

DEAN'S YARD

WESTMINSTER ABBEY

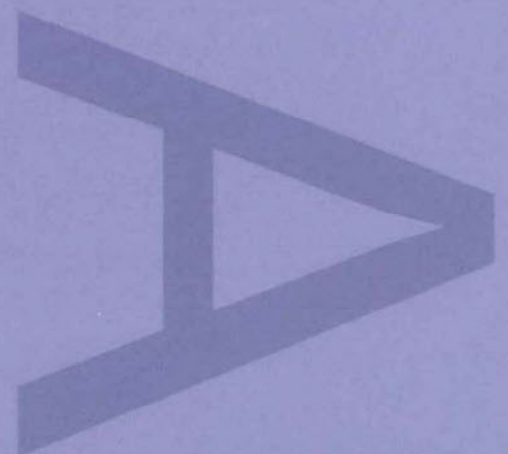
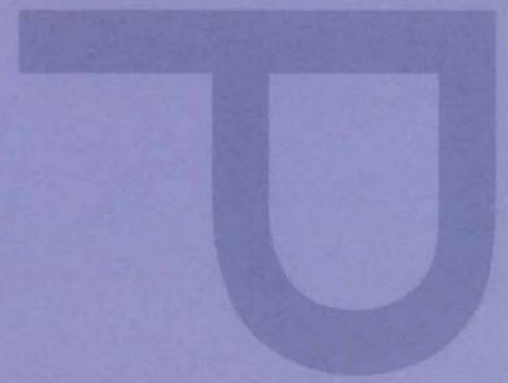
CITY OF WESTMINSTER

ASSESSMENT OF AN

ARCHAEOLOGICAL EXCAVATION

DYR 09

APRIL 2010



PRE-CONSTRUCT ARCHAEOLOGY

DOCUMENT VERIFICATION

**DEAN'S YARD
WESTMINSTER ABBEY
CITY OF WESTMINSTER**

EXCAVATION

Quality Control

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Assessment of an Archaeological Excavation in the Northwest Corner of Dean's Yard, Westminster Abbey, City of Westminster

Site Code: DYR09

Central National Grid Reference: TQ 2997 7941

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1 ABSTRACT

- 1.1 Between March and April 2009 an archaeological watching brief and subsequent excavation was undertaken by Pre-Construct Archaeology Ltd ahead of the construction of a subterranean transformer chamber. As outlined in a method statement prepared prior to the commencement of the work the removal of the upper strata was carried out as a watching brief and then, once stratified archaeological deposits were reached the remaining work was carried out as an archaeological excavation (Mayo 2009).
- 1.2 The site was situated within "the green" in the northeast corner of Dean's Yard, Westminster Abbey, City of Westminster. Dean's Yard is bordered to the east by a range of buildings, some of which date to the 14th century, and to the south and west by buildings belonging to the Westminster School while the 19th century building known as "the Sanctuary" is located to the north.
- 1.3 An archaeological stratum was encountered at approximately 3.20m OD (c.1.06m below the current ground level), at which point the work was carried out as an archaeological excavation to the depth of 0.24m OD.
- 1.4 A struck flint of possible Later Neolithic/Early Bronze Age date was recovered from the top of the natural sand and hints at a prehistoric presence on Thorney Island at this time.
- 1.5 A single pit containing a few sherds of late Iron Age or early Roman pottery was observed cutting the natural sand. A few sherds of residual Saxon pottery collected from later features may indicate activity during this period in the vicinity of the trench.
- 1.6 The majority of the strata recorded dated to the medieval and post-medieval periods consisted of ground raising deposits pertained to the formation and evolution of the yard although occasional pitting activity was also observed, especially throughout the earlier deposits. A single ditch and the remains of a hearth or oven, both of medieval date were recorded near the base of the excavation.
- 1.7 The finds recovered from the excavation, which include important assemblages of pottery, building material, animal bone and fish bone, have the potential to answer important questions regarding pottery supply to the monastic site, building material used in the monastic structures and the diet of the monastic inhabitants.

