BEDFORD COLLEGE ENERGY CENTRE
COOLING SYSTEM
BEDFORD

ARCHAEOLOGICAL OBSERVATION, INVESTIGATION, RECORDING, ANALYSIS AND PUBLICATION

Albion archaeology

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Preface

Every effort has been made in the preparation of this document to provide as complete an assessment as possible, within the terms of the specification. 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.

The fieldwork was undertaken by Mark Phillips (Project Officer), Christiane Meckseper (Project Officer) and Jeremy Oetgen (Project Manager). This report has been prepared by Mark Phillips with figures by Joan Lightning (CAD Technician). The project was managed by Jeremy Oetgen and all Albion projects are under the overall management of Drew Shotliff (Operations Manager).

The assistance and co-operation of Mark Eustace (Bedford College Estates Department), Liam Roberts and Andy Walsh (both of Morgan Sindal) are gratefully acknowledged. Thanks are also due to Vanessa Clarke (Archaeological Officer, Bedford Borough Council) for monitoring the archaeological work on behalf of the local planning authority.

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Key Terms

Throughout this document the following terms or abbreviations are used:

HET	Historic Environment Team at Bedford Borough Council
I*f*A	Institute for Archaeologists
WSI	Written Scheme of Investigation
Procedures Manual	*Procedures Manual Volume 1 Fieldwork*, 2nd ed, 2001 Albion Archaeology

Non Technical Summary

A programme of archaeological works was undertaken between 5th April and 25th July 2012 by Albion Archaeology during the installation of a new river water cooling system at the Cauldwell Street, Bedford, campus of Bedford College. The site was centred at NGR TL0485/4942, immediately south of the River Great Ouse within the modern town centre. A pipe trench was excavated in the college campus and across St Mary's Gardens to the edge of the river. The trench was up to 2.7m wide and 3m deep with a total length of 160m.

The site lies within the southern burh *of Bedford, established in the late Saxon period. This was surrounded by a ditched boundary which survives in part and is known as the King's Ditch. The development works were situated close to the western arm of the King's Ditch where it runs in modern concrete culvert.*

In the initial section of the trench through the western part of the college car park the observations were limited. Here, the trench lay alongside the modern concrete culvert for the King's Ditch and the observed deposits consisted of a deep layer of brick rubble over natural clay.

More detailed findings were obtained where the trench crossed St Mary's Gardens. The southern edge of this area was formerly bounded by a back channel of the river. This is shown on historical maps and probably corresponds to an area of dark silty clay at the southern edge of St Mary's Garden. Deep limestone foundations found here correspond to a building shown on a map of 1836 at the junction of the King's Ditch and the back channel. A later map suggests that this building had been removed by 1841.

To the north of the back channel the natural landform sloped gradually down to the main river channel. In this area the land had been built up and levelled with dump deposits, which contained refuse items dating from the late 19th and 20th centuries. These deposits were cut by modern foundations which corresponded to buildings shown on a 1967 Ordnance Survey map.

The results from this trench suggest that this part of St Mary's Gardens was not subject to development until the later 20th century. Prior to this period it would have been a low-lying area bounded by the river and the back channel. This contrasts with the eastern part of St Mary's Gardens where historical maps and previous archaeological investigations show development for wharfs and commercial premises in the post-medieval and modern period.

The investigations did not recover any evidence for the original form of the King's Ditch.

The project archive will be deposited with Bedford Museum (accession no. BEDFM: 2012.30).

1. INTRODUCTION

1.1 Planning Background

Bedford College was granted planning permission (12/00718/FUL) by Bedford Borough Council for the installation of a water cooling system. The installation is to serve the new energy centre on the Cauldwell Street campus using water from the river for cooling. The works included the excavation of a service trench from the college grounds to the River Great Ouse and the construction of an inlet station and outlet at the river bank.

The Historic Environment Team (HET) of Bedford Borough Council advised that the area was archaeologically sensitive. A written Scheme of Investigation (WSI) was prepared by Albion Archaeology following consultation with the HET (Albion 2012). The WSI detailed the methodology for a programme of archaeological observation, investigation and recording to be carried out during the groundworks. The recommendation for a programme of archaeological works was made by the HET in accordance with national planning guidelines in the form of *National Planning Policy Framework 2012* and Policy BE24 of the Bedford Borough Local Plan 2002.

Albion Archaeology was commissioned by Bedford College to undertake the archaeological works. Monitoring of the construction works took place between 5th April and 25th July 2012. The results are presented in this report.

1.2 Site Location and Description

The site is centred at National Grid Reference TL 0485 4942 and lies at a height of 26m OD. Bedford College is located immediately south of the River Great Ouse within the modern town centre (Figure 1).

The underlying geology mainly comprises river borne alluvium and gravels overlying the cornbrash on either side of the river.

1.3 Archaeological Background

The archaeological and historical background of this area has been fully described in an Extensive Urban Survey (Albion Archaeology 2001b) commissioned by English Heritage. The relevant points are summarised here.

