

# GUARD ARCHAEOLOGY



**The Helix Canal Hub Foul Drain Works, Falkirk;  
Archaeological Watching Brief  
Data Structure Report  
Project 3671**

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**The Helix Canal Hub Foul Drain Works, Falkirk;  
Archaeological Watching Brief  
Data Structure Report**

**On behalf of:** The Helix Trust

**NGR:** NS 90925 81759

**Project Number:** 3671

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**Approved by:**



**Date:**

22/08/2013

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

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## Contents

Executive Summary	5
Introduction	5
Site Location, Topography and Geology	5
Archaeological Background	5
Aims and Objectives	6
Methodology	7
Results	8
Discussion	8
Conclusions	9
Acknowledgements	9
Appendices	11
Appendix A: Bibliography	11
Appendix B: List of Contexts	11
Appendix C: List of Drawings	11
Appendix D: List of Digital Photographs	11
Appendix E: Discovery and Excavation Scotland Report	12
Appendix F: Written Scheme of Investigation	

## List of Figures

Figure 1: Location of SAM area, NMRS sites & watching brief area	4
Figure 2: West facing section of pipe trench	9

## List of Plates

Plate 1: Working shot of pipe trench showing telecom cables and a metal service pipe (foreground)	8
Plate 2: West facing section of pipe trench showing in-fill deposit and modern disturbance to the north canal wall	8