2 INTRODUCTION

- 2.1 This document details the results and working methods of archaeological investigations conducted in the northwest corner of Dean's Yard, Westminster Abbey, City of Westminster (Fig. 1). The site is centered on National Grid Reference TQ 2997 7941. The work was commissioned by J Murphy and Sons Limited and was undertaken by Pre-Construct Archaeology under the supervision of Paw Jorgensen and the project management of Chris Mayo. It was monitored by the Archaeological Advisor to the City of Westminster, Diane Walls of English Heritage and Professor Warwick Rodwell, the archaeological consultant to Westminster Abbey.
- 2.2 Due to the small size of the main trench (Trench 1) (c.8m by 8m in plan to a depth of approximately 4.10m) it was not considered practicable or archaeologically desirable to carry out an evaluation prior to the commencement of the ground works (Fig. 2). As such the initial ground reduction was carried out under the supervision of an archaeologist and once archaeologically significant strata were reached the remaining ground reduction was carried out as an archaeological excavation.
- 2.3 Following the completion of the chamber a watching brief was carried out during the excavation of the service trench for the cables connecting the new transformer to the abbey. This trench (Trench 2) measured approximately 65.00m in length (east-west) by 0.75m in width (north-south) and was excavated to a depth of 1.00m with the exception of the easternmost part which was excavated to a depth of 1.45m. Trench 2 was excavated to the north of Trench 1; roughly following the centre line of the northern road around Dean's Yard.
- 2.4 The completed archive comprising written, drawn and photographic records and artefactual material will be deposited with the Westminster Abbey Museum under the site code DYR09.
- 2.5 Westminster Abbey, along with Westminster Palace and St Margaret's Church, is a World Heritage Site (number 426, designated inscription in 1987).



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Figure 1
 Site Location
 1:20,000 at A4

