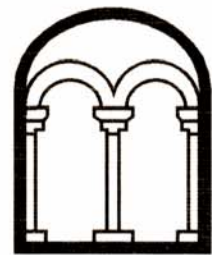


**LAND AT RIVERSIDE/BRIDGE STREET
STAFFORD**

ARCHAEOLOGICAL EVALUATION

Albion
archaeology



**LAND AT RIVERSIDE/BRIDGE STREET
STAFFORD**

ARCHAEOLOGICAL EVALUATION

Project: SR1965
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14th August 2012

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Produced for:
RPS Group

on behalf of:
LXB RP (Stafford) Limited.

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Preface

Every effort has been made in the preparation of this document to provide as complete a summary as possible within the terms of the method statement. All statements and opinions in this document are offered in good faith. Albion Archaeology cannot accept responsibility for errors of fact or opinion resulting from data supplied by a third party, or for any loss or other consequence arising from decisions or actions made upon the basis of facts or opinions expressed in this document.

Acknowledgements

The project was commissioned by Simon Blatherwick (RPS) on behalf of LXB RP (Stafford) Limited. It was monitored on behalf of the Local Planning Authority by Stephen Dean, Staffordshire County Archaeologist.

This report has been prepared by Christiane Meckseper (Project Officer) and Kathy Pilkinton (Archaeological Supervisor), with contributions by Holly Duncan (Project Manager Artefacts) and Jackie Wells (Finds Officer). Illustrations were prepared by Joan Lightning (CAD Technician). The fieldwork was undertaken by Christiane Meckseper and Kathy Pilkinton. The project was managed by Robert Wardill of Albion Archaeology and Simon Blatherwick of RPS.

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Key Terms

Throughout this report the following terms or abbreviations are used:

Client	LXB RP (Stafford) Limited
Consultant	RPS Group London
IfA	Institute for Archaeologists
LPA	Local Planning Authority
SCA	Staffordshire County Archaeologist
LCC	Stafford City Council
HER	Historic Environment Record
PDA	Proposed Development Area (i.e. the site)





Non-Technical Summary

LXB RP (Stafford) Limited are gathering information to support proposals for the re-development of the land at Riverside/Bridge, Stafford. In line with the National Planning Policy Framework (NPPF) and local planning policy, a historic environment assessment (HEA) was carried out by RPS in November 2011. In response to the HEA a planning condition was placed on consent for the redevelopment of the site requiring an archaeological evaluation. Albion Archaeology was then commissioned to undertake the works in accordance with a Written Statement of Investigation prepared by RPS.

The site lies just outside the line of the former southern town wall that formed the limit of the medieval town of Stafford, close to the southern gateway of the historic town. Historical and cartographic evidence suggest that the site consisted of undeveloped land until the early 19th century. The “Thieves Ditch” along the southern wall is not shown on maps until 1838.

This evidence was largely confirmed by the archaeological evaluation. No archaeological remains pre-dating the post-medieval period were revealed in any of the trenches suggesting that the riverside ground outside the southern town wall was never extensively reclaimed and/or used for industrial purposes.

Sampling of the geological and archaeological deposits revealed rich environmental evidence which demonstrate changes in the landscape of the area from the Bronze Age period to the present day. The early landscape is characterised by a moving river channel in a partially wooded landscape, until the river settled on a southerly course and localised thick layers of peat indicate the forming of a marshy bank with seasonal flooding.

From the Saxon period onwards there is environmental evidence for cereal production in the vicinity and a developing urban environment. Flooding of the area continued until the post-medieval period, probably until the area was drained by the construction of the Thieves Ditch.

Trench 2 contained a timber revetment driven into the post-medieval alluvial layers and underlying peat. This ran parallel to the line of the South Walls street and potentially the Thieves Ditch, but no evidence for the location of the ditch was revealed in any of the trenches.

The evaluation confirmed the presence of surviving demolition layers and cellars of the 19th century buildings along South Walls and their backyards and gardens as well as extensive evidence for the modern foundations of the Riverside Recreation Centre.



1. INTRODUCTION

1.1 *Planning Background*

LXB RP (Stafford) Limited are gathering information to support proposals for the re-development of the land at Riverside/Bridge, Stafford. The site falls in to two areas, north and south of The River Sow. The southern area contains a disused multi-storey car park. The northern area, with which this document is primarily concerned, is currently a 'flat-top' pay and display car park.

The site previously contained buildings associated with the Riverside Recreation Centre. Although it is not located in an Archaeological Priority Area or Residential Area of Special Character, the western edges of the red-line plan fall into the Stafford Town Centre Conservation Area. However, this only effects the southern portion of the site.

A historic environment assessment (HEA) was carried out by RPS in November 2011 (RPS 2011). Consultations with the Staffordshire County Archaeologist (SCA) confirmed that information on the archaeological potential of the site, depth of burial and thickness of surviving deposits was required in order to assess the development impact and to support a future planning application.

In response to the HEA a planning condition was placed on consent for the redevelopment of the site. Planning condition 13 states: "*No construction shall take place until a staged programme of archaeological work, including (where appropriate) evaluation, excavation, watching brief, post-excavation analysis and appropriate levels of publication, in accordance with a written scheme of investigation, which has been submitted to and approved in writing by the Local Planning Authority. The programme of archaeological work shall be fully implemented in accordance with the approved written scheme of investigation.*"

The Written Scheme of Investigation (WSI) detailing the 'programme of archaeological works' was prepared by RPS on behalf of the developer, LXB RP (Stafford) Limited (RPS 2012). This document was approved by the SCA. Albion Archaeology was commissioned by RPS to implement the archaeological works.

This report forms part of the agreed 'programme of works' and provides an evaluation of the site to support a future planning application for development.

1.2 *Site Location, Topography and Geology*

The northern part of the PDA is located to the south of South Walls, Stafford town centre (Figure 1). It is bounded to the east by the Queensway ring road, to the west by another car park and the River Sow runs to the south.

The site measures 1.7 ha in extent and is centred on NGR SJ 92507 23066. Topographic Survey indicated that the car park is located at *c.* 74.0 – 74.5m OD. At the time of the investigations the PDA was used as a public car park.



1.3 Archaeological Background

The archaeological background to the site is discussed in detail in the Historic Environment Assessment (RPS 2011). A summary is given below.

The site lies just outside the line of the former southern town wall that formed the limit of the medieval town of Stafford. It is located just outside the defined settlement, close to the southern gateway of the historic town.

The earliest suggestion of settlement, within the peninsula on which Stafford now lies, dates to the Iron Age. Excavations in the 1970s and '80s revealed a number of granaries associated with the storage of emmer and spelt wheat. Three worked timbers, radiocarbon dated to the Iron Age, were revealed during a watching brief on the site of the supermarket directly to the east of the PDA. Some evidence of Roman activity has been recovered but this appears to be largely agricultural with a decrease in activity towards the end of the period.

The earliest phase of significant activity dates to the founding of the Saxon *burh* or defended settlement in the early 10th century. The settlement was defined by The River Sow to the south and west and streams and marshes to the to the east. This phase of activity was represented by the building of a chapel in the centre of the peninsula at St Bertelin's. Archaeological sites have also produced Saxon evidence for the processing of grain and the baking of loaves of bread and oatmeal bannocks on the peninsula.

There is also evidence of a smithy and stable block and potters' workshops, producing a wide range of pots, pitchers, bowls and lamps including the widely spread Stafford-type ware. To the east at the marsh edge appears to be the town dump, with piles of pottery wasters and butchered animal bone present.

Recent excavations undertaken by Oxford Archaeology directly to the north west of the site produced further evidence of extensive pottery production for this period, along with quantities of charred grain, slag and hammerscale suggesting further activity (Oxford Archaeology 2011).

Palaeo-environmental evidence from excavations at the eastern end of the north walls suggests a period of inactivity or abandonment after the 14th century, characterised by episodes of waterlogging possibly associated with climactic conditions during that period.

The town walls are mentioned for the first time in the Domesday Survey of 1086 but originally may have enclosed a smaller area than the later medieval walls, probably following the line of Salter Street and tipping Street. The construction of the main stone town walls is dated to the 16th century and these followed the lines marked today by the streets of North Walls, South Walls, Mill Bank, Tenterbanks and Chell Road.

Speed's map of 1610 showed a ditch along the eastern wall but no ditch outside the southern walls of the town. By the early 19th century the



upstanding southern walls have been replaced by a road and a map of the town dating from 1838 now shows a ditch running east-west along the northern perimeter of the site. On the first edition OS map of 1881 this ditch is clearly labelled as the 'Thieves Ditch'.

The late 19th and early 20th century see the development of a row of houses along the line of the road and the division of the land between South Walls and Thieves Ditch in to garden plots.

A watching brief on the construction of the supermarket to the east of the PDA also revealed a 19th century sewage works and bottle dump, confirming that the area was only subject to peripheral settlement activity until the 20th century.

1.4 Project Objectives

The project was carried out according to requirements of current national and local planning policy, including the National Planning Policy Framework (NPPF). The research framework for Stafford is provided by *The Archaeology of the West Midlands: A Framework for Research* (Watt 2011).

The project objectives for the archaeological works at PDA were stated in the WSI (RPS) and are reproduced here:

- Establishing the presence or absence of remains of the Town Wall which surrounded the central core of Stafford;
- Establishing the presence or absence of the Thieves Ditch, recorded as running parallel to the Town Wall;
- Targeting peat and alluvial deposits (with a view to sampling these deposits) recorded in the geo-archaeological watching brief on Site Investigation works;
- Establishing the former course of the River Sow; and
- Establishing the presence or absence of other archaeological features which inform the history of the landscape of the Proposed Development Site. These may include both midden deposits and/or medieval post-medieval industrial deposits that provide evidence of the usage of the site.

1.5 Archiving

The archive of finds and records generated during the project will be archived according to the guidelines issued by the Potteries Museum & Art Gallery, Stoke on Trent, and to the standards outlined in Appendix 3 of English Heritage's *Management of Archaeological Projects*. Details of the project and its findings have been submitted to the OASIS database (reference: albionar1_104232) in accordance with the guidelines issued by English Heritage and the Archaeology Data Service.

The integrated project archive (including both artefacts/ecofacts and project documentation) will be prepared upon approval of this report.



2. METHODOLOGY

2.1 Introduction

The methodological approach to the project was detailed in the WSI (RPS 2012) and was approved by the SCA. The archaeological investigation was conducted in accordance with appropriate national and regional standards and guidelines including:

- Albion Archaeology
- Archaeological Archive Forum
- English Heritage
- IfA
- *Procedures Manual: Volume 1 Fieldwork* (2nd ed, 2001)
- *Archaeological Archives: A Guide to best practice in creation, compilation, transfer and curation* (2007)
- *Management of Research Projects in the Historic Environment* (2009).
- *Environmental Archaeology: A guide to the theory and practice of methods, from sampling and recovery to post-excavation. 2nd ed. (2011)*
- *By-Laws and Code of Conduct*
- *Standard and Guidance for Archaeological Field Evaluation* (2009) and *Finds* (updated 2008)

2.2 Field Evaluation

A total of six trenches were investigated between Monday 11th and Thursday 27th June 2012 (Figure 2).

The trenches were designed to be *c.* 3.60m wide and 20m in length with a stepped depth of up to 2.4m. However, conditions and constraints on site meant that most trenches were adjusted in location and size. All trenches, other than Trench 3, were widened due to the unstable nature of the deposits revealed.

All trenches were opened by a mechanical excavator fitted with either a toothed bucket to remove modern rubble and hardcore or a ditching bucket 1.2m wide, operated by an experienced driver, under close archaeological supervision. Modern make up layers, 19th-century demolition material and undifferentiated post-medieval layers were removed down to the top of undisturbed archaeological deposits, to a maximum depth of 2.4m. In most trenches this was at a depth of *c.* 2m below modern ground level.

Auger investigations were carried out in trenches 1, 3 and 4 to investigate the nature and depth of the natural deposits beyond 2.4m. Deposits from Trenches 3 and 4 and were sampled for environmental evidence and radio carbon datable material.

All deposits were recorded in a unique number sequence, using Albion Archaeology's *pro forma* sheets. The trenches were subsequently drawn and



photographed as appropriate. The spoil heaps were scanned for artefacts by eye and metal detector.