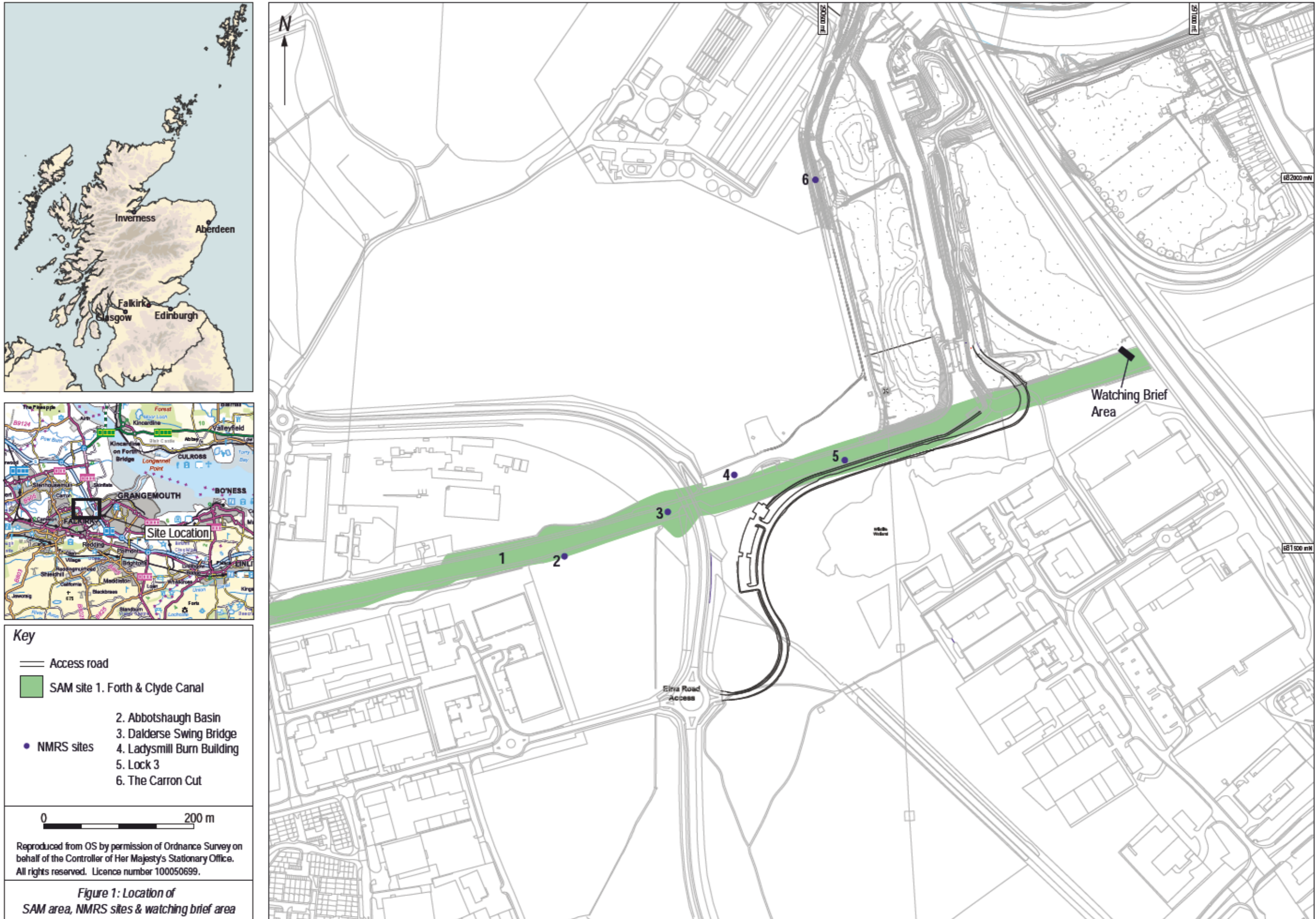


Figure 1: Location of SAM area, NMRS sites & watching brief area

## Executive Summary

- 1.1 GUARD Archaeology Limited were commissioned to undertake an archaeological watching brief during the construction works for the insertion of a drainage pipe through an in-filled section of the Forth & Clyde Canal Scheduled Monument at the Helix Canal Hub, Falkirk. This work was undertaken over three days between 1st August and 6th August 2013. The excavation revealed a cut made during the removal of the original stone wall of the canal, and the modern material used to in-fill this canal section.

## Introduction

- 2.1 This report sets out the results of an archaeological watching brief undertaken by GUARD Archaeology Limited, commissioned by Ironside Farrar acting on behalf of the Helix Trust, during the insertion of a drainage pipe through an in-filled section of the Forth & Clyde Canal Scheduled Monument at The Helix Canal Hub, Falkirk (SAM No 6768).

## Site Location, Topography and Geology

- 3.1 The in-filled portion of the canal lies within the eastern part of the Castlecary-M9 Motorway section of the Forth and Clyde Canal, located to the north of Falkirk and centred on NGR NS 90925 81759 (Figure 1). The precise area of groundworks subject to the archaeological watching brief is bounded to the north and west by the Helix development, to the south by West Mains industrial estate and to the east by the M9 motorway.
- 3.2 The underlying superficial deposits consist of undifferentiated Intertidal Deposits of silt and clay, while the bedrock is Clackmannan Group Type sedimentary rock. (British Geological Survey <http://mapapps.bgs.ac.uk>).

## Archaeological Background

- 4.1 Examination of PASTMAP previously identified six sites of archaeological interest within the immediate environs of the in-filled section of the canal (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), but no significant archaeological remains were encountered.
- 4.8 This section of the canal was in-filled some time after 1963 (NMRS entry for Forth & Clyde Canal section Abbotshaugh-Glenburgh-Grangemouth).
- 4.9 GUARD Archaeology undertook an archaeological watching brief between November and December 2011 during an earlier phase of construction works for the Helix Canal Hub Access Road, within the same section of the Forth & Clyde Canal Scheduled Monument (centred at NS 905 816). This work revealed only made ground, modern service trenches and early modern artefacts.
- 4.10 A further archaeological watching brief carried out by GUARD Archaeology in January and February 2013 at The Helix Canal Connection (NGR: NS 9053 8162) revealed the foundation cut for the canal wall and allowed its method of construction to be recorded.

## Aims and Objectives

### 5.1 The aims of the watching brief were:

- to ensure that any surviving archaeological remains associated with the Forth and Clyde Canal, encountered during ground-breaking works required for the insertion of a drainage pipe, were 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 were disturbed during the movement of machine plant during the development works.

### 5.2 The 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 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 prepare a report to data structure level and an accompanying post-excavation research design and costing if required.