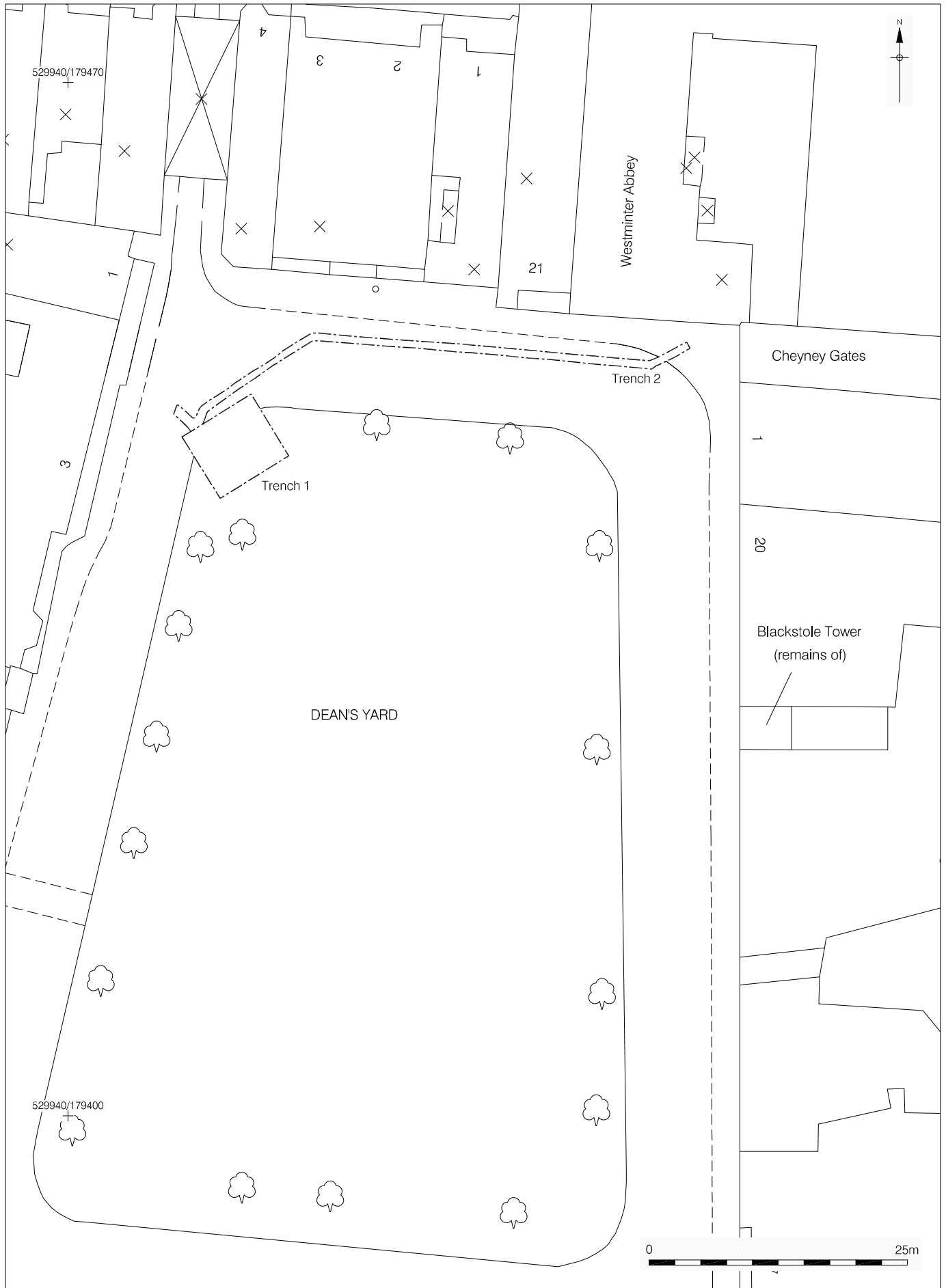


Figure 2
Trench Location
1:500 at A4

3 PLANNING BACKGROUND

- 3.1 The study aims to satisfy the objectives of the City of Westminster, which fully recognises the importance of the buried heritage for which they are the custodians. In November 1990 the Department of the Environment issued Planning Policy Guidance Note 16 (PPG16) 'Archaeology and Planning'. It provides guidance for planning authorities, property owners, developers and others on the preservation and investigation of archaeological remains.
- 3.2 The site is located within the World Heritage Site of the Palace of Westminster and Westminster Abbey including St. Margaret's Church (number 426, designated inscription in 1987).
- 3.3 The Council's Archaeology Policy, as defined in the City of Westminster's Unitary Development Plan adopted 24 January 2007, is as follows:

DES 16: WORLD HERITAGE SITE

Aim

10.188 To safeguard the World Heritage Site.

POLICY DES 16: WORLD HERITAGE SITE

Permission will only be granted for developments that protect and conserve the character, appearance, setting and ecological value of the World Heritage Site

Policy application

10.189 Although no additional statutory controls follow from the designation of a World Heritage Site, PPG15: Planning and the Historic Environment states, in paragraph 2.22, that the designation highlights the outstanding international importance of the site which should be a key material consideration to take into account when determining planning and listed building consent applications. Great weight is placed upon the need to protect them for future generations. Development proposals affecting these sites or their settings need to be compatible with this objective and require careful scrutiny, often by way of formal environmental assessments, to ensure that their immediate and long term impact are fully evaluated.

Reason

10.190 The member states of United Nations Educational Scientific and Cultural Organisation UNESCO adopted the Convention concerning the Protection of World Cultural and Natural Heritage in 1972. This Convention provided for the creation of the World Heritage Committee which, in 1987, inscribed the area formed by the Palace of Westminster, St Margaret's and

Westminster Abbey as a World Heritage Site, now one of twenty six in the United Kingdom. This area has thus been recognised as being of 'outstanding universal value from the historical, aesthetic, ethnological or anthropological point of view'.

4 GEOLOGY AND TOPOGRAPHY

- 4.1 Topographically there is little variance within the site although it did slope gently from 4.34m above Ordnance Datum (OD) in the east to 4.32m OD in the west. This largely reflects the trend of the wider Dean's Yard area.
- 4.2 The study site is located on what used to be Thorney Island, the largest and probably the highest of the islands within the Tyburn delta. The island was located at the confluence of the Tyburn and the Thames rivers. Geologically Thorney Island consisted primarily of sand and gravel overlying London Clay (Thomas *et al* 2006).

5 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

5.1 Palaeoenvironmental

5.1.1 The meandering stream of the Tyburn river divided into two branches forming a tripartite division of the land near its confluence with the River Thames. Deposition of sand and gravel occurred on the land between the two branches of the stream around 3800 cal BP and from about 3500 cal BP to 2700 cal BP marshland established across the area leading to the formation of organic mud, the Storey organic mud bed. This area of firm ground amidst the marshland in the Tyburn delta later became known as Thorney Island (De Maré 1968) on which the current study site is located.

5.1.2 At the opening of the Bronze Age the higher ground of the island was dominated by lime forest which was later replaced by woodlands of oak and hazel while the low lying areas around the periphery of the island were dominated by alder and sedge. Deforestation of the island occurred sometime during the early Bronze Age with evidence for arable cultivation appearing shortly thereafter (Thomas *et al* 2006).

5.2 Prehistoric

5.2.1 Archaeological investigations undertaken ahead of the Jubilee Line extension between 1991 and 1998 revealed evidence for Bronze Age activity along the east side of the island in the form of a timber revetment along the river as well as possible boundary fences. Environmental data collected during investigation in the 1990s show the presence of cereal pollen which suggests arable cultivation of the land during this period. While major activity may have occurred on the island from the Late Neolithic through the Early Bronze Age it seems that this spike in human activity dwindles towards the later part of the Bronze Age (Thomas *et al* 2006).