The site lies within the southern *burh* of Saxon Bedford, thought to be one of the earliest *burhs* in the country. This land may have been used for settlement and/or industrial activities during this period. The service trench for the cooling system runs parallel to the King's Ditch (Figure 1). This was a substantial D-shaped earthwork which was laid out in the Saxon period to demarcate the southern *burh*. The modern line of the King's Ditch within the College grounds is largely contained within a modern culvert.

During the medieval period the area within the southern *burh* remained in use, evidence for which has been encountered during previous archaeological

investigations within land currently occupied by Bedford College. An evaluation in 1996 recorded the presence of probable domestic and/or industrial remains dated to between the 13th and 15th centuries (BCAS 1996). Investigations on other land, immediately west of St Mary's Street and south of the college (Baker 1979, Albion Archaeology 2005) also recorded the presence of similar remains.

The post-medieval period saw a growth in the population of Bedford and the development of local land for industrial purposes. This included land within the development area which was located not only in the centre of town, but also on the banks of the river, a route which was used for the transportation of goods to and from the town.

Cartographic sources dating to the 19th century, and consulted at the Bedfordshire and Luton Records and Archives Service, depict the presence of a wharf (New Wharf) and several buildings (timber yard and other light industrial buildings) on land to the east of the development area. The development area itself is shown as open land with a number of mature trees. The King's Ditch is clearly marked (Ordnance Survey map, 1883[1]).

Archaeological observation works during the construction of the Bedford College Performing Arts Centre revealed sub-surface deposits, comprising geological deposits, a brick culvert which enclosed a back channel of the river and a brick-lined basin that would have been joined, via a channel, to the river. Historical plans show that the back channel of the river was culverted at some time between 1841 and 1854. The brick-lined basin appears to have been built as part of the same phase of construction work and probably functioned as a berth for the loading or unloading of barges, possibly in connection with the work of the timber yard that occupied the site around the basin (Albion 2006).

1.4 Project Objectives

The research framework for Bedfordshire states that, while there have been many archaeological investigations in the centre of Bedford the chronology and character of the town, with the exception of the castle quarter, is still not well understood (Oake 2007, 15).

The general objectives of the investigation were to:

- establish the nature of any archaeological remains present at the site;
- establish the integrity and state of preservation of any archaeological features or deposits present at the site.

The specific objectives of the investigation were:

- What is the evidence for land use on the southern bank of the River Ouse in the Saxon, medieval and post-medieval periods?
- Is there any evidence for the King's Ditch or evidence related to the King's Ditch that is earlier than the current modern culvert?

[1] Ordnance Survey Map, 1883 (CRO:MC 1/4/15)

- Do the 19th-century wharf structures and culverts encountered on the site of the Performing Arts Building extend westwards into the development site? If so, what is there nature?
- What is the extent and survival of those potential structures and do any earlier remains (pre-19th century) survive?

The broader objective of the project was to add to the knowledge and understanding of Bedford and its river economy in the Saxon, medieval, post-medieval and modern periods and to produce an archive report that fully describes the archaeological works.

1.5 Methodology

Archaeological monitoring of groundworks was carried out between 5th April and 25th July 2012. Groundworks consisted of the excavation of a trench to lay pipes and two boreholes which were drilled next to the river edge to test the ground in the locations of the inlet and outlet structures.

The trench was aligned approximately north-south. It extended from the Brundtland Building in the south-west part of the campus across the college car park and St Mary's Gardens to the south bank of the river. Approximately 25m from the riverbank the trench split to form separate inlet and outlet branches with the outlet located 30m downstream from the inlet. Including the outlet branch the trench measured 160m long; it was 1.2–3m deep and up to 2.7m wide.

Monitoring visits were coordinated with the contractors and the trench was inspected following the removal of the turf and topsoil deposit and monitored during the removal of the underlying deposits down to undisturbed geological strata.

Throughout the project the standards set out in the following documents were adhered to:

- IfA's *Code of Conduct (now revised, 2012);*
- IfA's *Standards and Guidance for Archaeological Watching Briefs and Field Excavations and finds (now revised, 2012);*
- Albion Archaeology's *Procedures Manual for Archaeological Fieldwork and the Analysis of Fieldwork Records* 2nd edn. (2001);
- English Heritage's *Management of Archaeological Projects* (1991) and *Management of Research Projects in the Historic Environment (MoRPHE) Project Managers' Guide (2006)*.

2. RESULTS

The results are shown in plan (Figure 2), section (Figure 3) with the deposits summarised in Table 1. In the following text sections are referred to as S1, S2 etc and are shown in Figure 3 and are located in plan on Figure 2. Deposits are labelled (A), (B) etc. and are shown in section in Figure 3 and summarised in Table 1.

2.1 College Car Park

The first excavated section of trench crossed the college car park, a level area at a height of *c*. 26m OD (Image 1). Here the trench was 1.2–2m deep and 1.7m wide. Deposits consisted of a tarmac surface on top of 0.7m of brick rubble above a 0.3m-thick layer of dark soil which lay on the undisturbed clay geology. The trench followed the west side of the King's Ditch which ran within a concrete culvert beneath the car park (Image 2). Groundworks began in this area prior to the start of archaeological monitoring and the base of the trench had been filled with fine gravel before it was examined.