## Methodology

- 6.1 The Written Scheme of Investigation, outlining the following methodology, agreed in advance with Historic Scotland, is presented in Appendix F. The in-filled area of the Scheduled Monument subject to ground-breaking works associated with the insertion of a drainage pipe 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 Monument were recorded, photographed and planned using conventional proforma sheets and a digital camera.
- 6.2 The Watching Brief Archaeologist supervised 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 supervised by the Watching Brief Archaeologist to ensure that no disturbance was 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 An archaeological watching brief was carried out during the ground-breaking works to ensure that no significant archaeological remains were disturbed, without first being recorded. The watching brief involved the monitoring of all topsoil and/ or over-burden stripping operations by machine.
- 6.5 All machines used for topsoil stripping were fitted with a c. 1.6 m wide flat-bladed (toothless) ditching bucket.
- 6.6 The topsoil was removed in spits to the first archaeological horizon or, where none was found, to the required depth of groundworks. Where it was safe to do so, any archaeological features encountered were cleaned by hand to determine the date of the deposits, their character and extent; this included recording any part of the canal face that remained in-situ. Such features were recorded by written description on *pro forma* recording sheets, by photograph and by measured drawing.
- 6.7 Any archaeological finds were dealt with by the on-site Archaeologist. The general practice was bulk recovery of all artefacts by context.
- 6.8 A representative section was recorded from the excavated trench showing the canal cut and the material used as in-fill. The section was recorded by digital photography, by written description and by measured section drawing at a scale of 1:50.

## Results



*Plate 1: Working shot of pipe trench showing telecom cables and a metal service pipe (foreground).*



*Plate 2. West facing section of pipe trench showing in-fill deposit and modern disturbance to the north canal wall.*

- 7.1 GUARD Archaeology undertook this programme of work between 1st August and 6th August 2013. The detailed results are presented in Appendices B-D and Figures 1-2.
- 7.2 A total area of 100 m<sup>2</sup> was stripped of topsoil/overburden (Context 001) to reveal mottled light brown, orange and grey clay subsoil (Context 002) over a blue/grey glacial clay deposit (Context 003). The overburden comprised pockets of topsoil intermixed with debris from the removal of the canal wall. Over the majority of the trench, the topsoil/overburden deposit was 0.25m in depth. Modern cuts for the insertion of telecom service cables, a water pipe and a metal service pipe were noted in the exposed section.
- 7.3 During the course of the watching brief, the cut created during the removal of the canal wall (Context 005) and the material used to in-fill this section of the canal (Context 006) were exposed. Although the canal wall was a vertical structure, the cut noted on the exposed section sloped at an angle down from north to south, becoming markedly deeper and steeper towards the southern limit of the excavation (Figure 2). The in-fill material comprised building bricks, rectangular blocks of dressed sandstone, corrugated metal sheeting, red blaes and modern plastics in a mid-brown silt matrix that included pockets of brown and grey clay (Plate 2).
- 7.4 Some modern artefacts, including a glass bottle and pieces of metal, were noted within the in-filled canal section. The instability of the trench edges combined with the depth of the excavated trench meant that these could not be recovered.

## Discussion

- 8.1 The watching brief identified a cut that related to the removal of the original stone wall on the north side of this section of the Forth & Clyde Canal. The shape of the profile of the cut suggests that, after draining the canal section, a mechanical digger was used to remove the wall, pulling the stones in a northerly direction and creating a sloping cut.
- 8.2 The material used to in-fill the canal is a mix of brown silt with pockets of clay. The silt element in this deposit may have been material removed from the canal as it was being emptied, or could be topsoil from the canal bank. The clay is also likely to be related to the original canal walls, most probably having been used to seal the walls and base of the canal. Some of the stones from the canal wall were re-deposited as part of the in-fill.
- 8.3 No artefacts related to the construction of the canal were uncovered. Modern disturbances include the insertion of a concrete-clad manhole, two pipes and two telecom cables.