5.2.2 Evidence for Iron Age occupation is limited and has almost exclusively been observed towards the higher points of the island. It has been hypothesised that this may be due to a major flooding event occurring towards the middle of the 11th century, which caused the complete erosion of the Late Bronze Age, Iron Age and Roman deposits along the peripheral areas of Thorney (Thomas *et al* 2006).

5.3 Roman

5.3.1 The Roman settlement of *Londinium* centred upon the modern day City of London, to the east of Westminster. While no definite Roman features have been recorded during excavations on the former Island, artefacts dating to this period have occurred

on most sites. In the vicinity of the abbey itself a number of antiquarian discoveries have been reported including a Roman sarcophagus found on the north side of the abbey (Poole 1870). Although the sarcophagus itself might date to the Roman period it is likely that it was brought to the island and reused during the Saxon period.

5.3.2 Part of a Roman hypocaust and walls have allegedly been observed below the floor of the nave of the abbey church and two fragments of Roman concrete floor have been recorded near the south side of the cloister and infirmary cloister (Thomas *et al* 2006). Some of the accounts of the origins of Westminster Abbey claim that a temple dedicated to Apollo was constructed on Thorney Island in the second century AD and that when it was destroyed by a violent earthquake and King Lucius built the island's first church in its place (Morley 1890); no archaeological evidence exists to substantiate this claim.

5.4 Saxon

5.4.1 The main Saxon settlement of *Lundenwic* was situated between present day Charing Cross and Aldwych to the northeast of the site. During the late Saxon period Thorney Island became an important religious centre. This is reflected by the place name 'Westminster', which derives from the Saxon word 'minster', referring to either the monastery church built on the island by Edward the Confessor or an earlier church on the site. It was consecrated prior to the Norman invasion of 1066.

5.4.2 One of the earliest references to a church derives from Offa's Charter, c.AD 785. It refers to 'St. Peter and the people of the Lord dwelling in Thornea at the awesome place called Westminster' (Barton 1992). The authenticity of this charter has been brought into question by various 20th century scholars and it seems likely that it is a later forgery.

5.4.3 It is more likely that the foundation of the abbey dates to the reign of King Edgar (959-75) who granted a foundation charter to St Dunstan. The church founded by St. Dunstan was described as a *monasteriolum*, or little monastery, and was inhabited by 12 monks and an abbot (Thomas *et al* 2006).

5.4.4 Under Edward the Confessor the abbey was refounded and a new church built in stone to replace the old church. The anonymous 11th century biographer of the Confessor stated in *Vita Ædwardi* that Edward's motives for founding a great Abbey church at Westminster were not only in his piety and devotion to St. Peter, the favourable location of the place, on the river and close to London, but principally because he chose to have for himself a place of burial there (Field 1996).

5.4.5 Work on the new church commenced in 1045 and, although not completed in its entirety, was consecrated in December of 1065. Vita Ædwardi states that the new church was built far enough to the east of the existing one to enable services to continue in it while Sulcard in his History of Westminster (written in the 11th century) states that the old church was demolished to make room for the new (Field 1996).

5.5 Medieval

5.5.1 In the early medieval period, the pre-established seats of government and law were retained by the Norman Kings in an attempt to legitimise their claims to the throne. The Palace of Westminster, largely built by Edward the Confessor, was to remain the legislative centre and abode for over 500 years (De Maré 1968).

5.5.2 The flow of the Tyburn was heavily impacted upon in 1236 when, on the request of Henry III and the Lord Mayor, a conduit was installed by Tyburn Springs (near present day Marble Arch) to ensure a supply of clean water to the growing population of the city. While it is unclear exactly how much this impacted on the flow of the river it has been suggested that the stream was reduced to a mere trickle as a result of the piping of the springs (Barton 1992).

5.5.3 Following his return from visits to France in 1242 and 1243 Henry III embarked on an ambitious mission to rebuild Westminster Abbey as a rival to the great abbeys and churches of France. With the assistance of Master Henry of Reynes, the newly appointed Master of the King's Masons, the task of demolishing the old Romanesque church began (Field 1996).

5.5.4 By the time of the king's death in 1272 the work of rebuilding the abbey had not yet been completed although the unfinished church had been consecrated in 1269. The church was described as fully finished to the end of the quire in 1285 (Field 1996).

5.5.5 Fire swept through Westminster Palace and the adjacent abbey in 1298 and while it did not reach the unfinished church itself the conflagration did cause widespread damage to many of the major monastic buildings on the site. As a result priority shifted from completing the nave of the church to rebuilding the auxiliary buildings (Bond 1909).