2.3 Monitoring

Monitoring meetings with the SCA and consultant were held regularly throughout the project. Monitoring meetings took place on Monday 18th June and Tuesday 26th June 2012. A car park backfill monitoring meeting was held on Monday 2nd July 2012.



3. RESULTS

3.1 Introduction

All archaeological features located in the trenches are shown on Figures 3–8 and detailed descriptions of individual contexts are provided in Appendix 1.

3.2 Overburden and Natural Geological Deposits

Apart from Trench 1, which was cut through a thin layer of turf and compacted soil, all trenches had a layer of Type 1 aggregate modern car park surface material or tarmac (Trench 3) above a series of compact gravelly and sandy make-up layers. These layers combined were on average 0.03-0.40m thick.

Natural geological layers were only exposed by machine in Trench 2 at a depth of c. 3.30m below modern ground level. They consisted of mid greyish yellow coarse silty sand with occasional to moderate gravel inclusions and represent alluvial sands and gravels. In Trenches 1, 3 and 4 the alluvial layers and overlying peat deposits were sampled by auger, these results are described below.

3.3 Prehistoric to medieval alluvial and peat deposits

The base of the stratigraphic sequence on site was formed by a series of post-glacial alluvial silts and peat deposits. A geo-archaeological survey had been carried out prior to the evaluation and had identified late glacial geo-fluvial deposits below fine to medium grained alluvial sands and a later, localised peat horizon, largely in the eastern part of the site (QUEST 2011).

On the basis of this report further environmental samples were taken from these deposits in Trenches 1, 3 and 4 during the evaluation using core samples retrieved by hand and gouge augering. These results are summarised here. The full report and radiocarbon dating certificates are given in Appendix II (Rackham 2012).

The upper horizons of the peat deposit were also exposed by machine in Trenches 2 and 3. In Trench 1 the alluvial and peat deposits were augured by J. Rackham and recorded by Albion Archaeology. These deposits are described in Appendix I (Trench 1).

A core sample of up to 1.5m soil sequence to a depth of 3.43m below present ground level was taken from Trench 3. In Trench 4 an auger sample was cored and logged through a 2.70m soil sequence to a depth of 5.0m below present ground level and a sample taken from the basal 10cm of postglacial sediments.

Three radiocarbon samples were obtained from the core samples. These indicate that the sequence of deposits in Trench 3 starts in the middle Iron Age and continues into the medieval period. The sample from Trench 4 was taken from a much lower level than in Trench 3 and indicates that here the sequence starts in the late Bronze Age (Appendix II).



Pollen sub-samples were taken at regular intervals from the core sample from Trench 3, and from the basal sample from Trench 4. These showed that pollen and spores were present in sufficient numbers and state of preservation to allow pollen counts and a pollen diagram to be constructed.

The deposits suggest a large pool of water with sedimentation beginning in the early Bronze Age, around 2000 BC. No peats were recorded in Trench 4, suggesting that this area always lay within, or on the edge of the water body. Sedimentation in Trench 3 starts around the middle Iron Age and waterlain silty sands in Trenches 3 and 1 suggest that the river channel may have expanded or moved across the site before settling on a more southerly position.

Peat deposits only occurred in Trenches 1 and 3 and suggest the development of marsh along the margins of the water body on the higher ground towards the north of the site. The decreasing organic components within the deposits suggest that they became dryer with seasonal winter flooding introducing a more clayey consistency to the upper layers. This may have occurred either in the Saxon period or earlier.

The preliminary pollen evidence shows that throughout the sequence the surrounding landscape was largely open with alder trees and marsh fringing the river. A slightly higher tree pollen count in the sample in Trench 4 may suggest an earlier wooded environment.

The tree pollen count falls sometime the 1st millennium AD and from the Saxon period onwards there is a marked rise in cereal pollen. A reduction in weed pollen (*Rumex* and *Plantago Lanceolata*) could suggest an increase in arable land at the expense of pasture. Microscopic charcoal in the later sediments may also reflect the development and increase in urban settlement in the area.

3.4 Post medieval alluvial layers and timber revetment

A layer of dark greyish black silty clay with occasional inclusions of small brick, glass and animal bone fragments was present in all trenches above the peat deposits. It was up to 0.60m thick. In Trench 2 the layer also contained occasional large reddish sandstone blocks. The deposit is alluvial in nature and most likely represents a period of regular flooding or marshy ground in the area. It is post-medieval in date.

In Trench 2, the alluvial layer was overlain by a slightly dryer, friable dark blackish grey clayey silt (211) with moderate inclusions of brick, animal bone and small stones, including a worn sub-rectangular limestone fragment (48g) from a possible tile or paving stone (L. 42mm; W. 41mm; TH. 24.6mm). Pottery comprises a sizeable sherd (69g) from a Blackware cup or tyg, datable to the seventeenth century. The layer was up to 0.40m thick and probably represents a built up of organic material mixed with some domestic dumping, still in an area of fairly wet and marshy ground.



Timber structure (215), consisting of a meandering east-west alignment of unconnected timber posts (216-232), was driven through this layer and into the underlying alluvial and peat deposits (Figures 9, 10). Six of the timber posts were removed during machining. They consisted of either whole or halved pieces of round posts usually with a four-faceted point hewn by an axe (Figure 10). The posts were between 0.40m-1.60m long and 110x150mm wide.

The exception was timber (231) which consisted of a rectangular, quartered piece of wood that was 570mm long and c. 45mm wide with an axe-hewn point and an upper end shaped into a hook or stopper (Figure 10d). The timber was very reminiscent of a tent peg and most likely re-used.

It is likely that the timbers were part of a revetment, potentially related to the Thieves Ditch that used to run on the same east-west alignment along South Walls. However the ditch itself was not revealed in the evaluation.

The 17th century date of deposit (211) provides a *terminus post quem* for the timber revetment so it is most likely post-medieval in date.

3.5 19th century and modern remains

The southern side of South Wall was occupied by a line of 19th century terraced houses which were demolished c. 4-5 years ago. The buildings are shown on the early OS maps of the town and are still visible on fairly recent Google Earth imagery of the site (Figure 11).

Trench 1 revealed the remains of a cellar and a number of wall foundations, related to the terraced houses and possible backyard structures. The cellar was filled with brick rubble from the demolition of the buildings.

Trench 3 contained a brick wall with a sandstone foundation [209] on an east-west alignment with a foundation cut up to 1.10m in depth. It is possible that this was a boundary wall demarcating the back of the properties along South Wall. A thick garden soil (205) was located to the northern side of the wall.

A further wall [207] on a perpendicular north-south alignment but with a much more shallow foundation may have served as a property divider. This was deliberately demolished and overlain by a further build up of garden soil and mixed with building rubble (202) up to 0.80m thick, suggesting that the wall was removed some time prior to the main demolition of the South Wall properties in recent years.

A layer made up predominantly of utilitarian glass bottles and jars and ceramic plates and vessels was present in Trenches 3 to 6 (layers 303, 403, 504, 603). This was 0.30-0.50m thick and consisted of black gritty sandy clay mixed with orange silty gravelly sand with additional inclusions of charcoal, brick and small stones. The shapes and forms of the bottles suggest a date of the early to mid 20th century for their manufacture.



In Trenches 4, 5 and 6 (Figures 6-8) the bottle layer was cut through and overlain by a number of concrete piles, concrete foundations and large construction cuts which represent the remains of foundations for the “Riverside Recreation Centre” that previously stood on the site. This was built in the early 1970s and demolished together with the houses along South Wall around 4-5 years ago to make way for the development of the site.



4. CONCLUSIONS

The evidence contained in the sequence of natural and archaeological deposits revealed by the trenching at the Riverside/Bridge Street site demonstrate changes in the landscape of the area from the Bronze Age period to the present day.

From around 2000BC to the 1st millennium AD the environment was characterised by a moving river channel, possibly lined with alder trees and woodland nearby. Eventually the channel settled on its position in the southern part of the site and the fringes of the water course became marshy, indicated by layers of peat. Summer dry periods and winter flooding introduced increasingly clayey alluvial layers onto the site.

From the Saxon period onwards there is environmental evidence for cereal production in the vicinity and a developing urban environment. These early layers contained rich pollen evidence.

No archaeological remains pre-dating the post-medieval period were revealed in any of the trenches suggesting that the riverside ground outside the southern town wall was never extensively reclaimed and/or used for industrial purposes.

An alluvial layer which lay directly above the peat and contained post-medieval artefacts suggests that seasonal flooding continued into the post-medieval period.

Trench 2 contained a timber revetment driven into the post-medieval alluvial layer and underlying peat. This ran parallel to the line of the South Walls street and potentially the Thieves Ditch, but no evidence for the location of the ditch was revealed in any of the trenches. It is possible that it lies either to the north or south of the timber revetment. Alternatively, the revetment could have been used to demarcate or secure a working area or boundary of a different nature. It may have been constructed once the area was made accessible by the construction of the Thieves Ditch.

It is possible that the construction of the Thieves Ditch in the post-medieval period represented a first attempt at draining and reclaiming the land outside the south walls of Stafford.

Above the alluvial layers a dryer soil began to build up in the late 19th and 20th century. This included an extensive spread of utilitarian glass and ceramic vessels, which may represent an early act of fly tipping in the empty and marshy ground beside the river.

The evaluation also confirmed the presence of surviving demolition layers and cellars of the 19th century buildings along South Walls and their backyards and gardens.

The Riverside Recreation Centre, which stood on the site until recently, was built on piled foundations which truncated the alluvial and built-up layers in



the southern part of the site. It is possible that those foundations removed earlier archaeological remains. However based on the evidence from all of the trenches on site, it is not likely that any substantial archaeological layers or structures ever existed on the site.



5. REFERENCES

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6. APPENDIX 1: TRENCH SUMMARY



Trench: 1

Max Dimensions: Length: 20.00 m. Width: 3.80 m. Depth to Archaeology Min: 2.5 m. Max: 2.5 m.

Co-ordinates: OS Grid Ref.: SJ (Easting: 92417; Northing: 23092)

OS Grid Ref.: SJ (Easting: 92434; Northing: 23085)

Reason: To establish presence and alignment of Thieves Ditch.

Context:	Type:	Description:	Excavated:	Finds Present:
100	Topsoil	Friable dark grey brown clay silt Thickness	<input checked="" type="checkbox"/>	<input type="checkbox"/>
101	Demolition layer	Friable dark grey brown clay silt frequent small-large CBM Thickness: 0.65m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
102	Demolition layer	Friable mid grey brown clay silt moderate small-large CBM Thickness: 1.2m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
103	Demolition layer	Friable dark grey brown clay silt frequent small-large CBM Thickness: 0.9m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
104	Demolition layer	Friable dark grey brown clay silt frequent small-large CBM Thickness: 1m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
105	Make up layer	Friable mid brown grey silty gravel occasional small CBM Thickness: 0.4m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
106	Levelling layer	Friable dark brown grey silty gravel occasional small CBM Thickness: 0.85m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
107	Make up layer	Friable mid brown pink silty gravel frequent small CBM Thickness: 0.37m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
108	Make up layer	Plastic mid blue grey clay occasional large CBM Thickness: 0.9m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
109	Alluvium	Friable dark brown grey sandy silt occasional small stones Thickness: 0.75m - Extent of depth reached in auger sample	<input checked="" type="checkbox"/>	<input type="checkbox"/>
110	Foundation trench	Straight linear N-S sides: vertical dimensions: max breadth 0.55m, max depth 1.m, min length 4.1m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
111	Foundation	Brick foundation	<input checked="" type="checkbox"/>	<input type="checkbox"/>
112	Foundation trench	Straight linear N-S sides: vertical dimensions: max breadth 1.5m, max depth 1.m, max length 3.m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
113	Foundation	Brick foundation	<input type="checkbox"/>	<input type="checkbox"/>
114	Backfill	Friable dark brown grey silty clay occasional small CBM Thickness: 0.95m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
115	Foundation	Corner of foundation visible in base of trench.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
116	Internal surface	One layer brick foundation with thin (10mm) concrete surface.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
117	Wall	Brick. Irregular alternate header/stretcher coursing bonded with compact whitish mortar.	<input type="checkbox"/>	<input type="checkbox"/>
118	Internal surface	Brick. May not be in-situ	<input type="checkbox"/>	<input type="checkbox"/>
119	Make up layer	Friable dark brown grey silty gravel frequent small CBM Thickness: 0.4m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
120	Alluvium	Friable mid brown sandy silt frequent small stones Thickness: 0.2m	<input type="checkbox"/>	<input type="checkbox"/>
121	Alluvium	Friable dark grey silt Thickness: 0.15m	<input type="checkbox"/>	<input type="checkbox"/>
122	Peat	Friable mid brown silty peat occasional small stones Thickness: 0.15m	<input type="checkbox"/>	<input type="checkbox"/>
123	Peat	Compact mid red brown peat Thickness: 0.1m	<input type="checkbox"/>	<input type="checkbox"/>
124	Peat	Compact mid red brown peat Thickness: 0.25m	<input type="checkbox"/>	<input type="checkbox"/>
125	Alluvium	Friable dark grey brown silt Thickness: 0.35m	<input type="checkbox"/>	<input type="checkbox"/>
126	Alluvium	Friable mid yellow grey silty sand Thickness: 0.3	<input type="checkbox"/>	<input type="checkbox"/>



Trench: 2

Max Dimensions: Length: 15.00 m. Width: 3.80 m. Depth to Archaeology Min: 1.2 m. Max: 1.2 m.

