comprehensive report submitted to *Discovery and Excavation Scotland*, will form the final publication of the site.

7.0 *Archive, Small Finds and Human Remains*

- 7.1 The resultant site archive will be deposited with the National Monuments Records for Scotland within six months of the completion of all work.
- 7.2 The laws relating to Treasure Trove and *Bona Vacantia* in Scotland apply to all finds where the original owner cannot be identified. This includes all material recovered during archaeological fieldwork. Accordingly, all assemblages recovered from archaeological fieldwork are claimed automatically by the Crown and must be reported to the Scottish Archaeological Finds Allocation Panel through its secretariat, the Treasure Trove Unit. In the event of the discovery of small finds, a filled-out copy of the form "Declaration of an Archaeological Assemblage from Fieldwork" and two copies of the pertinent Data Structure Report will be submitted to the Panel at the conclusion of the fieldwork. The Panel will then be responsible for recommending to the Queen's and Lord Treasurer's Remembrancer which museum should be allocated the finds. All artefacts will be temporarily stored by GUARD until a decision has been made by the panel.

8.0 *Timetable and Staffing*

- 8.1 The precise dates for the work will be agreed between the client and GUARD, and notified to Candice Hatherley, the relevant Historic Scotland Inspector, and Geoff Bailey, the Falkirk Council Keeper of Archaeology no less than two weeks prior to work beginning on site.
- 8.2 Once the dates of groundworks have been agreed, a suitably qualified project officer from GUARD will be appointed. All project team members will be qualified and suitably experienced professional archaeologists and CVs will be supplied if required. The project will be managed for GUARD by Mr Ronan Toolis, who will be the point of contact for the archaeological works.

9.0 *Health & Safety and Insurance*

- 9.1 GUARD will conduct the archaeological works in accordance with Health and Safety legislation and with the guidelines and standards governing archaeological fieldwork set down in the IFA approved Health and Safety in Archaeological Fieldwork document prepared by SCAUM. Prior to fieldwork commencing a risk assessment of the project will be undertaken, giving rise to a project-specific safety plan. GUARD also possess all necessary insurance cover, including employer's and public liability insurance cover, proofs of which will be supplied upon request.

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