2.2 St Mary's Gardens

At the north edge of the car park the pipes for the cooling system were threaded beneath the concrete culvert and the boundary fence. Trenching was restarted on the north side of the boundary in St Mary's Gardens. Here the ground falls gently towards the river from 26.5m OD, level with the college grounds, at the south to 26m at the north, next to the river.

2.2.1 Modern landscaping deposits

The upper deposits in this section of the trench consisted of turf and topsoil (A) above levelling deposits connected with modern landscaping of the park (B), (C), (D) and (F). The area closest to the river had been built up in the 20th century with mixed make-up deposits behind the concrete foundations of the river bank retaining wall.

2.2.2 Structural remains

Foundations representing the remains of three different buildings were found in the trench through St Mary's Gardens.

Deep foundations were found at the south end of the trench (Figure 2, Image 3). These consisted of two blocks of masonry aligned NNW-SSE and ENE-WSW which probably represent the north-west corner of a building or structure. The base of the foundation extended to the bottom of the trench at a depth of *c*. 2.8m below the current ground surface. The truncated upper part of the masonry was sealed by a recent construction/levelling layer (D). A few bricks were incorporated into the foundation which mainly consisted of limestone rubble which was set on a thin layer of concrete or mortar at the base.

In the middle of the trench across St Mary's Gardens there were a series of foundations aligned approximately NE-SW and NW-SE, which appear to have been the external and internal cross-walls of a building aligned NW-SE (Figure 2

and Image 4). The foundations survived just below present topsoil and levelling layers. They were comparatively shallow, consisting of Fletton common bricks made by the London Brick Company, and were set on narrow, concrete strip footings. They were cut into a dark silty soil containing late 19th- and 20th-century refuse (I). A layer of yellow gravel with fragments of brick and concrete (E) represented the remains of an internal floor construction layer.

A set of concrete foundations were found, *c*. 20m from the edge of the river, at the junction of the inlet and outlet branches of the trench. These consisted of concrete strips aligned NE-SW and NW-SE and some substantial concrete blocks which contained cut-off bases of vertical I-sectioned steel columns. As with the brick foundations described above these were cut into soil layer (I) and were sealed by modern topsoil.

2.2.3 Refuse and levelling deposits

The naturally sloping ground adjacent to the river had been covered by a series of layers which became deeper to the north, towards the river bank. These deposits contained some domestic refuse and may either represent casual disposal of waste on a convenient area of open ground or the deliberate use of domestic refuse as landfill.

The most extensive deposit was a fairly homogenous layer of dark silty soil (I), which extended across the whole mid part of the trench from section S3 to S4, becoming thicker to the north. It contained a mixture of domestic debris including animal bone, bottle glass, tile and pottery dateable to the late 19th and earlier 20th century. At the north this merged into a more mixed deposit (J) of silty and stony layers. The mixed deposit corresponds to distinct layers of silty (G) and stony soil (H) recorded at section S6.

A distinct layer containing tile, brick and mortar fragments (K) was found in the northern part of the trench, beneath the layers containing domestic refuse (Image 6). The layer was at least 20m wide east to west, being seen in the southern part of the inlet trench and extending eastwards along the outlet trench as far as section S5 where it ran out. It was up to 0.2m thick and comprised a mixed deposit of mainly tile and mortar with some brick. The mortar debris consisted of soft yellow mortar and the tiles were fragments of plain peg tiles. This demolition debris may have been used to form an area of hard standing or could just have been a dump deposit.

2.2.4 Buried soil

A layer of dark grey or black silty loam (L) recorded at section S6 may have been a buried soil layer. The dark colour could reflect its marshy riverside location.

2.2.5 Geological and riverine deposits

Geological deposits seen in the base of the trench consisted of clean light to mid yellow clay (Q) and clean mid grey clay (R). This is flood plain alluvium formed during the Holocene period (Green 2000, 14).

Deposits associated with the main river channel were recorded at a depth of approximately 24.3–24.6m OD in the northern end of the trench. These comprised

dark clay (P), dark greenish grey clay (N) and mid orange brown sandy gravel with occasional fragments of preserved branches or roots (M). The deposits formed a layer directly above the clean yellow alluvial clay in the base of the trench. They may have been deposited as alluvium on the river bank or within the southern edge of the channel prior to its canalisation in the modern period. The sand and gravel layer (M) was found slightly deeper than other layers and may have been the fill of a channel.

A dark silty clay deposit (S) towards the south end of the trench in St Mary's Gardens, next to a deep limestone foundation may represent silting within a back channel of the river (Image 3). This channel is shown on historical maps from the 16th century to the mid 19th century.

3. INTERPRETATION AND CONCLUSIONS

The observations provided information on modern land use and geological deposits on the south bank of the river. It did not uncover any evidence for Saxon or medieval features associated with the original form of the King's Ditch.