Co-ordinates: OS Grid Ref.: SJ (Easting: 92482: Northing: 23095)

OS Grid Ref.: SJ (Easting: 92496: Northing: 23100)

Reason: To establish presence and depth of Thieves Ditch.

Context:	Type:	Description:	Excavated:	Finds Present:
200	External surface	Compact mid pinkish grey hardcore Thickness: 0.3m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
201	Make up layer	Loose mid red brown sandy silt frequent small-large CBM, frequent small-large concrete Thickness: 0.3-0.4m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
202	Dump material	Friable dark brown black sandy silt moderate small-medium CBM, occasional small stones Thickness: 0.5 - 0.8m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
203	Demolition layer	Loose mid brown sandy silt frequent small-large mortar Thickness: 0.1m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
204	Dump material	Friable dark brown sandy silt occasional small CBM, occasional small mortar, occasional small stones Thickness: 0.4m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
205	Buried topsoil	Friable dark grey brown sandy silt occasional small CBM, occasional small stones Thickness: 0.6m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
206	Foundation	Linear N-S dimensions: max breadth 0.6m, max depth 0.2m, max length 3.2m Cut for wall foundation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
207	Foundation	Large, roughly hewn, squared sandstone blocks, at least 500 x 500 x 150mm in size. One course only, no discernible bonding.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
208	Foundation	Linear N-S sides: stepped dimensions: max breadth 1.2m, max depth 1.1m, max length 15.m Cut for wall foundation.	<input type="checkbox"/>	<input type="checkbox"/>
209	Foundation	Sandstone blocks forming base of foundation. Reddish, grey and yellow, roughly hewn, squared and rectangular sandstone blocks, size 300 x 400 x 100mm. One to two courses, single line.	<input type="checkbox"/>	<input type="checkbox"/>
210	Backfill	Loose light yellow white silty sand frequent small CBM, frequent small-large mortar Thickness: 1.1m	<input type="checkbox"/>	<input type="checkbox"/>
211	Dump material	Friable dark grey black clay silt moderate small CBM, occasional small stones Thickness: 0.4m	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
212	Alluvium	Friable dark green black silty clay Thickness: 0.3-0.5m Occasional large red sandstone blocks.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
213	Peat	Friable mid orange brown clay peat	<input checked="" type="checkbox"/>	<input type="checkbox"/>
214	Natural	Loose light yellow grey silty sand moderate small stones	<input type="checkbox"/>	<input type="checkbox"/>
215	Timber structure	Meandering line of wooden posts. Possibly not forming structure but associated. Timbers 216 - 232.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
216	Timber		<input type="checkbox"/>	<input type="checkbox"/>
217	Timber		<input type="checkbox"/>	<input type="checkbox"/>
218	Timber		<input checked="" type="checkbox"/>	<input type="checkbox"/>
219	Timber		<input checked="" type="checkbox"/>	<input type="checkbox"/>
220	Timber		<input checked="" type="checkbox"/>	<input type="checkbox"/>
221	Timber		<input type="checkbox"/>	<input type="checkbox"/>
222	Timber		<input type="checkbox"/>	<input type="checkbox"/>
223	Timber		<input type="checkbox"/>	<input type="checkbox"/>
224	Timber		<input type="checkbox"/>	<input type="checkbox"/>
225	Timber		<input type="checkbox"/>	<input type="checkbox"/>
226	Timber		<input type="checkbox"/>	<input type="checkbox"/>



Trench: 2

Max Dimensions: Length: 15.00 m. Width: 3.80 m. Depth to Archaeology Min: 1.2 m. Max: 1.2 m.

Co-ordinates: OS Grid Ref.: SJ (Easting: 92482: Northing: 23095)

OS Grid Ref.: SJ (Easting: 92496: Northing: 23100)

Reason: To establish presence and depth of Thieves Ditch.

Context:	Type:	Description:	Excavated:	Finds Present:
227	Timber		<input checked="" type="checkbox"/>	<input type="checkbox"/>
228	Timber		<input checked="" type="checkbox"/>	<input type="checkbox"/>
229	Timber		<input type="checkbox"/>	<input type="checkbox"/>
230	Timber		<input type="checkbox"/>	<input type="checkbox"/>
231	Timber		<input checked="" type="checkbox"/>	<input type="checkbox"/>
232	Timber		<input checked="" type="checkbox"/>	<input type="checkbox"/>
233	Timber		<input type="checkbox"/>	<input type="checkbox"/>



Trench: 3

Max Dimensions: Length: 20.00 m. Width: 3.80 m. Depth to Archaeology Min: 2. m. Max: 2. m.

Co-ordinates: OS Grid Ref.: SJ (Easting: 92545: Northing: 23108)

OS Grid Ref.: SJ (Easting: 92550: Northing: 23089)

Reason: To evaluate blank area of site and area of good peat deposits.

Context:	Type:	Description:	Excavated:	Finds Present:
300	Tarmac	Thickness: 0.04m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
301	Make up layer	Compact mid pinkish grey sandy gravel Thickness: 0.32 - 0.4m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
302	Dump material	Friable dark grey black sandy silt moderate small-medium CBM, moderate small stones Thickness: 0.6m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
303	Dump material	Friable dark green black sandy silt Thickness: Contains frequent modern debris, particularly glass bottles.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
304	Alluvium	Friable black sandy silt occasional small CBM Thickness: 0.4 - 0.6m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
305	Alluvium	Plastic light blue grey clay Thickness: 0.20 - 0.4m	<input type="checkbox"/>	<input type="checkbox"/>
306	Peat	Friable mid orange brown clay peat Thickness: 0.4m	<input type="checkbox"/>	<input type="checkbox"/>
307	Peat	Friable dark brown peat occasional small stones	<input type="checkbox"/>	<input type="checkbox"/>



Trench: 4

Max Dimensions: Length: 20.00 m. Width: 4.00 m. Depth to Archaeology Min: 2. m. Max: 2. m.

Co-ordinates: OS Grid Ref.: SJ (Easting: 92467: Northing: 23044)

OS Grid Ref.: SJ (Easting: 92480: Northing: 23030)

Reason: To evaluate blank area.

Context:	Type:	Description:	Excavated:	Finds Present:
400	External surface	Mid pinkish grey hardcore Thickness: 0.1 - 0.2m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
401	Demolition layer	Loose mid brown grey silty sand frequent small-large CBM, frequent small-large concrete, frequent small stones Thickness: 1m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
402	Levelling layer	Friable mid red brown sandy silt frequent small stones Thickness: 0.5 - 0.8m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
403	Dump material	Friable dark green black silty sand frequent small stones Thickness: 0.2 - 0.4m Contains frequent 20th century debris, particularly glass bottles.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
404	Dump material	Plastic mid blue grey clay Mixed with patches of dark grey black silt.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
405	Alluvium	Friable dark brown silty clay Contained clay pipe fragment.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
406	Peat	Compact brown peat Only recorded in auger investigation.	<input type="checkbox"/>	<input type="checkbox"/>
407	Alluvium	Friable mid green grey sandy silt	<input type="checkbox"/>	<input type="checkbox"/>



Trench: 5

Max Dimensions: Length: 20.00 m. Width: 4.00 m. Depth to Archaeology Min: 2. m. Max: 2. m.

Co-ordinates: OS Grid Ref.: SJ (Easting: 92525: Northing: 23050)

OS Grid Ref.: SJ (Easting: 92539: Northing: 23057)

Reason: To evaluate blank area.

Context:	Type:	Description:	Excavated:	Finds Present:
500	External surface	Compact light pinkish grey hardcore Thickness: 0.05	<input checked="" type="checkbox"/>	<input type="checkbox"/>
501	Demolition layer	Loose mid red yellow silty sand frequent small-large CBM, frequent small-medium concrete Thickness: 1.15m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
502	Alluvium	Plastic mid brown grey clay	<input checked="" type="checkbox"/>	<input type="checkbox"/>
503	Alluvium	Friable dark grey black silty clay moderate small CBM Thickness: 0.1m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
504	Dump material	Friable dark green black silty sand frequent small stones Thickness: 0.9m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
505	Feature	sides: 45 degrees dimensions: max breadth 3.6m, max depth 1.6m, max length 7.m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
506	Fill	Loose dark brown grey sandy silt frequent small-large CBM, frequent small stones Thickness 1.6m	<input checked="" type="checkbox"/>	<input type="checkbox"/>



Trench: 6

Max Dimensions: Length: 20.00 m. Width: 4.00 m. Depth to Archaeology Min: 2. m. Max: 2. m.

Co-ordinates: OS Grid Ref.: SJ (Easting: 92512: Northing: 23030)

OS Grid Ref.: SJ (Easting: 92518: Northing: 23011)

Reason: To evaluate blank area.

Context:	Type:	Description:	Excavated:	Finds Present:
600	External surface	Compact light pinkish grey hardcore Thickness: 0.05m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
601	Demolition layer	Loose mid red grey sandy silt frequent small-large CBM, moderate small-large concrete, frequent small stones Thickness: 0.75m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
602	Make up layer	Loose mid pinkish grey sandy gravel Thickness: 0.4m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
603	Dump material	Friable dark green black sandy silt frequent small stones Includes 20th century debris particularly glass bottles. Thickness: 0.55m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
604	Alluvium	Friable dark grey black clay silt occasional small CBM Thickness: 0.05m	<input checked="" type="checkbox"/>	<input type="checkbox"/>
605	Alluvium	Plastic mid grey blue clay	<input checked="" type="checkbox"/>	<input type="checkbox"/>
606	Foundation	Reinforced concrete.	<input type="checkbox"/>	<input type="checkbox"/>
607	External surface	Cemented concrete occasional small-medium CBM Thickness 0.45m	<input type="checkbox"/>	<input type="checkbox"/>



7. APPENDIX 2: ENVIRONMENTAL REPORT

South Walls, Stafford

Palaeoenvironmental sampling and assessment

Introduction

A current carpark area on South Walls, Stafford, with a proposal for the re-development of the site for a Marks and Spencer store was the subject of a Geotechnical Investigation by QUEST of the University of Reading (Batchelor and Green 2011). This investigation revealed a sequence of peat and alluvial deposits underlying the modern overburden towards the east of the site and the potential of the peats was highlighted as a source of palaeoenvironmental information on the site. As part of an evaluation excavation undertaken by Albion Archaeology in advance of the new M&S store the Environmental Archaeology Consultancy was commissioned to investigate and sample these peat deposits.

Fieldwork and sediment sequences

On a site visit in June a sequence was recovered from the southern end of Trench 3 (Fig. 1), Trench 1 was cored and logged by Albion, and the northern end of Trench 4 was cored and logged and a sample taken using the gouge auger from the basal 10cm of postglacial sediments.