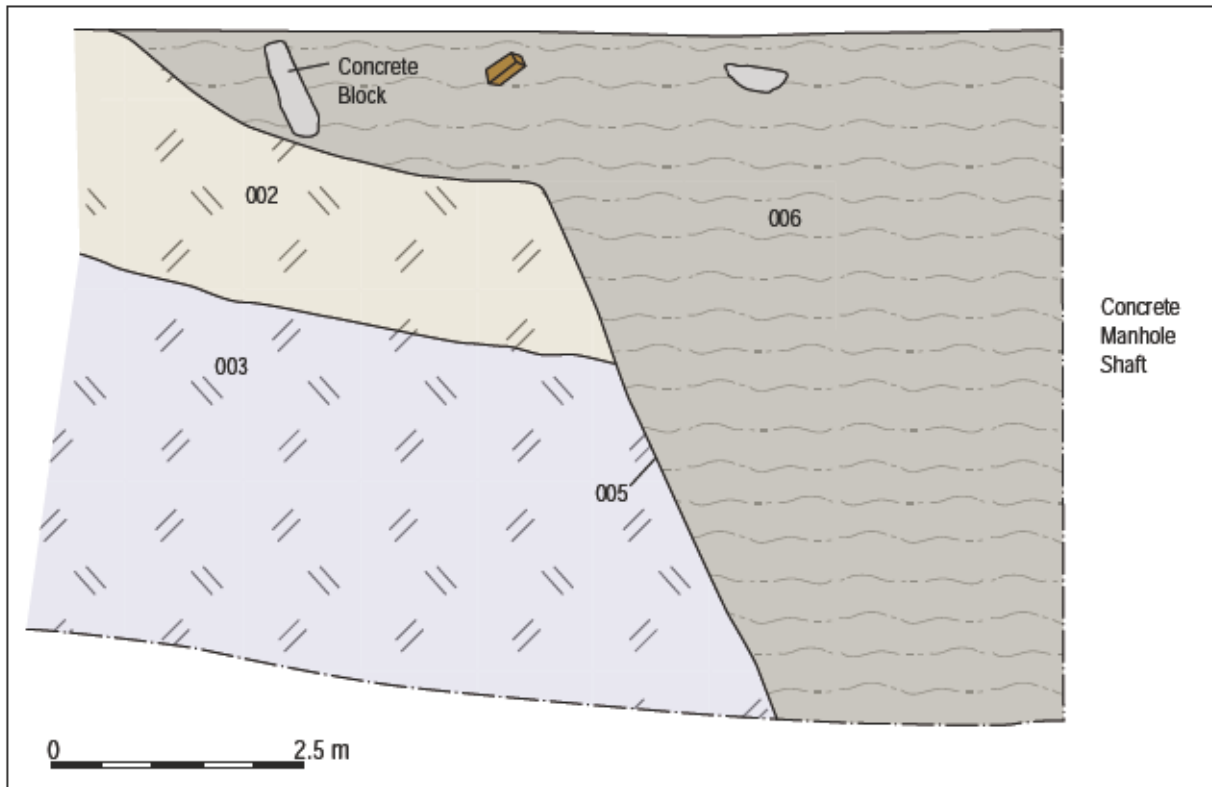


Figure 2: West facing section of pipe trench.

## Conclusions

- 9.1 The north canal wall of the Forth & Clyde Canal at this juncture was clearly destroyed when the canal section was in-filled. Some stones from the wall were used as in-fill, while others were retained but have not yet been put to another purpose. Subsurface deposits on the north side of the canal have been disturbed by service trenches. The in-fill material has been disturbed by the insertion of a manhole and, presumably, a water pipe.
- 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 E. 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: guardarc1-156703) has been completed. 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.

## Acknowledgements

- 10.1 GUARD Archaeology would like to thank Balfour Beatty and Ironside Farrar for their assistance during this work. Plant and driver was supplied by Ian Orr/Balfour Beatty. Technical support was provided by Aileen Maule and John Keily. The watching brief was undertaken by Christine Rennie and Rowena Thomson. The illustrations were produced by Fiona Jackson. The report was desk top published by Gillian McSwan. The project was managed for GUARD Archaeology by Ronan Toolis.

**The Helix Canal Hub Foul Drain Works, Falkirk;  
Archaeological Watching Brief  
Data Structure Report**

**Section 2: Appendices**



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## Appendices

### Appendix A: Bibliography

#### Documentary Sources

British Geological Survey <http://mapapps.bgs.ac.uk> [Accessed 7 August 2013].

