Gloucestershire
COUNTY COUNCIL

Archaeological Excavation and Watching Brief at Commercial Road Sub-Station, Gloucester 2010-2012

For
AMEC Environment & Infrastructure UK Limited

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Environment Directorate

Site details

Report title:	Archaeological Excavation and Watching Brief at Commercial Road Sub-Station, Gloucester 2010-2012
Site address:	Commercial Road, Gloucester
OS NGR:	382862 218471
Site type:	Watching Brief and Excavation
Client:	AMEC
Date of fieldwork:	August 2010 – September 2012
GHER No:	35746
Scheduled Monument	330
Scheduled Monument Consent	S00005667
Planning reference	10/00118/CON
Recipient museum:	Gloucester City Museum and Art Gallery
Museum Accession Number:	GLRCM 2010.30
Archived finds:	Yes
Date of report:	June 2013
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Contributors:	Kurt Adams (Coins). Dr Hugo Anderson-Whymark (Flint). Hilary Cool (Small finds). Claire Ingrem (Animal Bone). Jane Timby (Pottery). Alan Clapham (Environmental sampling).

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Summary
Gloucestershire County Council Archaeology Service (GCCAS) was commissioned to undertake a programme of archaeological monitoring during demolition and upgrading works at Commercial Road Sub-Station, Gloucester. The majority of the site lies within the Scheduled Monument area of Glevum Colonia (SM 330). All groundworks were undertaken in accordance with the agreed specification and Scheduled Monument Consent.

Significant archaeological remains were encountered during the excavation to install a new cable trough; this area was subject to hand excavation which recorded archaeological features and deposits shown to represent five separate phases of activity. The first and second phases related to the Roman settlement and comprised deposits of 2nd and 4th century date. The third phase comprised two pit features which have been dated to the middle to late Saxon period and included a significant pottery assemblage which is provisionally dated as being middle Saxon. Two later phases which span the late Saxon to earlier medieval periods included settlement activity in the form of a probable cooking pit and a clay layer which may have formed a surface, and later layers which represent either occupation layers or middens. The archaeological features and finds from the late Saxon to earlier medieval phases have close comparisons with the remains of the Norman Castle, excavated at the adjacent site of 28-32 Commercial Road in 1983-4.

1 Introduction

1.1 Gloucestershire County Council Archaeology Service (GCCAS) was commissioned by Stephen Townend of AMEC Environment & Infrastructure UK Limited (Formerly Entec UK Ltd) to undertake a programme of archaeological monitoring during demolition and upgrade works at Commercial Road Sub-Station, Gloucester (OS NGR 382862 218471). The watching brief was carried out between August 2010 and September 2012 as required when groundwork was undertaken. Following the exposure of significant *in-situ* archaeological deposits during the watching brief a phase of excavation was carried out.

1.2 The archaeological monitoring and excavation were undertaken to satisfy Condition 4 of the Conservation Area Consent (application no.10/00118/CON) as granted by Gloucester City Council on 13 April 2010, and Condition (ii) of the Scheduled Monument Consent (reference S00005667) as granted by the Secretary of State, as an area within the site is a designated Scheduled Monument (SM 330).

1.3 The archaeological monitoring and excavation was undertaken in accordance with a Written Scheme of Investigation produced by Entec (Townend 2010), now part of AMEC; and in accordance with a Project Brief prepared by Gloucester City Council's Historic Environment Team (Smith 2010).

1.4 The watching brief and excavation were carried out in accordance with the Institute for Archaeologists' guideline documents *'Standard and Guidance for an Archaeological Watching Brief'* and '*Standard and Guidance for Archaeological excavation'* (IfA 2008). Gloucestershire County Council Archaeology Service is an 'Institute for Archaeologists' (IfA) Registered Organisation (IfA RO 42).

1.5 The excavation was carried out by Nick Witchell, Nathan Thomas, Andy Walsh and Briege Williams. The initial phase of the watching brief was carried out Eddy Stratford. The main phase of watching brief was undertaken by Nick Witchell, with some monitoring visits made by Paul Nichols who also managed the project.

2 Site location (see Figure 1)

2.1 The Commercial Road Sub-Station is situated at the western end of Commercial Road, Gloucester, to the north of the Docks and east of (the former) Gloucester Prison, the site is centred on Ordnance Survey NGR 382862 218471. The Commercial Road site comprises the operational substation area and surrounding derelict land to the north and west all of which is under the ownership of Western Power Distribution (formerly Central Networks). Geologically the site is situated

on Mudstone of the Blue Lias and Charmouth formations (BGS 2008) and lies on sloping ground at a height of between 12m and 13m above Ordnance Datum (aOD)

3 Archaeological and historical background

3.1 Information has been sourced from the Gloucestershire Historic Environment Record (GHER) and the Gloucester Urban Archaeological Database (GUAD). The site is in a sensitive location in terms of archaeology and cultural heritage. It is located within the Barbican Conservation Area and an area of Principal Archaeological Interest as defined by Gloucester City Council. The majority of the site lies within the Scheduled Monument area of *Glevum Colonia* (SM 330), which comprises a number of separate Scheduled areas within the City of Gloucester.

3.2 Previous excavations on the site

3.2.1 Excavations on the site for the power station chimney stack in 1899 recovered a stone from the Roman city wall, which was subsequently incorporated into the fabric of the power station and later into the present sub-station switchgear building. Archaeological excavations undertaken at the site in 1983-4 (Darvill 1986) identified and partially recovered extensive deeply stratified deposits of the Roman to modern periods (1st century to early-20th century). Key finds and features recognised on the site include a high status Roman civic building, features associated with the early Norman castle – including the moat – and the internationally significant Gloucester Tabula Set (an early form of Backgammon), now on display in Gloucester City Museum. These excavations incorporated a 172 square metre area in the southeast corner of the site. Although only c.9% of the total site area, the 1983-4 excavations indicated that the site has a high archaeological potential for sub-surface remains of the 1st through to the 20th centuries to survive in good condition (Entec 2010).

3.3 Prehistoric

3.3.1 A small amount of prehistoric activity is recorded within 250m of the site, a Neolithic pit was recorded during an excavation at 13-17 Berkeley Street (GHER 10093), along with a scatter of flints, isolated finds of Iron-Age pottery are also recorded on the GUAD.

3.4 Roman

3.4.1 Although little recorded evidence exists for the exact location of the northeast to southwest orientated 'western' line of the Roman city wall. The First Edition Ordnance Survey map (OS 1884-6) shows the projected line of the wall along Barbican Road, and it is clear from remains excavated surrounding the site that it is within the boundary of the Roman city.

3.4.2 Excavations in and around the site, such as Barbican Road (GHER 10029) and the proposed Magistrates Court site, between Barbican Road and Ladybellegate Street (GHER 15454), have recorded deeply stratified Roman deposits including high status buildings (Medland 1895 and Knowles 1934).

3.5 Early Medieval

3.5.1 The 1983-4 Commercial Road excavation (GUAD 789) recorded features interpreted as being of Saxon date along with several sherds of pottery recovered dating from the 6th – 9th centuries (Darvill 1988).

3.6 Medieval

3.6.1 Approximately 20m to the northwest of Commercial Road Sub-Station lies what is considered to be the centre of the Barbican mound, which has been placed by many, including Hurst, as being the motte or mound of Gloucester's Norman motte and bailey Castle. Excavations in 1983-84 at 28-32 Commercial Road recorded the bailey surface and part of the bailey ditch (Darvill 1988). The Norman Castle, 'the old Castle', was replaced at the start of the 12th century with a larger structure built to the north west of the Barbican mound, on the site of the former monks garden, located on the site of what is now Gloucester Prison. By 1143 documents of the Abbey of St Peter's document the existence of

both an old and a new Castle. (Hurst 1984). The 'new Castle' according to Hurst may have incorporated some of the defensive structures of the earlier castle, the new Castle itself was destroyed in 1791 (Renn 1973) and the site was built over by the creation of Gloucester Prison.

3.7 Post Medieval

3.7.1 The major recent post-medieval activity recorded on the site is the electricity generating power station which was constructed at the end of the 19th century. The Victoria County History records that 'From 1889 onwards several companies put forward proposals for supplying the city with electricity, but the corporation decided to provide its own supply and took powers for doing so in 1896. Its works, built in Commercial Road, were opened in 1900 and the provision of street lamps and the connexion of private consumers to the supply began that year. In 1943 the works were replaced by a new power station built at Castle Meads with access for coal supplies from a branch railway and a jetty on the Severn' (VCH 1988).

3.8 Cartographic evidence

3.8.1 A detailed analysis of the historical map evidence was produced by Birmingham Archaeology (Tyler 2010) as part of the overall archaeological mitigation for the site and this should be referred to. To summarise, the earliest maps of the area show the Barbican hill present, to the south of the Castle of the time, with a large open space on the eastern side of the Castle, known as the 'Bare land', (the name of which survives today as Bearland) with little development shown over the area.

3.8.2 The tithe map of Gloucester (Gwatkin 1997) shows the site to be within an open area or field. The First Edition Ordnance Survey map (OS 1884-6) shows the site as being significantly developed, with buildings situated along the central part of the site (from the location of the present day transformers, north to the existing car park) although there are also large areas of undeveloped land. A carriage and wheel works consisting of several buildings was located in the area of the most recently demolished part of the power station. The Second Edition OS map (OS 1902) shows the power station building, in the centre of the site, having replaced the carriage and wheel works. There are indications of ground level changes or possible earthworks to the east and south of the power station, although these may be the result of the construction of the power station. There is some extension of the power station between the Second Edition and Third Edition (OS 1923) maps, and some further extension of the power station between 1923 and the revised Third Edition (OS 1936-8), along with the addition and alteration of ancillary buildings, to the extent that very little of the site, apart from the entrance way, is undeveloped.

3.9 Built heritage on the site

3.9.1 The derelict power station and administration buildings on the site were identified by Gloucester City Council as being of cultural heritage interest in relation to the industrial heritage of the city. In view of this, a Level 2 historic building record was made of the surviving buildings associated with the site's former use as a power station. The historic building report suggested that the exterior appearance and detailing of the administration block suggest an origin pre-dating the construction of the electricity works buildings, in their current form dating to at least 1843, and possibly as early as the 1830s. (Tyler 2010).

3.9.2 The remains of the power station were demolished as part of these works (see **5.2**).The administration building has been refurbished and converted to become a new switch gear building for use as part of the substation.

4 Methodology

4.1 A watching brief was carried out during all intrusive groundwork on the site. Excavation of trenches was carried out using mechanical excavators equipped with toothless buckets, under close archaeological supervision and archaeological deposits, where present, were investigated by hand and recorded.

4.2 Following the identification of significant archaeological deposits, during excavation for the installation of a cable trough (Trench 5), the machine excavation was halted. Following consultation with Mel Barge, English Heritage Inspector of Ancient Monuments, Charlotte Lewis of Gloucester City Council and Stephen Townend of Amec it was decided to investigate the area through hand excavation. Two sondages were excavated to investigate the nature of the deposits, the results of this informed the decision to hand excavate all archaeological deposits.

4.3 In the area of excavation (Trenches 5-7) a mechanical excavator was used to remove modern deposits, including modern walls and foundations, archaeological deposits were then cleaned by hand, photographed and planned.

4.4 Deposits were excavated by hand using single context excavation and recording. Deposits were planned at 1:50 or 1:20 and sections were drawn where appropriate at a scale of 1:10 or 1:20.

4.5 A photographic record, consisting of black and white film and colour digital images, was made of all archaeological deposits identified during the excavation and watching brief.

5 Results

5.1 The results of the archaeological monitoring are outlined below, the watching brief and excavation areas are described separately and discussed as a whole.

5.2 Watching brief

5.2.1 Initial phase (Figure 2)

The first phase of monitoring involved the demolition of the derelict power station building and the removal of an underground tank (Figure 2), the monitoring was undertaken between 11th and 18th August 2010 and the results of the monitoring were documented in an interim report (Stratford 2010).

5.2.1.1 Demolition of the derelict power station building

Groundwork to demolish the derelict power station building impacted to a depth of up to 2.5m below ground level, though this depth was only reached in the internal basement of the building and halted at the top of a concrete floor, which was left *in situ*. In areas exterior to the former building, groundwork impacted to a maximum of 2m below ground level. Only modern deposits of made ground comprising dumped rubble and silts were recorded and no archaeological features or deposits were encountered.

5.2.1.2 Removal of the underground tank

Groundwork for the removal of the underground tank in the scheduled area revealed a brick and concrete built chamber directly below the concrete ground surface, measuring 2m by 1m in plan and up to 1.5m in depth below ground level. The tank, surrounded by yellow sand, was removed from this chamber. No excavation beyond the interior of the chamber was undertaken and consequently no archaeological features or deposits were exposed during the work.

5.2.1.3 The first phase of archaeological monitoring recorded no archaeological features or deposits in the areas impacted by the groundwork for the development.

5.2.2 Trenches 1-3 (Figure 3)

Trenches 1 - 3 were three trial pits excavated to locate existing services for the excavation of a new service trench. No significant archaeological deposits were encountered during excavation of these trenches.

5.2.2.1 Trench 1

The trench measured 1.7m in length, 0.4m in width and up to 0.9m deep. The trench revealed the footings of the demolished lean-to at a depth of 0.5m below ground level. Modern electric cables were located at a depth of 0.8m b.g.l. The earliest deposits within the trench were post-medieval in date.

5.2.2.2 Trench 2

Trench 2 was 1m in length, 0.4m wide and at its deepest part was 0.9m deep. A modern drain was present in the deepest section of the trench, overlain by backfill deposits.

5.2.2.3 Trench 3
Trench 3 measured 0.5m in length, 0.4m in width and up to 0.8m in depth. Two 19th or 20th century metal drains were revealed at the base of the trench, and these were overlain by backfill deposits.

5.2.3 Trench 4 (Figure 3)
This trench was excavated for the installation of a new service connection to the refurbished former administration building. The trench was 15.6m in length, between 0.4m and 0.5m in width and up to a maximum depth of 1.20m b.g.l (11.18m AOD).

5.2.3.1 Due to the narrowness and instability of the trench, access was restricted and little cleaning or investigation work could be carried out (see plate 1). The deposits observed during excavation and visible in the trench sections differed greatly between the north-west facing side and the south-east facing side.

5.2.3.2 Along much of the north-west facing section of the trench the earliest deposit was clean yellow sand (410) measuring up to 0.2m in depth which appears to be backfill associated with 19th or 20th century electricity cables or other services. The sand was overlain by a mixed backfill deposit of dark grey clay silt (411) which contained 19th century red brick and ceramic electricity capping tiles and measured up to 0.70m in depth. Deposit (411) was overlain by a layer of crushed stone hardcore (402) which was sealed by the tarmac surface of the access road (400), together the hardcore and tarmac measured a maximum of 0.30m in depth.

5.2.3.3 In the southeast facing section of the trench, the earliest deposit visible was a thin lens of orange sand (409) which was up to 70mm in depth, this was overlain by a deposit of blue-grey clay (408) which was up to 0.80m deep and contained limestone pebbles, charcoal, and fragments of ceramic building material (CBM), three pieces of Roman CBM were collected along with a single sherd of medieval pottery. The clay (408) was cut by a 19th century pipe trench [406], which contained a metal pipe and grey silty clay backfill (407), this was sealed by a 19th century or later 'makeup layer' composed of black silt, brick rubble and white limestone cobbles (403) which was between 0.21m and 0.38m in depth. The levelling was cut by a modern cable trench [404] which had been backfilled with pink stone hardcore (405) and had truncated much of the southern end of the trench, this was overlain by tarmac surfacing (400) measuring no more than 0.1m in depth.

5.2.3.4 Deposits were recorded along the southernmost 8.8m of the trench, further north of this the sections were too disturbed to distinguish any changes and the depth and narrowness of the trench did not allow access to clean the sections.

5.2.3.5 Throughout much of the excavated area of Trench 4 the deposits encountered were composed of 19th to 21st century intrusion and backfill and modern surfacing. Some stratified archaeological deposits were visible in the southeast facing section and these appear to correspond with deposits excavated and record in Trench 5 (see below).

5.2.4 Trench 8 (Figure 4)
Trench 8 was excavated to allow for the installation of cables to join the cable trough (Trenches 5-7) with electricity transformers to the east. An area 3.60m in length by 3.15m in width was excavated to a maximum depth of 0.90m b.g.l (11.55m AOD).

5.2.4.1 A series of northeast to southwest orientated capping tiles for electric cables (803) were observed across the base of the whole excavated trench, these were overlain by a covering layer of sand (802) which was up to 0.25m in depth, this was itself covered by modern backfill deposit of blue grey clay containing red brick fragments and small limestone pebbles (801) which was up to 0.55m in depth. Sealing the modern backfill was the tarmac road surface (800) which was up to 0.10m in thickness.

5.2.4.2 It was evident from the presence of the electric cable capping tiles that modern disturbance was present to a depth of at least 0.2m below the base of the trench, a depth of ca. 11.35m AOD.

5.2.5 Trench 9 (Figure 4)
A small trench was excavated to locate existing electric cable ducts linking the switch gear building to

the transformers. Trench 9 measured 1.30m in length, 0.40m in width and was excavated to a depth of 0.60m below ground level.

5.2.5.1 The earliest deposit encountered was light blue-grey clay (904) which contained frequent water washed pebbles and limestone grit. Deposit (904) was only 40mm deep within the trench and was overlain by a deposit of grey clay (903) which measured up to 0.52m in depth and contained limestone cobbles and charcoal flecks. Deposit (903) contained a single, stone, tesserae along with several pieces of CBM and pottery of Roman date and a medieval sherd of Gloucester Type Fabric 40, which being typically 11th to 14th century in date is the latest clearly dated pottery found on site, disregarding 19th century and later material in backfill and demolition deposits. A single probable modern CBM fragment was also present within deposit (903), but this may be due to disturbance in the upper 0.1m of the deposit. A modern cut [901] for the electricity cable ducting approximately 0.90m in length and 0.40m wide was visible cutting deposit (903), this was filled by the ducting and cables (902) that were sealed by a thin spread of modern crushed stone hardcore (900) 40mm in depth .

5.2.5.2 The trench was excavated to a maximum depth of 0.60m below ground level, a height of approximately 12.10m AOD. The height is estimated from survey data provided by Entec (Drawing 26635-S30 April 2010) as the level staff could not be used within the transformer compound.

5.2.5.3 Deposits (904) and (903) appeared, from their compact nature and the general lack of post-medieval and modern finds, to be *in-situ* archaeological deposits rather than backfill, as recorded in other parts of the site. Trench 9 was situated between an existing wall and a modern cable trough and whilst the limited nature of the excavations must make any conclusions tentative, the deposits recorded indicate that relatively undisturbed archaeology could survive in this area beneath the sub-station structures.

5.2.6 Trench 10 (Figures 4 and 13)
Trench 10 was excavated to allow the installation of cables linking the existing switch gear house with the new transformer. The curved shape of the trench was due to the line being changed to avoid a series of live cables on the western side of the trench. The trench measured 10.5m in length and 0.50m in width and was excavated to a depth of up to 1.30m b.g.l. (between 11.96m AOD and 11.90m AOD).

5.2.6.1 The earliest deposit was light blue grey clay (1006), which measured up to 0.18m in depth, and contained infrequent limestone pebbles, but no finds. Although unclear, it appeared that (1006) was overlain by a mixed deposit of dark grey clay and fragmented red pennant sandstone (1004), this appeared to be broken sandstone tile, which varied in size but was entirely fragmentary and no whole pieces were observed. Two sherds of 1st to 2nd century Roman pottery were recovered from within (1004) along with two pieces of animal bone.

5.2.6.2 Overlying deposit (1004) on the northeast side was a deposit of dark grey silty clay (1005) which was up to 0.20m deep. Sealing this was a compacted deposit of light grey clay (1003) containing limestone and sandstone pebbles and charcoal flecks, which measured up to 0.84m in depth; it appeared that in places the upper 0.1m to 0.15m had been subject to modern intrusion. A low density of finds was recovered from the undisturbed part of deposit (1003), consisting of seven pieces of CBM, including Roman roof tile, two sherds of 2nd to 3rd century Roman pottery, six pieces of animal bone and one piece of slag. No finds dating from later than the Roman period were recovered.

5.2.6.3 Deposit (1003) was cut by a modern electricity cable trench [1002] which was filled by cables within red sand and gravel (1001) totalling up to 0.42m in depth, this was sealed by a modern layer of graded crushed stone hardcore (1000) which was up to 0.22m deep.

5.2.6.4 It was difficult to clearly investigate and interpret the activity present in Trench 10; the earliest deposits in the trench (1004, 1005 and 1006) appear to be *in-situ* archaeology and may represent lenses of backfilling. The overlying clay layer (1003) also appeared to be *in-situ* and although no finds later than Roman date were observed, may be medieval in date, given the similarity with other medieval deposits on the site.

5.2.7 Trench 11 (Figure 4)

Trench 11 was excavated to allow for new cables to be installed, linking electricity transformers to the east with the new cable trough (Trenches 5-7). Trench 11 was largely excavated within the scheduled monument area. An area measuring 12m in length and a width of between 4.15m (northwest end) and 0.65m (southeast end) was excavated to a maximum depth of 0.80m b.g.l, a height of between 12m AOD (northwest end) and 11.65mAOD (southeast end)

5.2.7.1 The south east end of the trench was excavated between a transformer base and an existing cable trough. The earliest deposit revealed was black clay silt (1102) which contained post-medieval brick fragments; the silt was bounded to the west by red brick wall [1103] with cement bonding, this was 0.50m in length, 0.30m wide and six courses in height. The relationship between the wall [1103] and deposit (1102) was unclear. To the west of [1103] were the remains of a second (partially demolished) red brick wall [1104] of the same measurements, but only two courses high. Both walls were overlain by a mixed demolition deposit of clayey silt and red brick rubble (1101) which contained limestone rubble and waste metal, within this deposit a large number of 'tar insulated' electricity cables were encountered, and deposit (1101) was present throughout the majority of the trench.

5.2.7.2 At the northwest end of the trench the earliest deposit was black silty clay, assumed to be the same as (1103), and of apparent 19th century date (based on finds of clay pipe and glass). The deposit was exposed in a small area of the trench and was overlain by modern deposits of sand and gravel (1105) associated with a number of electricity cables, the cuts for the cable trenches could not be distinguished. Sealing deposits (1105) and (1101) was a layer of modern crushed stone hardcore (1100) which was up to 0.30m in depth.

5.2.7.3 All the deposits encountered within Trench 11 were 19th century or later in date and the area was very heavily disturbed by electricity cables, which were observed to be present within much of the trench. Some of the cables were clearly dead and were removed, while others were left *in situ*. It was clear that this 19th century disturbance extends deeper than the depth of the excavated trench, as at the north western end the top of ceramic electricity capping tiles were revealed at the maximum depth of excavation.

5.2.8 Trench 12 (Figures 4 and 14)
The trench was excavated to allow for new cables to be installed linking the new transformer with the new cable trough (Trenches 5-7). The trench was 53.50m in length, between 1.25 and 1.50m in width and excavated to a depth of between 0.80m and 1.10m below ground level (with the base of the trench at a height of between 11.47m AOD at its south western end and 12.00m AOD at its eastern end. The trench is discussed from southwest to east.

5.2.8.1 South western end of Trench 12 (0m to 9m)
The earliest deposit present was black clay silt (1212) which measured up to 0.15m in depth and containing frequent limestone pebbles and charcoal throughout, animal bone and oyster shell were noted within the deposit but not kept, a single sherd of medieval pottery (Gloucester fabric Type 41) was recovered along with Roman pottery and CBM. Deposit (1212) was overlain by dark brown clay silt (1213) up to 0.26m in depth, which had similar inclusions to (1212) but a distinct colour. Deposit (1213) was overlain by a light brown silty clay deposit (1214), which again was distinct from the underlying deposit but contained similar inclusions. Deposit (1214) was sealed by a 0.20m deep layer of slag and cinder (1217) which could be dated as being post-medieval in date by fragments of red brick within it, and appeared to relate to the former administration building on site. The cinder layer (1217) was cut by a series of post-medieval intrusions and trenches, including the construction cut [1218] for a brick built chamber [1219] monitored during the first phase of the watching brief work (see 5.2. The chamber had been backfilled with brick demolition waste (1220) during this work. Also cutting (1207) were a sewer trench [1221] with associated brick manhole (1222) and a pipe trench [1208] filled by mixed grey silty clay and rubble backfill (1209), all of these intrusions were sealed by a crushed stone hardcore layer (1210) which was between 0.10m and 0.40m in depth.

5.2.8.2 Central area of Trench 12 (9m to 28m)
The earliest deposit in this part of the trench was light brown clay silt (1215) with inclusions of limestone fragments, lumps of blue clay and fragments of mortar, a maximum depth of 0.30m of the deposit was revealed in the trench. Deposit (1215) was cut by numerous 19th and 20th century cable and service trenches (these were not individually recorded), at least one of these cable trenches ran through the midline of Trench 12 and had almost entirely truncated any earlier deposits. Investigation

by hand indicated that deposit (1215) appeared to be present beneath the impacting depth of the cables. Overlying deposit (1215) was a mixed backfill deposit of blue grey clay and brick rubble fragments (1206), which measured up to 0.22m in depth. In the upper part of (1206) there were frequent pieces of white limestone blocks, mostly rounded and sub angular, but some of which appeared to have been roughly cut.

Deposit (1206) appears to represent post-medieval levelling forming a solid base for construction of the roadway. To the south, deposit (1206) was cut by post-medieval trench [1208]. To the northeast (1206) was overlain by an earlier surface of tarmac (1207) measuring up to 0.13m in depth, this was covered by modern surfacing layers of crushed red brick rubble (1202) or recently laid crushed stone hardcore (1210).

5.2.8.3 Eastern end of Trench 12 (28m to 53.5m)

The earliest deposit revealed in this part of the trench was blue grey clay (1204) with inclusions of limestone pebbles and grit, charcoal flecks and red brick fragments. Deposit (1204) was cut by a north to south orientated red brick wall [1205] which was 1.25m in length, 0.45m wide and 0.60m in height.

Clay (1204) was overlain by two deposits interpreted as Victorian levelling, which were the mixed rubble and blue clay layer (1206), which was up to 0.60m deep and a deposit of dark grey clay silt (1203), containing red brick fragments and oyster shell which measured up to 0.40m in depth. Deposit (1203) was butted or cut by a second red brick wall [1201] which lay 4.50m to the east of [1205] and had similar dimensions. Both walls appear to relate to the power station, as wall [1201] matched the alignment of a former switch gear building, on a map held by Central Networks (*pers comm.* Greg Price, Stirling Power). Levelling deposit (1206) was sealed by a layer of tarmac (1207) and this along with all other deposits was covered by a recent levelling deposit of crushed brick rubble, silt, sand and concrete (1202) which was up to 0.45m in depth.

To the east of wall [1205] modern red brick rubble was present to a depth of 0.90m b.g.l., this is the demolished remains of the power station building, monitored during the first phase of watching brief work (see 5.2). No archaeological deposits pre-dating the post-medieval period were recorded in this part of the trench.