The sampled sequence in Trench 3 was as follows:

	Ground level at approximately 74.2m OD
0-175cm	post-medieval fill of debris, bottles, brick, tarmac, etc
175-188	empty – compression!
188-191	dark greyish brown (10YR 4/2) (oxidised) fine silt
191-209	dark grey (10YR 4/1) silty clay
209-212	dark grey (10YR 4/1) silty clay with thin organic bands – alluvium
	sharp boundary
212-226	very dark greyish brown (10YR 3/2) slightly organic silt;
	224-225cm C14 date 1060±35 BP
226-236	dark brown (10YR 3/3) humified silty non-fibrous peat, oxidising to 10YR 3/2
236-240	very dark greyish brown (10YR 3/2) slightly organic silt
240-258	dark brown (10YR 3/3) oxidising slightly fibrous humified peat
258-270	very dark brown (7.5YR 2.5/2) slightly fibrous silty humified peat – oxidising on exposure
	sharp boundary
270-322	slightly organic silt with occasional penetrating roots, 10YR 3/2 with occasional pebbles to 4cm
322-335	grey sandy silt – 10YR 4/1; 323-333cm C14 date 2375±35 BP
335-343	fine to medium sand with occasional small grits, 2.5Y 5/4

The upper part of the alluvial and peat sequence was sampled in a core of 102mm diameter, but the ingress of water and depth necessitated the sampling of the lower part of the sequence with the gouge auger. The basal silts were sampled in 5cm units throughout the whole sequence recovered using the gouge auger.

Trench 1

The central area of Trench 1 was augered and the log taken by Albion. The sequence in this trench is similar to that in Trench 3 with peats and underlying slightly organic silts to a similar depth, with the possible addition of ‘ditch’ fills above the peats.

Trench 4

The overburden deposits at the north end of Trench 4 were machined out so that we access the underlying alluvial sediments and auger the deposits. Hand augering in Trench 4 obtained post-glacial sediments to a depth of nearly 5m, over 1.5m deeper than the sequence sampled in Trench 3.

The following sequence was recorded:

	Ground Level at approximately 74.6m OD
0-230cm	fill and recent made ground
230-290	alluvial clays
290-480	onto silts, very silty peats/peaty silts, then onto fine organic silts – 470-480cm C14 date 3520±35 BP
480-490	silty sands – channel sands
490-500	pinky fine sands

The core recovered from Trench 3 was subsequently split in the laboratory, logged and sampled for pollen at 4cm intervals. A sample was taken of the upper organic silts at 224-225cm depth for radiocarbon dating. Below 272cm the 5cm units taken from the gouge auger on site were each sampled for pollen and two 5cm units from the base of the sequence at 323-333cm were washed on a fine mesh sieve and seeds and insect fragments extracted for submission for radiocarbon dating.

The 10cm sample unit recovered from the base of the post-glacial sequence in the Trench 4 auger hole was sub-sampled for pollen and then washed over a fine sieve for the extraction of organics suitable for radiocarbon dating. This sample yielded a few fragments of unidentified wood that were submitted for dating.

Radiocarbon Dating

Three samples were submitted for dating (Table 1) and the results indicate sediments dating from the early Bronze Age to the medieval period.

Table 1. AMS Radiocarbon dating results (depth measured from modern ground surface).

Lab.no.	context	material	13C/12C Ratio	Conventional Radiocarbon Age	Calibrated Age at 2 sigma
SUERC-41215	Trench 4 470-480cm	Wood	-28.3 ‰	3520±35 BP	1938-1749 cal. BC
SUERC-41216	Trench 3 323-333cm	Seeds & beetles	-27.0 ‰	2375±35 BP	726-693 cal. BC (5%) and 541-388 cal. BC (90.4%)
SUERC-41220	Trench 3 224-225	Peaty silt	-30.5 ‰	1060±35 BP	895-927 cal. AD (18.5%) and 935-1025 cal. AD (76.9%)

The sampled sequence in Trench 3 starts sometime in the middle Iron Age. The peats clearly form in the 1st millennium AD and the silts and alluvial clays overlying the peats must continue well into the medieval period, possibly right up until the post-medieval period when dumping occurs on the site.

The silts sampled from Trench 4 at an appreciably lower level than those recovered in Trench 3 indicate sedimentation in this area of the site starts some 1500 years earlier in the early Bronze Age.

Pollen Analysis

Dr Rob Scaife

For the purpose of assessment of the potential of the whole sedimentary sequence pollen samples were submitted from 196, 220, 248, 272, 298 and 323cm depth in Trench 3 and from 470-480 in Trench 4. These cover the earlier silts, the peats, the upper silts and alluvial silty clays. The samples have been examined for their sub-fossil pollen and spore content. This assessment analysis was undertaken to ascertain the presence or absence of pollen and spores and, if results were positive, to provide a preliminary view of the past vegetation and environment of the site and potential for more detailed analysis. Pollen and spores have been obtained from all of the samples analysed and useful information has been obtained.

Pollen method

Standard techniques were used for concentration of the sub-fossil pollen and spores on these sub-samples of 1.5 ml. volume (Moore and Webb 1978; Moore *et al.* 1992) at a preliminary sampling interval of 24 or 25cm. Extracted pollen was identified and counted using an Olympus biological microscope. A pollen sum (dry land) of 150 grains per level was counted for each sample. Aquatic/marsh taxa and spores of ferns were counted outside of this basic sum. The pollen diagrams for Trench 3 (Figure 2) was produced using Tilia and Tilia Graph and the data for the basal sample from Trench 4 is presented in Table 2. Taxonomy in general follows that of Moore and Webb (1978) modified according to Bennett *et al.* (1994) for pollen types and Stace (1991) for plant descriptions. These procedures were carried out in the Palaeoecology Laboratory of the School of Geography, University of Southampton.

Percentages used in figure 1 have been calculated as follows:

Sum =	% total dry land pollen (tdlp)
Marsh/aquatic =	% tdlp + sum of marsh/aquatics
Spores =	% tdlp + sum of spores

The pollen data

A series of samples from Trench 3 and a single, basal sample from Trench 4 (for comparative purposes) have been examined. Overall, the pollen spectra from both sequences are dominated by herbs with relatively few trees and shrubs. *Alnus* (alder) is the predominant tree in the lower section of Trench 3, but as a high pollen producer, the numbers are not indicative of great importance.

Trench 3

This profile spans 1.25m of sediment comprising humic silt and peat (see above for detail). Palynological changes occurring within the sequence largely relate to the vegetation of the depositional environment and the resulting changes in taphonomy. Two local pollen assemblage zones have been recognised and are described from the base of the profile upwards as follows

l.p.a.z. 1: 323cm to 262cm: Stratigraphically comprises a slightly humic silt. Palynologically, it is delimited by higher values of *Alnus* (alder; to 23%). Other trees and shrubs include *Quercus* (oak; 9%), *Corylus avellana* type (hazel but may include bog myrtle; to 7%) and sporadic occurrences of *Betula* (birch), *Pinus* (pine), *Ulmus* (elm) and dwarf shrubs (heather and ling). Poaceae (grasses) are the dominant herb (45%) with *Rumex* (dock; to 8%) and *Plantago lanceolata* (ribwort plantain; to 6%). There are occasional pollen grains of cereal

type. There are few marsh and aquatic taxa with only very small numbers of Cyperaceae (sedges) and *Typha latifolia* (reed mace). Ferns comprise *Pteridium aquilinum* (bracken; 14%) and monolete spores of *Dryopteris* type (typical ferns).

l.p.a.z. 2: 262cm to 198cm: Stratigraphically, there is a change to peat whilst palynologically, values of alder in the preceding zone are much diminished and Cyperaceae values increase (to 27%). *Quercus* and *Corylus avellana* type remain with the former in slightly greater numbers. The herbaceous assemblages become more diverse and numbers increase throughout. With a further stratigraphical change to organic silt upwards from 226m, there is a marked expansion of cereal type pollen and Poaceae of >45u. This latter type is delimited by its large size but with thinner (non-cereal type) pollen wall (exine) and may be from cereals or certain wild grasses (e.g. *Glyceria*). Cereal type is also of large size with thick exine, pronounced pore and annulus and columellate structure. After an initial expansion of Cyperaceae at the lower zone boundary (in the peat), there is some increase in the diversity of fen types including *Alisma* (water plantain), *Potamogeton* (pondweed), and *Typha angustifolia* type (burr reed and/or reed mace). This is associated with the change to humic sediments above the peat. Cyperaceae decline.

Interpretation

It is clear that the local environment was open throughout the period represented by the sediment depositional sequence. Alder in l.p.a.z 1 is the most prominent tree taxon. However, it is a copious producer of wind pollinated pollen which is generally over represented in pollen spectra compared with other tree types noted here (Andersen 1970). It is probable that this pollen was fluvially transported from upstream areas of more dominant flood plain (carr) woodland or, derived from local trees lining the banks of this river. Oak and hazel in the values recorded here are typical for the historic period in southern England and are likely to derive from more regional, possibly managed woodland. The occasional occurrences of birch and pine are also considered to be from longer distance origins. Beech (*Fagus*), however, is poorly represented in pollen and is likely to be of more local/nearby origin assuming fluvial transport has not occurred.

The on site habitat initially appears to have been a river floodplain which became more stable allowing formation of peat in a grass-sedge fen as indicated by the increase in Cyperaceae from c. 270cm. Although the boundary between these sediment units is sharp, there is no clear indication of a hiatus at this point. After the phase of peat formation in wet, anaerobic conditions, there was a return to alluviation. During this phase, quantities of cereal pollen along with blue cornflower (*Centaurea cyanus*) increase sharply to the top of the profile, especially in the top sample. This clearly shows the use of cereals and may derive from very local cultivation. However, there is also the strong possibility that the pollen is of secondary origin coming from crop processing activities such as a mill upstream or from domestic refuse disposed of in the river.

Apart from the levels of cereal in the upper samples, the overall habitat as noted, was open and was probably grassland and pasture both on the floodplain and on the drier surroundings.

Trench 4

A single sample was examined from Trench 4 at a depth of 4.80-4.70m to compare with the basal levels of Trench 3. Pollen count data obtained are given in Table 2 below.

Figure 2. Pollen diagram for the six assessment samples from the sequence in Trench 3.

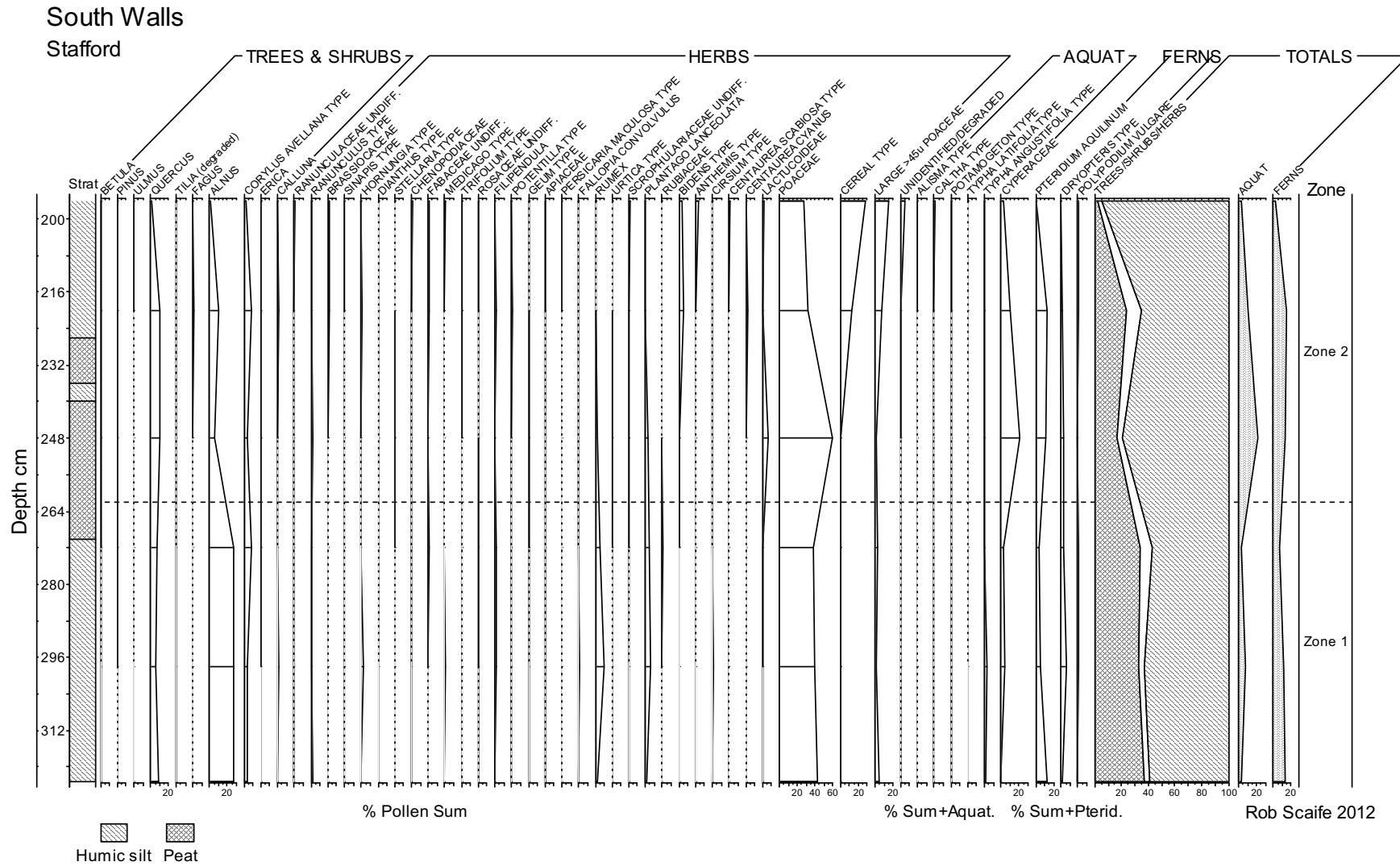


Table 2: Pollen count data from Trench 4 at 470-480cm. – C14 date 3520±35 BP.