The section through the deposits in St Mary's Gardens provided good evidence of the general sequence of deposits on the river bank. Prior to any landscaping activity in this area the river channel appears to have been wider, with ground rising gradually from the river's edge at *c*. 24.3m OD to something over 25m OD at the edge of what is now the college grounds.

A watercourse used to flow parallel to the river following a line roughly on the boundary between the college and St Mary's Gardens (Figure 4). It is first illustrated, albeit in a topographically inaccurately form, on Jeffery's map of 1765. A dark silty deposit seen close to the south end of the trench in St Mary's Gardens may correspond to silting in this watercourse which was probably a naturally formed back channel of the river. By the later 19th century the channel had largely been culverted or filled in as shown on Mercer's plan of 1876.

The deep limestone foundations found at the south end of the trench correspond to the position of a building shown on the 1836 Dewhurst and Nichols map of Bedford. The map shows the King's Ditch immediately west of the building and the back channel of the river on the north side of the building. This probably accounts for the extremely deep foundations as the building appears to have been built on the edge of these two watercourses. The Dawson panorama of 1833 shows a number of buildings in this approximate location, but there are no buildings on the 1841 Reynolds map which could correspond to the foundations.

During the modern period the land adjacent to the river was built up with dumped deposits. The initial deposit consisted of demolition debris made up of fragments of plain tile, brick and soft yellow mortar. The main layer of build-up was derived from domestic refuse and included bottle glass, ceramics and other debris dating from the late 19th and earlier 20th centuries. This use of the area certainly post-dates Dawson's 1833 panoramic view of Bedford which shows it as a riverside meadow grazed by cows and sheep.

The area adjacent to the river was built on in the mid 20th century. Modern brick and concrete foundations found close to the surface in St Mary's Garden correspond to buildings associated with the college which appear on an Ordnance Survey map of 1967 (Figure 4).

The results of the investigations provide little information on the area contained within the college campus. The deposits seen in that area were adjacent to a large concrete culvert which forms the modern line of the King's Ditch.

The results from this trench suggest that this part of St Mary's Gardens was not subject to development until the later 20th century. Prior to this period it would have been a low-lying area between the main river and a back channel which

would have been liable to flooding. This contrast with the eastern part of St Mary's Gardens where historical maps and archaeological investigations show wharfs and commercial premises were developed close to the town bridge during the post-medieval and modern periods (Albion Archaeology 2006). Within St Mary's Gardens the excavated trench revealed no evidence of earlier settlement or structures. However, there is high potential for the preservation of archaeological remains in the vicinity, either in features cut into natural geology or within the riverine deposits. This might result from temporary use of the floodplain in dry seasons or exploitation of the river channels, e.g. for transport or fishing. Such evidence could have been preserved beneath the modern levelling layers which are approximately 1m thick in the area close to the river.

The written scheme of investigation identified a series of detailed objectives. In relation to these the monitoring found no evidence of Saxon or medieval activity and no direct evidence for the King's Ditch. However, deep limestone foundations located close to the southern boundary of the college appear to correspond to a building (shown on a plan of 1836) which stood at the junction of the King's Ditch and a back channel of the river. On this plan the King's Ditch is shown branching off the back channel and did not appear to extend across the riverside meadow at this time.

The site records do not merit any further analysis or reporting. The project archive will be deposited with Bedford Museum (accession no. BEDFM: 2012.30). This report will be uploaded onto the Archaeology Data Service's OASIS website (ref. albionar1-125281).

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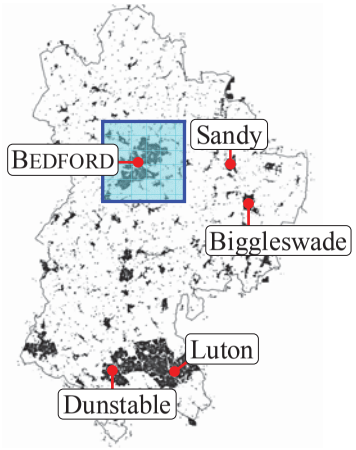
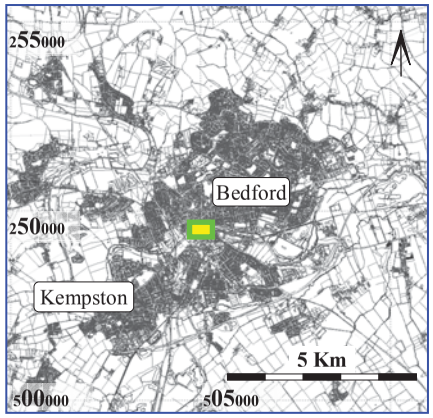