5.2.8.4 Trench 12 summary

The trench recorded significant areas of disturbance and the majority of deposits recorded were of 19th century and later date, however in small areas, a series of three deposits (1212), (1213) and (1214) were recorded and have been interpreted as being stratified archaeology, they were present at a height of between 11.72m and 12.39m AOD.

The three deposits (see plate 4) appear to be analogous with layers recorded during the excavation of Trench 6 and may represent medieval dumping layers, or midden deposits. Another similar deposit (1215) may also be an undisturbed medieval layer, although this was less clear, it was recorded at a height of between 11.91m and 12.37m AOD and appeared to be present beneath the level of 19th century disturbance.

It was noted that a significant amount of limestone rubble was present in a 19th century levelling deposit (1206), which had been laid as hardcore for an earlier road surface (1207), this included several roughly cut pieces, and it is possible that this material came from earlier nearby structures.

5.3 Excavation (Trenches 5, 6 and 7) (Figures 5-12 and 15)

5.3.1 The excavation area (Trenches 5, 6 and 7) was excavated for the installation of a concrete cable trough, allowing new cables to be linked with the converted former administration building, now used as a switch room. The work had to be carried out in three separate phases, which were recorded as the three separate trenches, as the cellar of the former administration building was considered structurally unstable, and unable to withstand the entire length of the trench being excavated at once.

5.3.1.1 The excavation of Trench 5 took place between 15th and 31st August 2011, Trench 6 was excavated between 19th and 26th September and Trench 7 was excavated between 5th and 20th October 2011.

5.3.1.2 The central area (Trench 5) measured 6.10m in length by 1.80m in width, the northern end (Trench 6) was 3.40m in length and 2.20m in width and the final section (Trench 7) measured 4.60m in length and 2.40m width.

5.3.1.3 Deposits were removed to the required depth of the development, and the excavation was halted once that depth was reached. There was a slight drop in the depth of excavation from north to south. Trench 6 was excavated to 11.14m AOD, Trench 5 to 11.05m AOD and Trench 7 to a depth of 10.95m AOD.

5.3.1.4 Prior to the start of excavation a brick built lean-to with a concrete floor was removed by the contractors. There was significant truncation of the archaeology along the western side of the excavated area, caused by the foundations of the lean-to. In the south west corner of the area the disturbance was almost as deep as the final excavation depth.

5.3.1.5 The three trenches will be discussed as a whole, context numbers remain the same as originally designated (in some cases multiple numbers refer to a single deposit).

5.3.1.6 The level of the natural geology was not reached at any point and all the deposits, layers and features excavated dated from the 2nd century AD to the early centuries of the medieval period.

5.3.2 Prehistoric

A single worked flint of prehistoric date was found during the excavation this was residual within a medieval context (617) (see Appendix 3).

5.3.3 Roman (Phases 1 and 2)

Archaeological deposits dating to the Roman period were excavated and recorded throughout Trench 7 and the southern part of Trench 5, in the rest of the excavated area medieval deposits appear to have truncated the Roman levels. A sondage excavated at the base of Trench 5 indicated that the Roman levels continue well below the depth reached by the excavation.

5.3.3.1 Phase 1 - Roman (2nd century)

Some sherds of 1st century pottery were recovered during the excavation, but these were residual finds in later contexts, the earliest recorded deposits were dated from the pottery and small finds to the 2nd century.

The earliest recorded deposit was a mottled light brown, pink and red coloured silty clay (711), with limestone fragments and grit, which contained charcoal throughout with some concentrated patches of charcoal, the areas of reddish colouring also indicated burning or dumping of burnt waste as did the presence of lumps of fired clay. The layer was at least 0.17m in depth, but was not fully excavated as the required depth of the trench was reached. The finds recovered suggest domestic activity, with animal bone, pottery and iron nails, including a hobnail, being recovered.

A possible structural feature, a small sub-circular mound, formed of compacted oolitic limestone rubble with an apparent mortar matrix (736), was recorded as being cut into deposit (711), but the depression may have been caused by the stone sinking in to deposit (711). Feature (736) was 0.95m in length, 0.8m in width and was 0.1m in thickness, although the function was uncertain, this could have been some form of post-pad.

A series of three deposits of unclear stratigraphy overlay (711) and (736), the most distinct being a mixed deposit of sand clay (735), containing pebbles, fired clay and a single sandstone block, this deposit is interpreted as being post-demolition rubble and was potentially related to (736). The two other deposits (733) and (734) had similar characteristics, being mottled coloured, clay sand with high levels of charcoal, and could represent the same event or activity. The finds from these deposits were of domestic waste and the high levels of charcoal and the mottled colouring, indicated a high level of burning activity.

A shallow oval pit [732], measuring 1.60m by 0.80m and at least 0.3m in depth, was recorded cut into deposit (733). The fill of light greenish brown sandy loam (731) contained early 2nd century pottery and animal bone, along with other finds. Sealing (731) and all the earlier deposits was a thick layer of grey brown sandy clay (730) up to 0.26m in depth. At the south west end was a distinct area of charcoal and burnt material, which was up to 40mm in thickness, and although no structural elements were present this could have been a hearth.

Deposits (720), (728) and (729) were recorded separately but appear to represent the same period of activity, composed of layers of orange sandy silt, with lumps of clay, fragments of limestone and lenses of gravel. Some metal fragments of lead, copper and iron and a single piece of slag indicate some industrial activity may have been taking place. The activity is interpreted as being building or demolition waste.

The Roman 2nd century deposits present on the site were confined to Trench 7 and the southern part of Trench 5. Some residual finds of 1st century pottery indicate earlier activity on or near to the site and potentially beneath the deposits excavated. A possible structural feature was identified, although in general the deposits were of demolition type material, with evidence for domestic activity and also industrial activity in the form of metal working slag. Several of the deposits had similar characteristics showing significant evidence of burning, with one concentrated area of burning which may have been a hearth. The finds from the deposits comprised a high proportion of domestic waste, but also included items of personal use.

Over the majority of the area the top of the 2nd century deposits was at a height of 11.30m AOD, although the top of deposit (728) was significantly higher at 11.64m AOD.

5.3.3.2 Phase 2 - Roman (4th century)

A small number of contexts dated to the 4th century were recorded; however these layers were only present in discreet areas, due to the truncation from later archaeological activity.

A layer of green tinged dark brown silty sand (725) overlay (730); this was up to 0.34m in depth and contained a mixture of domestic waste, and some evidence of industrial activity in the form of metal slag. Overlying (725) were two successive layers of mottled orange, blue and grey sandy clay (727) and (726); these contained relatively few finds and were 0.20m and 0.12m in depth respectively. A later feature [723] cut through these deposits and was filled by dark grey silty clay, with charcoal and mortar inclusions (724), which contained 29 sherds of Roman pottery, and measured up to 0.47m in depth. A significant amount of disturbance from post-Roman activity had truncated fill (724) and it was unclear from the remains what the feature represents although it is likely to be a pit.

Sealing pit fill (724) was another layer composed of dark brown sandy clay (717), up to 0.14m in depth, which contained river pebbles, fragments of sandstone tile, mortar and CBM. The nature of the deposits appeared to reflect demolition material, with a high proportion of domestic waste present. The finds recovered included pottery of 2nd to 4th century date, stone tesserae and fragments of glass (see Appendices1 and 2).

Later Roman activity was limited to a series of deposits and a single cut feature, which probably represents a pit, no structural features were present and the general nature of the deposits is of demolition activity with some evidence of industrial and domestic activity. Finds of painted wall plaster and tesserae indicate the presence of a high status building in the vicinity.

The top of the Phase 2 Roman deposits was at a height of between 11.78m AOD and 11.86m AOD.

5.3.4 Phase 3 - Middle to late Saxon (Figure 15)

Two features on the site have been dated as being of middle to late Saxon date. The earlier of the features was a sub-circular pit feature [721] measuring c. 1.10m by 0.90m and c. 0.90m in depth. The pit had been excavated to allow for a single large block of oolitic limestone to be placed within it. The block measured 0.88m in length by 0.52m in width and a similar depth and was cut on seven sides with the base of the stone angled to form a wedge (see plates 7, 8 and 9). The top of the stone had

split along several planes and in its centre was a worn and polished concave circular area, measuring roughly 0.40m in diameter.

Around the stone block was a primary fill of mid grey clayey silt (722) containing angular fragments of limestone, this deposit was approximately 0.50m in depth, although it was difficult to distinguish from the underlying deposit (724). The few finds from this backfill were residual Roman material. Overlying (722) was a secondary fill (716), of fragmented limestone rubble packed around the stone itself. Around three quarters of the fill was rubble, the majority being of small fragments up to 50mm in length with some larger pieces, up to 0.20m in length. The total fill depth was between 0.20m and 0.25m in depth. Within the rubble were twenty four fragments of architectural limestone. One single small fragment of Type 41a pottery attributed to this deposit has been considered as being intrusive from the overlying deposit.

The size and shape of the limestone block, along with the fact it is cut limestone indicate that it is likely to have come from the Roman city wall. The stone was raised above the surrounding backfill deposit (716) to a height of c.0.1m and this, along with the apparent polished/worn central area on the top of the stone, is strong evidence that the block has been re-used as a substantial post-pad.

Cut into fill (716) was a deep pit [715], which was probably originally sub-circular in shape, but had been truncated by the construction cut of a post-medieval wall. The surviving remains measured 0.90m in length and 0.50m in width, and the pit was excavated to a depth of 1.11m (10.80m AOD) although the base of the cut was not reached. The pit had a single excavated fill of dark brown silty clay with limestone grit (714), which contained a high frequency of charcoal throughout. Pit fill (714) was rich with finds, notably 695 pieces of animal bone which included the remains of cattle, sheep, pig, dog, mallard, wader and domestic fowl. There were six pieces of worked antler as well as a worked bone mount (small find ID 25) found within the fill suggesting bone and antler working was taking place on the site in this period. There were eighty three pottery sherds found in fill (714), and thirty three of these have been dated as middle Saxon with a number of different handmade fabric types, hinting at a variety of different sources (see Appendix 1). A number of pieces of Saxon handmade pottery found in the deposit overlying (714) are likely to have been misattributed and to have been from fill (714). Other finds recovered included metal slag, lead, glass fragments and pennant sandstone tile. A single piece of human skull was also found within fill (714), although this was only identified during the post-excavation phase of work.

An environmental sample was taken of (714) and assessed (see Appendix 5) this found evidence of cereals in the form of free-threshing wheat grains and hulled barley grains, small mammal and fish bones and the eggs of parasites. The sample assessment also noted the presence of horn shavings, which is further evidence of bone/antler/horn working taking place on the site.

Only two features found on the site have been phased as being of middle to late Saxon date, but both features are of interest and indicate a wider pattern of activity and settlement than is reflected in the surviving archaeology on the site. The earlier of the two features was a substantial limestone block, set within a pit [722] and packed with limestone rubble which included pieces of architectural stone. The most likely origin for the limestone block is the nearby Roman city wall, and it appears to have been reused here as a large post pad. A later pit [715] was cut through the fills of pit [722], and a large number of finds came from the later pit fill (714), including worked bone, four worked antler roughouts and two antler offcuts. It is unclear whether the pit had an earlier function, its size and shape does indicate that it may have been a well.

The pit contained thirty three pieces of middle Saxon pottery (see Appendix 1). Six further sherds of middle Saxon pottery were found in the overlying deposit (713) and may have also come from pit fill (714). The presence of bone working is typical of late Saxon sites (see Appendices 2 and 4), and the fact that the middle Saxon pottery sherds were fairly fragmentary may suggest a degree of residuality. However the fact that no later Saxon pottery (Type 41a) was present and that stratigraphically these are the earliest of the post-Roman features does add weight to the argument that these two features may be middle Saxon in date. The type of material present within pit fill (714) comprised a mixture of domestic waste as well as industrial material, showing a variety of activities taking place on or near to the site.

The top of the Phase 3 features was at a height of between 11.87m and 12.09m.

5.3.5 Phase 4 Late Saxon/early medieval

5.3.5.1 Phase 4a - Late Saxon/early medieval 10-11th century

The archaeological deposits dating to the late Saxon/ early medieval period have been phased based on the pottery and small find information, the appearance of pottery considered to date from the 10th century onwards has been the main method of dating these deposits (see discussion).

There was some difficulty in tying together the layers excavated in the three trenches; however what was considered to be a single layer did extend over the three trenches. This layer was dark grey clay silt (530)/ (617) / (713) with inclusions of lumps of clay, limestone fragments, and occasional larger pieces of limestone. The layer was rich in finds, including 10th century pottery, animal bone, a large amount of residual Roman material, and finds of plaster, mortar and other building demolition waste. The layer was up to 0.40m in depth and appears to represent an occupation or midden deposit, which sealed pit fill (714).

Cut into (530) was a shallow pit [541] which was 1.75m in length and 1.25m in width and up to 0.20m in depth. The pit had four fills, the primary being a distinct layer of burnt material and charcoal (545) up to 30mm in depth, which was overlain by an inconsistent thin layer of blue-green clay (543), and this was in turn covered by a compacted layer of green-yellow sandy silt (542) both of a similar depth to the primary fill. The main fill of the pit was a charcoal rich, black clay silt (525) which was up to 0.12m in depth, and contained seventy pieces of animal bone and a large amount of pottery, including seventy sherds of late Saxon ware of 10th century date (Gloucester Type fabric 41a). Further Saxon pottery was recovered from fill (542). An environmental sample taken from fill (525) showed the presence of charred wheat and oat grains, along with mammal, fish and bird bones (see Appendix 5). Pit [541] was probably used for cooking, and the clay layer (543) and compacted layer (542) may well have formed a basic hearth base.

One other feature was cut into deposit (530) and comprised a small irregular linear cut [546] measuring 1m in length and 0.35m in width. It was orientated east to west and filled by brown sandy clay (548) up to 0.26m in depth. The function of this feature was unclear.

A second pit feature [718] was partially exposed at the southern end of the excavation, and measured at least 0.95m in length by 0.50m in width and at least 0.95m in depth. The fill of [718] was dark grey silty clay (719) with lumps of clay and limestone fragments, which contained residual Roman ceramic finds, along with a single sherd of late Saxon pottery.

A shallow sub-circular feature [707], interpreted as being a small pit, was recorded cut into (713). Only finds of Roman date were recovered from the fills and the stratigraphic relationships suggested these were residual in a pit of probable late Saxon/ early medieval date.

The archaeology in this phase comprised an occupation or midden deposit, four pits and a linear feature. The larger of the pits [541] was the most securely dated and showed use as a probable fire pit or hearth for cooking, with abundant mammal bone and pottery waste within a shallow fill. Environmental evidence from the pit showed the use of cereals as well as fish and bird species.

The top of fill (719) was at a height of 11.78m AOD. The top of pit fill (525) was at a height of 11.16m AOD. The top of deposit (530) was at a height of 11.53m AOD.

5.3.5.2 Phase 4b - Late Saxon/early medieval 11th century

Whilst there appears to be continuous occupation through the late Saxon/ early medieval period it has been possible to make a distinction between earlier (Phase 4a) and later (Phase 4b) activity based on the first occurrence of medieval pottery Type fabric 41b (Gloucester TF series). However, as noted in the pottery report, there is some difficulty distinguishing Type 41a and 41b (see Appendix 1).

Sealing the pit fill (525) was a distinct layer of blue green clay (520) which varied in depth between 80mm and 20mm and extended over an area of 4.85m in length and 1.55m in width, although it was less distinct over the northern half (Trench 6). Few finds were recovered from the southern half, while

a significant amount of pottery dating to the 11th century (Gloucester Type fabric 41b) was found in the northern half, which may reflect intrusion from the overlying layers. Abutting the clay layer on the southern side was a layer of light orange brown silty sand (538) up to 30mm in thickness (plates 10 and 11) although it was not level, the clay layer (520) appeared to form a surface, which may have slumped into the underlying feature, although it is also possible that it was laid to seal the pit. It was unclear whether the sandy layer (538) formed part of the same activity.

The clay layer was overlain by a layer of dark grey brown silty clay (524)/ (615), which was up to 0.20m in depth and contained lumps of redeposited clay, limestone rubble and an area of large un-worked limestone boulders, up to 0.20m in their largest dimension. Layer (524) contained discreet patches of different material, one these was an area of compacted sandy clay (618) with evidence of burning in the form of fired clay, and this may represent evidence for a further hearth. The layer was rich in finds including evidence of industrial activity in the form of a significant amount of metal slag and lead waste, along with pottery including large amounts of both late Saxon types 41a and 41b. A fragment of frit melon bead (ID 45) of 5th century date and relatively large amounts of residual Roman building material were also recovered from layer (524). This layer could be interpreted as being an occupation layer or midden deposit.

Cut through layer (524) was an amorphous curvilinear pit [517] which was 3m in length and 0.80m in width, it had three identified fills, sequentially (523), (516) and (535), although these all had similar characteristics, and may represent a single phase of fill that has leached in colour over time. The fills were of mid to light brown silty sand, up to a combined depth of 0.51m, although the base of the feature was not reached. The fills contained fragments of limestone and mortar, along with charcoal flecking, metal slag and residual Roman finds. Pottery from the lowest fill (523) included late Saxon material.

A single feature [540]/ [705] was recorded cut through pit fill (535) and extended over a large part of Trench 5 and into the northern part of Trench 7, measuring 5.8m in length and 1.6m in width. The base of the cut was not reached and it was shown to be at least 1.15m in depth. The feature had been recorded during the excavation as a number of separate features and deposits, but appears to represent a single episode of backfilling with multiple lenses of material and has been interpreted as the infill of a sub-circular pit which has been cut through the Roman and earlier medieval deposits. The fill (508) comprised lenses of compacted blue-grey clay, containing angular limestone lumps, CBM and other Roman period debris, with separate lenses of dark grey and black silty clay, also mixed with similar inclusions. The latest datable finds from the lenses of fill (508) were pottery sherds of late Saxon date (11th century) and a horse shoe fiddle key, common from the 11th to 13th centuries (see Appendix 2).

In the northern section of the excavation (Trench 6) layer (524) was overlain by two successive layers which had similar characteristics to (524) but had distinct differences in terms of colour and texture. The earlier of the two layers was dark grey-brown silty clay (613) up to 0.19m in depth, this was overlain by greenish dark brown sandy clay (608) up to 0.24m in depth, which contained green staining throughout, indicative of cess within the layer. Both layers contained large amounts of domestic waste (animal bone and pottery), although layer (613) was generally richer in finds and also contained a higher number of metal finds and metal working slag. Both these layers, as with (524) appear to be midden or occupation type deposits and both layers contained a large number of pottery sherds dating to the late Saxon period.

These three layers (524) (613) and (608) appeared to be analogous with layers (1212), (1213) and (1214) recorded in Trench 12.

Two possible circular pit features [609] and [611] were recorded cut into layer (608). The finds attributed to them were residual material of Roman date. Sealing (608) and the possible cut features was a further layer of black silty clay (607), which contained limestone pieces, and was up to 0.42m in depth.

The archaeology present reflects a high level of activity within this period. The earlier activity in this phase included what may be a clay surface (520) and a pit feature [515]. One early layer appears to represent an occupation deposit, while four successive later layers may well be midden deposits; all of these layers contained a large number of finds and all included late Saxon pottery, which was the

latest datable material present. No pottery sherds later than 11th century in date were identified across the site, apart from a couple of obvious intrusive post-medieval finds which came from the backfilled construction cut of the extant administration building.

The top of fill (514) was at height of 12.30m AOD. The top of layer (607) was at a height of 12.45m AOD.

5.3.6 Phase 5 - Post-medieval

Three post-medieval layers were recorded in section overlying pit fill (719) at the southern end of Trench 7. A layer of cinder/ slag was present across the whole of the excavation area, sealing contexts (713), (514) and (607). It appears as though there had been wholesale levelling across the area in the post-medieval period, likely to relate to the construction of the administration building. The other post-medieval activity in the area was restricted to walls and associated water pipe and sewage trenches. The walls were largely from the brick built lean-to that was demolished prior to the start of the excavation, although there were other ancillary structures to the administration building. In the southern most part of the excavated area (Trench 7) part of these 19th century walls intruded as far down as the required depth of the excavation (10.95m AOD).

6 Discussion

6.1 Roman

6.1.1 One of the main research aims identified in the Written Scheme of Investigation (Townend 2010) was to assess the presence and character of the remains of *Glevum Colonia*, particularly within the scheduled area. Roman archaeological remains were revealed and recorded within the southern part of the excavated area (Trench 7 and Trench 5), and represented two distinct phases of activity, the earliest being dated to the 2nd century and the later to the 4th century. Evidence of 1st century activity in the area was present in the form of residual pottery finds.

6.1.2 During the 2nd century there was some limited evidence for structures in the form of a circular limestone rubble feature, possibly a post pad, and some demolition material. Painted plaster, mortar, tile and nails were also strongly represented within the Roman deposits and as residual material in later contexts. A series of overlying deposits contained a mixture of domestic waste and personal equipment, including a fragmentary melon bead. Metal slag and areas of heavy burning provide some evidence for industrial activity in this period.

6.1.3 The bulk of the pottery assemblage from the site, 828 sherds, 69.3% of the assemblage, dated to the Roman period and comprised a mixture of continental and regional imports and local wares. One of the most interesting aspects of the assemblage was the presence of at least two sherds of late amphora, one thought to come from Gaza, Palestine, dating to the 4th to 6th centuries, and a second from North Africa, which was imported sporadically between the 2nd and 6th centuries. Further examples of these late vessels have been found at other sites in the city, and point to distant trade routes continuing into at least the later part of the Roman period.

6.1.4 Roman deposits were restricted to the southern part of the excavation area, although in this area they survived at a high level relative to the existing ground level, the top of the Phase 2 Roman deposits was at a height of between 11.78m AOD and 11.86m AOD. The absence of Roman deposits over the rest of the excavation area is due to truncation by later activity, and it is likely that *in-situ* Roman archaeology survives beneath both the early medieval and post-medieval levels.

6.2 Middle to late Saxon

6.2.1 Two features, [721] and [715] were interpreted as being middle to late Saxon in date and may point to a much wider picture of occupation during this period. However, the ceramic dating of these contexts is somewhat tentative, being based on the presence of what is thought to be pottery of 6th to 9th century date, with a corresponding lack of what is considered to be 10th century ware, indicating that the activity pre-dates the 10th century. These two features are also stratigraphically the earliest post-Roman features recorded on the site. The earlier of the two features, [721], has been interpreted as a large post pad and incorporates a large limestone block, which may well have originated from the

Roman city wall, and broken architectural stone which has been used as packing material. .

6.2.2 Within the fill (714) of a later pit [715] there was a diverse range of what is considered to be 6th to 9th century pottery, interpreted as 'the largest group of potentially early-middle Saxon pottery to be documented from the City' (Appendix 1). Evidence from excavations up until the early 1980's had produced no pottery dating to the early to mid Saxon period within the city and it had been considered that, as with the corresponding period in Hereford, this period in Gloucester may have been aceramic (Vince 1984). The Saxon pottery sequence in Gloucester had been considered to have started in the 10th century; however the presence of this small assemblage further demonstrates that pottery was in use during the early to mid Saxon period in Gloucester. The pottery types present are derived from a number of non-local sources, indicating a wide trade network operating during this period.

6.2.3 Pit [715] may have originally been a well that has been backfilled over time with domestic and other waste. This waste material included worked antler off-cut and rough-outs, worked bone and horn shavings and shows that bone and antler working was taking place on or very near to the site. There was a diverse range of animal bones within the pit fill (714) including wild species such as mallard, a wading bird and fish, along with domestic animals (Appendix 4), other food waste, in the form of cereals, was present in an environmental sample from pit [715].

6.2.4 Finds from the middle Saxon period did occur as residual material in later contexts, but were restricted to some further sherds of middle Saxon pottery and a polychrome glass bead (Small find ID no.25) The latter was found in a later Phase 4b context and is considered to date to the middle Saxon period, as it is less well made than Roman examples of a similar form.

6.3 Late Saxon/early medieval

6.3.1 A large amount of activity was recorded dating from this period, with the presence of settlement activity in the form of a possible cooking pit and a possible surface, during the early part of this period. Later activity includes midden deposits or possible layers of occupation with a high level of finds.

6.3.2 The main dating material for this period is pottery of Gloucester Type Fabrics 41a and 41b and whilst there is likely to have been continuous occupation throughout this period the distinction between these two fabrics has been used to suggest an earlier and a later phase of late Saxon/ early medieval activity. However, it should be noted that, in the absence of typological features, it is difficult to distinguish between the two fabrics (Appendix 1).

6.3.3 The small finds from this period point to the presence of higher status activity on the site and include: two socketed leaf-shaped arrowheads (ID no's 50 and 51), thought to be used for hunting rather than warfare; bone fittings (ID no's 36 and 46); and a manuscript /parchment pricker. The animal bone remains also point to a relatively wealthy part of society occupying the site with wild animals including red deer, mallard, hare and woodcock among the species represented. Domestic animals from this phase also appear to have been used primarily for their meat, a feature of higher status sites (Appendix 4).

6.3.4 Projections based on the location of the Barbican mound/ Barbican hill (Hurst 1984 and Darvill 1988) would place the site within the bailey of the first Norman Castle on the site, and geographically and chronologically the remains found during this work appear to fit into this picture. However nothing was encountered during the excavation phase or watching brief that could be considered to be analogous with the stone bailey surface recorded during the 1983-4 'Castle excavation' (Darvill 1988).

6.3.5 The 1983-4 excavations also recorded the bailey ditch of the castle, and the only deposits recorded during this work which could relate to this, were the layers found within Trench 10, which could reflect the mixed backfilling of a large feature. The midden or occupation type deposits recorded during excavation phase and within Trench 12 of the watching brief appear to reflect settlement activity

6.3.6 The Norman Castle of Gloucester is mentioned in 'Domesday book' and was extended between 1086 and 1101 (Renn 1973). The pottery dating from the earlier phase (4a) of this period

appears to reflect activity pre-dating the Norman Conquest; however the difficulty in accurately dating the late-Saxon pottery on the site means this cannot be conclusively stated.

6.3.7 During both the excavation and watching brief phases there were no finds of pottery typical of the 12th century in any part of the site, and there was an absence thereafter of any later medieval remains or activity. Chronologically the next datable finds on the site were post-medieval and these are generally later 18th and early 19th century in date.

6.3.8 As previously noted, the excavation area was subject to truncation which appears to relate to the construction of the standing administration building. However post-medieval activity does not seem to have been responsible for significant truncation over the remainder of the site and is unlikely to be responsible for the absence of 12th century or later archaeology. It seems more likely that, following the disuse of the Norman Castle and the construction of the new Castle, the site stood in open undeveloped land, the 'bare land' shown on early maps of the site (see 3.8), which it was necessary to keep clear for the effectiveness of the Castle defences.

6.4 Post-medieval and modern

6.4.1 It was clear from much of the monitoring that there has been significant post-medieval and modern truncation as a result of electricity cabling over much of the central area of the site. The location of many of these cables is detailed on plans held by Stirling Power. There was a general depth at which these cables were present, as shown on section drawings, and beneath this level archaeological remains were seen to be preserved *in situ*.