Trees & Shrubs	Count
<i>Betula</i>	3
<i>Quercus</i>	12
Tilia – degraded	
<i>Alnus</i>	47
<i>Corylus avellana</i> type	7
<i>Erica</i>	1
Herbs	
<i>Ranunculus</i> type	1
Chenopodiaceae	2
<i>Potentilla</i> type	1
<i>Persicaria maculosa</i> type	1
<i>Fallopia convolvulus</i>	1
<i>Rumex</i>	7
<i>Stachys</i> type	1
<i>Plantago lanceolata</i>	7
<i>Succisa</i>	1
Lactucoideae	1
Poaceae	58
Cereal type	1
Poaceae >45u	1
Cyperaceae	8
Unidentified/degraded	1
Ferns	
Pteropsida (<i>Dryopteris</i> type)	7
<i>Pteridium aquilinum</i>	10
<i>Polypodium</i>	1
Mosses	
<i>Sphagnum</i>	1
Total Pollen	162
Total Spores	20

Being a single sample, it is not possible to evaluate any changing patterns of vegetation. However, the sample does provide an insight into the vegetation growing at the time of the sediment accumulation. It is clear that with the exception of *Alnus* (29% of total pollen), there are few other trees and shrubs and that herbs are dominant. For the latter, Poaceae (grasses; 36% tp) are most important with *Plantago lanceolata* (ribwort plantain) and other possible pasture types including *Ranunculus* (buttercups), *Rumex* (dock) and *Succisa* (devil's-bit scabious). There is only a minor representation of cereal type pollen. Cyperaceae (sedges; 5% tp)

Comparison with Trench 3: This sediment/sample was thought to correlate with the basal sequence of Trench 3 although it has now been dated to significantly earlier. Palynologically, it is very similar. The high values of alder here appear similar to l.p.a.z. 1 of Trench 3. Furthermore, the values of the other trees/shrubs, grasses, sedges and cereal type are all of the similar proportions, although overall the tree and shrub pollen is somewhat higher than the samples from Trench 3.

Summary and Conclusions

This analysis sought to establish the presence or absence of pollen and spores and the potential of the sediment archive for providing a record of the past vegetation and environment of the site. The following principal points have been made in this study.

- The main series of samples examined came from Trench 3 with a single sample from comparison from the base of Trench 4
- Pollen and spores are present and in sufficient numbers and state of preservation to allow pollen counts and a preliminary pollen diagram to be constructed.
- The pollen assemblages are dominated by herbs with relatively little tree and shrub pollen except for alder, a wetland taxon.
- Two pollen assemblage zones have been recognised in the Trench 3 sequence based largely on the presence of alder but also relating to the change in stratigraphy (and taphonomy) from mineral sediment to peat.
- Alder was growing as floodplain woodland at some distance to the site or as trees along the fringes of the river or floodplain. Oak and hazel formed the remaining background regional woodland (probably managed).
- The drier ground adjacent to the site was predominantly grassland/pasture throughout most of the time-span of sediment deposition.
- At the top of the Trench 3 profile cereal pollen becomes important. This may have come from nearby cultivation or from secondary sources such as domestic waste or from crop processing mill waste.
- The environment of deposition was initially a river floodplain or channel probably with occasional fringing alder trees. Conditions became stable enough on site, possibly with increasing wetness, for development of a grass-sedge fen. Subsequently there was reversion to mineral sedimentation/alluviation.
- The single pollen sample from trench 4 corresponds with the lower part (l.p.a.z. 1) of Trench 3, although with a higher tree and shrub component.

Discussion

The augering on site and subsequent radiocarbon dating and pollen analysis has allowed a superficial picture of the sediments underlying the site and the local environment. The site lies immediately north-east of the present River Sow and the sediments appear to have formed in association with the river, although in their early manifestation they may have formed within a large pool, perhaps fed by the river.

The basal grey silts in all three boreholes (Trenches 1, 3 and 4) were very similar, although those in Trench 4 at a level of 69.7m OD are 1.15m lower than those in Trench 3 and have been shown by the radiocarbon dating to be significantly earlier. These silts suggest a large pool with sedimentation beginning in the early Bronze Age, around 2000 BC, and expanding as a result of rising water levels, with sedimentation in Trench 3 at a level of 70.85m OD beginning in the middle Iron Age. Some movement of the river channel is suggested by silty

sands and sandy silts at the base of the sequence in Trenches 1 and 3, perhaps indicating that the channel in the Iron Age approached the northern edge of the site. It must subsequently have moved southwards towards its modern course as peats developed beneath Trenches 1 and 3, probably sometime in the 1st millennium AD. These peats appear to be on the margins of the pool or watercourse since they were not recorded in Trench 4, although fairly organic silts were present. Trench 4 appears to have lain within, or on the edge of, the water body for the whole of its sedimentary sequence up until the overlying clays, immediately beneath the fill deposits, which are likely to reflect overbank flooding of the river. Similar silty clays on top of the sedimentary sequence in Trench 3 also reflect overbank flooding of the river.

The peat deposits recorded beneath Trenches 1 and 3 indicate the development of marsh along the margins of the waterbody against the rising ground to the north. These marshes were clearly present in the late Saxon period, and probably earlier, but on the basis of a decreasing organic component upwards must have become seasonally dry with winter flooding introducing the clays.

The preliminary pollen analyses show that throughout most of this depositional history the surrounding landscape was largely open with alder trees or woodland, and marsh, fringing the river, although a slightly higher tree pollen count in the sample from Trench 4 might reflect a more wooded environment. Significant vegetation changes are reflected in the fall in alder pollen, probably sometime in the 1st millennium AD, a marked rise in cereal pollen, perhaps from the Saxon period, a reduction in *Rumex* and *Plantago lanceolata* in the upper part of the sequence suggesting a fall in pasture, perhaps as a result of increasing arable. A final fall in tree pollen is recorded in the top alluvial sample.

Archaeological activity is recorded in and around Stafford throughout the period represented within these deposits, and the development of the late Saxon and medieval town is occurring contemporary with the build-up of the upper silts and alluvial clays. Pollen has survived in all the deposits assessed and clear indications of human impact on the vegetation are recorded in the preliminary pollen assessment. Furthermore the extraction of seeds and beetles from the small samples processed for radiocarbon dating indicates that macrofossil assemblages also survive in the deposits. Microscopic charcoal in the sediments may also reflect the development and increase in urban settlement in the area.

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James Rackham and Rob Scaife¹

The Environmental Archaeology Consultancy
August 7th 2012

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RADIOCARBON DATING CERTIFICATE 06 August 2012

Laboratory Code	SUERC-41215 (GU28047)
Submitter	James Rackham Environmental Archaeology Consultancy 25 Main Street South Rauceby, Sleaford Lincolnshire NG34 8QG
Site Reference	SR 1965 - Stafford
Context Reference	470-480cm
Sample Reference	SR1965/Tr4/470-480
Material	Wood : unidentified
$\delta^{13}\text{C}$ relative to VPDB	-28.3 ‰
Radiocarbon Age BP	3520 \pm 35

N.B. The above ^{14}C age is quoted in conventional years BP (before 1950 AD). The error, which is expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standards, background standards and the random machine error.

The calibrated age ranges are determined using the University of Oxford Radiocarbon Accelerator Unit calibration program OxCal 4.1 (Bronk Ramsey 2009). Terrestrial samples are calibrated using the IntCal09 curve while marine samples are calibrated using the Marine09 curve.

Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Facility and should be quoted as such in any reports within the scientific literature. Any questions directed to the Radiocarbon Laboratory should also quote the GU coding given in parentheses after the SUERC code. The contact details for the laboratory are email g.cook@suerc.gla.ac.uk or Telephone 01355 270136 direct line.

Conventional age and calibration age ranges calculated by :-

Date :-

Checked and signed off by :-

Date :-

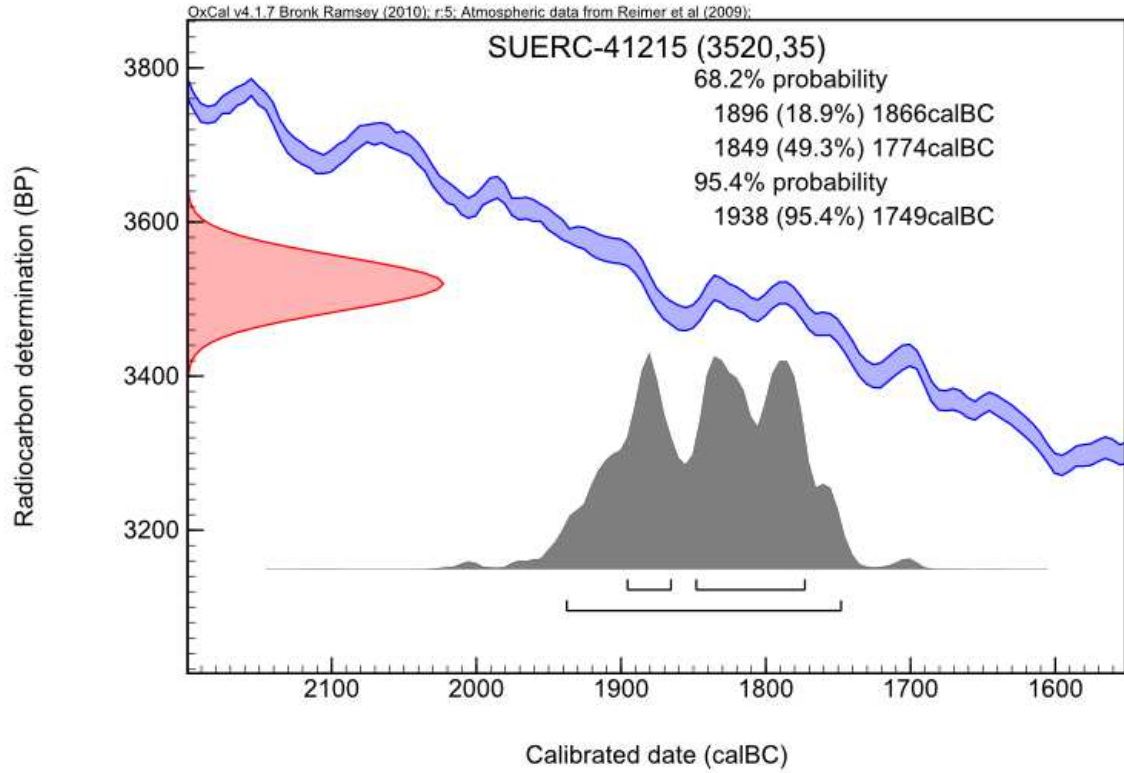


The University of Glasgow, charity number SC004401



The University of Edinburgh is a charitable body, registered in Scotland, with registration number SC005336

Calibration Plot



**RADIOCARBON DATING CERTIFICATE**

06 August 2012

Laboratory Code SUERC-41216 (GU28048)

Submitter James Rackham
Environmental Archaeology Consultancy
25 Main Street
South Rauceby, Sleaford
Lincolnshire NG34 8QG

Site Reference SR 1965 - Stafford

Context Reference 323-333

Sample Reference SR1965/Tr3/323-333

Material Seeds and Beetles : not identified

$\delta^{13}\text{C}$ relative to VPDB -27.0 ‰

Radiocarbon Age BP 2375 \pm 35

N.B. The above ^{14}C age is quoted in conventional years BP (before 1950 AD). The error, which is expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standards, background standards and the random machine error.