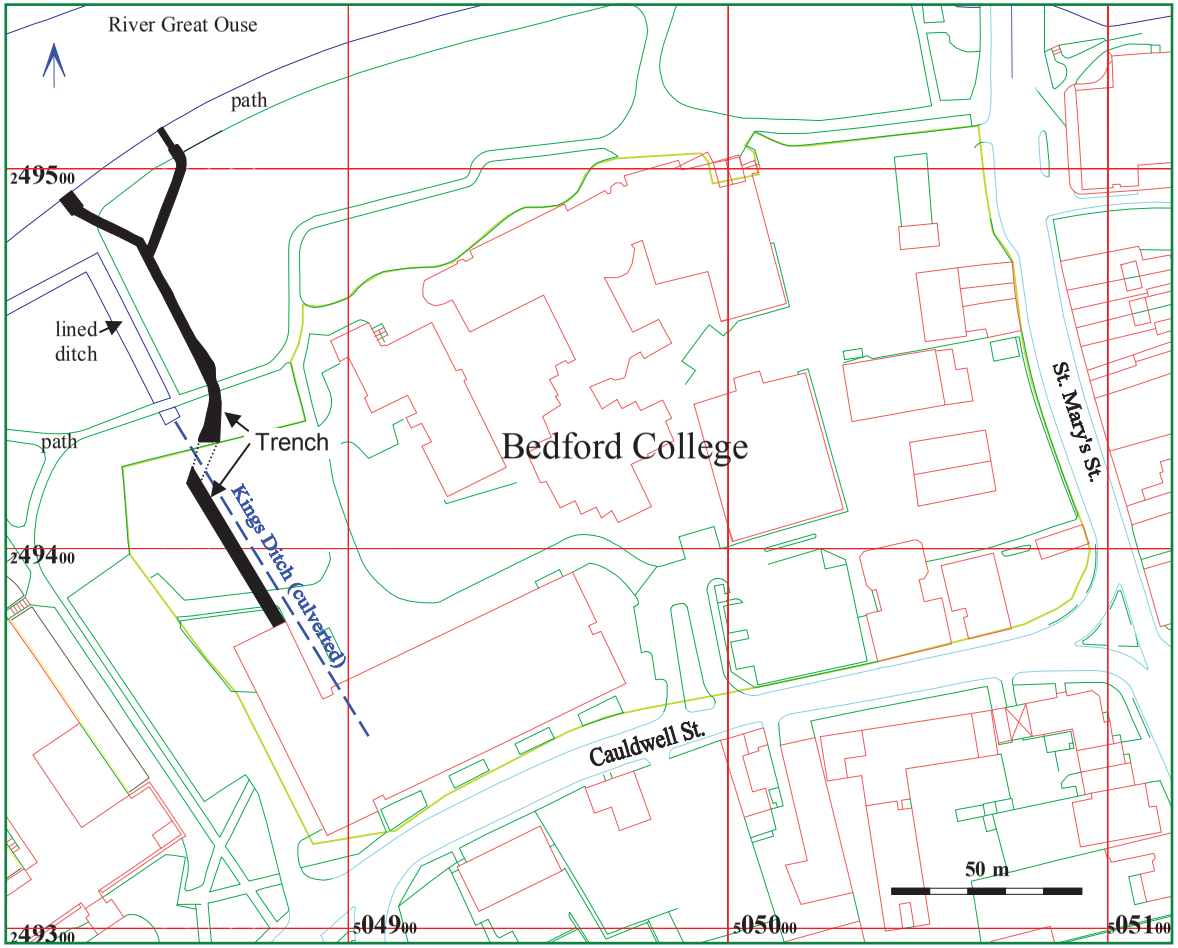