6.4.2 Groundworks to demolish the derelict power station building impacted to a depth of up to 2.5m below ground level, though this depth was only reached in the internal basement of the building and halted at the top of a concrete floor, which was left *in situ*. In areas exterior to the former building, groundworks impacted to a maximum of 2m below ground level, this whole area had already been truncated by the building itself.

6.4.3 Ancillary walls associated with the power station were recorded in Trenches 12 and 8 of the watching brief, although they were themselves cut through post-medieval deposits. The site contained a large number of buildings during the 19th and early 20th century, as shown on Ordnance Survey maps. The majority of these are now absent, but would have caused a degree of truncation.

6.4.4 The former administration building (now converted as a new switch house) has a large open cellar which is over 3m deeper than the floor level, it is almost certain that this building has entirely truncated all the archaeological remains within its footprint.

6.4.5 Although there has been significant post-medieval truncation over the site, there are areas where archaeological remains of medieval and earlier periods have been shown to survive. The area of excavation (Trenches 5, 6 and 7) showed a remarkably good level of preservation of remains within a very small area, although there was truncation from 19th century walls and drainage.

6.4.6 The survival of the archaeology recorded during the excavation phase appears to have partly been the result of a brick built lean-to attached to the administration building, which had the effect of protecting the archaeology from later disturbance, specifically trenching for electricity cables.

6.4.7 A deep sewer, estimated to be over 4m in depth by building staff, is present on the site. The sewer runs parallel to the eastern side of the administration building and under the access road leading into the site. No details are shown on the Severn Trent online asset website and it is presumed that the sewer is not recorded. Although the route is not known for certain by the author, it is clear that this sewer will have entirely truncated any archaeological remains along its route.

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8 Archive contents

The site archive is presently being stored at Shire Hall, Gloucester under a unique site code, GHER 35746, issued by the Gloucestershire Historic Environment Record Officer. The site archive will be deposited with Gloucester City Museum and Art Gallery, under accession number GLRCM 2010.30.

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Photographic plates

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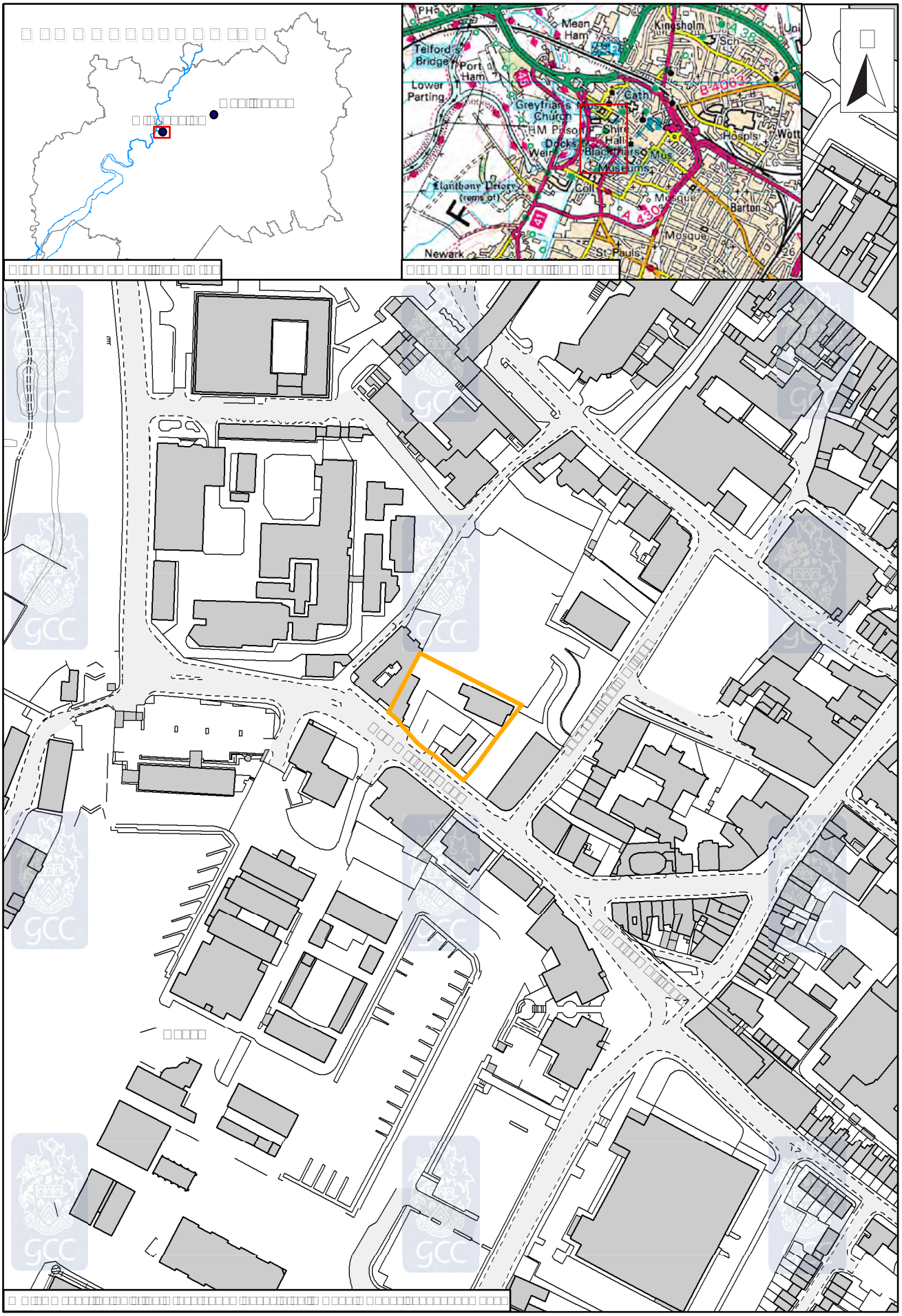
Plate 10: Phase 4 clay layer 520 within Trench 5 looking north (Scale 0.50m).

Plate 11: Pit [541] beneath layer 520 (Scale 0.20m).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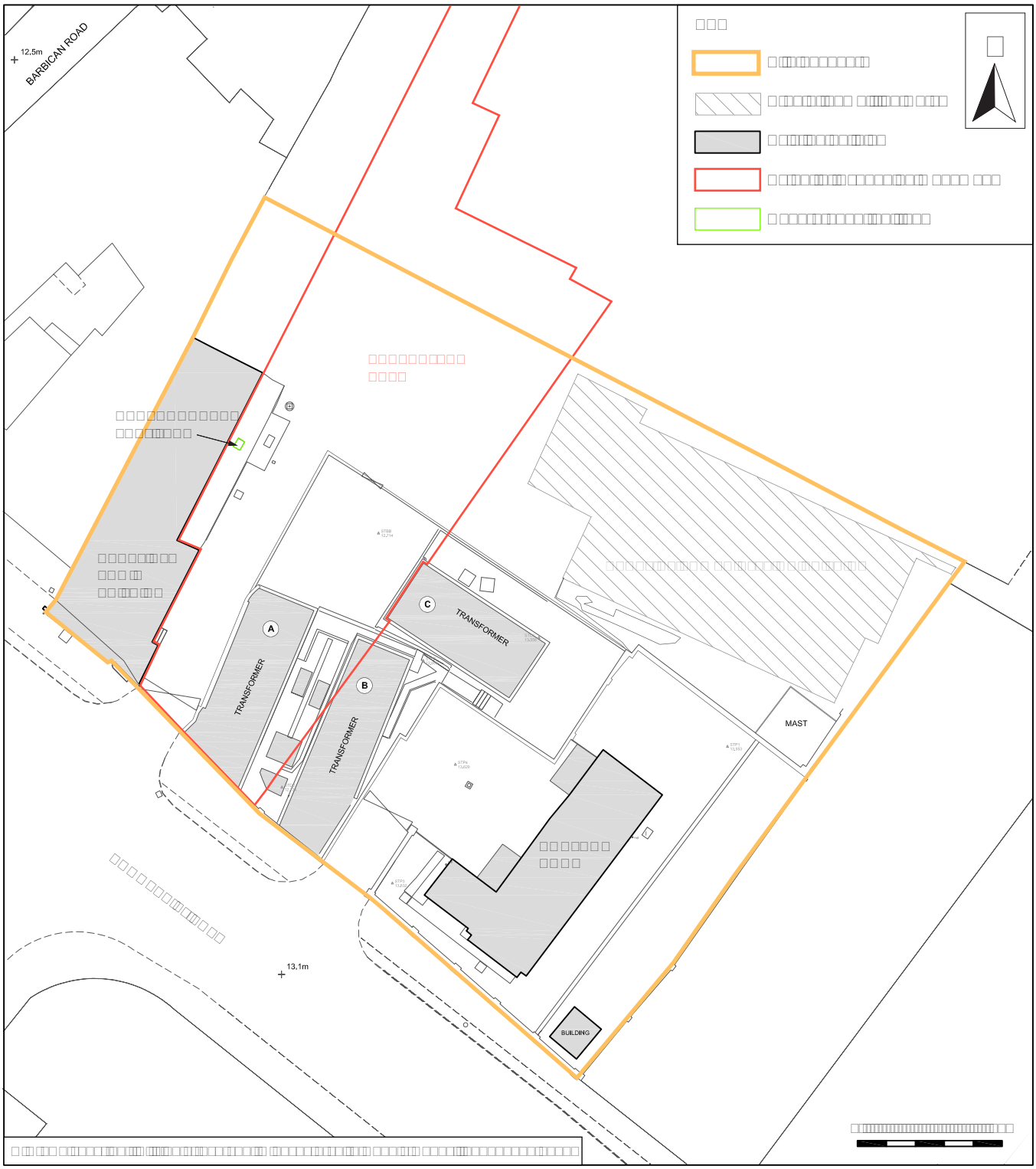
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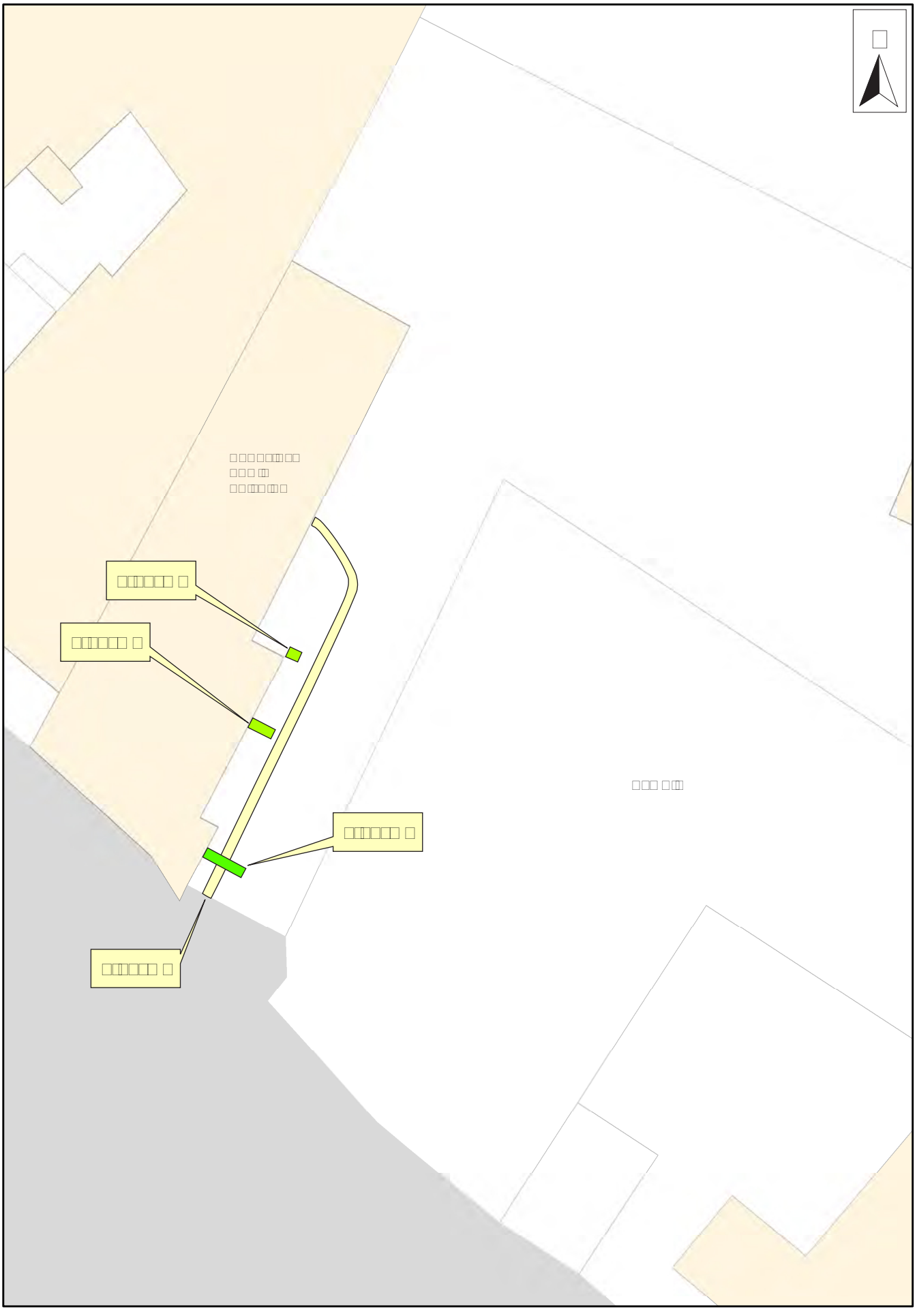