The calibrated age ranges are determined using the University of Oxford Radiocarbon Accelerator Unit calibration program OxCal 4.1 (Bronk Ramsey 2009). Terrestrial samples are calibrated using the IntCal09 curve while marine samples are calibrated using the Marine09 curve.

Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Facility and should be quoted as such in any reports within the scientific literature. Any questions directed to the Radiocarbon Laboratory should also quote the GU coding given in parentheses after the SUERC code. The contact details for the laboratory are email g.cook@suerc.gla.ac.uk or Telephone 01355 270136 direct line.

Conventional age and calibration age ranges calculated by :-

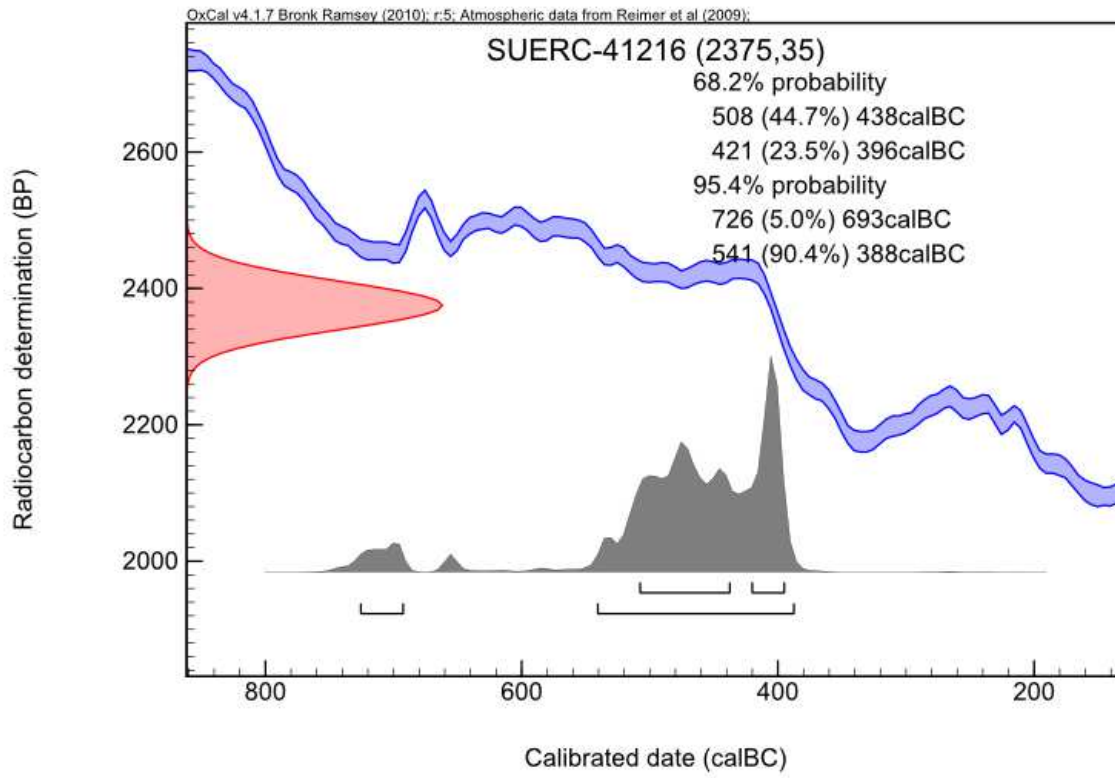
Date :-

Checked and signed off by :-

Date :-



Calibration Plot





Scottish Universities Environmental Research Centre

Director: Professor A B MacKenzie Director of Research: Professor R M Ellam

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RADIOCARBON DATING CERTIFICATE

06 August 2012

Laboratory Code SUERC-41220 (GU28049)

Submitter James Rackham
Environmental Archaeology Consultancy
25 Main Street
South Rauceby, Sleaford
Lincolnshire NG34 8QG

Site Reference SR 1965 - Stafford

Context Reference 224-225

Sample Reference SR1965/Tr3/224-225

Material peat/charcoal :

$\delta^{13}\text{C}$ relative to VPDB -30.5 ‰

Radiocarbon Age BP 1060 ± 35

N.B. The above ^{14}C age is quoted in conventional years BP (before 1950 AD). The error, which is expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standards, background standards and the random machine error.

The calibrated age ranges are determined using the University of Oxford Radiocarbon Accelerator Unit calibration program OxCal 4.1 (Bronk Ramsey 2009). Terrestrial samples are calibrated using the IntCal09 curve while marine samples are calibrated using the Marine09 curve.

Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Facility and should be quoted as such in any reports within the scientific literature. Any questions directed to the Radiocarbon Laboratory should also quote the GU coding given in parentheses after the SUERC code. The contact details for the laboratory are email g.cook@suerc.gla.ac.uk or Telephone 01355 270136 direct line.

Conventional age and calibration age ranges calculated by :-

Date :-

Checked and signed off by :-

Date :-

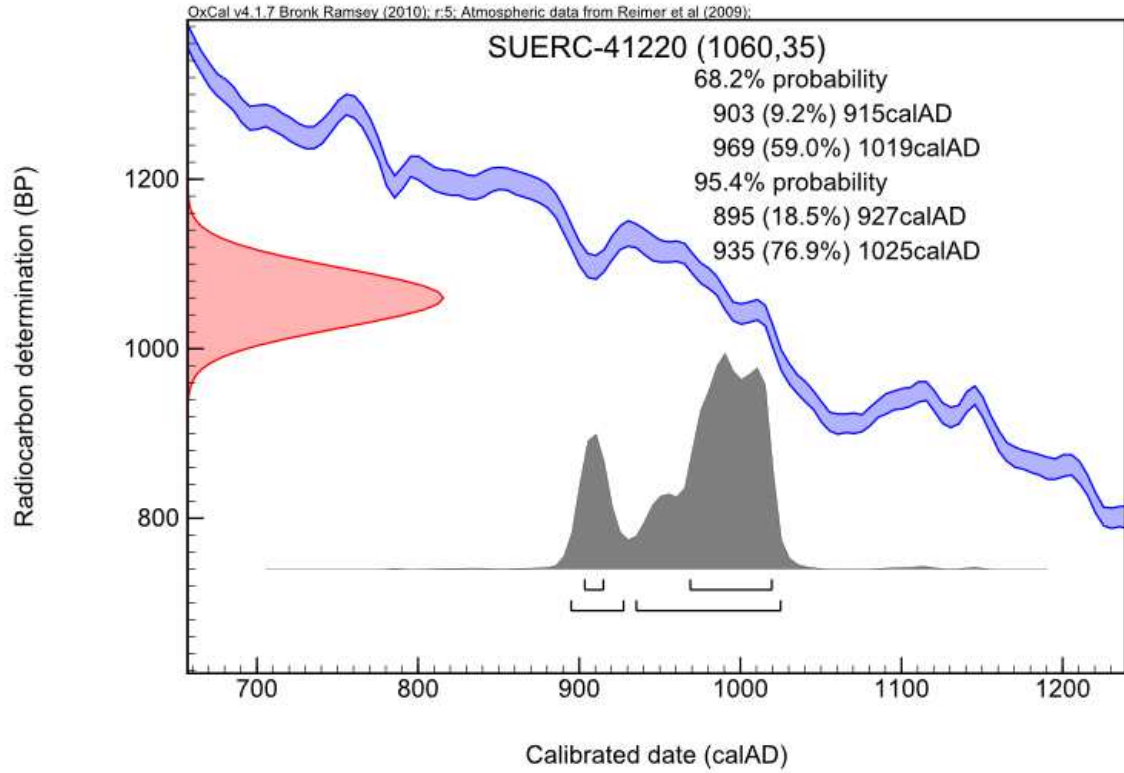


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Calibration Plot





8. FIGURES

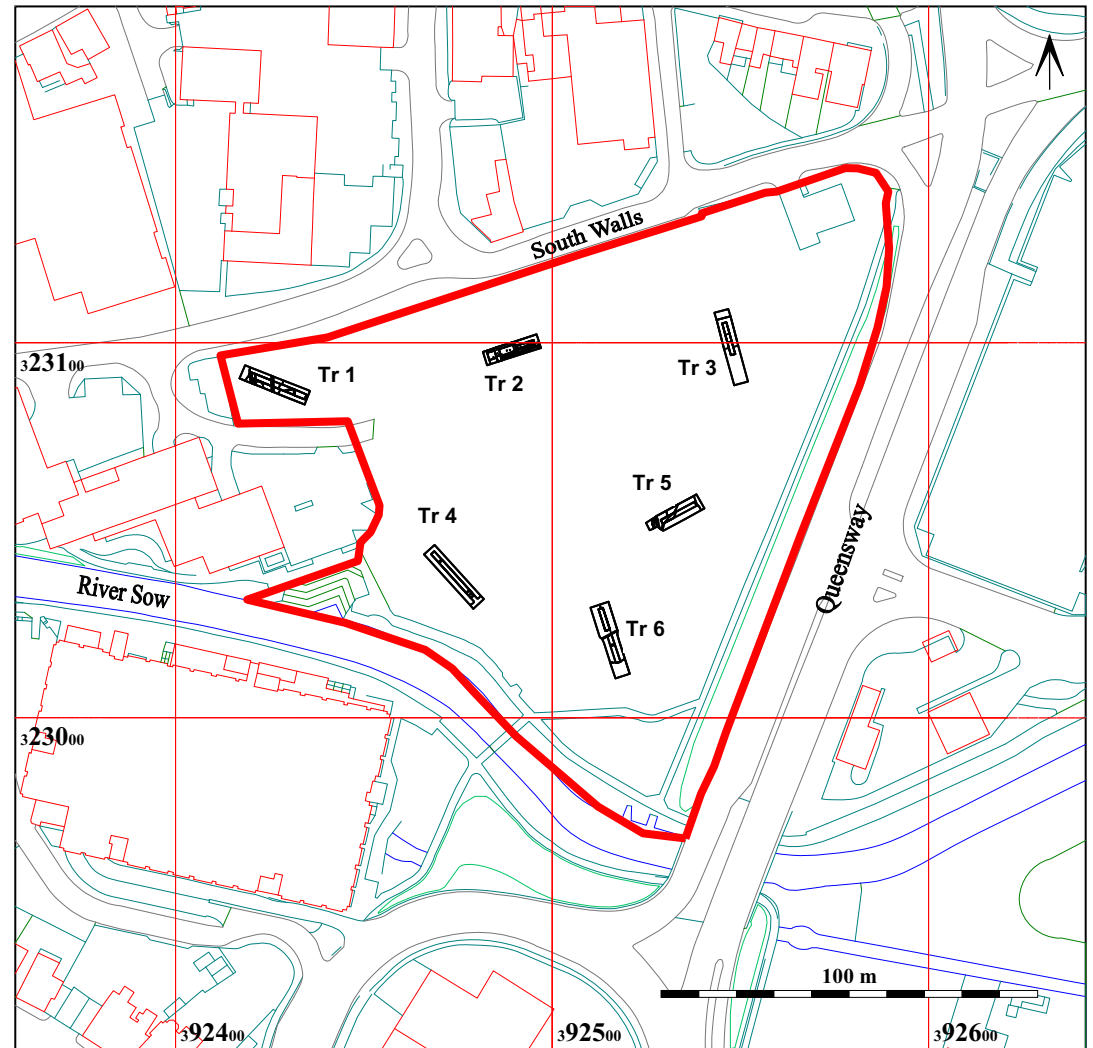
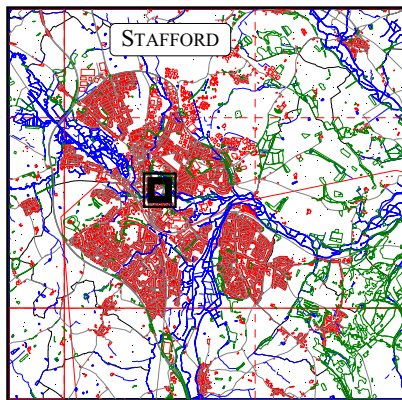
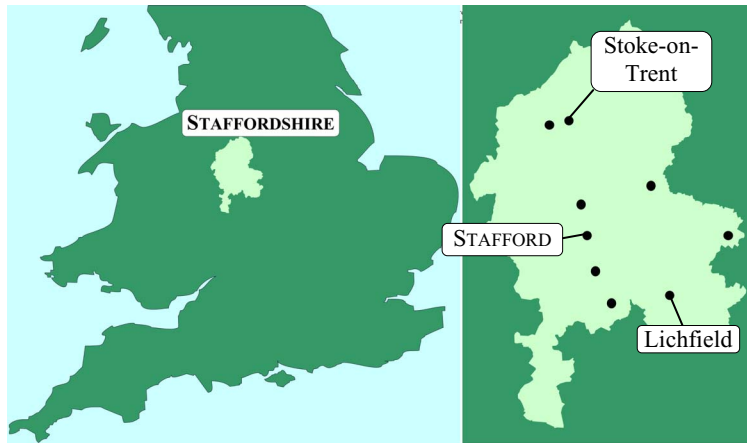