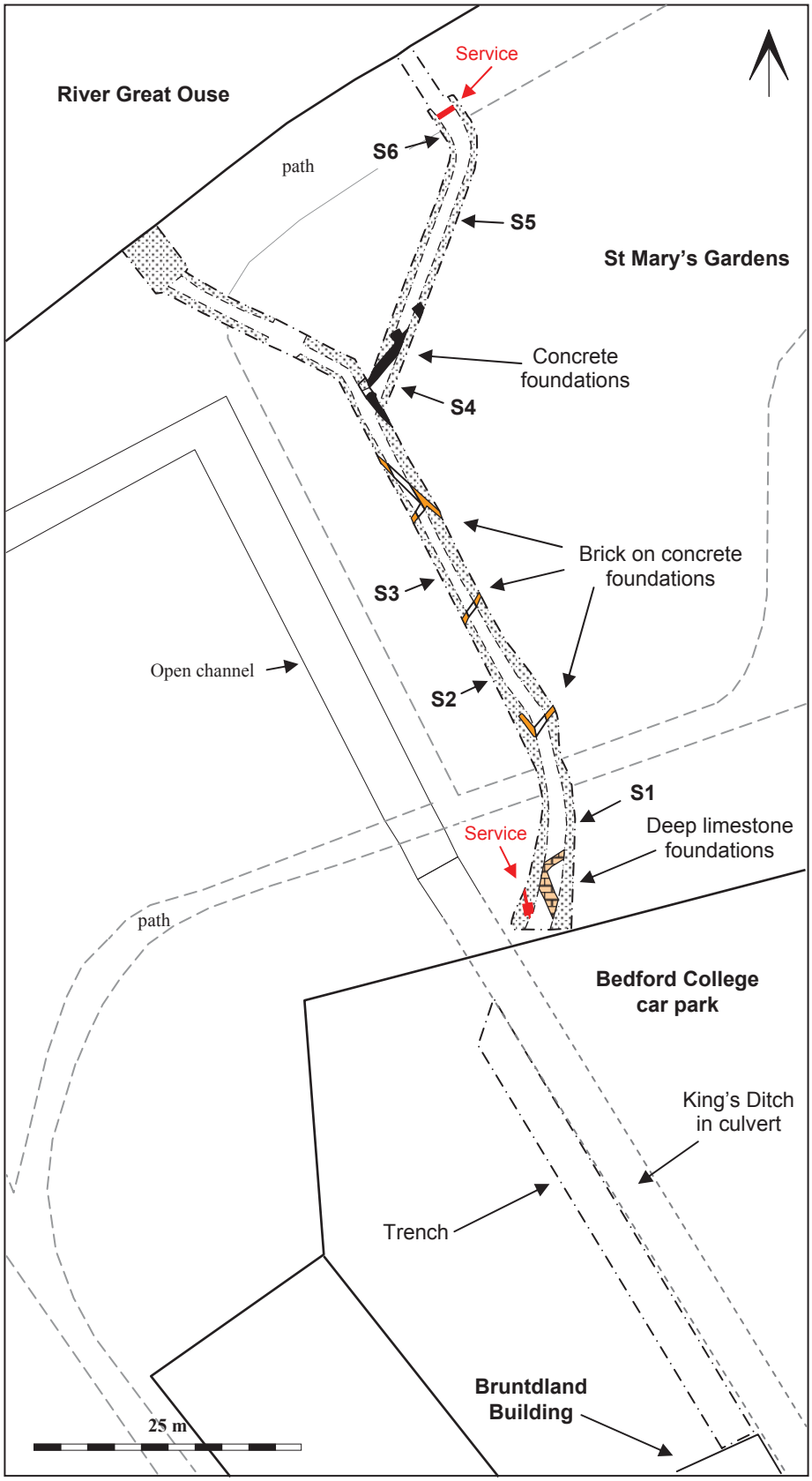