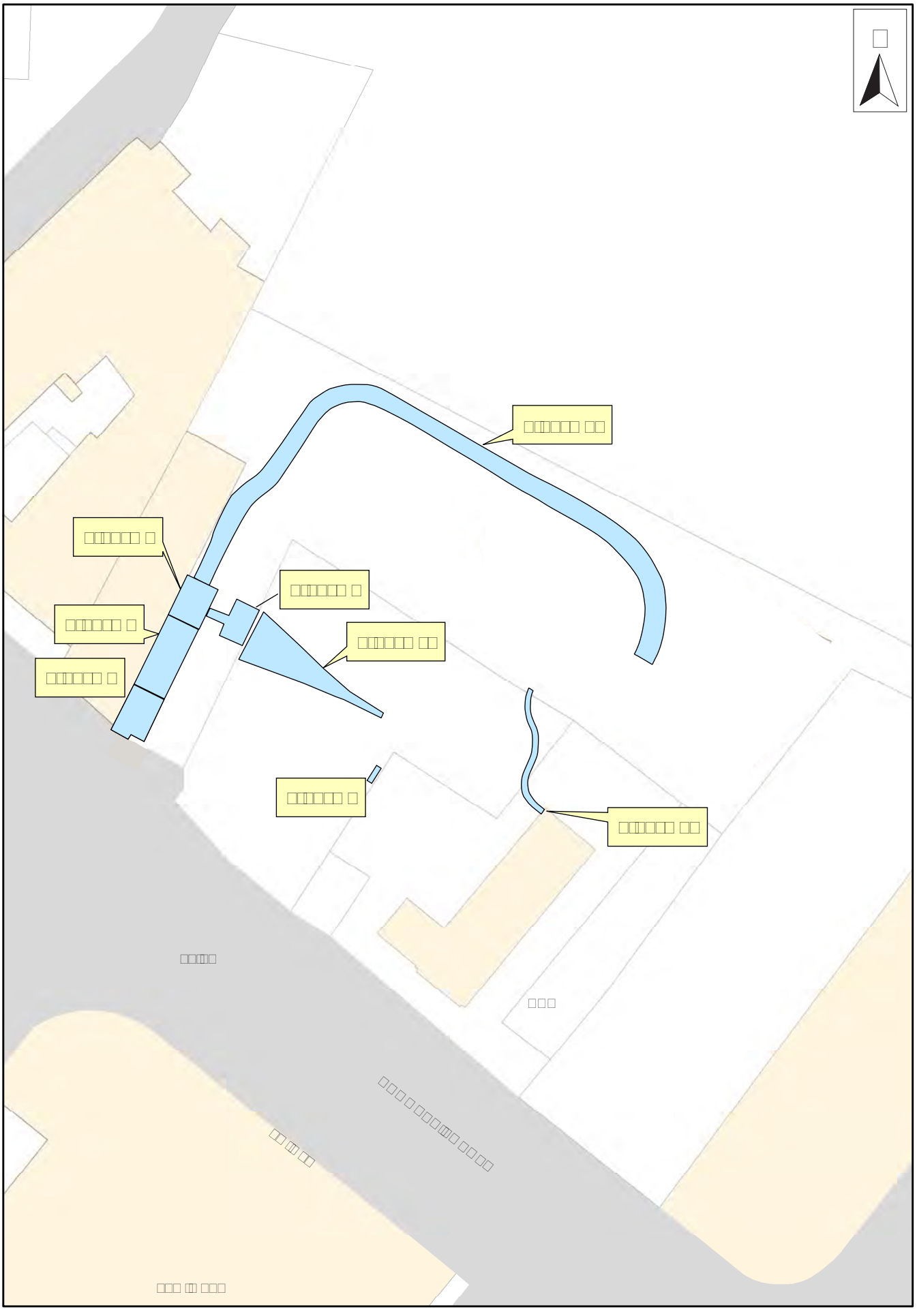

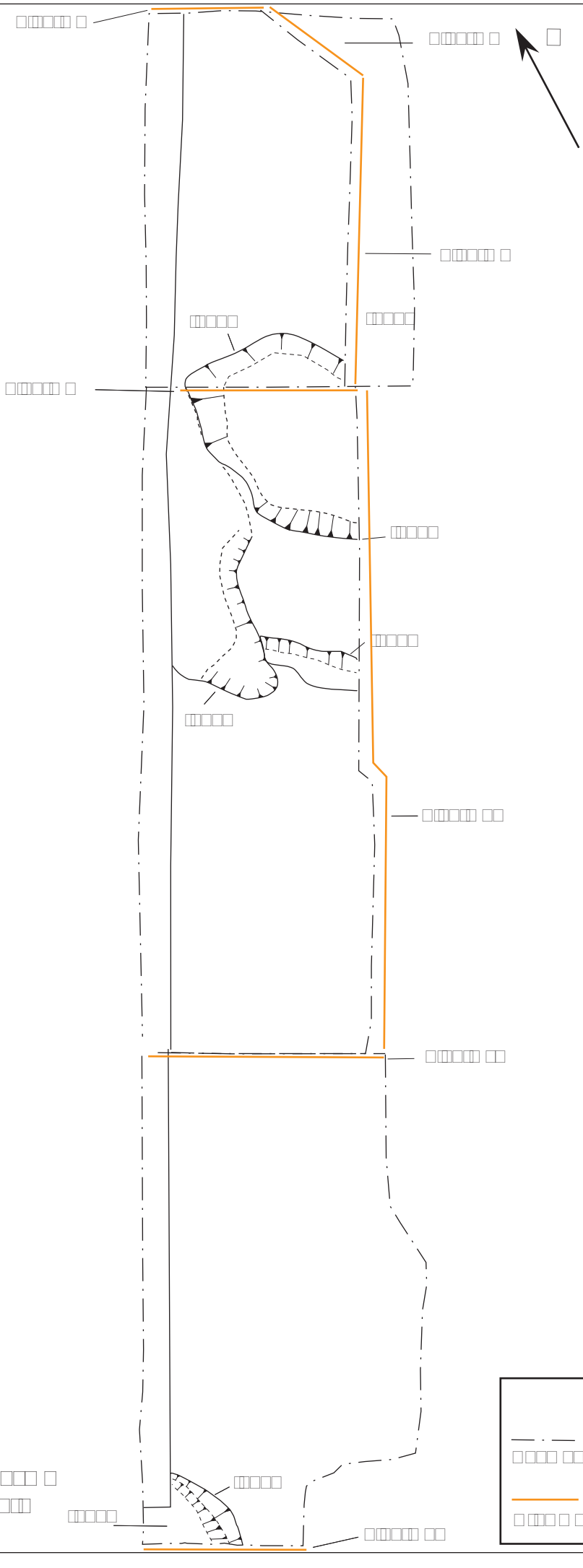

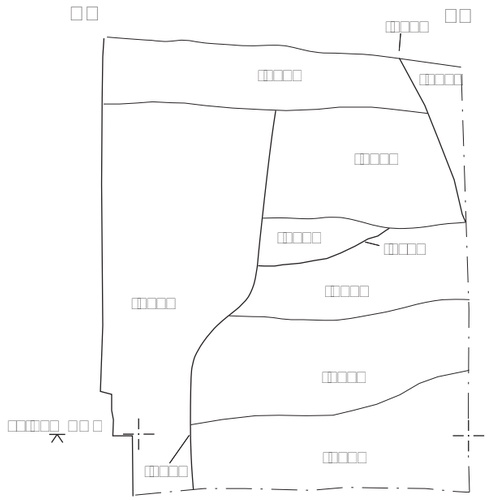

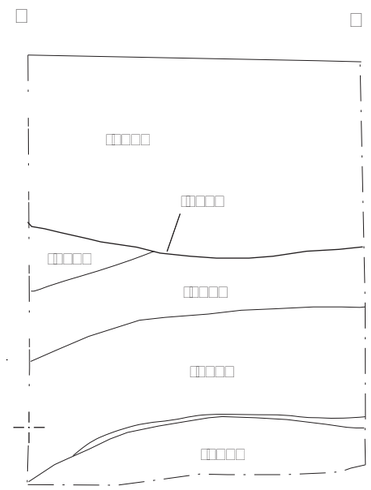

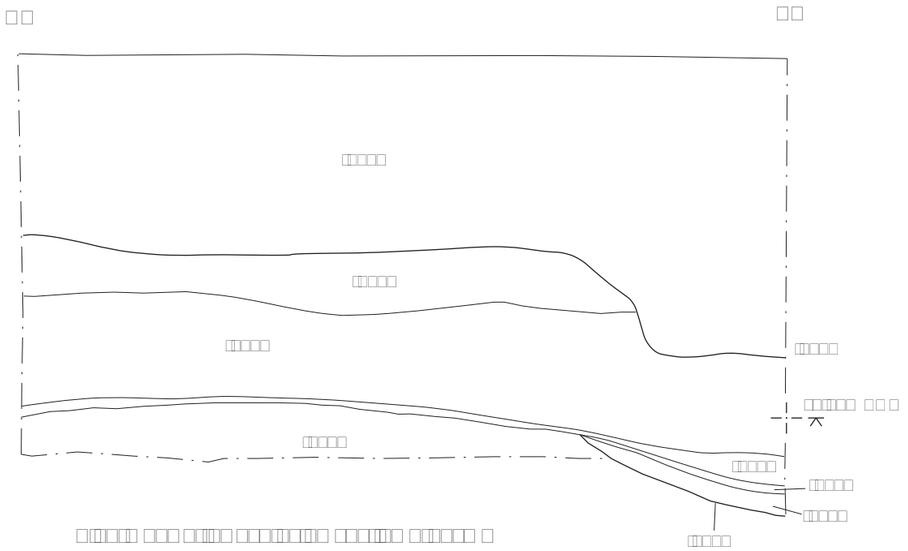

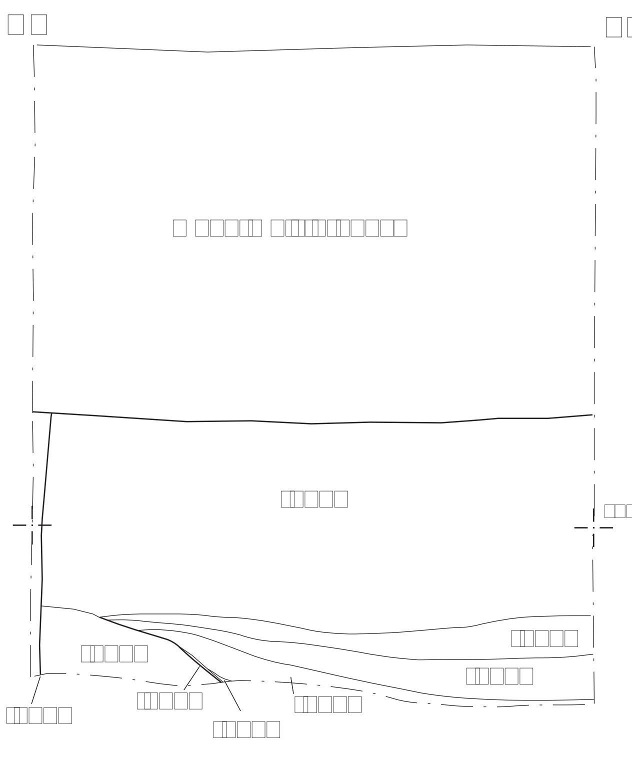

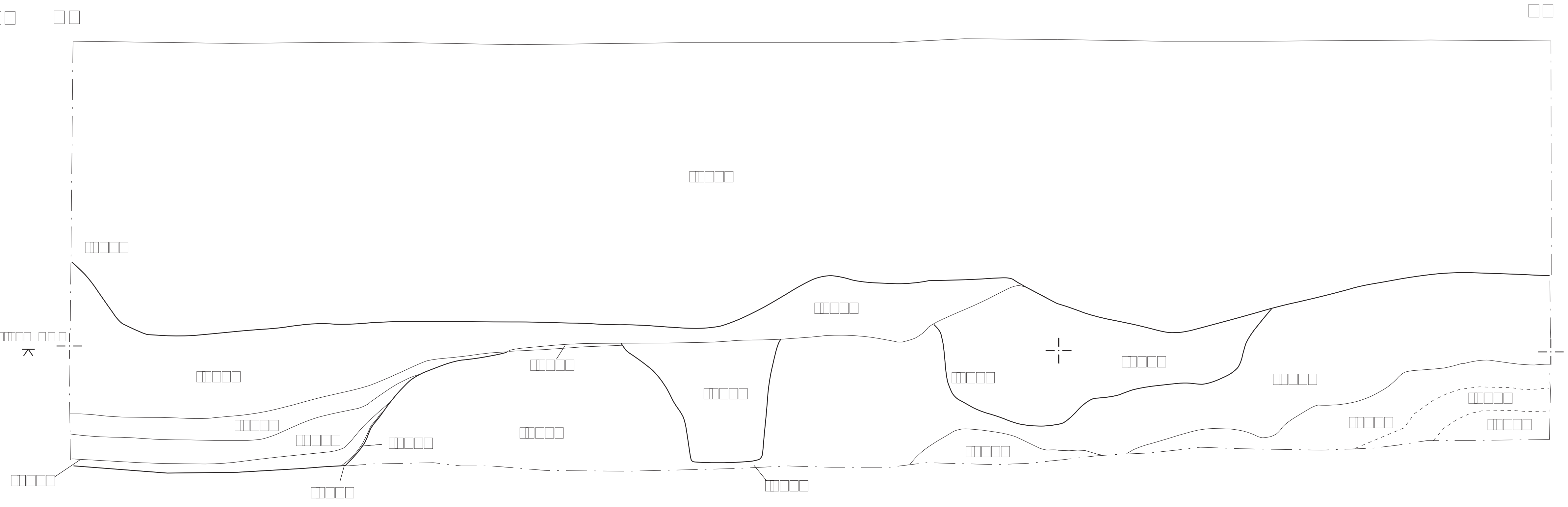

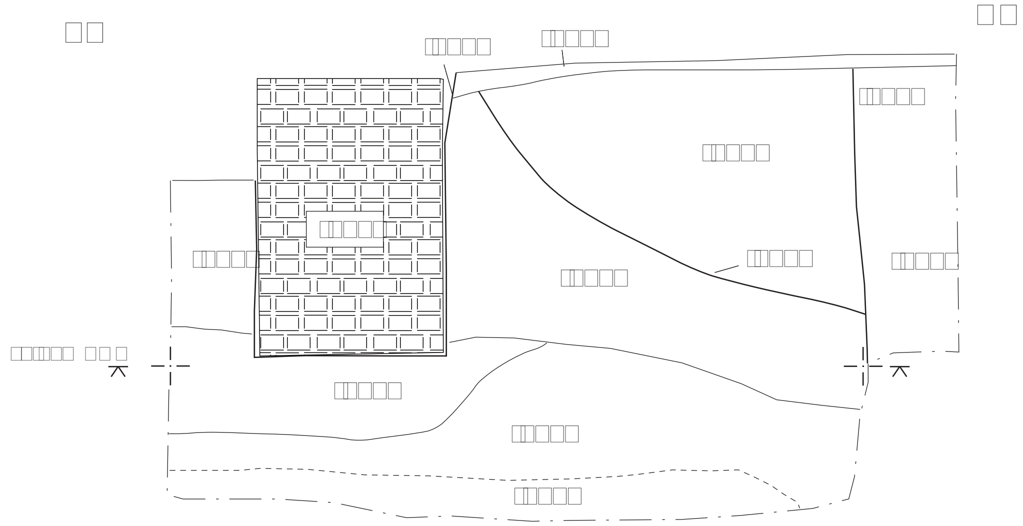

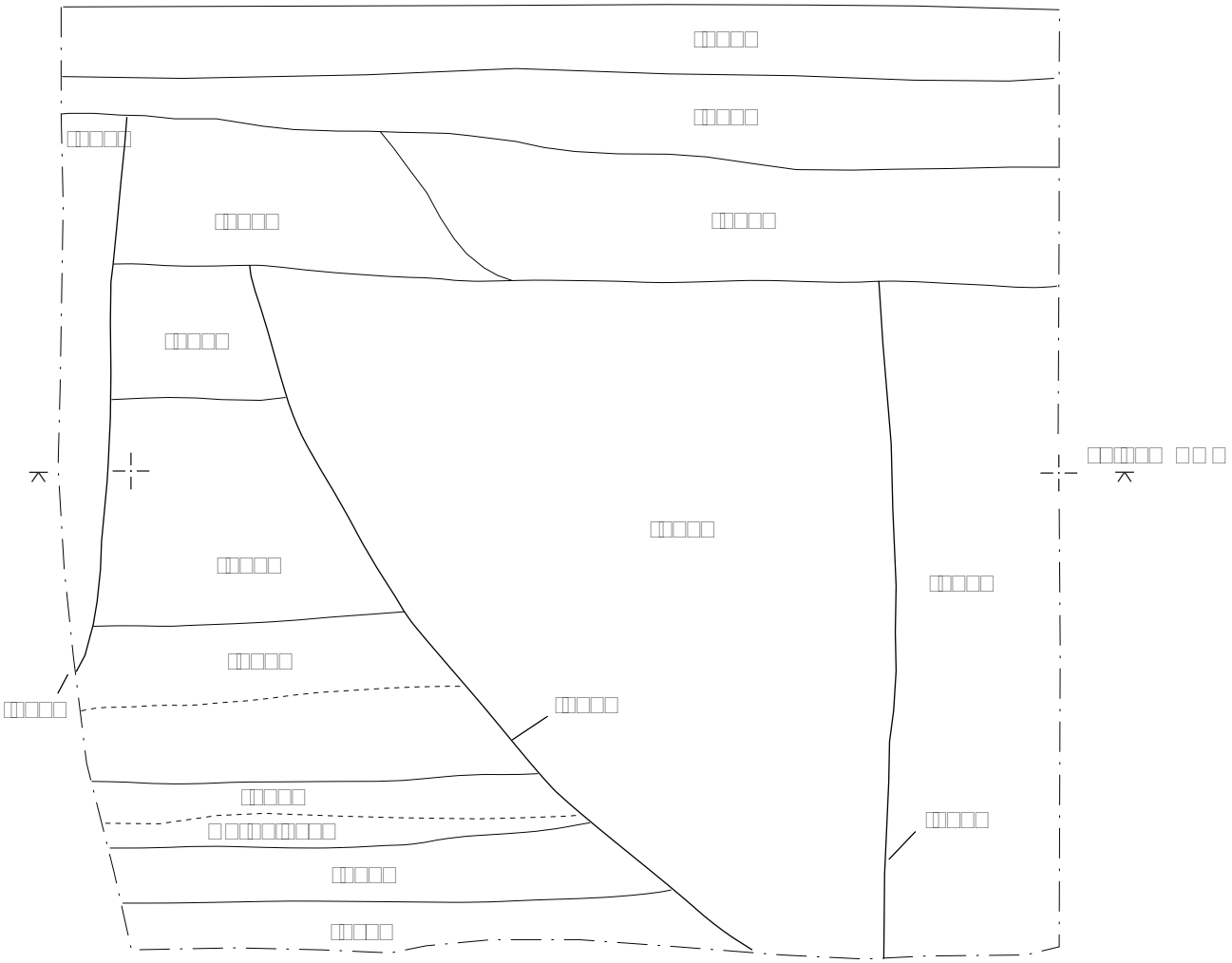

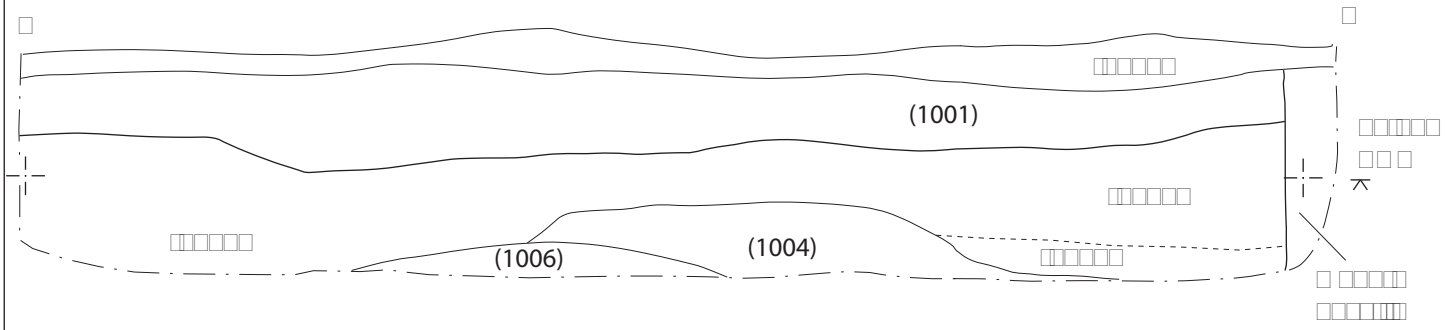
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[1205]

NW

S

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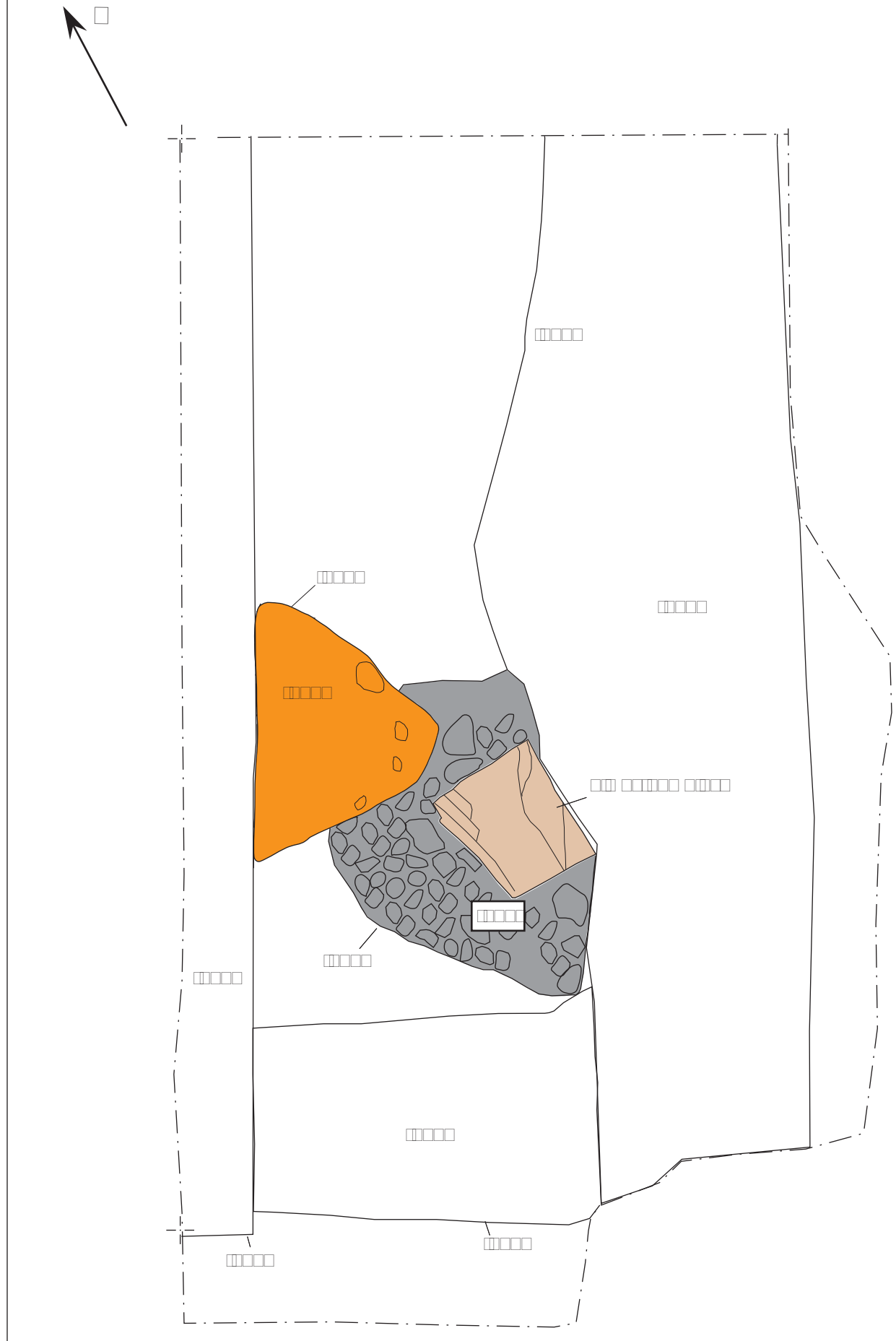

Appendix 1: Pottery and ceramic building material by Jane Timby

Pottery

Introduction and methodology

The archaeological work has recovered some 1194 sherds of pottery weighing 95.7kg and 604 fragments of ceramic building material (CBM) weighing just over 336kg largely dating to the Roman, Saxon and early medieval periods. The assemblage is of particular interest for Gloucester City due to the presence of a number of Saxon sherds some of which can be paralleled with material from the site of the Castle (Vince 1988) but which are accompanied by other wares previously undocumented from Gloucester. Later medieval and post-medieval finds are conspicuous by their almost complete absence.

The pottery was sorted into fabric categories according to type, size and quantity of inclusions in the clay combined with firing colour. For the Roman wares known named wares were coded using the National Fabric reference system (Tomber and Dore 1998). Other more local wares where possible were coded using the Gloucester Museum type fabric numbers (Glos TF) (cf. Ireland 1983). The medieval wares were also coded using the Gloucester fabric series (cf. Vince 1983). The sorted material was quantified by sherd count and weight only and the data entered onto an Excel spreadsheet a copy of which is deposited with the site archive.

Pottery was recovered from 67 defined contexts, with quantities ranging from single sherds up to a maximum of 97 sherds. The condition of the sherds was very variable but generally quite fragmented with an overall average sherd size of just 8g. There is a considerable level of residual material present with most of the Roman material coming from post-Roman horizons. The reliability of the groups is limited in many cases where quantities are small or the assemblage chronologically mixed.

Roman (Pottery table 1)

The bulk of the assemblage, some 828 sherds, 69.3% of the assemblage, dates to the Roman period with material spanning the later 1st through to the later 4th century. The assemblage comprises a mixture of continental and regional imported wares and local wares. The range of material is very typical of that to be found in Gloucester with a moderately diverse range of imported fine ware and amphorae. Samian wares, largely of Central Gaulish origin account for just under 7% of the assemblage by count. Approximately 21% are from decorated bowls (Dragendorff 30 and 37) again typical of an urban location. Plain ware forms present include Drag. types 27, 33, 18, 31, 35, 35/6, 38 and 79.
Other imported fine wares include small quantities of Central Gaulish colour-coated ware, Moselle black-slipped ware and Central Gaulish black slipped ware dating to the 1st and later 2nd-3rd centuries respectively.

The amphorae are of interest in that there are at least two potentially late sherds present; from deposit (607) there is a small bodysherd with smeared close ridging typical of a Late Roman Almagro 54 (Peacock and Williams 1986, class 49) and from deposit (516) a sherd from a North African type. The former is thought to come from Gaza, Palestine dating to the 4th to 6th centuries AD (Keay and Williams 2005) and contained wine. The North African type was imported sporadically from the 2nd to 6th centuries bringing olive oil. Sparse finds of late Roman amphorae have previously been found in Gloucester and both types were found at the New Market Hall site (Peacock 1974; figs 10.25 and 35.37) and at East Gate (Ireland 1983, 109). North African sherds have also been found at Westgate Street (Vince and Goudge 1980; 96), the Castle site (Greatorex 1988, 21) and St Oswalds Priory (Peacock 1982, 49); the latter with some late Roman ribbed sherds.

regional imports are well represented, particularly Dorset black burnished ware which make up 26% of the assemblage by count. Also present are various products of the later Roman colour-coated industries in Oxfordshire, the New Forest and the Lower Nene Valley. Late Roman shelly ware, circulating in the last quarter of the 4th century and accounting for 1.8% of the Roman assemblage, was present in the post-Roman levels.

Local products include Severn Valley wares which make up 18.1% of the assemblage and vessels from the Gloucester kilns (Glos fabrics TF 3a, 7, 9b, 11a and 25) which were operating in the 1st and 2nd centuries account for a further 21.7%.

Saxon (Pottery table 2)

One of the most interesting components of the assemblage is the presence of some 48 sherds provisionally dated as middle Saxon. These were recovered from ten contexts with the highest incidence, 33 pieces, from context (714). In addition there are at least 15 sherds of Gloucester late Saxon ware (Glos TF 41a) from deposits (530) and (621) and probably several more pieces from other contexts which have been difficult to discriminate from early medieval TF 41b.

The other 48 sherds are all from handmade vessels in a diverse range of fabrics only two of which have been previously documented from Gloucester (Vince 1988, 21, Glos TF 300 and 301). The pieces are generally very small with an overall average weight of 5.9g. Eight groups have been defined which have been sub-divided into 12 fabrics characterised as follows:

Organic-tempered ware (OR). Two very small bodysherds containing a common frequency of quite coarse burnt out linear organic material.

Sandy organic-tempered ware (SAOR). One thick-walled basesherd (14 mm) (Pottery fig. 1.7). The paste contains a sparse to moderate frequency of organic inclusions and a sparse frequency of sub-angular to rounded quartz sand with grains up to 2-3mm.

Sandy wares (SA1). Five bodysherds. Dark brown, grey or black in colour. The sherds have a slightly sparkling appearance from a sparse to moderate frequency of sub-angular to angular facetted quartz sand, fine white mica, rare brown rounded grains of iron and rare fragments of a fine-grained stone (?marlstone) and the odd inclusion of organic matter or calcareous grains. Most have a smoothed surface finish; one sherd has a burnished finish. One example from (713) has a sooted exterior from use.
(SA2): Two rims, one from a burnished bowl (Pottery fig. 1.1) and six bodysherds. The second rim is the tip of a simple everted rim jar. Seven of the sherds have a burnished finish. The fabric contains a common frequency of moderately well-sorted, sub-angular quartz creating a granular texture.

Sandy with calcareous inclusions (SACA1). One rim (Pottery fig. 1.9) and one bodysherd. Smoothed surfaces. Very hard with a sparse to moderate frequency of ill-sorted, rounded quartz grains up to 1mm and rare calcareous grains or fragments of fossil.
SACA2: Three bodysherds, two of which are burnished. One with a slightly raised cordon (Pottery fig. 1.5). Finely micaceous with a sparse frequency of fine limestone including discrete ooliths (0.5-1mm) and sub-angular to rounded quartz sand (0.5mm and less in size) with rare iron. This probably equates with Glos TF 301 defined by Vince (1988, 21).

Sandstone-tempered (SST). Two rims from shallow bowls (Pottery figs 1.2 and 1.6) and base angle. A black ware containing a sparse to moderate frequency of sub-angular quartz and rare grains of fine quartz sandstone. Inclusions are largely 1-2mm in size and finer.

Calcareous (LIME1). Two rims and seven bodysherds three of which are burnished. One rim is from a small lugged or handled vessel with burnishing on the interior and exterior surfaces (Pottery fig 1.8); the other is from a simple expanded rim jar (Pottery fig. 1.3). The fabric contains a sparse to common frequency of discrete rounded limestone ooliths and in some cases fragments of conglomerate. This matches the fabric defined as Glos TF 300 by Vince (ibid) from Gloucester Castle.
(LIME2): Two very fragmentary rim sherds from simple everted rim jars and two bodysherds, one 8mm thick. Dark grey-black with a sparse to moderate frequency of oolitic limestone, calcite and fossiliferous debris with fragments up to 2-3mm.

(LIME3): Two bodysherds and a base angle. One bodysherd is 13mm thick; the other 10mm. The fabric appears poorly mixed with fragments of decaying limestone, rare quartz sand (0.5mm), pellets of fine grained argillaceous rock (?marlstone) up to 3mm and varying amounts of crushed fossiliferous matter.

Limestone, sand and slag-tempered (LISLSA). Two base fragments, one rim from a simple, everted rim jar (Pottery fig. 1.4) and four bodysherds. One of the base fragments, flat in profile has a burnished upper surface and three of the other sherds have a burnished finish. Dark brown in colour with a sparse frequency of quartz sand, rare oolitic limestone and rare to sparse fragments of what appears to be small fragments of metallic-looking slag and vesicular clinker up to 4mm in size and finer.

Igneous rock-tempered (IGN). A single bodysherd of igneous-rock-tempered ware characterised by fine flecks of muscovite and biotite, ill-sorted sub-angular to angular quartz up to 1mm, quartzite and ?granitic rock fragments. A possible source for this fabric is the Charnwood Forest area of Leicestershire which was a known centre for Saxon pottery production. However, give that there was an extensive medieval pottery in Malvern Chase also with a granitic geology it is possible this come from an earlier phase of this more local industry.

Gloucester TF 41a. This limestone-tempered ware was originally defined by Vince (1979, 171) following the discovery of a waster pit on Westgate Street with round-based cooking pits and crucibles. This was dated to the late Saxon period to be replaced in the 11th century by Gloucester early medieval ware (TF41B). Two groups from Commercial Road, those from contexts (530) and (621) (Pottery figs. 1.10 and 1.11) appear typologically to be TF 41a. The two fabrics are quite difficult to distinguish from one another in the absence of typological features. Other unfeatured sherds from a number of deposits are also likely to belong here.

Discussion

Very little pottery dating to the early-mid Saxon period has been found in Gloucester City. Despite the fact that there are now several sites known in the Lower Severn Valley which have produced organic-tempered pottery sherds,, for example Eastington, Frocester and Cheltenham, only two sherds have been documented from Gloucester, both from the site of St Oswald's Priory (Vince 1984, 252). Traditionally organic-tempered pottery is seen as dating to the 6th to 8th/9th centuries. Until 1988 and the publication of the small group of pottery from the site of the Castle (Vince 1988) it was thought that this period was aceramic in Gloucester. A date of 5th-7th century was proposed for the Castle assemblage which largely comprised two fabrics: an oolitic-limestone-tempered ware (TF 300) and an oolitic limestone tempered ware with quartz/quartzite-tempered ware (TF 301) (ibid. 21).

The Commercial Road group is the largest group of potentially early-middle Saxon pottery to be documented from the City. It is very diverse in character and hints at supplies coming from several sources. It is difficult to know at present whether this diversity also reflects a long chronology to the material. The forms of the vessels are unusual and appear to include two basic shapes, enclosed jars with simple everted rims and small bowl forms. There are at least three base-angles implying flat based vessels, another unusual feature for pottery of this period which normally show sagged or rounded bases. The presence of odd sherds of TF 41 from some of the same contexts as the Saxon sherds in the Commercial Road sequence is also slightly problematical. This ware has been traditionally dated to the late Saxon period and indeed a waster pit was excavated at Westgate Street with oolitic limestone (TF 41a) cooking pots and glass-working crucibles (Vince 1979, 171, fig. 7). The latter show a similar shape to the shallow bowls here and from the Castle site but for these two groups the vessels are burnished and not likely to be crucibles. It is also of interest that one of the pottery fabrics described above appears to have slag in the fabric which suggests glass or metal-working in the vicinity of the pottery making.

The dilemma is are we looking at pottery spanning the mid to late Saxon period and that the levels above the Roman truncation are dated by the presence of TF 41a which Vince acknowledged was not precisely known but thought to be not earlier than the early 10th century or, can pottery macroscopically very similar to TF 41a date back into the middle Saxon period. In favour of the first theory is the fact that nearly all the

Saxon sherds are extremely fragmentary so could well be residual. The problem will only be solved when more early stratified groups are investigated from this locality.

Medieval

The medieval pottery assemblage comprises almost exclusively sherds of early medieval limestone-tempered ware (TF41B) with a single sherd of Malvern Chase cooking pot (TF 40). The sherds are almost all from plain cooking pots with at least one spouted pitcher from (525). One sherd from (526) is decorated with impressed circular grid stamps (Pottery fig. 1.12). The absence of any of the typical 12th century wares found in Gloucester might suggest that most or all the TF 41 sherds from these deposits date to the 11th century/ early 12th century or earlier and could well include potential late Saxon pieces.

Site distribution and dating

Although there is some Roman pottery present dating from the 1st century the earliest stratigraphic levels from the site date to the 2nd century. Thus at the base of the sequence context (711) produced 14 Roman sherds including two pieces of Central Gaulish samian, one Oxfordshire white ware and local wares indicating a 2nd century date. Unfortunately the group includes one sherd of TF 41 which must be seen as intrusive. The successive horizons (deposits 733, 735 and 734) similarly all produced typical 2nd century material. Feature [732] produced 30 sherds amongst which were eight pieces of DOR BB1, four Central Gaulish samian and the only sherd of Baetican amphora with a suggested *terminus post quem* from the mid 2nd century. Deposit (730) above this produced several Gloucester kiln wares including a ring-necked flagon, mortarium spout, globular beaker, lid and carinated jar alongside a Les Martres-de-Veyre samian dish (Drag 35/6) which would suggest a Trajanic date overall but as it is stratigraphically above a mid 2nd century feature suggests it is largely redeposited material.

The next group of contexts in the sequence (725, 726, 717, pits [723] and [721]) produced later Roman pottery. On the basis of the DOR BB1, pit, [723] appears to date to the 3rd century. Two tiny sherds of Oxfordshire colour-coated ware from deposits (725) and (726) suggest these are likely to date to the mid-later 3rd century.

The parallel sequence in Trench 5 produced later 1st or 2nd century sherds from deposits (533) and (527) but with only three sherds dating must be provisional. From this point in both trenches the latest Roman horizons appear to be truncated although 4th century pottery appears residually in the higher levels. The fill (716) of pit [721] produced 14 Roman sherds, three Saxon pieces and one sherd of TF 41. Pit [714] (715) produced a large assemblage with 45 Roman sherds including several late 4th century sherds and 33 potential middle Saxon pieces. Deposit (713) sealing the pit produced two middle Saxon sherds, one sherd of TF 41 and 14 Roman sherds. A single sherd of TF41 also came from pit [719] accompanied by several Roman sherds.

The contemporary levels to (713) in Trench 5 produced a further three middle Saxon sherds from (526) with sherds of TF 41a from (530), (540) and (541). One of the sherds from (526) is decorated with impressed circular grid-stamps.

No further post-Roman pottery was recovered from Trench 7, Roman sherds were recovered from contexts (706) and (708). A large quantity of material came from the upper levels of Trench 5 with 360 sherds of which 41% are TF 41a/b and 59% are residual Roman sherds including the piece of North African amphora. It seems likely that these date to the late Saxon/early medieval period.

The sequence in Trench 6 produced 274 sherds of which 48%, 134 sherds are TF 41a/b, two are middle Saxon and the remainder Roman in date. The lowest excavated level, deposit (617), produced seven Roman sherds and three sherds of TF 41a and appears to be broadly contemporary with (713) and (530) suggesting potentially a late Saxon level.

Catalogue of illustrated pottery *(Pottery figure 1)*

1. Shallow bowl, black in colour. Good burnished finish on the interior and exterior. Fabric: SA2. Pit [715] (714).
2. Shallow bowl with an exterior burnish. Fabric: SST. Pit [715] (714).
3. Expanded, rounded rim jar. Fabric: LIME1. Pit [715] (714).
4. Narrow necked, everted rim jar. Burnished exterior. Fabric: LISLSA. Pit [715] (714).
5. Bodysherd with a horizontal ridge. Burnished exterior. Fabric: SACA2. Pit [715] (714).
6. Curved wall shallow bowl. Burnished on the interior and exterior. Fabric: SST. Deposit (713).
7. Basesherd. Fabric: SAOR. Deposit (713).
8. Curved wall vessel? bowl with part of a handle or lug attachment. Burnished on the interior and exterior surfaces. Fabric: LIME1. Deposit (615).
9. Small everted rim jar. Burnished exterior. Fabric: SACA1. Context (1215).
10. Handmade everted rim cooking pot, dark grey in colour. Fabric: TF 41a. Pit [619] (621).
11. Simple everted rim. Wide-mouthed cooking pot. Pale reddish brown with a grey interior. Traces of sooting on the exterior. Fabric: TF 41a. Pit [619] (621).
12. Bodysherd from a pitcher decorated with circular, poorly impressed grid stamps. Fabric: TF 41b. Deposit (526).

Ceramic building material

A substantial quantity of ceramic building material was recovered which was briefly scanned for any unusual pieces or marks and quantified by count and weight. A note was made of the main featured pieces.