National Monuments Record for Scotland <http://canmore.rcahms.gov.uk> [Accessed 7th August 2013].

Thomson, R & Rennie C 2012 *The Helix Canal Hub Access Road, Falkirk, Archaeological Watching Brief*, unpublished GUARD Archaeology Data Structure Report, Project 3146.

Thomson, R 2013 *The Helix Canal Connection, Falkirk, Archaeological Watching Brief*, unpublished GUARD Archaeology Data Structure Report, Project 3618.

#### Cartographic Sources

Ordnance Survey 1865 *Stirling, Sheet XXIV.16 (Combined)*. 1st Edition 25" to the mile map.

Ordnance Survey 1897 *Stirlingshire, Sheet 024.16*. 2nd and later Edition 25" to the mile map.

Ordnance Survey 1915 *Stirlingshire, Sheet n024.16*. 2nd and later Edition 25" to the mile map.

Ordnance Survey 1947 *Stirlingshire, Sheet n024.16*. 2nd and later Edition 25" to the mile map.

### Appendix B: List of Contexts

Context No.	Area	Description	Interpretation
001	SAM	Mid-brown silt	Topsoil/overburden
002	SAM	Mottled orange/brown/grey clay	Subsoil
003	SAM	Grey/blue clay	Glacial deposit
004	-	Number voided	-
005	SAM	Linear cut	North canal edge after removal of stone wall
006	SAM	Mix of silt, clay and modern debris - bricks, sandstone blocks, metal, plastic and red blaes	In-fill material at this section of the Forth & Clyde canal

### Appendix C: List of Drawings

Drawing No.	Area	Sheet No.	Subject	Scale
1	SAM	1	West facing section of canal cut	1:50

### Appendix D: List of Digital Photographs

Frame	Area	Context No.	Subject	Taken from
1	SAM	001-003	Deposits at north end of trench	E
2	-	001-003	Deposits at north end of trench	E
3	-	001-003	Deposits at north end of trench	E
4	-	-	File ID shot	-
5	-	-	Existing excavation as at 5/8/13	N
6	-	-	Existing excavation as at 5/8/13	N
7	-	-	Existing excavation as at 5/8/13	NE
8	-	-	Pre-excavation view of area to be excavated	NE
9	-	-	Pre-excavation view of area to be excavated	ENE
10	-	001-003	North-east facing section of deposits	NE
11	-	001-003	North-east facing section of deposits	NE
12	-	001-003	Excavated area prior to insertion of dry-box	NW
13	-	001-003	Excavated area prior to insertion of dry-box	NW

Frame	Area	Context No.	Subject	Taken from
14	-	-	Northern section of trench after re-instatement	SE
15	-	001-003	Post-excavation view of central section of trench	NW
16	-	001-003	West facing section at central portion of trench	NW
17	-	001-003	East facing section at central portion of trench	N
18	-	005, 006	Cut of Forth & Clyde canal	NW
19	-	005, 006	Cut of Forth & Clyde canal	NW
20	-	005, 006	Cut of Forth & Clyde canal	NW
21	-	005, 006	Detail of cut showing metal objects	NW
22	-	-	Concrete face of existing manhole	NW
23	-	-	General view of southern extent of trench	N

## Appendix E: Discovery and Excavation Scotland Report

LOCAL AUTHORITY:	Falkirk
PROJECT TITLE/SITE NAME:	The Helix Canal Hub Foul Drain Works
PROJECT CODE:	3671
PARISH:	Grangemouth
NAME OF CONTRIBUTOR(S):	Christine Rennie
NAME OF ORGANISATION:	GUARD Archaeology Limited
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 909 817
START DATE (this season)	1 <sup>st</sup> August 20013
END DATE (this season)	6 <sup>th</sup> August 2013
PREVIOUS WORK (incl. DES ref.)	Watching Brief (GUARD Archaeology 3146) DES 2012
MAIN (NARRATIVE) DESCRIPTION: (May include information from other fields)	GUARD Archaeology Limited were commissioned to undertake an archaeological watching brief during the construction works for the insertion of a drainage pipe through an in-filled section of the Forth & Clyde Canal Scheduled Monument at The Helix, Falkirk, Stirlingshire. The excavation revealed a cut made during the removal of the original stone wall, and the modern material used to in-fill this canal section.
PROPOSED FUTURE WORK:	None
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 F: Written Scheme of Investigation**