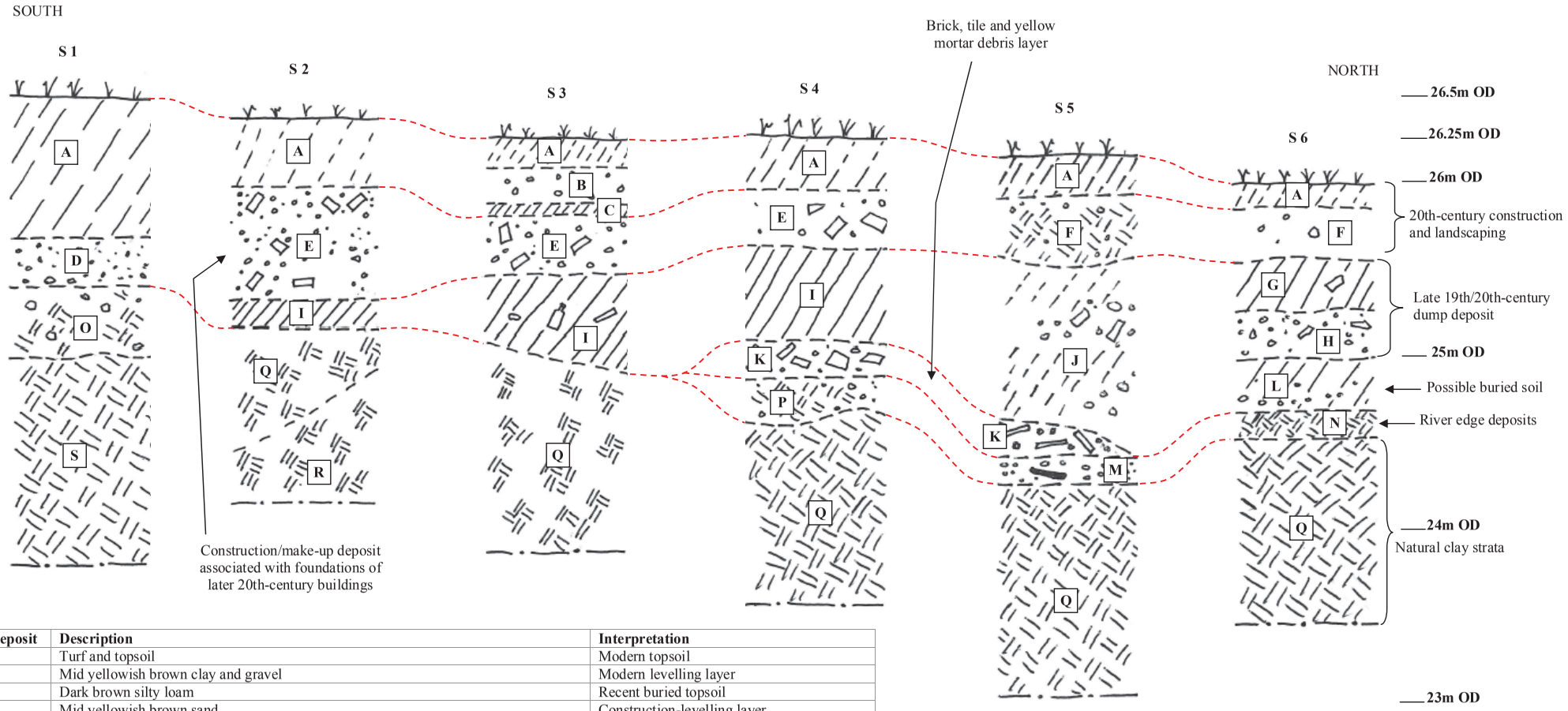
Figure 1: Site location plan

Base map reproduced from the Ordnance Survey Map with the permission of the Controller of Her Majesty's Stationery Office, by Bedfordshire County Council, County Hall, Bedford. OS Licence No. 100017358 (LA). © Crown Copyright. With amendments based on Dwg No. 42 Project 35772 supplied by Charter Consultant Architects.



* Numbers S1, S2 etc indicate locations of sections shown on Figure 3

Figure 2: All features plan



Deposit	Description	Interpretation
A	Turf and topsoil	Modern topsoil
B	Mid yellowish brown clay and gravel	Modern levelling layer
C	Dark brown silty loam	Recent buried topsoil
D	Mid yellowish brown sand	Construction-levelling layer
E	Mid yellowish brown sand/gravel with occasional fragments of brick and concrete	Construction make-up deposit associated with C20th foundations
F	Mid orange brown sandy clay	Modern levelling layer
G	Dark grey silty loam with modern brick/tile fragments and modern refuse	Modern dump deposit
H	Mid yellow brown silty gravel with brick, tile and glass	Modern dump deposit
I	Dark grey/black silty soil with late C19th/20th debris (bottle glass, enamel plate, fragment of enamel advertising sign, stoneware and leather boot)	Late C19th/early C20th refuse/dump deposit
J	Mixed silt and stony layers containing C19/20th debris	Late C19th/early C20th refuse/dump deposit
K	Layer with frequent fragments of brick, tile and lumps of yellow mortar	Demolition debris
L	Dark grey/black silty loam with small stones	Buried soil
M	Mid orange brown sandy gravel with occasional fragments of wood (branches or roots)	River edge deposit
N	Dark greenish grey clay	River edge deposit
O	Mixed dark grey clay/silt with moderate stone concentration	Possible river edge deposit
P	Dark grey clay with occasional stones	Possible river edge deposit
Q	Mid yellow brown clay	Holocene river alluvium
R	Mid to dark grey clay	Holocene river alluvium
S	Dark grey silty clay	Possible channel deposit

Figure 3: Schematic section through deposits in St Mary's Gardens (See Figure 2 for the location of each component section)