Trench 5 produced 413 pieces weighing 17.63kg. Most of this where it could be determined dates to the Roman period and includes a number of fragments of roofing tile (*tegulae* and *imbrices*) and one possible piece of box-flue. There were also pieces of flat *pilae*. Of note is a piece inscribed with a possible batch mark made before firing from (525).

A smaller quantity of 120 pieces, 8.89kg in weight was recovered from Trench 6. Apart from a piece of medieval ridge tile from (607) again most of the assemblage appears to be residual dating from the Roman period. Two fragments of box-flue with incised lattice came from contexts (607) and (608). A further more modest assemblage came from Trench 7 with 71 pieces, 5.666kg again largely comprising roofing tile of Roman date.

Pottery table 1: Quantified summary of Roman pottery

	Fabric	Description	No	% No	Wt	% Wt
Imports	LGF SA	South Gaulish samian	2	0.2	5	0.1
	LEZ SA	Central Gaulish samian	47	5.7	217.5	3.1
	MDV SA	Les Martres de Veyre samian	7	0.8	29	0.4
	EG SAM	East Gaulish samian	1	0.1	7	0.1
	CNG BS	Central Gaulish black slipped	3	0.4	4	0.1
	CNG CC	Central Gaulish colour-coated ware	1	0.1	1	0.0
	MOS BS	Moselle black slipped ware	5	0.6	6	0.1
	NOG WH	North Gaulish white ware	1	0.1	246	3.6
	BAT AM	Baetican amphorae	1	0.1	6	0.1
	CAD AM	Cadiz amphora	1	0.1	161	2.3
	GAL AM	Gallic amphora	2	0.2	126	1.8
	NAF AM	North African amphora	1	0.1	14	0.2
	PAL AM	Palestinian amphora Cam 189	3	0.4	40	0.6
	LRA	Gaza wine amphora	1	0.1	5	0.1
	AMP	miscellaneous amphora	2	0.2	68	1.0
Regional	DOR BB1	Dorset black burnished ware	214	25.8	1317.5	19.1
	LNV CC	Lower Nene Valley colour-coat	7	0.8	51.5	0.7
	MAH WH	Mancetter-Hartshill	3	0.4	40	0.6
	NFO CC	New Forest colour-coat	2	0.2	4	0.1
	OXF RS	Oxfordshire colour-coated ware	25	3.0	317.5	4.6
	OXF RS(M)	Oxfordshire colour-coated mortaria	3	0.4	31	0.4
	OXF WH	Oxfordshire white ware	7	0.8	137	2.0
	OXF WHM	Oxfordshire whiteware mortaria	1	0.1	19	0.3
	ROB SH	late shelly ware	15	1.8	81	1.2
	SOW OX	Southwest oxidised ware	1	0.1	2	0.0
	SOW WS	Southwest white-slipped ware	12	1.4	22	0.3
	WIL RE	Wiltshire grey ware	2	0.2	12	0.2
	WIL GR	Wiltshire grey grogged ware	4	0.5	41	0.6
Gloucester	TF 3A	mica-slipped oxidised	1	0.1	3	0.0
	Glos TF 7	white-slipped oxidised	40	4.8	230.5	3.3
	Glos TF 11a	reduced oxidised fine sandy	131	15.8	966	14.0
	Glos TF 24	Kingsholm flagon fabric	1	0.1	2	0.0
	Glos TF 25	oxidised or grey sandy	6	0.7	52	0.8
	Glos TF 9B	mortaria	2	0.2	141	2.0
Local	SVW OX	Severn Valley ware (oxidised)	150	18.1	1709	24.7
	MALV C	sandstone tempered Malvernian ware	1	0.1	2	0.0
	MAL RT	Malvernian wheelmade	1	0.1	12	0.2
	Glos TF 5	micaceous grey ware	5	0.6	20.5	0.3
	Glos TF 12D	local colour-coated ware	6	0.7	44.5	0.6
	Glos 207	loal oxidised roughcast ware	1	0.1	11	0.2
Unknown	BW	black sandy wares	49	5.9	282	4.1
	CC	misc colour-coated ware	2	0.2	7	0.1
	GREY	grey sandy ware	45	5.4	249	3.6
	OXID	oxidised ware	7	0.8	144	2.1
	CREAM	cream sandy ware	3	0.4	8	0.1
	MISC	misc sandy wares	3	0.4	11	0.2
TOTAL			**828**	**100.0**	**6905.5**	**100.0**

Pottery table 2: Quantified summary of middle Saxon pottery

Fabric	Description	No	% No	Wt	% Wt
OR	coarse organic tempered	2	4.2	3	1.1
SAOR	sandy with sparse organic	1	2.1	20	7.0
SA1	micaceous with sparse quartz sand	5	10.4	33	11.6
SA2	common well-sorted quartz	8	16.7	57	20.1
SACA1	dense sandy with sparse calcareous	2	4.2	4	1.4
SACA2	micaceous, sparse calcareous & quartz	3	6.3	8	2.8
SST	sandy with rare quartz sandstone	3	6.3	19	6.7
LIME1	frequent discrete limestone ooliths	9	18.8	51	18.0
LIME2	sparse oolitic limestone / fossil	4	8.3	24	8.5
LIME3	sparse limestone, sand and ?marlstone	3	6.3	24	8.5
LISLSA	mixture limestone, quartz and slag	7	14.6	36	12.7
IGN	igneous rock-tempered	1	2.1	5	1.8
TOTAL		**48**	**100.0**	**284**	**100.0**

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Appendix 2: Small finds and vessel glass by H.E.M. Cool

Introduction

The excavations at Commercial Road produced a small but interesting small find and vessel glass assemblage. It is derived in part from Roman occupation which would appear to have continued into the early 5th century, but in the main is from the occupation on the site belonging to the 10th to 11th centuries. In what follows the finds will be discussed according to the main Phase groupings, followed by an overview considering the nature of the later occupation.

Roman material – Phases 1 and 2

The Roman material from this site consists primarily of personal equipment, vessel glass and material derived from buildings.

Both of the datable items of personal equipment belong to the 1st and 2nd centuries. The fragmentary melon bead (no. 3) would have been in use prior to the mid 2nd century (Crummy 1983, 30). The fragmentary and residual finger ring (no. 4) is an example of a Henig (1978) Type III ring. Other items in this category are hobnails from nailed shoes. All of these are common types.

The small vessel glass assemblage as a whole is summarised in Small finds table 1. Two items found residually belong to the toilet category as they are small blue/green neck fragments from unguent bottles (no. 5). The rest belong to the household category and consist where identifiable of tablewares. As can be seen the majority of the glass was found residually.

Small finds table 1: Roman vessel glass by colour and site phase.

Phase	*Light green*	*Colourless*	*Blue/green*	*Light greenish bubbly*	*Total*
1	1	-	2	-	3
2	-	2	2	1	5
3	-	1	4	4	9
4a	-	1	7	2	10
4b	-	-	7	-	7
Total	1	4	22	7	34

From the colours present, this is primarily a 1st to 3rd century group, with 4th century material (light greenish bubbly in the table) forming nearly one quarter. The more closely dated material include the body fragment no. 7 which is probably from a ribbed conical jug of the mid first to mid second centuries (Price and Cottam 1998, 152-4). The cast body fragment found residually (no. 9) would have come from a contemporary bowl. Also found residually was a fragment from a colourless cylindrical cup of the late 2nd to mid 3rd centuries (Price and Cottam 1998, 99-101). All of these are common forms both generally and at Gloucester (see for discussion Price and Cool 1986, 47).

Much less common is the bowl no. 6 (Small finds fig. 1). Shallow forms like this are much commoner in the 4th century than earlier. This piece comes from a Phase 1 context and though light green, lacks the many small bubbles that are a feature of 4th century glass. The rim is also ground, again not a common feature of 4th century vessels. A 1st to 2nd century date would be appropriate given the colour, the rim finish and the decoration and this would be consistent with the date of the context. It is a useful addition to the range of forms known to have been in use at the time.

Only one fragment of the 4th century glass was found stratified in a Roman context (no. 11). This clearly comes from a jug or a bottle, but given the folded rim the latter identification might be the correct one as the common 4th century jug forms had fire rounded rims with a trail below. The commonest 4th century bottle form with a folded rim has a corrugated mould blown body (the Frontinus bottle – Price and Cottam 1998, 209-11). This has previously been identified at Gloucester in the assemblage from the Defences (Price and Cool 1986, 54 no. 38, fig. 26). Two other 4th century

drinking vessels can be identified amongst the material from later contexts. No. 12 is a fragment of a conical beaker (Price and Cottam 1998, 121-3). It is made of the yellow/green shade of bubbly glass that is often associated with late 4th into 5th century vessels. No. 13 is made in a similar shade of glass and comes from an equally common form, the hemispherical cup (Price and Cottam 1998, 117-9). Both these cup and beaker forms have been regularly found at Gloucester on sites with 4th century occupation, for example at 1 Westgate Street (Price 1980, 112 nos. 4-5, fig. 17) and Berkeley Street (unpublished). No. 12, from Phase 3, is one of the larger fragments of glass from the site. No. 13 from a Phase 4a context is much smaller and is more of the size to be expected in a residual context. Possibly this suggests that Phase 3 contexts include 5th century occupation contexts.

Material from the floors (nos. 14-20), the walls (no. 21) and the windows (no. 22) of Roman buildings were found. The tesserae nos. 14-15 and a small amount of wall plaster (no. 22) was found stratified in Roman contexts, but the majority of these finds were found residually in the Phase 4 contexts including the window glass which is of a 4th century type. A total of 34 iron nails (quantified by heads) were present from the site as a whole. Of these only four were found stratified in Roman contexts. Roman sites normally produce a considerable number of nails, so given the residuality noted in the other Roman building material, it might be suspected that many of those from Phases 3 and 4 were residual Roman items. It may be noted though that only three nails were complete and all came from Phase 3 and later contexts, possibly suggesting that some were in use contemporaneously with their contexts.

Personal ornaments and equipment

1 Hobnail. Pyramidal head. Length 15mm, head width 9mm. 711 : Phase 1.

2 Hobnail. Iron. Present length c. 10mm. 726 : Phase 2.

3 Melon bead. Turquoise frit with glaze remaining. A quarter extant in two pieces. Length 16mm. 728 : Phase 1.

4 Finger ring. Copper alloy. D-sectioned expanding hoop; empty oval bezel; upper third only. Width bezel 9mm. 613 : SF 2 : Phase 4b.

Toilet equipment

5 Unguent bottles; neck fragments. Blue/green. 524 : Phase 4b, 617 : Phase 4a

Household

6 Shallow hemispherical bowl; rim fragment. Light green glass. Rim inturned slightly, edge cracked off and ground. Abraded band below rim and another on lower body. Rim diameter 150mm, wall thickness 1mm, present height 31mm. 711 : Phase 1.

7 Conical jug (?), body fragment. Blue/green. Straight, slightly convex side. Parts of two prominent narrow vertical trails. Dimensions 24 x 20mm, wall thickness 1mm. 730 : Phase 1.

8 Body fragment. Colourless. Trailed. 717 : Phase 2

9 Body fragment, cast colourless glass. 714 Phase 3

10 Cylindrical cup. Colourless. Vertical rim, edge fire rounded. Rim diameter 70mm, wall thickness 1mm. 617 : Phase 4a.

11 Bottle, rim and handle fragment. Light greenish bubbly. Outbent rim, edge rolled in, cylindrical neck; remains of folded upper handle attachment on underside of rim and neck. Rim diameter 55mm, neck thickness 2mm, present height 13mm. 717 : Phase 2.

12 Conical beaker, rim fragment. Yellow/greenish bubbly. Curved rim, edge cracked off but not ground; side sloping in. Wide abraded band on upper body. Rim diameter 70mm, wall thickness 1mm. 714 : Phase 3.

13 Hemispherical cup, rim fragment. Yellow/green bubbly glass. Curved rim edge, cracked off and not ground, abraded band. Dimensions 16 x 16mm, wall thickness 2mm. 526 : Phase 4a.

Building

14 Tessera. Cube, dark grey fine-grained stone. Dimensions 22.5 x 22.5 x 15mm. 730 : Phase 1.

15 Tessera. Cube, dark grey fine-grained. Dimensions 13 x 11 x 10. 717 : Phase 2.

16 Tessera. Cube, cream fine-grained stone.. Dimensions 11.5 x 11 x 9mm. 515 : Phase 4a.

17 Tessera. Cube, dark grey fine-grained stone. Dimensions 14.5 x 14 x 10mm. 542 : Phase 4a.

18 Tessera. Cube, dark grey fine-grained with pink mortar. Dimensions 17 x 15 x 13.5mm. 526 : Phase 4a.

19 Tessera. Cube, dark grey fine-grained stone. Dimensions 14 x 12 x 11mm. 516 : Phase 4b.

20 Tessera. Cube, white fine-grained stone. Dimensions 20 x 15 x 12mm. 903 : Unphased.

21 Painted wall plaster. Fragment with white ground with pale green, yellow and red dots. Probably foliage pattern. Area 3cm2. 724 : Phase 2. Also two flakes from surface painted red from same context and a similar flake from 516 Phase 4b

22 Blown window glass; pale green bubbly. 714 Phase 3 – 3.5cm^2, 713 Phase 4a – 4cm^2, 530 Phase 4a – 2cm^2.

Fasteners

23 Washer. Copper alloy. Sheet with broken edges, central circular perforation. Length 12mm, perforation diameter 5mm. 711 : Phase 1.

24 Perforated plate. Iron. Corner of square or rectangular plate with perforation in corner. Dimensions 54 x 63, perforation diameter 3mm, thickness 3mm. 711 : Phase 1.

Middle to late Saxon – Phase 3

Relatively few items that were not obviously residual Roman finds were found stratified in contexts of this phase. A significant part of the contemporary assemblage consists of the fragments from working antler (nos. 28-33, Small finds plate 1) all found in the fill of a single pit. These consist of the typical offcuts found on sites of the 9th to 11th centuries when antler was used to make a variety artefact types, especially the ubiquitous combs (see MacGregor *et al* 1999, 1905-12 for a detailed discussion). The pit fill contained two pieces that can be regarded as true offcuts, as no. 28 is part of the crown and most of what remains is cancellous tissue. This was of limited use in antler working as it was the compact tissue that was needed. No. 29 has a higher proportion of compact tissue left but clearly most of the useful material had already been cut away. Nos. 30-2 were probably roughouts in the first stages of manufacture. No. 31 for example is the sort of strip that needs to be prepared prior to comb manufacture. Tine tips such as no. 33 are often found unmodified amongst waste, but this example shows modification at both ends and so could have been intended to be further work.

Of the other finds found stratified in Phase 3 contexts, the bone mount no. 26 (Small finds plate 1) can be assigned a late Saxon date. It would have decorated a small box or chest. The small perforations on the piece could have been intended either to aid attachment using small pins or nails or as a decorative technique allowing whatever the colour of the object it was attached to, to be seen in contrast to the white of the plate. Neither technique is used on the bone inlay common in the Roman period and both are more frequently found on the bone inlays of the late Saxon and medieval period. On sites such as York and Winchester which have large stratified finds assemblages, it can be shown that the practice of using these inlays started in the later 10th century and continued on into the later medieval period (Cool 2011, 60-61).

One other item may be discussed here though it does not fit the site phasing. That is the polychrome glass bead no. 25 (Small finds plate 2) found in a Phase 4b context. It was clearly residual there as the late Saxon period is not one where such beads were in use. The period when they can be expected is from the 1st to 7th centuries. This bead has a mid to dark blue ground with opaque white waves. Generally it belongs to the Guido (1978, 63) Group 5a, but the Roman examples of the form use a much richer deep blue glass, tend to be deeper and are better made than this example (see for example the remarkable group of 230 from a pit at Llandygai – Cool 2009, 97-9). In discussing the Roman ones Guido did note that examples of paler blue ground colour were used in the post Roman period. These were designated Group 6ix in her work on the beads from Anglo-Saxon England and numerous examples from 5th to 7th century graves were noted (Guido 1999, 53, 267-9). It seems likely that no. 25 should be assigned to this date.

Personal ornaments and equipment

25 Bead, irregular annular; approximately one third extant. Deep blue glass with opaque white waves. Diameter c. 17mm, section 7x4mm - 6x3mm. 524 : Phase 4b.

Household

26 Mount. Bone. Trapezoidal sheet with curved row of 3 small circular perforations. Dimensions 19 x 18mm, thickness 2mm. 714 : Phase 3.

Fasteners

27 Stud? Iron. Small domed head. Head diameter 8mm, length 12mm. 722 : Phase 3.

Working Waste

28 Offcut. Antler. Crown fragment, sawn across base to remove burr and across base of three tines; down one side a sawn face where compact tissue has been removed. Length 128mm. 714 : Phase 3.

29 Offcut. Antler. Beam fragment, outer face consisting primarily of compact tissue. Sawn across beam and one tine and down length. Length 115mm. 714 : Phase 3.

30 Roughout. Antler. Tapering wedge from beam consisting mainly of compact tissue. Length 73mm, maximum width 12mm. 714 : Phase 3.

31 Roughout. Antler. Approximately rectangular-sectioned, rectangular strip of compact tissue. Length 102mm, section 11 x 5mm. 714 : Phase 3.

32 Roughout. Antler. Small rectangular strip of compact tissue. Length 24mm, section 5 x 4mm. 714 : Phase 3.

33 Roughout / offcut. Antler. Tine tip, saw unevenly across both ends. Length 59mm. 714 : Phase 3.

Late Saxon to early medieval – Phases 4a and 4b

The finds belonging to this phase of occupation are an interesting combination of what might be termed typical late Saxon items and quite unusual ones. The common items that are to be expected in the material from a late Saxon urban assemblage are considered first, followed by the less common ones. Finally two items that are stratified in contexts of this date, but which would normally be considered to be of later date are discussed.

Amongst the items in the first category there are two from types that have already appeared in the Phase 3 contexts. One is another fragment of bone inlay (no. 36, Small finds plate 1), and the other an antler roundel (no. 52, Small finds plate 1) possibly again indicating antler working. There are also two horseshoe nails (nos. 41-42) from the type of shoe with countersunk holes which may be dated broadly to the 10th to early 14th centuries. (Clarke 2004, 85-7, fig. 75). There is a fragment probably from a knife (no. 43) and part of a hone (no. 44, Small finds plate 2). The lithology of the hone indicates it was an import from Norway. Hones of micaceous schist and phyllite first appear in

England in the 10th century and continue in use into the medieval period. On many sites during that time it is not unusual for imported hones to outnumber ones made from more local stones (for discussion see Ottaway and Rogers 2002, 2794-7). Another common find on mid 10th to late 11th century sites are riveted mounts (Cool 2011, 82-4). Their precise function is unknown, but they are often found in large quantities, so the presence of no. 45 (Small finds plate 1) here is to be expected. Finally two socketed leaf-shaped arrowheads may be noted (nos. 50-51, Small finds plate 2). Leaf-shaped blades are typical of late Saxon arrowheads as can be seen by comparing the ones from Anglo-Scandinavian contexts at Coppergate in York (Ottaway 1992, 710-11) with those from medieval contexts in the same city (Ottaway and Rogers 2002, 2967-9). The two from Commercial Road are relatively small and were probably for hunting rather than for military use.

Amongst the less common items there is a lead alloy ring (no. 34, Small finds plate 2), and a decorated copper alloy rod with a zoomorphic terminal at one end and a point at the other (no. 35, Small finds plate 2). Parallels have not been found for either piece. The ring has been tentatively identified as a pendant, though it might be a piece of fortuitous run-off. As will be discussed below lead melting might have been being carried on at the site during this period. The rod has been cautiously identified as a toilet implement. Other possible uses might be as a dress pin or a stylus though neither identification is convincing. Though it has a point, no. 35 lacks an eraser and is too short to comfortably be used to write with. Equally the section of the shank is not circular as would be expected in a dress pin, and the whole piece is more robust than normal if it had functioned as such. Against an identification as a toilet implement is the fact that generally the only toilet items found on late Saxon sites are tweezers (see for example Mainman and Rogers 2000, 2600). Toilet implements including points are a feature of later assemblages of the later 13th and 14th centuries (Egan and Pritchard 2002, 377-81). The zoomorphic terminal would certainly better fit a late Saxon *milieu* than a medieval one, and the shape of the implement could also have functioned well as toilet implement as the lower jaw would have been an ideal nail cleaner.

Late Saxon urban assemblages frequently have equal-armed balances, a fork from one was found, for example, in a late 11th to early 12th century context during excavation at Gloucester Castle (Isaac 1988, 39 no. 360, fig. 15). These are lacking at Commercial Road but it seems likely that no. 39 (Small finds plate 2) is a weight designed to be used with them. In general form it resembles the pan weights found at Winchester (Biddle 1990, 919 no. 3192, 921 no. 3195, fig. 280). These were larger and both consisted of an openwork copper alloy sheath with a lead alloy core. Investigative conservation has been conducted on no. 39 by Karen Barker and she found no trace of any filling. The overall similarities with the Winchester pan weights though is strong. Those were not recovered from usefully dated contexts, but on art historical grounds Biddle (1990, 910) assigned their decoration to the late Saxon period. They may well therefore have been contemporary with no. 39. It is notoriously difficult to link weights found in the archaeological record with known units of measurement because of weight loss through corrosion. This piece has been cleaned and its current weight (12.78g) is very slightly under the weight of 10 scruples (13g) (Biddle 1990, 911 Table 91).

Normally there is little that need be said about the fastener category, but here attention is drawn to no. 46 (Small finds plate 2). During the assessment, features on the x-radiograph suggested that this was not a straight-forward nail head. Investigative cleaning by Karen Barker has revealed that the nail head had an integral loop curving up and over. It is suggested that this might have been a small hasp. As the loop only occupies half of the head it would have been possible to drive the shank into wood and then the small loop would have projected. Little loop-headed nails like this have not, to my knowledge, been noted before, but this is not surprising as it would need x-radiography and then careful investigation to reveal the details, and often such delicate detail might have disappeared into the corrosion.

The two items that would be conventionally dated to a later date than that of their contexts are a small fragment of vessel glass (no. 38) and a parchment pricker (no. 40, Small finds plate 1). The style and dating of prunted glass vessels is well established and the earliest no. 38 is likely to be is of the later 14th or 15th centuries (Tyson 2000, 88 Type B16), and it might equally belong to the post-medieval tradition. It seems very likely this piece is intrusive in the Phase 4b context it was found in, as that was in an area where disturbance was possible. The context of the parchment pricker though is secure. These items were used to prick the holes used as guides when ruling lines on manuscripts. They are found in some number in medieval assemblages from sites where manuscript production could be expected. Battle Abbey, for example, produced a large group of presumably late medieval ones from

the Dissolution levels (Geddes 1985, 151 nos. 5-20, fig. 45). Known examples are generally recovered from contexts belonging to the late 12th century and later (Biddle and Brown 1990, 734). They have been on sites where there is late Saxon monastic activity which might have made use of them, but never in secure contexts (MacGregor 1985, 124). In discussing those from the Winchester suburb sites, Crummy (in Rees *et al* 2008, 286) acknowledged the conventional dating, but suggests that they probably did start to appear in the early medieval period.

No. 40 fulfils all the criteria of a parchment pricker, it is short and stubby and has the remains of an iron point at its lower end. Where it differs from the medieval series is that it does not have a knob head and is decorated by bands of quatrefoil dotted petals. Given the date of the rest of the material culture from the site and the fact that no. 40 stands to one side of the normal series, perhaps what we have here finally is a parchment pricker from a secure 11th century context.

There were also a number of miscellaneous items such as unidentified fragments of metal and four bone shank fragments from the Phase 4 contexts. These are catalogued in the archive. It is worth noting that amongst this material a disproportionate amount of lead came from the Phase 4 contexts. In total there was 200g of sheet metal and 27g of runoff. This compares to only 9g of sheet in total from the Roman contexts. Whilst the lead could be residual from the earlier context, it seems more likely that it was being re-fashioned in the urban renewal that would have been taking place during Phase 4.

Personal equipment

34 Pendant. Lead alloy. Heart-shaped, plano-convex with perforation in upper part. Length 18 x 18mm, thickness 5mm. 526 : Phase 4a.

Toilet equipment

35 Toilet implement? Copper alloy. D-sectioned bar tapering to broken point with five grooves around it. Other end upper face has psuedo-zoomorphic terminal consisting of three triangular facets terminating in blunt snout and lower jaw extending as a rounded point, jaw and snout separated by a shallow slot; collar around curved face behind the faceting. Length 62mm, upper shank section 4.5 x 4mm. 613 : SF1 : Phase 4b.

Household

36 Inlay. Bone. Trapezoidal sheet with two parallel bevelled edges on upper face, and bevelled diagonal edge on underside. Traces of cancellous tissue on rear. Dimensions 32 x 30mm, thickness 2mm. 713 : SF 5 : Phase 4a.

37 Escutcheon (?). Copper alloy. Side of pointed oval, shallow triangle section; back rough, Dimensions 32 x 18mm. 617 : Phase 4a.

38 Body fragment. Dark green/brown glass. Straight side with parts of two applied prunts. Dimensions 21 x 20mm, wall thickness 1.5mm. 613 : Phase 4b.

Weighing

39 Weight. Copper alloy. Hollow cheese-shaped drum, upper and lower faces have triangular apertures leaving an equal-armed cross. Diameter 22mm, height 8.5mm, weight 12.78g. 518 : Phase 4b.

Written Communication

40 Parchment pricker. Bone. Spindle-shaped with traces of iron point in lower end. Decorated by bands of small worked dots in quatrefoil petal pattern. Length 53mm, maximum diameter 10mm. 713 : Phase 4a.

Transport

41 Fiddle-key horseshoe nail. Iron. Head width 15mm, length 33mm. 617 : Phase 4a.

42 Fiddle-key horseshoe nail. Iron. Triangular head. Head width 15mm, length 32mm. 608 : Phase 4b.

Tools

43 Blade fragment. Iron. Straight back, blade edge possibly originally at an angle. Blade edge now appearing angular due to harder corrosion at one edge Present length 42mm, blade section 13 x 3mm. 613 : Phase 4b.

44 Hone. Terminal of rectangular bar; dark grey mica schist . Present length 38mm, maximum section 19 x 6mm. 608 : Phase 4b.

Fasteners and fittings

45 Rivetted mount. Bone. Ends of two rectangular , slightly tapering plates with iron rivet in situ joining them together. Present length 38mm. Width 15mm. 525 : Phase 4a.

46 Hasp (?). Iron. Flat-headed nail with broken shank; integral eye loop curves over from one edge to centre. Head diameter 17mm, loop diameter c. 10mm, present length 21mm. 524. Phase 4b.

47 Chain. Iron. Four links. Square-sectioned bar with looped ends. Length individual link c. 35mm, section bar 4mm. 525 : Phase 4a.

48 Washer. Copper alloy. Circular with domed face forming ring with central perforation. Diameter 12mm, perforation diameter 2.5mm. 519 : Phase 4b.