Figure 1: Site location

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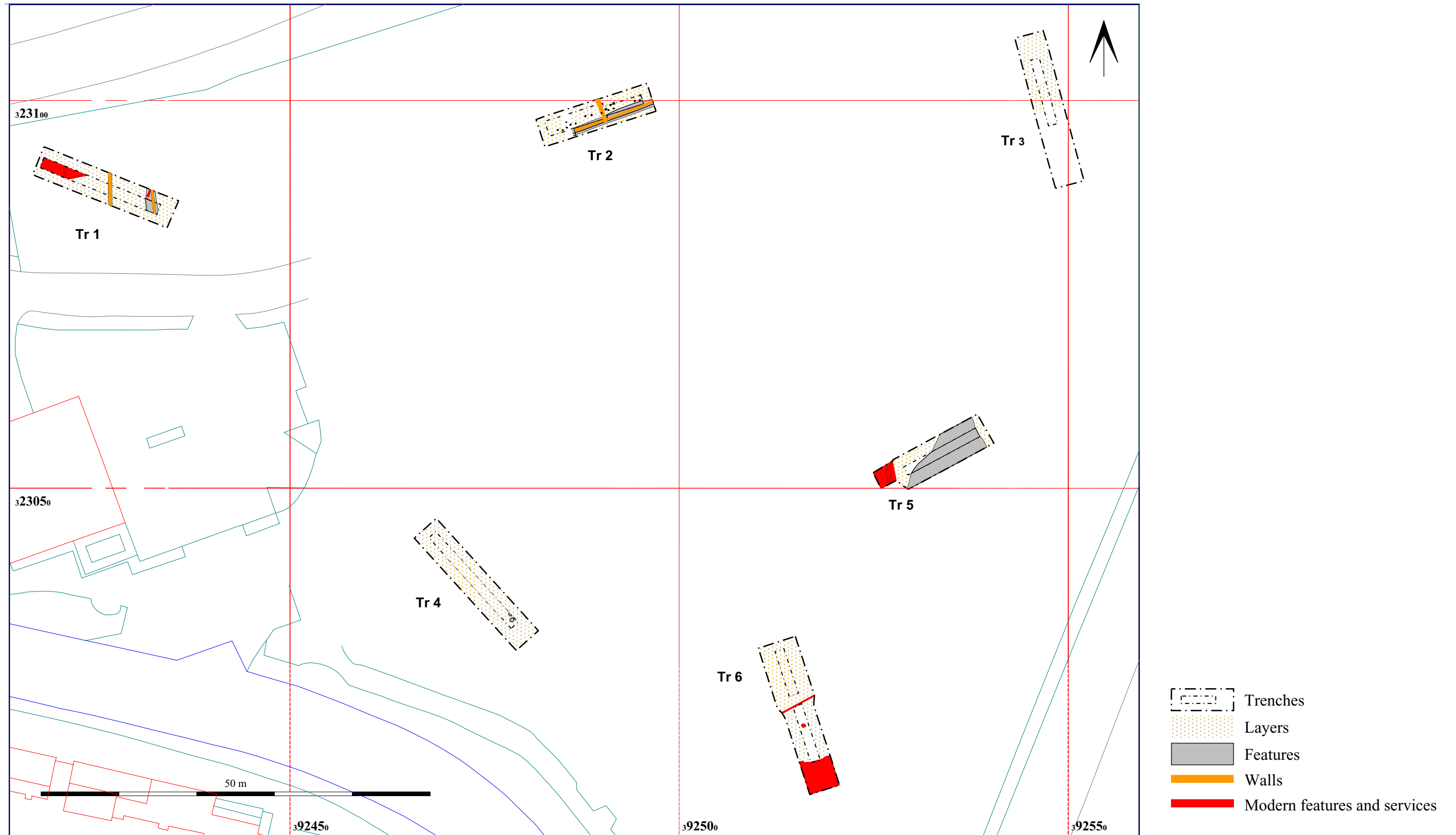
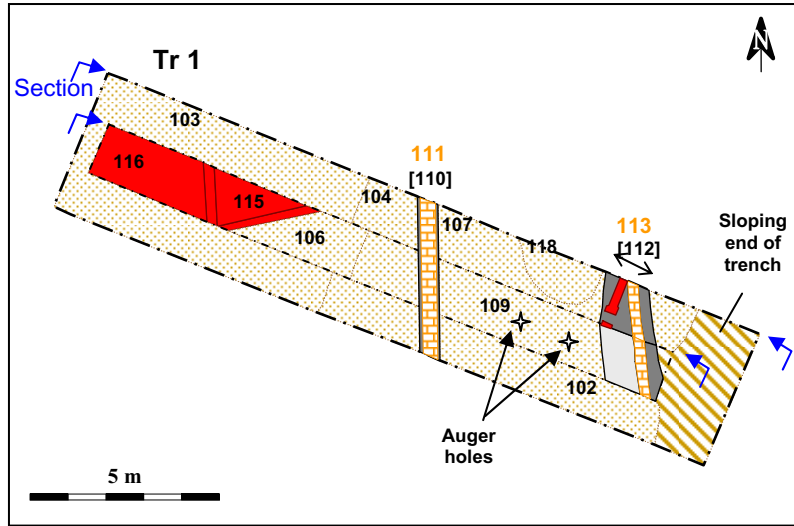


Figure 2: Trench locations and all features plan
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Trench 1 looking north (2 x 1m scale)

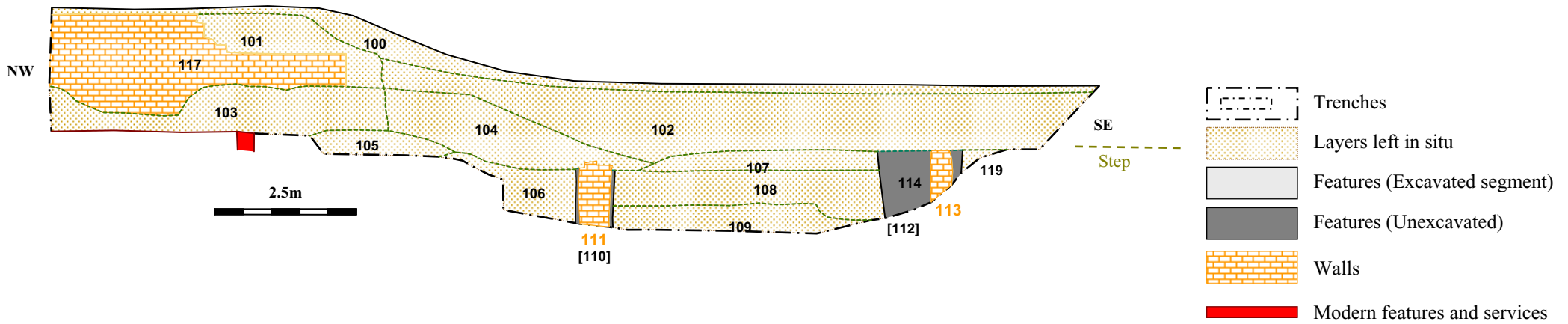
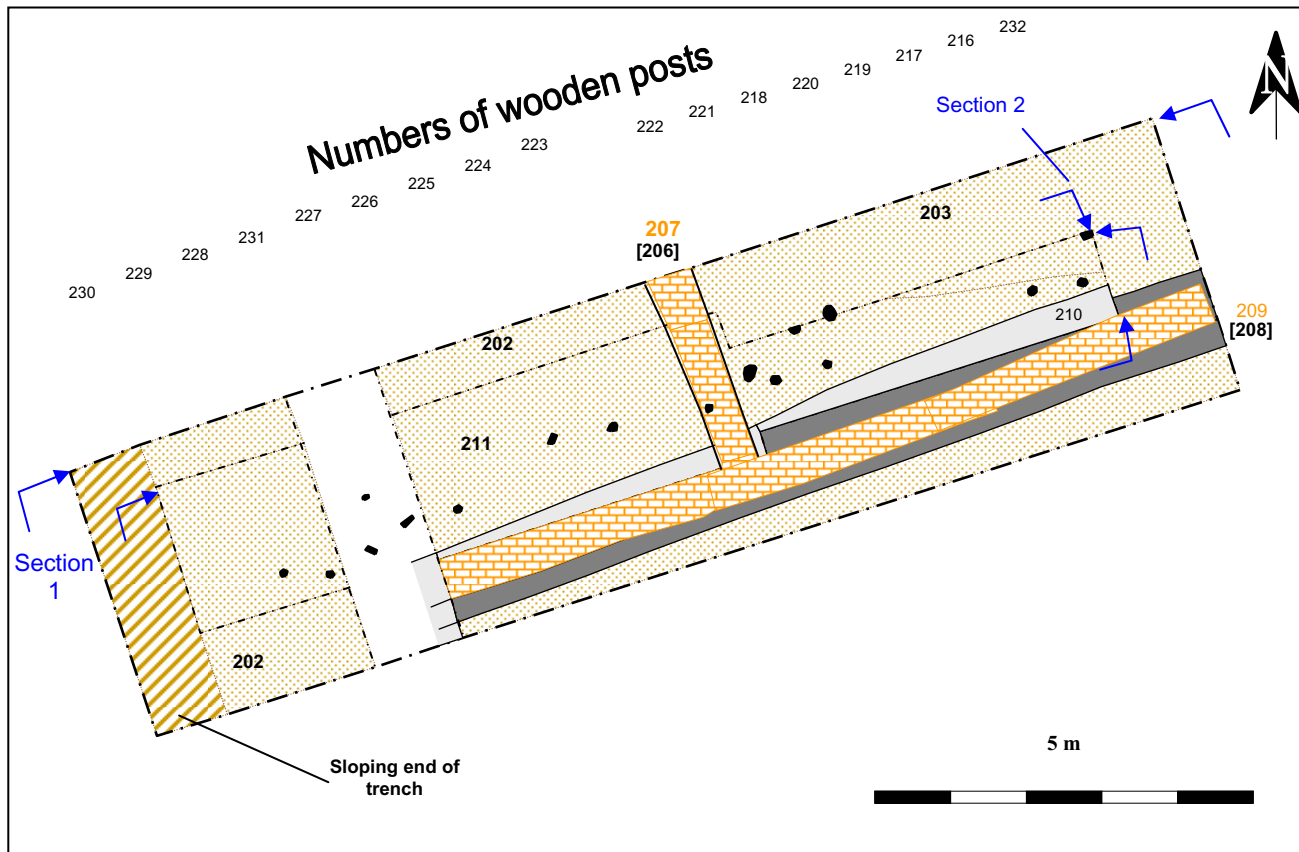
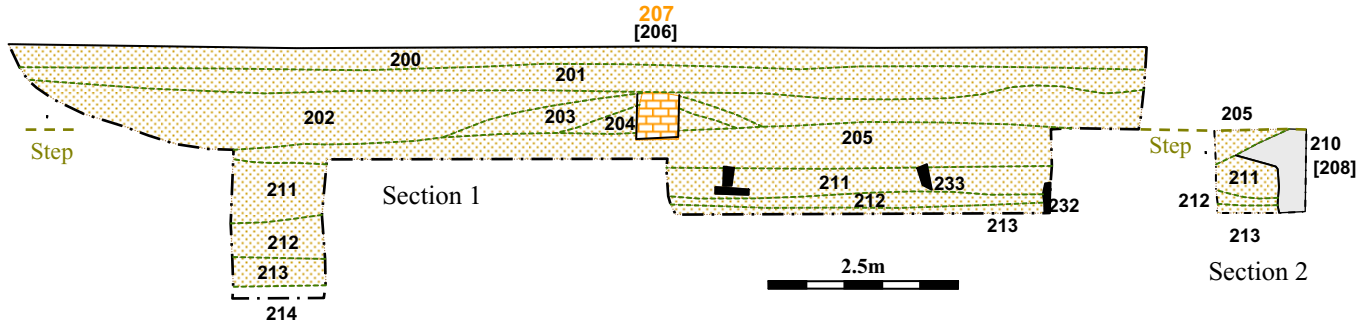
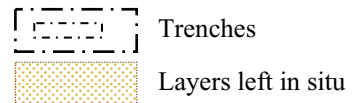
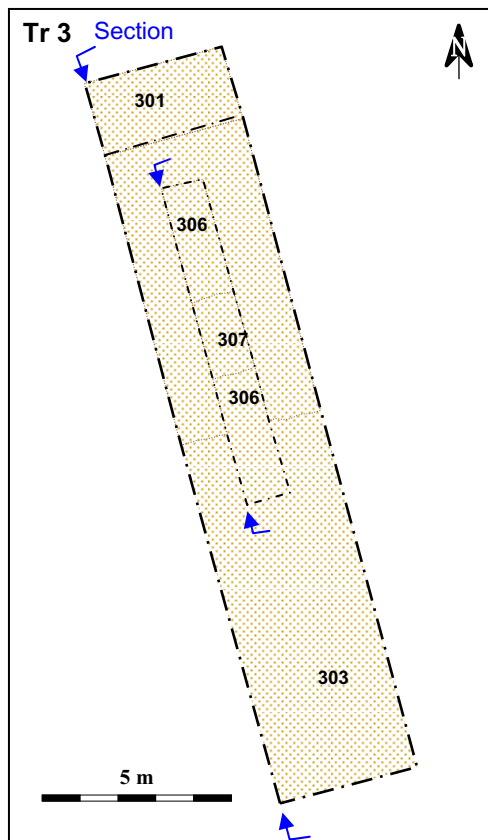