# THE HELIX CANAL CONNECTION

WATCHING BRIEF WRITTEN SCHEME OF INVESTIGATION

PROJECT 3618

## Contents

1.0	Introduction	1
2.0	Site Location and Cultural Significance of the Monument	1
3.0	Planning Background	2
4.0	Aims and Objectives	2
5.0	Methodology	3
6.0	Reporting	4
7.0	Archiving	4
8.0	Timetable, Staffing and Monitoring	4
9.0	Health & Safety and Insurance	5



**Key**

- t in rie re
- ess ro
- site ort C e C n
- sites

ots sin  
erse in ri e  
s i m i n  
o  
e C rron C t

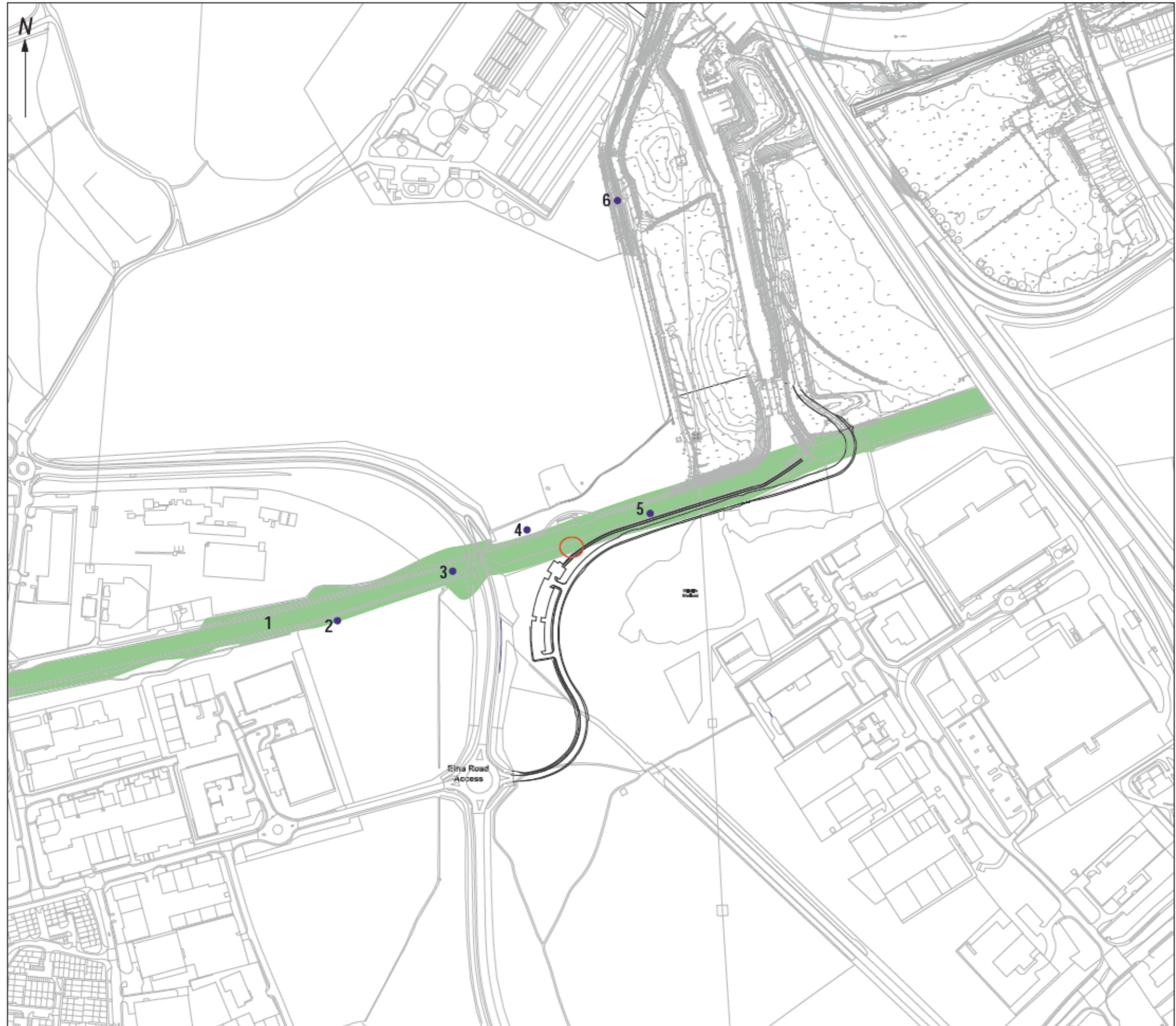
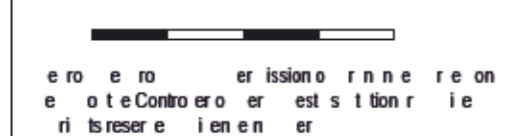