49 Caulking. Lead alloy. Rectangular strip with shallow triangular section. Length 44mm, width 9mm, thickness 6mm. Weight 10.06g. 608 : Phase 4b

Military / hunting equipment

50 Arrowhead. Iron. Leaf-shaped blade with shallow diamond section; remnants of open socket. Length 72mm, section blade 22 x 6mm. 525 : SF 84 : Phase 4a.

51 Arrowhead. Iron. Leaf-shaped blade with broken tip, flat-section; socket formed by flanges wrapped over. Length 52mm, section blade 16 x 3.5mm, internal socket diameter c. 5mm. 524 : SF 7 : Phase 4b.

Working Waste

52 Roundel. Antler. Sawn section of tine forming a flat roundel. Diameter 18 x 17mm, thickness 5mm. 713 : Phase 4a.

Overview

Small finds table 2 summarises the assemblage by broad function category by each of the three main periods when the site was in use. Items that are clearly residual as discussed in the forgoing section are assigned to the phase they would have originated in.

The assemblage of Roman finds is very small and can tell us little about the nature of the occupation at the time. The two categories represented are always ones that have numerous examples in a Roman small finds assemblage. The assemblage from the late Saxon / early Medieval contexts, by contrast though small does cover most of the functional categories that might be expected, though there are some curious absences. Equipment associated with the production of textiles is usually prolific on late Saxon sites as can be seen from the excavations at 1 Westgate Street in Gloucester itself (Heighway *et al* 1979, 201 figs. 18-9) and elsewhere (e.g. Cool 2011, Table 9). Here it is entirely absent. There are also few tools. Personal items such as combs are also absent. Instead there is

hunting equipment, possible evidence for the preparation of manuscripts and fittings from possible caskets that must have been made with some care (nos. 36 and 46) as well as what appears to be an uncommon form of pan weight (no. 39) and the unusual implement no. 35 cautiously identified as a toilet implement. On balance, therefore, it might be suspected that the occupation that generated this assemblage was not a straight forwards domestic one and may have involved some of the more elite members of contemporary Gloucester society.

Small finds table 2: Material by functional category (excluding vessel glass and items from buildings)

Function	*Roman*	*Mid to late Saxon*	*Late Saxon/ early Medieval*	*Total*
Personal	4	1	1	6
Toilet	-	-	1	1
Household	-	1	2	3
Weighing	-	-	1	1
Writing	-	-	1	1
Transport	-	-	2	2
Tools	-	-	2	2
Fasteners	2	-	5	7
Hunting	-	-	2	2
Craft debris	-	6	1	7
Total	6	8	18	32

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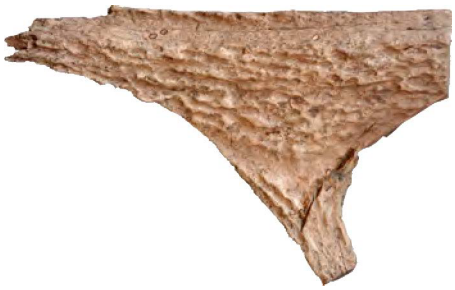
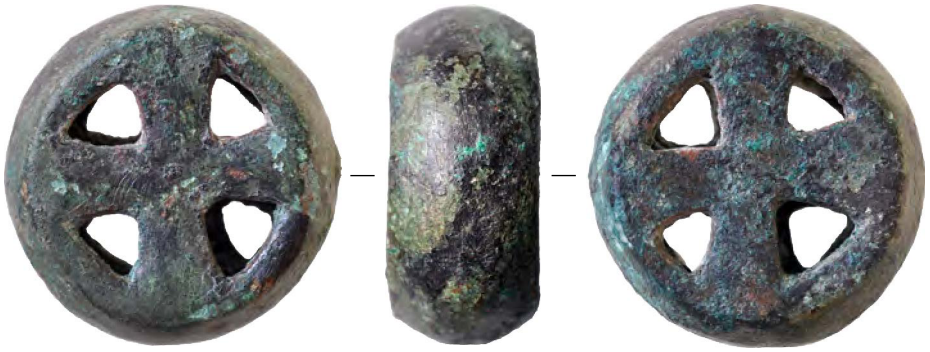
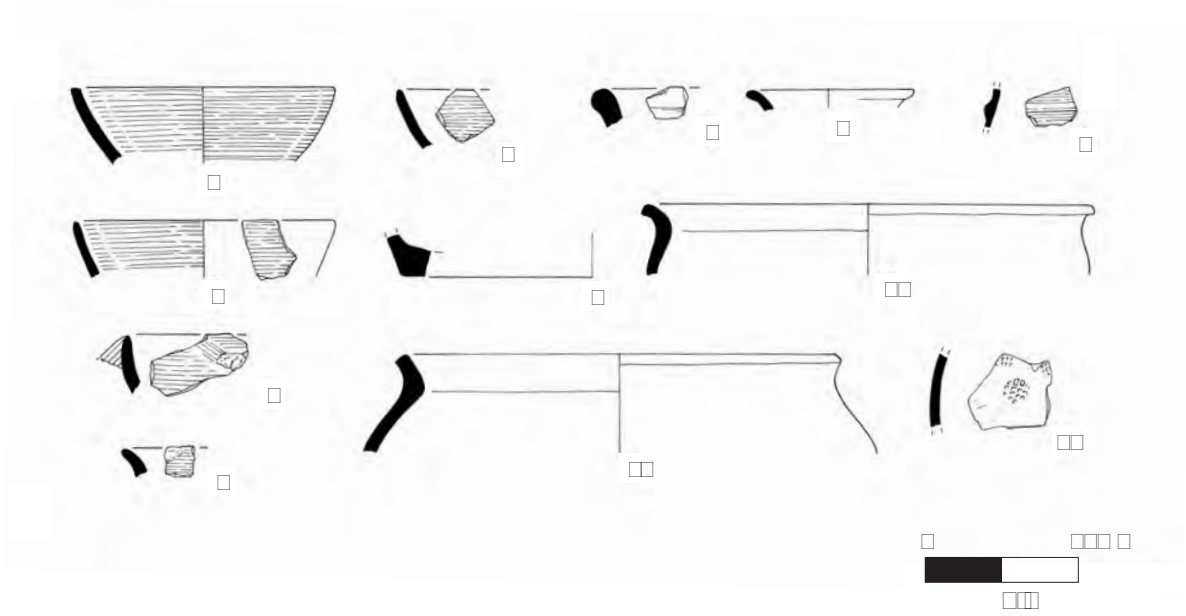
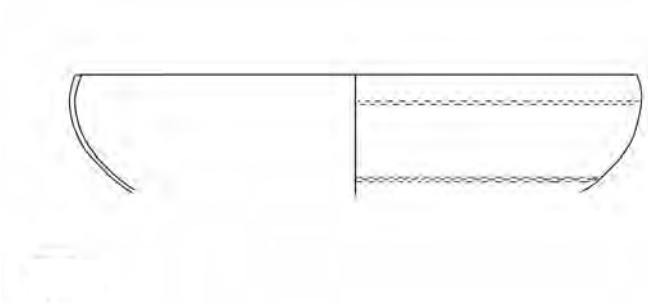
Appendix 3: The flint by Dr Hugo Anderson-Whymark.

A single struck flint flake was recovered from an early medieval context (617). The flake exhibits slight edge-damage indicating that it is probably a residual prehistoric artefact. This artefact cannot be closely dated, but a Neolithic or Bronze Age date is most probable.









Appendix 4: Animal bone by Claire Ingrem

An assemblage of animal bone was recovered from Commercial Road Substation, Gloucester during investigations by Gloucestershire County Council. The excavation was centred on a very limited area but spatially and chronologically the 10th to 11th century material appears to lie within the site of the Norman motte and bailey Castle which is thought to have stood on the site Witchell, *pers comm.)*. Most of the deposits are layers with a few isolated cut features, including a mid-Saxon pit which contained a large amount of bone. The majority of animal bone came from two phases: Phase 3 is middle to late Saxon in date whilst Phase 4 spans the late Saxon to early medieval period and has been subdivided into an earlier (Phase 4a) phase dated to the 10th – 11th century and a later (Phase 4b) phase which is of 11th – 12th century origin. There is evidence for activity at the site from the early Roman period but pre-Saxon animal bone is scarce and does not warrant in depth analysis (Ingrem n.d). In addition to the more general faunal remains, a number of pieces of worked bone and antler were recovered which are the subject of a separate assessment report (see Appendix 2).

Methods

The assemblage was analysed in May 2013 using the authors' comparative collection and illustrative identification guides (Schmid, 1972; Hillson, 1996; Cohen and Serjeantson, 1996). Anatomical elements were identified to species where possible with the exception of ribs and vertebrae which were assigned to animal size categories. Mandibles and limb bones were recorded using the zonal method developed by Serjeantson (1996) to allow the calculation of the minimum number of elements (MNE) and individuals (MNI); this is based on the most numerous zone of a single element taking into account size. In addition, all bone fragments over 10mm were recorded to species or size category to produce a basic fragment count of the Number of Identified Specimens (NISP). Fragments categorised as large mammal are likely to belong to cattle or horse those in the medium mammal category to sheep/goat or pig.

The presence of gnawing, butchery and burning were recorded, together with the agent responsible. Measurements were taken according to the conventions of von den Driesch (1976) and Payne and Bull (1982) for mammals, and Cohen and Serjeantson (1996) for birds. Withers height was calculated for horse using the factor given by Kiesewalter (1888) and for cattle by combining the factors given for steers and cows by Matolcsi, 1970 (both in Boessneck & von den Driesch, 1974).

The wear stages of the lower cheek teeth of cattle, caprines and pig were recorded using the method proposed by Grant (1982) and age attributed according to the method devised by Payne (1973) for sheep/goat, Legge (1982) for cattle and O'Connor (1988) for pigs. The fusion stage of post-cranial bones was recorded and age ranges estimated according to Getty for cattle, sheep and pigs (1975). The fusion stage was also recorded for cats and the age range estimated according to Smith (1969).

A selected suite of elements was used to differentiate between sheep and goat (Boessneck, 1969; Payne 1985; Prummel & Frisch, 1986): the distal humerus, proximal radius, distal tibia, distal metapodials, astragalus, calcaneus and deciduous fourth premolar. No elements were positively identified to goat so for the purposes of this report the caprine remains are referred to as sheep in the text and in all tables except Animal bone table 1. Cat (*Felis spp.)* and goose *(Anser spp.)* bones were assigned to species on the basis of size and in comparison with modern reference skeletons.

Metrical data is given in Animal bone appendix 1 and 2 and where possible has been compared with data recovered from contemporary sites and held on the Animal Bone Metrical Archive Project (ABMAP) (http://archaeologydataservice.ac.uk/archives/view/abmap/).

Taphonomic considerations

The condition of the animal bones was recorded during the earlier assessment and indicates that most of the assemblage is in good condition with surface modifications such as butchery and gnawing preserved. Despite its good condition, the assemblage is still likely to be biased as a result of density mediated

taphonomic processes which preferentially destroy smaller and less dense bones. As a result, porous bones belonging to juvenile animals and the remains of small animals such birds and fish are almost certainly under-represented in comparison to the bones of large animals such as cattle and horse.

The type of features and areas excavated at a site can also cause considerable bias due to activity related disposal practices (Maltby, 1985a; 1985b). For instance, primary butchery activities are often carried out on the outskirts of settlements with the resulting waste disposed of in ditches, whereas waste from cooking and consumption tends to be disposed of in more central areas. Differences in cooking practices related to animal size can also influence deposition as the meat from medium size animals such as sheep and pig is more likely to be cooked on the bone, or even spit roasted whole, with the waste discarded in a convenient pit in the area where it was consumed.

The preservation conditions of a feature/context will also depend on the nature of the soil matrix, the pH and the degree of exposure to the elements and scavengers. As a result of their enclosed nature, pits offer better conditions for preservation than exposed ditches and layers and consequently small, fragile bones have a greater chance of survival. Most of the late Commercial Road material is from layers and therefore bones belonging to small and medium size animals are likely to have been preferentially destroyed and/or fragmented thereby reducing not only their survival, but also their identifiability.

Data

The assemblage comprises a total of 1,814 fragments of animal bone of which 30% are identifiable (Animal bone table 1). Phase 3 produced the largest sample although a much smaller proportion is identifiable compared with the samples from Phases 4a and 4b.

Most of the remains belong to the three major domestic mammals - cattle, sheep and pig. Pig is the most numerous species overall, followed by cattle and with sheep half as common. Minor domestic taxa include horse, dog, cat and galliform (probably domestic fowl). Some wild animals are also represented including several wild bird species.

Phase 3: Middle – Late Saxon
The assemblage recovered from Phase 3 consists of 777 specimens of which 19% (n=145) are identifiable (Animal bone table 1). According to the NISP figures, pig is the most numerous species comprising 50% of the major domestic mammal remains; cattle and sheep are more equally represented (Animal bone figure 1, i). However, the calculation of MNE and MNI is slightly contradictory as it shows that a minimum of two cattle, three sheep and two pigs are represented (Animal bone table 2). Dog is represented by three specimens: an atlas, scapula and humerus. Five bones belong to domestic fowl – two ulnas and three tarsometatarsals.

Red deer *(Cervus elaphus)* is represented by at least two pieces of worked antler. A few bones are from wild taxa including a mallard *(Anas platyrhynchos)* tarsometatarsus and a tibiotarsus belonging to a wader *(Charadriidae spp.)*. Fish are represented by a precaudal vertebra belonging to a cyprinid *(Cyprinidae spp.)* Three amphibian bones are also present but probably represent natural casualties of animals that became trapped in pits.

Anatomical representation for the major domestic taxa is shown in Animal bone table 3, i according to NISP and indicates that for cattle, sheep and pig elements from most parts of the body –head, major limbs and feet - are represented. This is supported by the calculation of MNE (Animal bone table 2).

Tooth eruption and wear data is extremely scarce with only one pig mandible able to provide an estimate of the age at death and this belonged to an immature pig (Animal bone table 4a). Epiphyseal fusion data is more numerous but is still based on a relatively small sample (Animal bone table 4b) so should be treated with caution although it suggests that most cattle were culled between the ages of 2 to 4 years, an age when they would have provided good quality beef. Sheep appear to have been slaughtered at the slightly younger age of between 1 and 3 years. In respect of pig, all the late fusing bones are unfused

indicating they were generally slaughtered in their first and second years. Canine teeth indicate that at least one boar and one sow are represented.

A small proportion (3%) of the bones has been gnawed with cattle, sheep and pig all affected (Animal bone table 5, i). A higher frequency (7%) display evidence for butchery in the form of cut and chop marks; chop marks are more numerous than cuts and are visible on a few bones belonging to the three major domestic mammals. A single large mammal specimen is calcined.

The entire assemblage came from pit deposits. Pit 714 contained a particularly large amount of material (NISP = 306) and included the remains of cattle, sheep, pig, dog, mallard, wader and domestic fowl as well as all seven fish bones from this phase.

Metrical data is given in the appendix and where possible has been compared with ABMAP (2003) data. The majority of specimens fall within the range recorded at contemporary sites. The exceptions are two pig bones which probably belonged to a large boar: an astragalus with a medial length 0.4mm longer and a scapula whose glenoid cavity is longer by 0.2 mm. These probably indicate the presence of large boar. An estimate of withers height is available from a cattle radius and suggests that one cow/steer was 1138.96mm at the shoulder (Animal bone table 7).

Phase 4a. Late Saxon-Early Medieval (10th – 11th century)
The assemblage recovered from Phase 4a deposits comprises 450 specimens of which 40% (n=181) are identifiable (Animal bone table 1). According to the NISP data, cattle and pig are fairly equally represented with sheep half as numerous. The calculation of MNE and MNI contradicts this and suggests that a minimum of 4 pigs, 3 cattle and 2 sheep are represented (Animal bone table 2). Two bones belonging to horse are present - a radius and a metatarsal. Dog is represented by a canine tooth and a metapodial.

In respect of wild animals, red deer *(Cervus elaphus)* is represented by a piece of antler and hare *(Lepus europaeus)* by a radius.

Several bones belong to domestic fowl. A goose (*Anser anser)* humerus and femur have been assigned to the wild variety on the basis of their relatively small size whilst a sternum is comparable with that belonging to a domestic bird. A coracoid, scapula, femur and tibiotarsus belonging to mallard *(Anas platyrhynchos*) and a coracoid to woodcock *(Scolopax rusticola)* are amongst the wildfowl remains. In addition, a thrush (*Turdidae spp*.) ulna and a raven *(Corvus corax*) carpometacarpus are present.

Both the NISP and MNE data indicate that bones from most parts of the body are present for cattle, sheep and pig (Animal bone tables 2 and 3). Similarly, the galliform assemblage contains elements from the head, wing, leg and feet.

Dental ageing data is again scarce. A single mandible provides evidence that one sheep died between the age of 2 to 3 years and a deciduous premolar is from an immature pig (Animal bone table 4a). A larger number of specimens can provide epiphyseal fusion data and this suggests that in contrast with the earlier phase, a considerable proportion (60%) of cattle survived into adulthood. However, the culling of sheep between the ages of 1 and 3 years continues as does the slaughter of pigs in their first and second years (Animal bone table 4b). A canine tooth belongs to a sow.

Gnaw marks are preserved on 4% of the assemblage with cattle, sheep and pig all affected (Animal bone table 5). Seven percent of the assemblage displays evidence for butchery in the form of cut and chop marks, most are visible on bones belonging to cattle and pig although a goose bone also has a cut mark. A small number of specimens have been burnt including two belonging to cattle and one to pig.

Almost two-thirds of the assemblage came from layers and most of the remainder was recovered from pits; a small number of specimens are from post holes and other features (Animal bone table 6, i). Sheep and pig show a higher representation in the pits when compared with cattle. All the goose and the

majority of domestic fowl remains came from pits but most of the other bird bones were recovered from layers. A posthole (515) produced the hare radius.

Metrical data is given in the appendix and most fall within the range recorded at contemporary sites held on the ABMAP (2003) database. The exceptions are a cattle metacarpal with a distal breadth at the point of fusion smaller by 2.8mm and a horse radius with a distal breadth 2.3mm larger; in addition a sheep scapula which has a proximal length longer by 5.4 mm probably belonged to a large ram.

Phase 4b. Late Saxon – Early Medieval (11th -12th century)
A total of 576 specimens were recovered from Phase 4b deposits of which 39% (225) are identifiable. Horse, cattle, sheep, pig and dog are all present as was the case in Phase 4a but the proportion of pig is higher according to both the NISP (Animal bone table 1) and MNI data (Animal bone table 2). Cat is represented by two right tibiae and a humerus; the size of one tibia suggests it belonged to a domestic cat. Domestic fowl and domestic goose are also present as indicated by the size of a tibiotarsus and a tarsometatarsus belonging to the later.

Wild animals include mole *(Talpa europea),* badger *(Meles meles)*, mallard and pigeon/dove *(Columba spp.)*.

Cattle, sheep and pig are again represented by elements from most parts of the skeleton (Animal bone tables 2 and 3). According to the calculation of MNE major hind limbs belonging to cattle are more numerous than fore limb bones whilst for pig the humerus and radius are the most frequent elements. Horse is represented by a few bones (radius, tibia, astragalus and two lateral metapodials). The only dog bone is a metapodial. Most of the domestic fowl bones are from the wing or leg although a sternum is present.

Dental ageing data is again scarce, particularly in respect of cattle and sheep. A lower third molar indicates that one cow/steer died between the ages of 26 and 36 months whilst a mandible indicates one sheep was aged between 12 and 36 months. Five pig mandibles provide ageing data and all are from adults although an isolated deciduous premolar is from an immature animal. As was the case in Phase 4a, epiphyseal fusion data indicates that most (62%) cattle survived into adulthood. The number of bones able to provide ageing data for sheep is small but suggests that half were culled before reaching 2 years of age and that the other half were older than three and a half years. The bone data contradicts that obtained from tooth eruption and wear as once again it suggests that most pigs died between the ages of 1 and 2 years. Eight canine teeth belong to boars and three to sows.

A cat humerus and tibia with unfused proximal epiphyses belong to immature animal(s) below 1-2 years. The presence of immature domestic fowl is also indicated by the recovery of a few unfused/porous bones.

A higher proportion (8%) of bones from this phase display evidence for gnawing with horse, cattle, sheep and pig all affected. The proportion of butchered bones (7%) remains the same in all three phases with the majority of specimens chopped rather than cut. The only evidence for burning comes from a single calcined fragment belonging to a large size mammal (Animal bone table 5).

Most (93%) of the material was recovered from layers including all of the wild taxa; the remainder is from pit contexts (Animal bone table 6, ii). Layer 524 produced several of the more unusual specimens including the dog metapodial, cat humerus, a goose tarsometatarsus, the probable teal scapula and several domestic fowl bones. The horse astragalus came from a pit context (706) as did one of the cat tibiae (516).

Metrical data is given in the appendix and all measurements fall within the range recorded at contemporary sites and held on the ABMAP database (2003). An estimate of withers height is available from a cattle metacarpal and a horse radius and suggests that one cow/steer stood 1098.65 mm at the shoulder and a horse was 14.25 hands or 1443.05mm high at the shoulder (Animal bone table 7).

Discussion and interpretation

The assemblage of animal bone recovered from Commercial Road Substation is relatively small so cannot provide detailed information on all aspects of the animal husbandry regimes. However, assemblages of animal bone from Saxon sites in Gloucestershire are scarce, particularly compared with other regions and therefore the information it provides makes a valuable addition to the existing database.

As is usual for sites of this period, the assemblage is dominated by the three main domestic livestock taxa - cattle, sheep, pigs (O'Connor, 2010: 366). Contradictions between the NISP and MNI data for the earlier phases most probably reflect the relatively small size of the samples since MNI has a tendency to exaggerate the relative frequency of less common taxa. Consequently, in an assemblage of this size the NISP data is likely to be more reliable.

The overall predominance of pig is interesting as it contrasts with evidence recovered from contemporary assemblages in the region such as Bishop's Cleeve (Powell, 2007) and also the high status site at Holm Hill, Tewkesbury where there was a heavy reliance on sheep (Parry, 1997). A recent review by Matilda Holmes (*pers comm*.) for English Heritage shows a predominance of pig occurs at several early – late Saxon and Norman sites many of which are either religious or high status settlements including Aelfrics Abbey, Eynsham, Oxfordshire (Ayres et al, 2004) and Stafford Castle (Sadler & Jones, 2007). At some of these sites the frequency of pig reaches 70% which is much higher than those seen at Commercial Road; even so the predominance of pig coupled with the variety of wild animals still suggests that relatively wealthy individuals occupied the settlement.

At other sites, including some urban centres that have produced large assemblages of animal bone such as Southampton (Bourdillon, 2004) and York (O'Connor, 1994), cattle and sheep are more numerous than pig. However, Albarella (2006) believes that when variations in animal weight are taken into consideration there is little doubt that pork was generally eaten more often than lamb and mutton during the early medieval period. As a result, it has been suggested that the Saxon period was "the heyday of swine production" and was followed by a slow decline in pork consumption from the 11th century onwards (*ibid,* 2006: 73). At Commercial Road, the frequency of cattle increases during Phase 4a at the expense of pig, although during Phase 4b it returns to its former level once again. Whilst it is possible that this chronological variation reflects an increase in the amount of beef consumed during Phase 4a, given the relatively small size of the samples it may equally represent differential disposal practices and sampling bias. In which case, the continuing high frequency of pig that is apparent in Phase 4b suggests that any changes in animal husbandry must have taken place during or after the 12th century, a pattern also noted by Sykes (2001).

Pig husbandry relied heavily on the exploitation of woodland and the right to exploit demesne woodland for pannage is thought to have been in existence since the 7th century up until the end of the Middle Ages. It was often a communal affair with swineherds collecting pigs from different owners and driving them to woodland areas where they might spend two or three days during autumn and early winter. At other times of year, pigs may have been kept in back yards and fed household waste, cereals, legumes and occasionally grazed on pasture (Albarella, 2006: 77).

Pigs provide few secondary products, other than bristles and manure, so would generally have been slaughtered once they reached their optimum meat weight, which the bone epiphyseal fusion data indicates was before the end of their second year. The discrepancy that exists between dental and bone data may be related to diet since canine teeth indicate that males were more numerous than females and it is unlikely that excess males (other than those required for breeding purposes) were kept into adulthood. It is more likely that the diet of the pigs represented at Commercial Road included a component that resulted in heavier than normal toothwear. Evidence from contemporary settlements also indicates that most pigs were sub-adult or immature which is unsurprising since, according to Albarella (2006: 83) "pigs were believed to make the best porkers and baconers when they were rising two".

Body part representation suggests that as with the other domestic food mammals, pigs generally arrived at the site on the hoof as whole carcasses although during Phase 4 the high frequency of fore limb bones

suggests that some pork joints may have been imported. This agrees with the pattern noted by Albarella (2006: 84) at contemporary sites and the suggestion that demesne production was aimed at local consumption and self sufficiency.

Interpretations concerning animal mortality should be treated with caution due to the small sample sizes, especially that relating to Phase 3 when it appears that cattle and sheep husbandry practices were generally focused on meat production. If the data can be relied upon then it is probably a reflection of the high status of the site and the ability of its inhabitants to demand high quality meat. This is because during the Saxon period, the need for traction (O'Connor, 2010: 372) meant there was tendency to place a high value on fit young adult cattle that were in their physical prime and consequently most meat was derived from older animals. This is illustrated at Castle Mall, Norwich (Albarella *et al* 2009: 40) where during the late Saxon and early medieval times most cattle were killed when adult or elderly, when older than approximately 3–5 years. Older cattle were probably multi-purpose animals that provided milk, manure and traction before being slaughtered for meat and raw material such as horn and leather. At Commercial Road, the demand for traction and other secondary products is probably reflected in the increasing proportion of cattle that reached adulthood during both the 10th-11th and 11th -12th centuries.

In general, a relatively low proportion of old sheep are found at Saxon sites suggesting that wool production was not the overriding aim of sheep husbandry (O'Connor, 2010: 373). This appears to have been the case at Commercial Road although there is evidence to suggest some sheep lived to a slightly older age during the 11th/12th centuries, probably due to an increasing demand for wool and manure. The increasing demand for wool is also apparent at Bishop's Cleeve (Powell, 1997), Gloucestershire where the predominance of adult cattle and sheep was interpreted as flocks kept primarily for their wool and dairy herds.

Horses would have been valued as providers of transport and either died from natural causes or were slaughtered at the end of their working lives. Their remains are generally present in small numbers at Saxon sites (O'Connor, 2010: 366) as is the case at Holm Hill (Parry, 1997) and Stafford Castle (Sadler, 2011:170). According to Sadler *(ibid*) over 13 hands is a good size for medieval horse which suggests the late Saxon/early Medieval (Phase 4b) horse from Commercial Road, with its withers height of 14.25 hands, may have been quite sought after.

Dogs and cats are also common components of Saxon assemblages and would have been kept as working animals, to control vermin, for fur and as pets although some feral animals may also have livid in the vicinity of human habitation sites in order to exploit the rich pickings they offered. The recovery of dog and cat remains in not unusual at sites of this period and both were identified at Bishop's Cleeve (Powell, 1997) and Stafford Castle (Sadler, 2011). At Commercial Road, dogs were probably present in greater numbers than their remains suggests judging by the frequency of gnaw marks preserved on the bones of domestic mammals.