Figure 3: Trench 1 plan, section and photograph



- Trenches
- Layers left in situ
- Features (Excavated segment)
- Features (Unexcavated)
- Walls
- Modern features and services
- Wooden posts of timber revetment (215)

Figure 4: Trench 2 plan and section



Looking north with peat layer (306) exposed in base, 1 x 1m scale

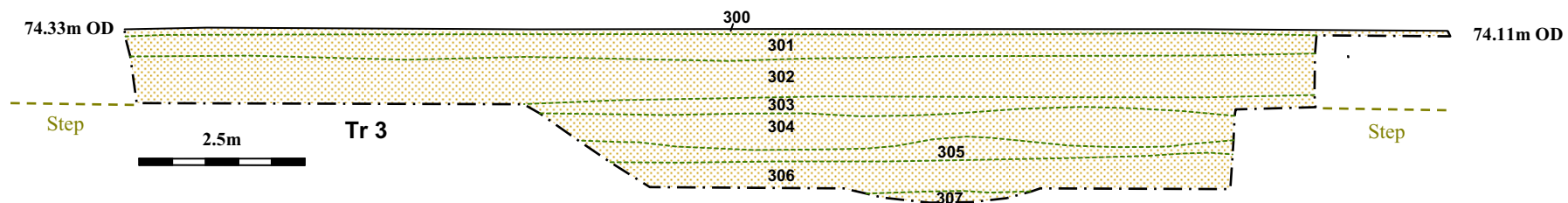
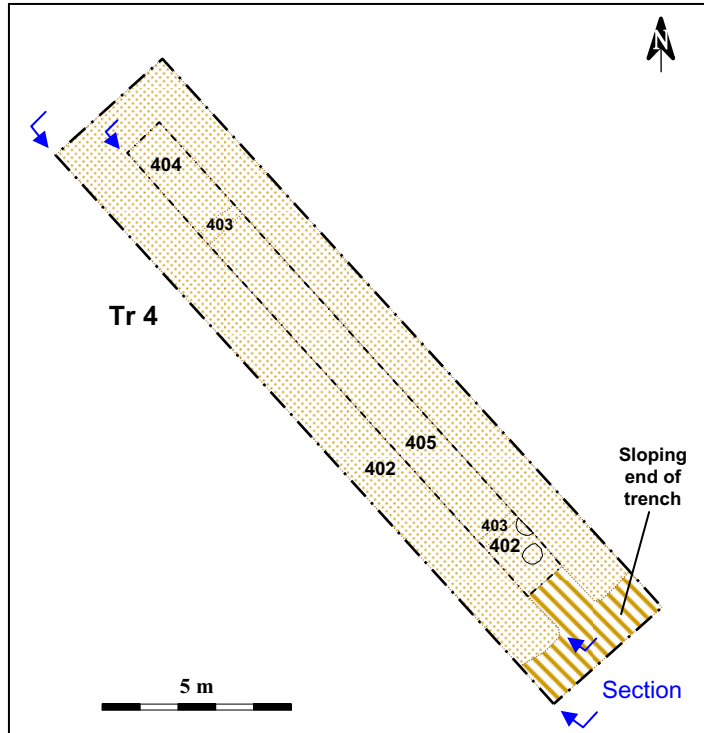


Figure 5: Trench 3 plan, section and photograph



Looking south, exposed alluvial layer (405) in centre base, 1 x 1m scale

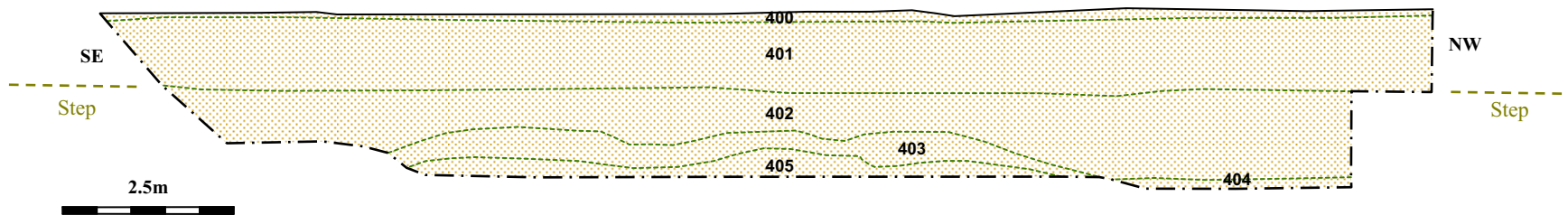
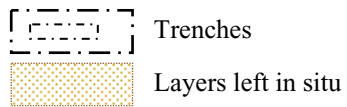
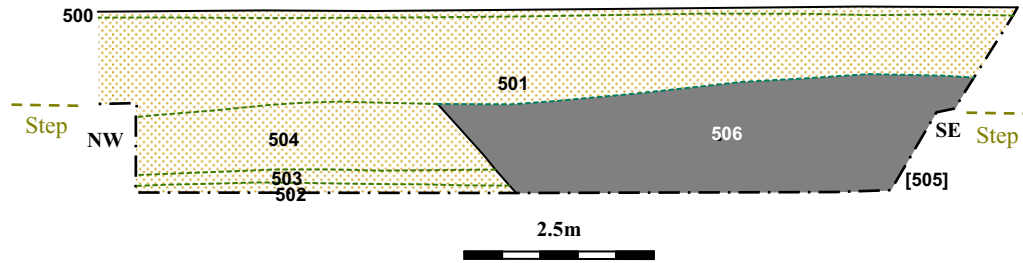
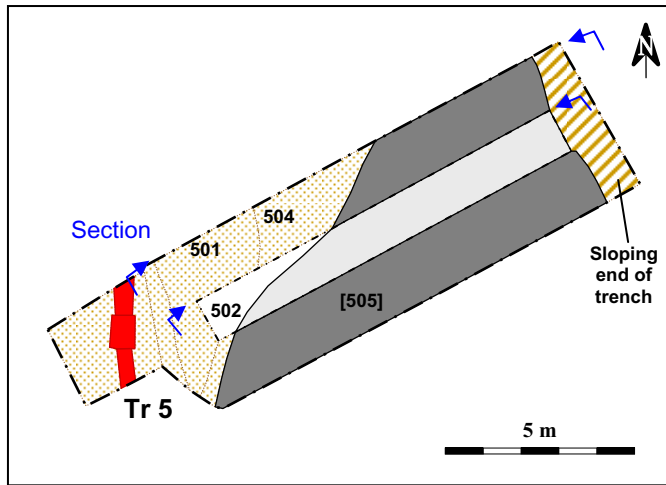
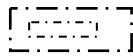

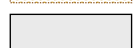
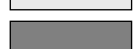



Figure 6: Trench 4 plan, section and photograph

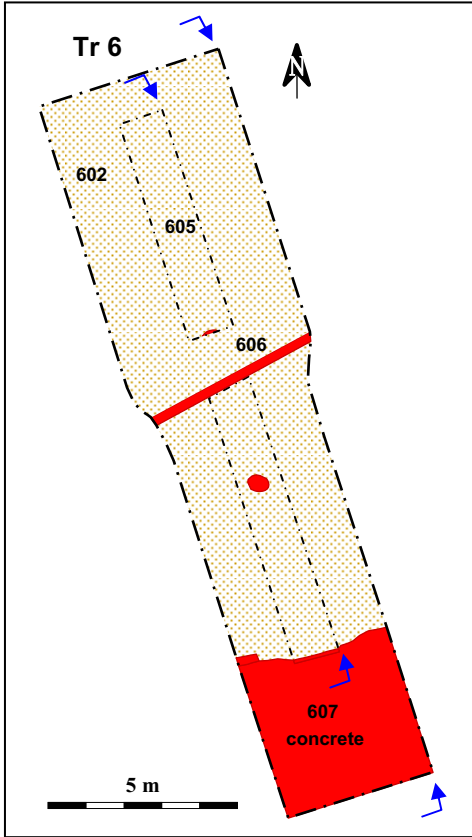


-  Trenches
-  Layers left in situ
-  Features (Excavated segment)
-  Features (Unexcavated)
-  Modern features and services



Looking east, alluvial layer (502) in foreground, modern cut [505] in rest of trench.
1 x 1m scale

Figure 7: Trench 5 plan, section and photograph



- Trenches
- Layers
- Modern features and services



Looking south-west, concrete leisure centre foundation (606), alluvial layer (605) in base. 1 x 1m scale.

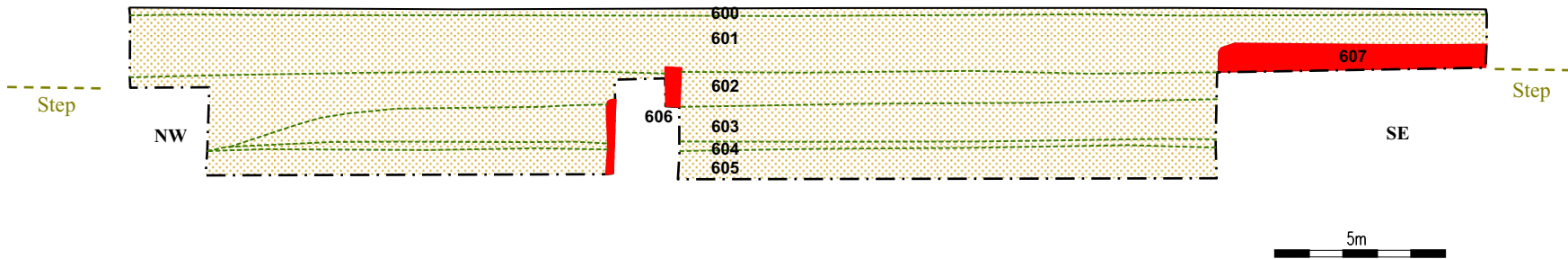


Figure 8: Trench 6 plan, section and photograph



Figure 9: Trench 2 looking west (top) and east (bottom). 2 x 1m scale.



a) Timber (228)



a) Timber (227)



c) Timber (219) point



d) Timber (231) "tent peg"

Figure 10: Selected timbers from timber revetment (215)



Figure 12: Aerial view, showing 19th century terraces along South Walls and the Riverside Recreation Centre

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