Figure 1: Location of SAM area, NMRS sites & watching brief area

## 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 Connection within the Forth and Clyde Canal Scheduled Monument Area (SAM No 6768).
- 1.2 The proposed groundworks will comprise the construction of an inlet chamber and pipework to the canal towpath/embankment to facilitate water extraction from the canal providing supplementary water to Helix lagoon. The chamber is effectively a manhole with a lid at existing ground level ensuring no change to existing embankment profile.
- 1.3 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 Connection. 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.
- 1.4 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.

## Site Location and Cultural Significance of the Monument

- 1.1 The canal connection area lies within 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 and east by the Helix Canal access road and to the west by the A9.
- 1.2 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.
- 1.3 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'.
- 1.4 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.
- 1.5 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.

- 1.6 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.
- 2.10 GUARD Archaeology undertook an archaeological watching brief between November and December 2011 during an earlier phase of construction works for the Helix Canal Hub Access Road, within the same section of the Forth & Clyde Canal Scheduled Ancient Monument (centred at NS 905 816). This work revealed only made ground, modern service trenches and early modern artefacts.

## Planning Background

- 3.1 This WSI has been drafted in response to Condition 1 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.

## 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 Connection, 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 work.

## Methodology

- 5.1 The area of the scheduled monument area subject to ground-breaking works associated with the construction of the Helix Canal Connection 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.
  - 1.1 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.
  - 1.2 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 canal connection.
- 5.2 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.
  - 1.4 The number of watching brief archaeologists required during stripping operations will be dependent upon 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.
  - 1.5 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.
  - 1.6 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 the relevant Historic Scotland Case Officer 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.
  - 1.7 All archaeological finds will be dealt with by the on-site Archaeologist. The general practice will be to bulk recover all artefacts by context.
  - 1.8 All hand-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.
  - 1.9 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.

- 1.10 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.

## 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 archaeological results of this work.

## Archiving

- 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 Archaeology until a decision has been made by the panel.

## Timetable, Staffing and Monitoring

- 8.1 The proposed dates for the watching brief comprise Tuesday 29 January -Thursday 31 January 2013. This timetable has been notified to the relevant Historic Scotland Case Officer and the Falkirk Council Keeper of Archaeology prior to work beginning on site.
- 8.2 All GUARD Archaeology field staff will be qualified and suitably experienced professional archaeologists and CVs will be supplied if required. The project will be managed for GUARD Archaeology by Mr Ronan Toolis, who will be the main point of contact for the archaeological works.
- 8.3 The relevant Historic Scotland Case Officer and the Falkirk Council Keeper of Archaeology will be informed of the site mobile phone number prior to the start date so that monitoring visits can be arranged.

## Health & Safety and Insurance

- 9.1 GUARD Archaeology will conduct the archaeological works in accordance with Health and Safety legislation and with the guidelines and standards governing archaeological fieldwork set down by the Institute for Archaeologists. Prior to fieldwork commencing a risk assessment of the project will be undertaken, giving rise to a project-specific safety plan. GUARD Archaeology 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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