Evidence for immature domestic fowl suggests chickens were raised at the settlement (Serjeantson, 2006: 140) as may have been the case for geese. Domestic geese and fowl provided meat, eggs and feathers and their remains are also commonly found on sites of this period including those at Holm Hill and Bishop's Cleeve where Powell (1997) suggested they were probably penned or kept among the houses. From the 11th or 12th century there is evidence for dovecotes (*ibid:* 141), which might explain the presence of the pigeon/dove at Commercial Road.

The presence of several wild animal species as mentioned above, lends support to the suggestion that the settlement was relatively high status even though the only evidence for deer comes from a few pieces of antler. Most of these have been worked and all could be derived from naturally shed antlers that were collected, rather than being removed from animals caught by hunting.

The settlement at Commercial Road has parallels with the high status site at Holm Hill, Gloucestershire (Parry, 1997) since it too produced specimens belonging to deer and hare as well as a single fish bone. A much wider range of wild species was recovered from Phase 2 deposits at Stafford Castle but it included deer, hare, mallard, woodcock, dove/pigeon and thrush – all of which are present at Commercial

Road. Hares would have been acquired by hunting and their meat would have made a welcome addition to the diet. Wild bird remains are mostly found at wealthier sites with woodcock and thrush amongst the most favoured taxa during the late Saxon and early medieval periods (Serjeantson, 2006: 138-142). Woodcock can be found in a variety of habitats including woodland, marshy ground and more open country (Heinzel *et al,* 1998) whilst mallard and freshwater fish would have been available on and in local rivers and streams. The remains of these small animals are almost certainly under-represented in the assemblage at Commercial Road compared with the bones of larger animals given the taphonomic factors discussed above and the absence of sieved samples.

Badger, raven and mole probably represent animals that died of natural causes although it is possible that the two foremost mentioned were exploited for fur and feathers respectively.

Butchery marks provide a clear indication that dismemberment generally took place using a heavy blade to chop the carcass into manageable pieces.

At Stafford Castle, Phase 2 (c.1070-c1325) cattle were of the small size typical of the medieval period (Sadler *et al*., 2011 :165) standing only a little over 1m (1.06m and 1.14m) at the shoulder; very similar estimates of withers height have been obtained from Phase 3 (1.09m) and Phase 4b (1.13m) specimens at Commercial Road. This is considerably smaller than indicated for late Saxon and early medieval cattle at Castle Mall, Norwich (Albarella et al, 2009: 43) where the range of withers height was estimated at 1.6m to 1.96m. Late Saxon and medieval cattle from Castle Mall are similar in size to animals from other medieval sites in central England, but larger than cattle in more marginal areas such as Cornwall (*ibid*) and it appears also the West Midlands which, according to Armitage (1982) might reflect the Saxons' introduction of the heavy plough.

Conclusions

In terms of taxa representation the assemblage of animal bone from Commercial Road Substation displays a very similar pattern to that seen at high status settlements in other regions of England. The consumption of high quality meat is evidence by the relatively high frequency of pig remains and the fact that most cattle and sheep died at an age when they would have provided prime beef and mutton. The range of wild animals also suggests that the site may have been occupied by relatively wealthy and/or powerful individuals. There is little evidence for chronological change in terms of taxa representation as the relatively higher incidence of cattle during the middle phase is more likely to be a function of the small sample size combined with the effects of differential disposal. However, there is some evidence to suggest that cattle and sheep were living longer in the later phases which was probably due to the increasing demand for traction and wool.

Animal bone table 1: Taxa representation according to phase (NISP)

	Phase			Total
	3	4a	4b	
Horse		2	5	7
Cattle	28	53	59	140
Sheep/goat	17	25	38	80
Sheep	5	3	3	11
Pig	49	49	91	189
Dog	3	2	1	6
Cat			3	3
Talpa europea			1	1
Meles meles			1	1
Cervus elaphus	2	1		3
cf Cervus elaphus	3			3
Lepus europaeus		1		1
Lagomorph		1		1
Amphibian	3			3
Bird	9	8	3	20
Anser anser		3	2	5
Anas platyrhynchos	1	4	1	6
cf.Anas creca			1	1
Anas/Aythya spp.		1		1
Galliform	5	12	11	28
?galliform		3	1	4
Scolopax rusticola		1		1
cf. Charadriidae sp	1			1
Columba spp.			1	1
Turdidae spp.		1		1
Corus corax		1		1
Bird	9	8	3	20
Cyprinidae spp	1			1
Fish	6	2		8
Large mammal	127	108	154	389
Medium mammal	78	68	94	240
Small mammal			1	1
Unidentifiable	430	101	105	636
Total	777	458	579	1814
Total identifiable	145	181	225	548
% identifiable	19	40	39	30

Animal bone table 2: Minimum number of elements (NME) and individuals (MNI)

i) Phase 3

	Cattle		Sheep		Pig	
	Left	Right	Left	Right	Left	Right
Mandible					2	
Scapula	1	2	1		1	1
Humerus						
Radius	1	1	1	1	2	
Ulna	1	1		1		
Pelvis	1	2	1			1
Femur	1		3	2	1	
Tibia	1	1				
Astragalus					1	2
Calcaneus				1	1	2
Metacarpal		2		1		
Metatarsal	1					
Metapodial						
MNE	7	9	6	6	8	6
MNI	2		3		2	

ii) Phase 4a

	Cattle		Sheep		Pig	
	Left	Right	Left	Right	Left	Right
Mandible	1	1			1	
Scapula			1		2	
Humerus	1	1		1	3	1
Radius	1	2	2	3	2	1
Ulna	1	1	2	1	1	1
Pelvis	1	1		1	1	2
Femur					1	4
Tibia		1	1	1	3	2
Astragalus	1					1
Calcaneus		2	1	1		
Metacarpal	1					
Metatarsal		1	2	1		
Metapodial						
MNE	7	10	9	9	14	12
MNI	2		3		4	

Animal bone table 2 (continued).

iii)Phase 4b

	Cattle		Sheep		Pig	
	Left	Right	Left	Right	Left	Right
Mandible				1	2	3
Scapula	2	1	2	1	2	
Humerus	1	1		1	5	3
Radius	1	2	1	3	2	5
Ulna				1	2	3
Pelvis	3	1	3	2		1
Femur	3	2	1	2		2
Tibia	3	2	3	2	1	1
Astragalus		1			1	
Calcaneus	1					2
Metacarpal		2	1			
Metatarsal	1	1		1		
Metapodial						
MNE	15	13	11	14	15	20
MNI	3		3		5	

Animal bone table 3: Anatomical representation of major domestic mammals (NISP).

i) Phase 3

	Cattle	Sheep	Pig	Dog
Horn core	1	1		
Frontal	1		1	
Zygomatic	1			
Occipital condyl			1	
Maxilla			2	
Mandible			2	
Incisor	1	2	4	
Lower Premolar			4	
Lower molar	1		1	
Atlas	2			1
Axis	1	2		
Scapula	4	1	3	1
Humerus		1		1
Radius	3	1	3	
Ulna	2		1	
Pelvis	3	1	1	
Femur	2	5	2	
Patella			2	
Tibia	2	2		
Fibula			1	

Animal bone table 3 (continued)

Astragalus		1	3	
Calcaneus		1	3	
Metacarpal	1	1		
Metatarsal	1			
Lateral metapodial			3	
1st phalanx	1	1	1	
2nd phalanx	1	1	1	
3rd phalanx			2	
Metapodial			1	
Pisiform			1	
Sacrum		1		
Skull fragment			5	
Tooth fragment			1	
Total	28	22	49	3

ii) Phase 4a

	Cattle	Sheep	Pig
Horn core	3		
Frontal	1		
Zygomatic	1		
Maxilla	1		
Mandible	2	1	1
Incisor	2		1
Canine			2
Upper premolar	1		
Upper molar	6	1	
Lower premolar			2
Lower molar	2	1	1
Atlas			1
Hyoid	1		
Scapula	1	1	2
Humerus	4	2	5
Radius	3	5	3
Ulna	3	3	2
Pelvis	2	1	4
Femur			7
Tibia	1	5	8
Fibula			2
Astragalus	1	1	1
Calcaneus	2	2	
Navicular cuboid	1		
Lunate	1		
Magnum	1		
Scaphoid	1		
Unciform	1		

Animal bone table 3 (continued)

External & middle cuneiform	1		
Metacarpal	3		
Metatarsal	2	3	
Metapodial			4
1st phalanx	1	2	1
2nd phalanx	2		
3rd phalanx			1
Tooth fragment	2		1
Total	53	28	49

iii) Phase 4b

	Horse	Cattle	Sheep	Pig
Frontal				1
Maxilla				3
Mandible		1	1	8
Incisor			1	5
Canine				8
U. Premolar		1		
Upper molar		2	1	1
L. Premolar		1	1	2
Lower molar		2	2	1
Atlas				1
Axis			2	1
Hyoid		1		
Scapula		3	4	4
Humerus		2	1	10
Radius	1	7	6	8
Ulna			1	7
Pelvis		7	6	1
Femur		8	3	3
Tibia	1	8	7	3
Fibula				3
Astragalus	1	1		1
Calcaneus		1		2
Metacarpal		3	3	
Metatarsal		3	1	
Metapodial				9
Lateral metapodial	2			4
1st phalanx		3	1	3
2nd phalanx		3		1
3rd phalanx		1		
Tooth fragment		1		
Skull fragment				1
Total	5	59	41	91

Animal bone table 4a: Estimated age according to tooth eruption and wear data (NISP)

	P4	M1	M2	M3	Estimated age
Phase 3					
Pig	(f)	d	E		Immature
Phase 4a					
Sheep		g	f	c	2-3 years
Pig	(d)				Immature
Phase 4b					
Cattle				e	26-36 months
Sheep	(n)	g	d		12-36 months
Pig	a	e	c		Adult
Pig	a	k	c		Adult
Pig		f	c	b	Adult
Pig		g	f	b	Adult
Pig			e	c	Adult
Pig	(k)				

** ( ) = deciduous tooth*

Animal bone table 4b: Estimated age according to tooth eruption and wear data (NISP)

i) Phase 3

Cattle		Fus-ed	Unfus-ed	%un-fused
7-10 month	Scapula			
"	Pelvis			
Subtotal< 1yr				**0**
12-15 month	Radius,p	1		
15-18 month	Phalanx II	1		
15-20 month	Humerus,d			
20-24 month	Phalanx I	1		
Subtotal< 2yrs		**4**	**0**	**0**
24-30 month	Tibia,d	1	1	
"	Metacarpal			
"	Metatarsal			
Subtotal< 3yrs		**1**	**1**	**50**
36 month	Calcaneus			
36-42 month	Femur,p		1	
42-48 month	Humerus,p			
"	Radius,d	1	1	
"	Ulna,p		1	
"	Femur,d			
"	Tibia,p			
Subtotal< 4yrs		**1**	**3**	**75**

Sheep		Fus-ed	Unfus-ed	%un-fused
3-4 month	Humerus,d			
"	Radius,p	1		
5 month	Scapula			
"	Pelvis			
5-7 month	Phalanx II	1		
7-10 month	Phalanx I	1		
Subtotal< 1yr		**3**	**0**	**0**
15-20 month	Tibia,d	1	1	
20-24 month	Metacarpal			
"	Metatarsal			
Subtotal< 2yrs		**1**	**1**	**50**
36 months	Calcaneus		1	
Subtotal< 3yrs		**0**	**1**	**100**
36-42 month	Femur,p		3	
42 month	Humerus,p			
"	Radius,d		1	
"	Ulna,p			
"	Femur,d		1	
"	Tibia,p			
Subtotal< $3^1/_2$yr		**0**	**5**	**100**

Pig		Fus-ed	Unfus-ed	%un-fused
12 month	Scapula	2		
"	Humerus,d			
"	Radius,p	3		
"	Pelvis	1		
"	Phalanx II	1		
Subtotal< 1yr		**5**	**0**	**0**
24 month	Tibia,d			
"	Metapodial		1	
"	Phalanx I		1	
Subtotal< 2yrs		**0**	**2**	**100**
24-30 month	Calcaneus		3	
Subtotal< 3yrs		**0**	**3**	**100**
36-42 month	Ulna,p		1	
"	Femur,p			
42 month	Humerus,p			
"	Radius,d		2	
"	Femur,d		1	
"	Tibia,p			
Subtotal< $3^1/_2$ yrs		**0**	**4**	**100**

Animal bone table 4b (continued)

ii) Phase 4a

Cattle		Fus-ed	Unfus-ed	%un-fused
7-10 month	Scapula			
"	Pelvis			
Subtotal< 1yr				
12-15 month	Radius,p			
15-18 month	Phalanx II	2		
15-20 month	Humerus,d	2		
20-24 month	Phalanx I		1	
Subtotal< 2yrs		**4**	**1**	**20**
24-30 month	Tibia,d	1		
"	Metacarpal	1	1	
"	Metatarsal			
Subtotal< 3yrs		**2**	**1**	**33**
36 month	Calcaneus	1	1	
36-42 month	Femur,p			
42-48 month	Humerus,p			
"	Radius,d	1		
"	Ulna,p	1	1	
"	Femur,d			
"	Tibia,p			
Subtotal< 4yrs		**3**	**2**	**40**

Sheep		Fus-ed	Unfus-ed	%un-fused
3-4 month	Humerus,d	1		
"	Radius,p	3		
5 month	Scapula	1		
"	Pelvis	1		
5-7 month	Phalanx II			
7-10 month	Phalanx I	1	1	
Subtotal< 1yr		**7**	**1**	**13**
15-20 month	Tibia,d	2	1	
20-24 month	Metacarpal			
"	Metatarsal			
Subtotal< 2yrs		**2**	**1**	**33**
36 month	Calcaneus		2	
Subtotal< 3yrs		**0**	**2**	**100**
36-42 month	Femur,p			
42 month	Humerus,p			
"	Radius,d			
"	Ulna,p	1		
"	Femur,d			
"	Tibia,p			
Subtotal< $3^1/_2$ yrs		**1**	**0**	**0**

Pig		Fus-ed	Unfus-ed	%un-fused
12 month	Scapula	2		
"	Humerus,d		1	
"	Radius,p	2		
"	Pelvis	1		
"	Phalanx II			
Subtotal< 1yr		**5**	**1**	**17**
24 month	Tibia,d	1	2	
"	Metapodial		2	
"	Phalanx I		1	
Subtotal< 2yrs		**1**	**5**	**83**
24-30 month	Calcaneus			
Subtotal< 3yrs				
36-42 month	Ulna,p		1	
"	Femur,p		1	
42 month	Humerus,p		1	
"	Radius,d			
"	Femur,d		5	
"	Tibia,p		2	
Subtotal< $3^1/_2$ yrs			**10**	**100**

Animal bone table 4b (continued)

iii) Phase 4b

Cattle		Fus-ed	Unfus-ed	%un-fused
7-10 month	Scapula	2		
"	Pelvis	1		
Subtotal< 1yr		**3**		**0**
12-15 month	Radius,p	2		
15-18 month	Phalanx II	3		
15-20 month	Humerus,d			
20-24 month	Phalanx I	2	1	
Subtotal< 2yrs		**7**	**1**	**13**
24-30 month	Tibia,d	2	1	
"	Metacarpal	2		
"	Metatarsal			
Subtotal< 3yrs		**4**	**1**	**20**
36 month	Calcaneus			
36-42 month	Femur,p	4	1	
42-48 month	Humerus,p			
"	Radius,d	1	1	
"	Ulna,p			
"	Femur,d			
"	Tibia,p		1	
Subtotal< 4yrs		**5**	**3**	**38**

Sheep		Fus-ed	Unfus-ed	%un-fused
3-4 month	Humerus,d			
"	Radius,p	3		
5 month	Scapula	3		
"	Pelvis	2		
5-7 month	Phalanx II			
7-10 month	Phalanx I	1		
Subtotal< 1yr		**9**	**0**	**0**
15-20 month	Tibia,d	1		
20-24 month	Metacarpal		1	
"	Metatarsal			
Subtotal< 2yrs		**1**	**1**	**50**
36 month	Calcaneus			
Subtotal< 3yrs				
36-42 month	Femur,p			
42 month	Humerus,p			
"	Radius,d			
"	Ulna,p			
"	Femur,d	1		
"	Tibia,p	1	2	
Subtotal< $3^1/_2$ yrs		**2**	**2**	**50**

Pig		Fus-ed	Unfus--ed	%un-fused
12 month	Scapula	1	1	
"	Humerus,d	1	2	
"	Radius,p	4	1	
"	Pelvis	1		
"	Phalanx II		1	
Subtotal< 1yr		**7**	**5**	**42**
24 month	Tibia,d		1	
"	Metapodial	1	5	
"	Phalanx I		3	
Subtotal< 2yrs		**1**	**9**	**90**
24-30 month	Calcaneus		1	
Subtotal< 3yrs		**0**	**1**	**100**
36-42 month	Ulna,p		2	
"	Femur,p			
42 month	Humerus,p			
"	Radius,d		1	
"	Femur,d		1	
"	Tibia,p		2	
Subtotal< $3^1/_2$ yrs		**0**	**6**	**100**

Animal bone table 5: Incidence of taphonomy (NISP)

i) Phase 3

	Gnawed		Butchered					Burnt	
	n	*%*	chop	cut	cut/chop	n	*%*	calcined	*%*
Cattle	2	*7*	2			2	*7*		
Sheep	1	*6*	1	1	1	3	*18*		
Pig	3	*6*	3	1		4	*8*		
Large mammal	1	*1*	7	3		10	*8*	1	*1*
Medium mammal	2	*3*		1		1	*1*		
Total	9	*3*	13	6	1	20	*7*	1	*<1*

ii) Phase 4a

	Gnawed		Butchered						Burnt			
	n	*%*	chop	cut	cut/chop	n	*%*	calcined	charred	part charred	n	*%*
Cattle	3	*6*	1	1	1	3	*6*			1	1	*2*
Sheep	4	*16*										
Pig	1	*2*	2	3		5	*10*		1		1	*2*
Anser anser			1			1	*33*					
Large mammal	2	*2*	4	1		5	*5*	1	2		3	*3*
Medium mammal	1	*1*	5	1		6	*9*	1	1		2	*3*
Total	11	*4*	13	6	1	20	*7*	2	4	1	7	*2*

iii) Phase 4b

	Gnawed		Butchered					Burnt	
	n	*%*	chop	cut	cut/chop	n	*%*	charred	*%*
Horse	2	*40*							
Cattle	13	*22*	5	1	2	8	*14*		
Sheep	8	*21*	1	1	1	3	*8*	1	*2*
Pig	10	*11*		3	1	4	*4*		
Anser anser				1		1	*50*		
Large mammal	4	*3*	9			9	*6*	1	*1*
Medium mammal			3	2		5	*5*		
Total	37	*8*	18	8	4	30	*7*	2	*<1*

Animal bone table 6: Taxa representation according to feature type (NISP)

i) Phase 4a

	Layer	Pit	Feature	Posthole	Total
Horse	2				2
Cattle	42	5	3	3	53
Sheep	20	5	3		28
Pig	26	17	2	4	49
Dog	2				2
Cervus elaphus	1				1
Lepus europaeus				1	1
Lagomorph		1			1
Anser anser		3			3
Anas platyrhynchos	4				4
Anas/Aythya spp.	1				1
Galliform	3	9			12
?galliform	1	2			3
Fish	2				2
Scolopax rusticola	1				1
Turdidae spp.	1				1
Corvus corax	1				1
Bird	3	4	1		8
Large mammal	70	32	4	2	108
Medium mammal	36	31		1	68
Total	216	109	13	11	349
%	62	31	4	3	

ii) Phase 4b

	Layer	Pit	Total
Horse	4	1	5
Cattle	48	11	59
Sheep	34	7	39
Pig	70	21	91
Dog		1	1
Cat	1	2	3
Talpa europea	1		1
Meles meles	1		1
Anser anser	1	1	2
Anas platyrhynchos	1		1
cf.Anas creca		1	1
Galliform	7	4	11
?galliform		1	1
Columba spp.	1		1
Bird	1	2	3
Large mammal	127	27	154
Medium mammal	71	23	94
Small mammal		1	1
Total	368	103	471
%	*78*	*22*	

Animal bone table 7: Withers height estimate (NISP)

Species	Element	GLmm	Phase	Factor	Estimated withers height (mm)
Cattle	Radius	255.5	3	4.3	1098.65
Cattle	Metacarpal	184	4b	*6.19	1138.96
Horse	Radius	332.5	4b	4.34	1443.05

** mean of factors given for cow and steer*

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Animal bone appendix 1: Metrical data for mammals

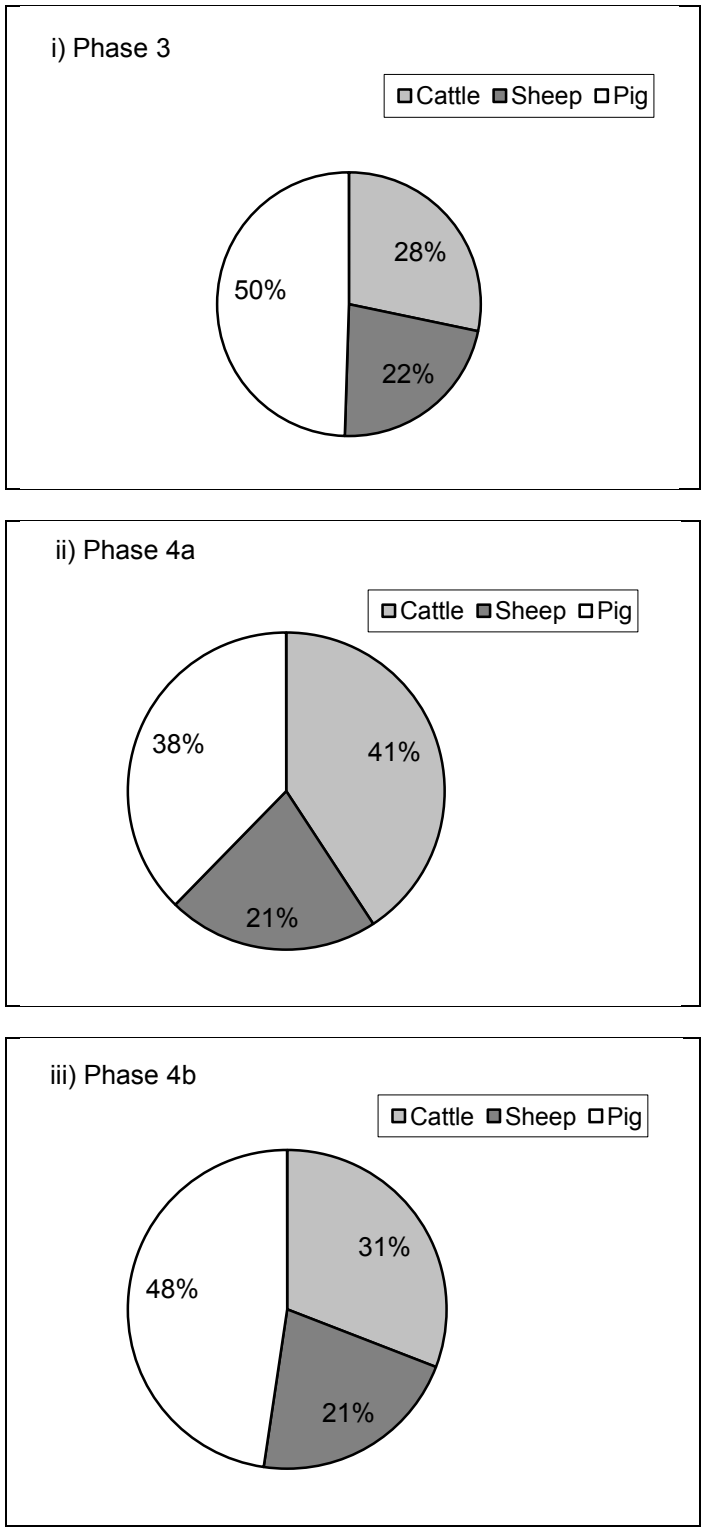
Phase	Taxa	Element	Measurement						
			GLl	*GLm*	*Lmt*	*GB*			
4a - Late Saxon/ early med	Cattle	Astragalus		56.3					
4b - Late Saxon/ early med	Cattle	Astragalus	56.1	52.6					
3 Middle-Late Saxon	Sheep	Astragalus	28.2	27.4					
4a - Late Saxon/ early med	Sheep	Astragalus	25.3	25.5					
3 Middle-Late Saxon	Pig	Astragalus	39.6	37					
3 Middle-Late Saxon	Pig	Astragalus		40.5					
4a - Late Saxon/ early med	Pig	Astragalus	35.1	34					
			GH	GB	BFd	LmT			
4b - Late Saxon/ early med	Horse	Astragalus	61	56.7	62.5	50.6			
			DC						
4b - Late Saxon/ early med	Cattle	Femur	35.3						
4b - Late Saxon/ early med	Cattle	Femur	40.5						
			max	*min*					
4a - Late Saxon/ early med	Cattle	Horn core	46.1						
3 Middle-Late Saxon	Sheep	Horn core	34.5	20					
			SD	*Bd*					
4a - Late Saxon/ early med	Cattle	Humerus	32.3						
3 Middle-Late Saxon	Dog	Humerus	10.7						
4a - Late Saxon/ early med	Sheep	Humerus		28.7					
			GL	*Bp*	*Dp*	*SD*	*Bd*	B@f	
3 Middle-Late Saxon	Cattle	Metacarpal					65.7	55.5	
4a - Late Saxon/ early med	Cattle	Metacarpal					42.9	40	
4b - Late Saxon/ early med	Cattle	Metacarpal	184	49.1	31.4	26.4	51.5	45.6	
4b - Late Saxon/ early med	Cattle	Metacarpal		49.3	31				