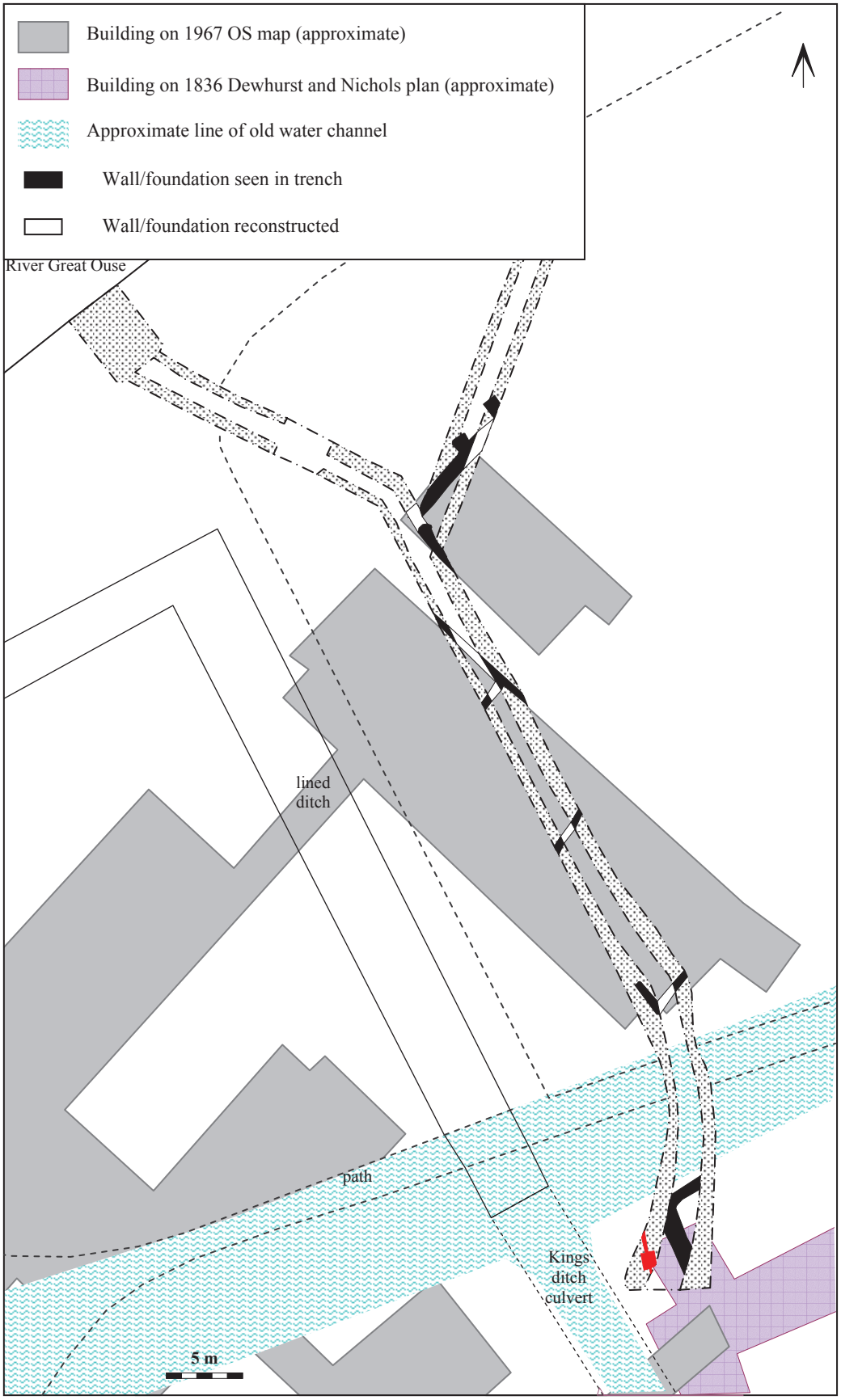


Figure 4: Historical map data superimposed onto all features plan

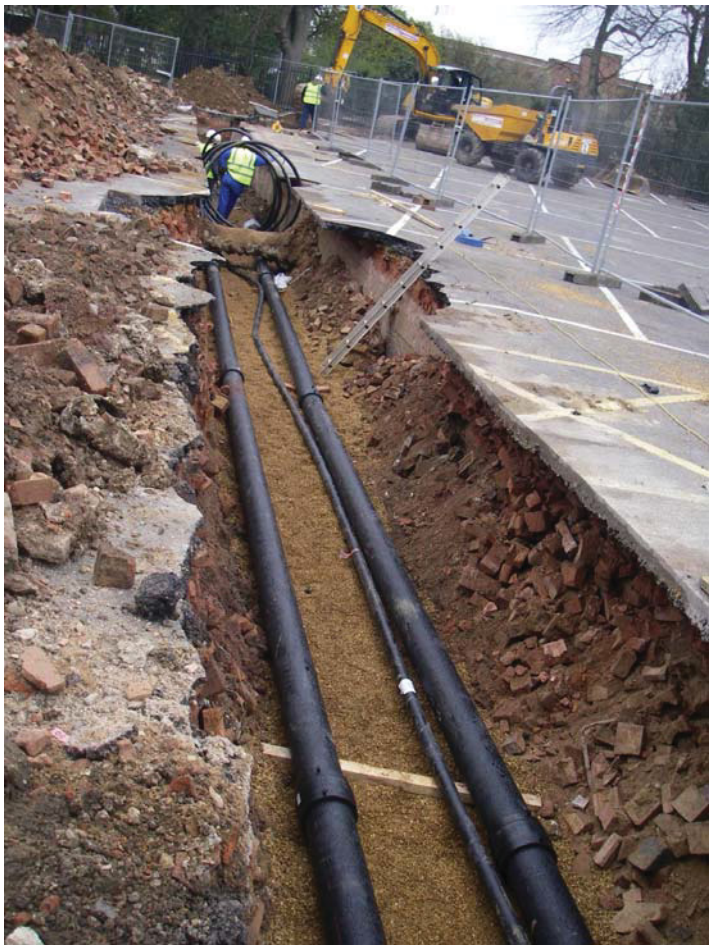


Image 1: Trench through Bedford College car park
Looking north

Image 2: Trench in car park showing King's Ditch culvert
A concrete culvert enclosing the King's Ditch is visible in the east side of the trench

Image 3: Limestone foundation at southern edge of St Mary's Gardens
The foundation is cut into the underlying subsoil (O) and geology (R) and is sealed beneath topsoil (A) and a yellow brown construction/levelling layer (D). Dark silty clay (S) visible to the left of the foundation may represent the fill of a former channel

Image 4: Brick foundations in St Mary's Gardens
Shows foundation in mid part of the trench where it crosses St Mary's Gardens (location S3 Figure 2, looking north). The yellow construction deposit (E) is visible on left hand/interior side of the wall and the wall cuts through a dark dump deposit (I) which contained late 19th/20th-century refuse.

Image 5: Trench in St Mary's Gardens
Image shows area where intake and output trenches diverge (near S4 Figure 2) looking towards the north-east with the trees along the river bank in the background.

Image 6: Trench in St Mary's Gardens showing Section S4
Image shows rubble from modern construction at top left (E) and dump deposit (I) sealing a narrow band of brick, tile and mortar debris (K) situated below the step in the side of the trench

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