4b - Late Saxon/ early med	Cattle	Metacarpal					51.4	47.4	
4b - Late Saxon/ early med	Sheep/goat	Metacarpal		22.3	16.9	13.8			
3 Middle-Late Saxon	Cattle	Metatarsal		42.2	42.7				
4b - Late Saxon/ early med	Cattle	Metatarsal		39.7					
4a - Late Saxon/ early med	Horse	Metatarsal		48.9	41.2				
4a - Late Saxon/ early med	Sheep/ goat	Metatarsal		17.8	19.2	10.5			
4b - Late Saxon/ early med	Sheep/goat	Metatarsal		20.2	21.5	11.7			
			LA						
3 Middle-Late Saxon	Pig	Pelvis	34.8						
4a - Late Saxon/ early med	Pig	Pelvis	33.5						
4b - Late Saxon/ early med	Sheep/goat	Pelvis	25.5						
			GL	*L2/GLM*	*Bp*	*BFp*	*SD*	*Bd*	*BFd*
3 Middle-Late Saxon	Cattle	Radius	255.5		71.3	65.7	34.4	53	48.7
4b - Late Saxon/ early med	Cattle	Radius						57.4	43.9
4a - Late Saxon/ early med	Horse	Radius						80.1	67.6
4b - Late Saxon/ early med	Horse	Radius	332.5		74.4	69.8	35.7	70	58.2
4b - Late Saxon/ early med	Sheep	Radius			30.1	27.1			
3 Middle-Late Saxon	Pig	Radius			28.1		15.9		
3 Middle-Late Saxon	Pig	Radius			30.5				
3 Middle-Late Saxon	Pig	Radius			31.6				
4a - Late Saxon/ early med	Pig	Radius			28		16.6		
4b - Late Saxon/ early med	Pig	Radius			24.6				
4b - Late Saxon/ early med	Pig	Radius			26.2				
4b - Late Saxon/ early med	Pig	Radius			26.7				
4b - Late Saxon/ early med	Pig	Radius					16.3		
4a - Late Saxon/ early med	Sheep/ goat	Radius					16.8		
4b - Late Saxon/ early med	Sheep/goat	Radius					14.8		
4b - Late Saxon/ early med	Sheep/goat	Radius					14		
4a - Late Saxon/ early med	Lepus europaeus	Radius			9.7				
			GLP	*BG*	*LG*	*SLC*			
4b - Late Saxon/ early med	Cattle	Scapula	60.1		41.3	46.1			
3 Middle-Late Saxon	Dog	Scapula		14.4					
3 Middle-Late Saxon	Pig	Scapula	39.3	27.7	34				
3 Middle-Late Saxon	Pig	Scapula		25.8		22.8			
4a - Late Saxon/ early med	Pig	Scapula				20.5			
4b - Late Saxon/ early med	Pig	Scapula	34.1		25.5				
4a - Late Saxon/ early med	Sheep/goat	Scapula	32.1	21.1	25.5	18.6			
4b - Late Saxon/ early med	Sheep/goat	Scapula				17.3			
4b - Late Saxon/ early med	Sheep/goat	Scapula				18.6			
			SD	*Bd*	*Dd*				
3 Middle-Late Saxon	Cattle	Tibia		52.8	38.3				
4a - Late Saxon/ early med	Cattle	Tibia			41.4				
4b - Late Saxon/ early med	Cattle	Tibia		55	41.3				
4b - Late Saxon/ early med	Cattle	Tibia		55.1	40.9				
4b - Late Saxon/ early med	Horse	Tibia	37.6	66.9	42.9				
3 Middle-Late Saxon	Sheep	Tibia		25.7	19.8				
4b - Late Saxon/ early med	Sheep	Tibia	13.6	25	18.4				

4a - Late Saxon/ early med	Pig	Tibia	20	30.1	26.7				
4a - Late Saxon/ early med	Pig	Tibia	18.2						
4a - Late Saxon/ early med	Sheep/goat	Tibia		26.5	20				
4a - Late Saxon/ early med	Sheep/goat	Tibia		29.1	21.4				

Animal bone appendix 2: Metrical data for birds

Phase	*Taxa*	*Element*	*Measurement*					
			SC	*Dd*				
			GL	*Bp*	*DiD*			
4a - Late Saxon/ early med	*Galliform*	Carpometacarpus	35	10.2	6.6			
			GL	*Lm*	*Bf*			
4a - Late Saxon/ early med	*Scolopax rusticola*	Coracoid	28.7	26.9	7.5			
			GL	*Bp*	*Dp*	*SC*	*Bd/LG*	*Dd*
4a - Late Saxon/ early med	*Anser anser*	Femur	76.8	18.75	7.8	19.7	15.1	
4b - Late Saxon/ early med	*Galliform*	Femur	74.3	15.1	10.4	5.9	14.4	11.8
4b - Late Saxon/ early med	*Galliform*	Femur		12	13.4	6.1		
			Bp	*SC*	*Bd*			
4a - Late Saxon/ early med	*Anser anser*	Humerus	28	9.2	19.6			
4a - Late Saxon/ early med	*Galliform*	Humerus	19.5					
			Dic					
4a - Late Saxon/ early med	*Anas platyrhynchos*	Scapula	10.6					
4b - Late Saxon/ early med	*Anas platyrhynchos*	Scapula	11.9					
			GL	*Bp*	*SC*	*Bd*		
3 Middle-Late Saxon	*Anas platyrhynchos*	Tarsometatarsus	43.5	9.1	4.5	9.1		
4b - Late Saxon/ early med	*Anser anser*	Tarsometatarsus	82.2	17.9	7.4	19.1		
3 Middle-Late Saxon	*Galliform*	Tarsometatarsus				11.3		
4a - Late Saxon/ early med	*Galliform*	Tarsometatarsus	63	11.3	5.2	11.1		
4a - Late Saxon/ early med	*Galliform*	Tarsometatarsus		11.5				
			GL	*Bp*	*Dip*	*SC*	*Did*	
3 Middle-Late Saxon	*Galliform*	Ulna	69.9	9	11.5	4.4		
3 Middle-Late Saxon	*Galliform*	Ulna					9.9	
4a - Late Saxon/ early med	*Galliform*	Ulna	45.9	6.1	8.5	2.5	5.2	
4b - Late Saxon/ early med	*Galliform*	Ulna		7.4	10.6	3.9		
4a - Late Saxon/ early med	*Turdidae spp.*	Ulna					3.8	



Animal bone figure 1: Relative representation of major domesticates (% NISP)

Appendix 5: Environmental remains by A J Clapham (Worcestershire Archaeology).

Summary

*Analysis of environmental samples from an excavation at Commercial Road, Gloucester was undertaken on behalf of Gloucestershire County Council Archaeology Service prior to redevelopment. Samples from three deposits of late Saxon/medieval date were selected for analysis. Plant remains were preserved by charring, waterlogging and mineralisation but were present in low quantities in all three samples. The charred remains consisted of free-threshing wheat (*Triticum *sp) grains, hulled barley (*Hordeum vulgare*) and oat (*Avena *sp) grains. Weed seeds were present in low quantities and were preserved by charring and mineralisation. The waterlogged taxa included spike-rush (*Eleocharis *sp) and water-plantain (*Alisma *sp) which are characteristic waterside plants. Other biological remains such as charcoal fragments, fish bones and scales, large mammal bone fragments, horn shavings and oyster shell suggest that the deposits represent rubbish pits or middens.*

Introduction and archaeological background

Three samples were selected by the Gloucestershire County Council Archaeology Service for processing and assessment, details are shown in Environmental table 1.

Project parameters

The environmental project conforms to relevant sections of the *Environmental Archaeology: a guide to the theory and practice of methods, from sampling and recovery to post-excavation*, 2nd edition (English Heritage 2011),

Aims

The aims of the assessment were to determine the state of preservation, type, and quantity of environmental remains recovered, from the samples and information provided. This information will be used to assess the importance of the environmental remains.
More specifically the following aims have been identified.
1) To identify the function of the features sampled.

Methods
Fieldwork and sampling policy

Samples were taken by the excavator from deposits considered to be of high potential for the recovery of environmental remains.

Processing and analysis

The samples were processed by flotation followed by wet sieving using a Siraf tank. The flots were collected on a 300μm sieve and the residue retained on a 1mm mesh. This allows for the recovery of items such as small animal bones, molluscs and seeds.

The residues were scanned by eye and the abundance of each category of environmental remains estimated, see Environmental table 2. A magnet was also used to test for the presence of hammerscale. The flots were scanned using a low power stereo light microscope and plant remains identified using modern reference collections maintained by the Worcestershire Archaeology Service, and a seed identification manual (Cappers *et al* 2006). Nomenclature for the non-cultivated plant remains follows Stace (2010).

Results

The results are shown in Environmental tables 2 and 3.
Context 525, sample 2
This context was a charcoal rich fill of a pit, bone fragments were also recognised in the deposit during excavation. Many charcoal fragments were present in the sample and the majority of them were of a size that would permit identification. A quick scan of the charcoal fragments showed that

both oak and non-oak taxa were present. This sample was the richest of the three assessed for this report and plant remains were preserved by charring, waterlogging and mineralisation. The majority of the plant remains were charred and consisted of cereal remains of free-threshing wheat (*Triticum* sp) grain and oat (*Avena* sp) grains. Weed seeds consisted of seeds of clover (*Trifolium* sp), sheep's sorrel (*Rumex acetosella)* and a grain of fescue grass (*Festuca* sp).

Waterlogged remains consisted of single finds of a birch seed (*Betula* sp), and water-plantain (*Alisma* sp) and two fruits of spike-rush (*Eleocharis* sp).

Mineralised plant remains consisted of single finds of vetch/pea (*Vicia/Lathyrus* sp), black whorehound (*Ballota nigra*) and a small grass caryopsis.

A small number of beetle remains and terrestrial molluscs were also recorded.

Biological and other artefacts recorded from the residue include moderate amounts of large mammal bone fragments (too small to identify), occasional fish and bird bone fragments and oyster shell fragments. Non-biological remains include pot fragments and several iron objects, most likely nails.

Context 714, sample 3
This context was the fill of pit 715 which was described on excavation as being rich in bone and charcoal. This sample was dominated by charcoal fragments some of which were of identifiable size and consisted of oak and non-oak taxa. Plant remains recorded from this sample were preserved by charring and consisted of free-threshing wheat grains and hulled barley (*Hordeum vulgare*) grains. Apart from these cereals the only other plant remain recorded was an achene of a thistle (*Cirsium* sp).

Mineralised nematode eggs and possible wireworm remains were also recorded from this sample.

Abundant large mammal bone fragments, some of which were burnt were recorded from the residue. Other biological remains include occasional small mammal and fish bones and abundant charcoal. Oyster shell and horn shavings were also noted. Non-biological material recorded included fragments of pot, fired clay and glass.

Context 1212, sample 5
This context was described as a black silty clay with a small proportion of small limestone fragments and was interpreted as being a possible midden deposit.
Charred plant remains were recorded from this context and consisted of free-threshing wheat, barley and oat grains. No other charred remains were identified from this context. A single waterlogged greater celandine (*Chelidonium majus*) seed was also recorded.

Freshwater and terrestrial molluscs were also present but in small numbers.

Biological remains recorded in the residue included large mammal bone fragments, fish scales, occasional bird bone, charcoal fragments and oyster shell. Non-biological remains recorded included occasional glass and ceramic building material fragments.

Discussion

The three samples assessed for this report were from two pits and a layer. The plant remains were preserved by charring, waterlogging or mineralisation with charring being the dominant preservation mode. Overall plant remains from these samples were present in low numbers apart from large numbers of charcoal fragments in contexts 525 and 714.

Cereals present in the assemblages included free-threshing wheat, hulled barley and oat grain no other crops were identified from the samples. Weed seeds were also present in low numbers and were probably associated with the cereal remains. It is not possible to say if the crops were grown locally but it is the most likely scenario. The presence of waterlogged plant remains suggests that either the watertable was high in the area or that the area was often inundated with flood water which would have deposited these waterside species.

The presence of a high watertable is supported by the presence of mineralised material in the form of seeds and arthropod remains. Mineralisation also requires a source of phosphate and in most archaeological cases this is provided by the presence of cess or other organic materials, such as bone. The presence of oyster shell, fish, bird, large and small mammal bones may have provided the necessary minerals for mineralisation.

The presence of horn shavings in [714] suggests that there was some industrial activity in the area.

The overall composition of the samples suggests that the pits were used for dumping domestic and industrial rubbish including cess and that [1212] showing a similar composition to the two pit fills is indeed a midden deposit.
The presence of large numbers of charcoal fragments some of which are of non-oak taxa and an adequate number of cereal grains indicates that there is suitable material for radiocarbon dating if required.

Significance

The composition of the plant remain assemblage is very typical of the late Saxon/ medieval period and therefore is not of any outstanding significance. The presence of horn fragments may be of some importance as it indicates some industrial activity on the site. Otherwise the material indicates general dumping of domestic and industrial waste.

The archive

The archive consists of:
Three AS21 Flot record and three AS17 Sample record sheets.

Acknowledgements

The Service would like to thank the following for their kind assistance in the conclusion of this project: Nick Witchell, Gloucestershire County Council Archaeology Service, for delivering the samples and supplying the relevant information.

Environmental table 1: Contexts processed and assessed

Context	Sample	Feature type	Fill of	Sample type	Sample volume (l)	Volume processed (l)	Residue assessed	Flot assessed
525	2	Pit		General	5	5	Yes	Yes
714	3	Pit	715	General	6	6	Yes	Yes
1212	5	Layer		General	8	8	Yes	Yes

Environmental table 2: Biological and other artefacts recorded from residues

Context	Sample	large mammal	small mammal	fish	bird	charcoal	Comment
525	2	mod	occ	occ	occ	mod	occ oyster shell, occ pot frags, occ Fe objects
714	3	abun (some burnt)	occ	occ		abun	occ oyster shell, horn, pot frag, fired clay, glass frags
1212	5	abun			occ	occ	occ oyster shell, occ coal, glass, occ cbm

Environmental table 3: Plant remains

Latin name	Common name	Habitat	525	714	1212
Charred					
Triticum sp (free-threshing) grain	free-threshing wheat	F	4	1	5
Triticum sp (free-threshing) grain fragment	free-threshing wheat	F			3
Hordeum vulgare grain (hulled)	barley	F		9	1
Avena sp grain	oat	AF	10		1
Avena sp grain fragment	oat	AF	2		1
Trifolium sp	clover	ABD	1		
Rumex acetosella	sheep's sorrel	ABD	1		
Cirsium sp	thistle	ABDE		1	
Festuca sp grain	fescue	ABCD	1		
Waterlogged					
Chelidonium majus	greater celandine	C			1
Betula sp	silver birch	C	1		
Alisma sp	water-plantain	E	1		
Eleocharis sp	spike-rush	E	2		
Mineralised					
Vicia/Lathyrus sp	vetch/pea	ABCD	1		
Ballota nigra	black horehound	C	1		
Poaceae sp indet grain (small)	grass	AF	1		

Environmental references

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

English Heritage 2011 *Environmental Archaeology: a guide to the theory and practice of methods, from sampling and recovery to post-excavation*, 2nd Edition, Centre for Archaeology Guidelines

Stace, C. 2010 *New Flora of the British Isles*, Cambridge University Press (3rd Edition)

Appendix 6: Catalogue of coins by Kurt Adams

Small find 6 context 724
Copper alloy contemporary copy Antoninianus (barbarous radiate) of Tetricus I
Date 271-274
Diameter 15mm, weight 0.98g
Obverse: radiated bust facing right
Obverse inscription: […]I[.]A[…]
Reverse: Possible figure standing
Reverse inscription: […]
Condition: fine

Context 716
Debased silver Antoninianus, unknown emperor
Date 274-296
Diameter 21mm, weight 1.22g
Obverse: bust facing right
Obverse inscription: […]
Reverse: Possible figure standing
Reverse inscription: […]
This coin is heavily encrusted in Cu alloy corrosion. Also,
Condition: fair

Small find 3 context 713
Copper alloy nummus of the House of Constantine
Date 347-348
Diameter 15.5mm, weight 1.55g
Obverse: diademed, draped & cuirassed bust right
Obverse inscription: […]
Reverse: Two victories facing each holding a wreath
Reverse inscription: [VICTORIAE D D AVGGQ NN]
This coin is heavily encrusted in Cu alloy corrosion. Also,
Condition: fine

Appendix 7: List of contexts.

Context No	Description	Same as	Contains fills	Dimensions	Finds	Period
500	Layer	600,700		Up to 0.20m thick		Late P/med
501	Cut	623, 741				Late P/med
502	Wall within 501	624, 742				Late P/med
503	Cut					Modern
504	Fill of 503					Modern
505	Cut					Late P/med
506	Wall within 505					Late P/med
507	Fill of 505					Late P/med
508	Fill of 540	Group - 508/511/ 512/528/ 536/534/ 513/514/ 515/ 706		0.70m thick. Partly removed by machine.		Phase 4b - Late Saxon/ early med 11^{th} – 12^{th} century
509	Deposit	Group - 509/522/ 526/529/ 530/539/ 544 617 713		Up to 0.40m deep		Phase 4a - Late Saxon/ early med 10-11^{th} century
510	Deposit	Group - 510/527/ 531/532/ 548				Phase 1 – Roman 2^{nd} Century +
511	Fill of 540	Same as 508				Phase 4b - Late Saxon/ early med 11^{th} – 12^{th} century
512	Fill of 540	Same as 508		Up to 0.25m deep		Phase 4b - Late Saxon/ early med 11^{th} – 12^{th} century
513	Fill of 540	Same as 508				Phase 4b - Late Saxon/ early med 11^{th} – 12^{th} century
514	Fill of 540	Same as 508				Phase 4b - Late Saxon/ early med 11^{th} – 12^{th} century
515	Fill of posthole 540					Phase 4a - Late Saxon/ early med 10-11^{th} century
516	Fill of pit 517					Phase 4b - Late Saxon/ early med 11^{th} – 12^{th} century
517	Cut of pit		523,516, 535			Phase 4b - Late Saxon/ early med 11^{th} – 12^{th} century
518	Deposit	Group 518, 519,524				Phase 4b - Late Saxon/ early med 11^{th} – 12^{th} century
519	Deposit	Same as 518				Phase 4b - Late Saxon/ early med 11^{th} – 12^{th} century
520	Surface/layer	Group 520,538, 616		Up to 4cm thick		Phase 4a - Late Saxon/ early med 10-11^{th} century
521	-			Nb. cut – recorded in sondage, Voided		Void
522	Deposit	Same as 509		Recorded during initial sondage investigation. Interpreted as being part of 526		Phase 4a - Late Saxon/ early med 10-11^{th} century
523	Fill of pit 517					Phase 4b - Late Saxon/ early med 11^{th} – 12^{th} century
524	Deposit	Same as 518				Phase 4b - Late Saxon/ early med 11^{th} – 12^{th} century

Context No	Description	Same as	Contains fills	Dimensions	Finds	Period
525	Upper Fill of pit 541	Same as pit fill 621		Up to 0.12m in depth		Phase 4a - Late Saxon/ early med 10-11th century
526	Deposit /Layer	Same as 509		Up to 0.40m in depth		Phase 4a - Late Saxon/ early med 10-11th century
527	Deposit	Same as 510		Up to 0.20m thick		Phase 1 – Roman 2nd Century +
528	Fill of 540	Same as 508		Up to 0.30m in depth		Phase 4b - Late Saxon/ early med 11th – 12th century
529	Deposit	Same as 509		see plan		Phase 4a - Late Saxon/ early med 10-11th century
530	Deposit	Same as 509		Up to 0.25m in depth		Phase 4a - Late Saxon/ early med 10-11th century
531	Deposit	Same as 510		Up to 0.10m in depth		Phase 1 – Roman 2nd Century +
532	Deposit	Same as 510		1.30m in length, c. 1m in width and up to 8cm depth		Phase 1 – Roman 2nd Century +
533	Deposit			At least 0.47m in depth. Sondage excavated into this deposit testing (532).		Phase 1 – Roman 2nd Century +
534	Fill of 540	Same as 508				Phase 4b - Late Saxon/ early med 11th – 12th century
535	Fill of pit 517			Up to 0.24m in depth		Phase 4b - Late Saxon/ early med 11th – 12th century
536	Fill of 540	Same as 508		1.40m in length, 0.90m in width and 0.55-0.60m in depth		Phase 4b - Late Saxon/ early med 11th – 12th century
537	Same as 540		534,536			Phase 4b - Late Saxon/ early med 11th – 12th century
538	Surface/layer			Up to 3cm thick		Phase 4a - Late Saxon/ early med 10-11th century
539	Deposit	Same as 509				Phase 4a - Late Saxon/ early med 10-11th century
540	Cut of feature/intrusion Same as 705		Group 508/511/512/528/536/534/513/514/515			Phase 4a - Late Saxon/ early med 10-11th century
541	Cut of pit	Same as cut of pit 619	525,542, 543,545	1.40m in length and 1.20m in width		Phase 4a - Late Saxon/ early med 10-11th century
542	Fill of pit 541	Same as pit fill 620				Phase 4a - Late Saxon/ early med 10-11th century
543	Fill of pit 541			Up to 5cm thick		Phase 4a - Late Saxon/ early med 10-11th century
544	Deposit	Same as 509		C.1m in length 0.53m in width and 0.15-0.20m in depth.		Phase 4a - Late Saxon/ early med 10-11th century
545	Fill of pit 541 (Primary fill)	Same as pit fill 622		c. 0.30m in width, 1-3cm in depth		Phase 4a - Late Saxon/ early med 10-11th century
546	Cut of linear feature		547	1m in length, 0.35m in width		Phase 4a - Late Saxon/ early med 10-11th century

Context No	Description	Same as	Contains fills	Dimensions	Finds	Period
547	Fill of feature 546					Phase 4a - Late Saxon/ early med 10-11th century
548	Deposit	Same as 510		Up to 0.17m in depth		Phase 1 – Roman 2nd Century +
600	Layer	500, 700		Up to 0.20m thick		Late Post-medieval
601	Cut	503	602			Modern
602	Fill of 601	504				Modern
603	Cut of pipe trench		604			Late P/med
604	Fill of 603					Late P/med
605	Cut of pipe trench					Late P/med
606	Fill of 605					Late P/med
607	Deposit			Up to 0.42m deep.		Phase 4b - Late Saxon/ early med 11th – 12th century
608	Deposit			Up to 0.24m deep		Phase 4b - Late Saxon/ early med 11th – 12th century
609	Cut of pit		610	1.2m long, 1.05m wide, 0.24m deep		Phase 4b - Late Saxon/ early med 11th – 12th century
610	Fill of pit 609			Up to 0.24m deep		Phase 4b - Late Saxon/ early med 11th – 12th century
611	Cut of pit		612	0.60m by 0.55m up to 0.18m deep		Phase 4b - Late Saxon/ early med 11th – 12th century
612	Fill of pit 611			Up to 0.18m deep		Phase 4b - Late Saxon/ early med 11th – 12th century
613	Deposit			Up to 0.19m deep		Phase 4b - Late Saxon/ early med 11th – 12th century
614	Deposit			Up to 0.20m deep		Phase 4b - Late Saxon/ early med 11th – 12th century
615	Deposit	Same as 518				Phase 4b - Late Saxon/ early med 11th – 12th century
616	Deposit	Same as 520		7-9cm in thickness		Phase 4b - Late Saxon/ early med 11th – 12th century
617	Deposit	Same as 509, 713		Not fully excavated		Phase 4a - Late Saxon/ early med 10-11th century
618	Deposit			0.54m in length, 0.29m in width, 6cm in depth		Phase 4b - Late Saxon/ early med 11th – 12th century
619	Cut of pit	Same as pit cut 541	620,621, 622			Phase 4a - Late Saxon/ early med 10-11th century
620	Secondary fill of pit 619	542				Phase 4a - Late Saxon/ early med 10-11th century
621	Fill of pit 621	Same as pit fill 525 (upper most fill)				Phase 4a - Late Saxon/ early med 10-11th century
622	Fill of pit 621 (Primary fill)	Same as pit fill 545		3-4 cm thick		Phase 4a - Late Saxon/ early med 10-11th century
623	Construction cut of Post-medieval wall (Administration building)	501, 741	624			Late P/med
624	Fill of 624 black silty clay	502, 742				Late P/med

Context No	Description	Same as	Contains fills	Dimensions	Finds	Period
700	Layer	500,600				Late P/med
701	Cut for wall		702			Late P/med
702	Fill of 701 (Wall)					Late P/med
703	Cut for wall		704			Late P/med
704	Fill of 702 (Wall)					Late P/med
705	Cut of pit		706	1.38m long, 0.80m wide, maximum 0.71m deep.		Phase 4b - Late Saxon/ early med 11^{th} – 12^{th} century
706	Fill of apparent pit 705	Same as 508		Maximum 0.71m deep.		Phase 4b - Late Saxon/ early med 11^{th} – 12^{th} century
707	Cut of feature (pit)		708			Late Saxon/ early med 11^{th} – 12^{th} century or later
708	Fill of feature 707					Late Saxon/ early med 11^{th} – 12^{th} century or later
709	Cut of modern pipe trench		710			Late P/med
710	Fill of 709					Late P/med
711	Deposit					Phase 1 – Roman 2^{nd} Century +
712	Deposit	Same as 727		…		Phase 2 – Roman 4^{th} Century +
713	Deposit	Same as 509, 617				Phase 4a - Late Saxon/ early med 10-11^{th} century
714	Fill of pit 715			1m in depth		Phase 3 - Middle - Late Saxon
715	Cut of pit	714				Phase 3 - Middle - Late Saxon
716	Fill of pit 721			Up to 0.25m deep		Phase 3 - Middle - Late Saxon
717	Deposit					Phase 2 – Roman 4^{th} Century +
718	Cut of pit		719	0.95m in length, 0.50m in width at least 0.95m in depth		Phase 4a - Late Saxon/ early med 10-11^{th} century
719	Fill of pit 718			0.95m in length, 0.50m in width at least 0.95m in depth		Phase 4a - Late Saxon/ early med 10-11^{th} century
720	Deposit	Same as 729				Phase 1 – Roman 2^{nd} Century +
721	Cut of pit	716,722		1.10m in length, 0.90m in width and 0.90m in depth		Phase 3 - Middle - Late Saxon
722	Fill of pit 721					Phase 3 - Middle - Late Saxon
723	Cut of pit		724	1.40m in length, 0.90m in width and 0.70m in depth.		Phase 2 – Roman 4^{th} Century +
724	Fill of pit 723			Up to 0.70m in depth		Phase 2 – Roman 4^{th} Century +
725	Deposit/layer					Phase 2 – Roman 4^{th} Century +
726	Deposit/layer			1m in length, 0.90m in width, up to 0.12m in depth		Phase 2 – Roman 4^{th} Century +
727	Deposit	Same as 712		Up to 0.20m in depth		Phase 2 – Roman 4^{th} Century +
728	Deposit			Up to 0.25m in depth		Phase 1 – Roman 2^{nd} Century +
729	Deposit	Same as 720				Phase 1 – Roman 2^{nd} Century +
730	Deposit					Phase 1 – Roman 2^{nd} Century +

Context No	Description	Same as	Contains fills	Dimensions	Finds	Period
731	Fill of feature 732			At least 0.30m in depth		Phase 1 – Roman 2nd Century +
732	Possible cut feature		731			Phase 1 – Roman 2nd Century +
733	Deposit					Phase 1 – Roman 2nd Century +
734	Deposit					Phase 1 – Roman 2nd Century +
735	Deposit			c. 0.15m in depth		Phase 1 – Roman 2nd Century +
736	Fill of feature 737			0.95m in length, 0.80m in width.		Phase 1 – Roman 2nd Century +
737	Cut of feature		736			Phase 1 – Roman 2nd Century +
738	Deposit			Up to 0.15m deep		Post-med?
739	Deposit			Up to 0.27m deep		Post-med?
740	Deposit/Layer			Up to 0.22m in depth		Post-med?
741	Construction cut for wall	623, 501				Post-med
742	Backfill of [741]	624, 502				Post-med
743	Layer of bedding sand for pavement					Modern
744	Paving slab surface – Current surface					Modern