5.5.6 Following the fire the royal household of Edward I was moved to York for the duration of the rebuilding of the palace on Thorney Island. During the King's absence the integrity of the inhabitants of the monastery was brought into question when the royal

treasury at the abbey was burgled. Even prior to the fire Edward had started to divert his attention, and funds, towards St. Stephen's Chapel in Westminster Palace and the burglary of 1303 resulted in a further reduction of royal support for the rebuilding of the abbey (Field 1996).

5.5.7 Work on the ancillary buildings progressed slowly until the later part of the 14th century when a "great fortune" was bequeathed to the abbey by Cardinal Langham. Even though the money had been intended to aide the completion of the nave Abbot Litlyngton directed a significant portion of it towards finishing the rebuilding of the auxiliary buildings (Bond 1909).

5.5.8 During Litlyngton's time as abbot (1362-1386) the areas to the north and east of Dean's Yard underwent significant changes. These included the rebuilding "... anew from the foundations" the whole of the abbot's place, the west and south sides of the cloister, the cellarer's range, the great malt house, the watermill, the dam, and the stone enclosure of the infirmary garden (Robinson 1911).

5.6 Post-medieval

5.6.1 By 1528 the work that Henry III had started nearly three centuries earlier was finally completed with the carving of the screens. Only 12 years later, as a result of the Dissolution of the monasteries, the deed surrendering the abbey to the crown was drawn up (Bradley 1895).

5.6.2 Following the Dissolution of the monasteries, Henry VIII, in 1541, granted to Thomas Thirlby, who had recently been appointed Bishop of Westminster, "... and his successors of the site and circuit of the dwelling-house, Cheynyngats in Westminster, Midd., in which William, late abbot of Westminster, dwelt, with all buildings and lands, &c., within and adjoining the said site, certain of the buildings abutting on:—the cloister of the said late monastery, the Elmes, the church of the said late monastery, the poors' house called the Kynges Almoshouse, and upon the street called the Brode Sentwarye" (Gairdner 1898).

5.6.3 During his time as Protector (1547-1549), Edward Seymour, 1st Duke of Somerset stripped away "... the plate and furniture" which had remained in the possession of the Chapter following the Dissolution of the monasteries under Henry VIII's reign. At this time the land that had been returned to the Chapter by Henry, including the Elms (Dean's Yard), was granted by the Dean to the Protector (Bradley 1895).

- 5.6.4 John Norden's 1593 survey of Westminster shows Dean's Yard as an enclosed rectangular area bordered to the south and east by buildings and planted with trees. Buildings are also shown extending east from the northwest corner of the enclosed space.
- 5.6.5 In 1561 Queen Elizabeth established the College of Westminster and the old monastic granary was converted into a dormitory for the Queen's Scholars. It subsequently became known as Scholars' or College Chamber (Tanner 1923).
- 5.6.6 Dr. Markham, headmaster of Westminster School, in 1756 submitted a proposal to enlarge Dean's Yard by pulling down the dormitory, which was then in a ruinous state, as well as the brewhouse and the buildings to the west of these. By 1760 Dean's Yard began to assume its present appearance although mostly gravelled with the exception of "the Elms" rectangle to the north. A row of "picturesque" houses extended east into the centre of the new quadrangle. These included the Scholars' Coffee-House (Tanner 1923).
- 5.6.7 In 1815 Dean's Yard was described as "...an odd mixture of decayed grandeur, modern ruins, strong old flinty walls, and crumbling new bricks" there "even the very trees nod in unison with falling structures and broken rails, and the earth, in many a rise and fall, shows some remote effects of Henry VIII's dissolution of monasteries" (Nightingale 1815).
- 5.6.8 By the end of that year the row of "picturesque" houses extending into the yard were demolished and the entire area turned into a large green space to be used as sports fields for Westminster School. The transformation of Dean's Yard from the small rectangular area of "the Elms" into the modern quadrangle was almost entirely completed by 1844 when flagstones replaced the gravelled area along the periphery of "the Green" (Tanner 1923).

6 ARCHAEOLOGICAL METHODOLOGY

- 6.1 In accordance with the method statement (Mayo 2009), the removal of the initial non-archaeologically significant layers was conducted with the use of a 20 tonne 360° tracked machine fitted with a flat grading bucket. This machine was monitored under archaeological supervision at all times. The spoil was initially loaded into skips, which were then periodically emptied and the spoil removed off site. No live services were known to exist on the site.
- 6.2 Once archaeologically significant deposits were reached these were recorded and, where appropriate, excavated by hand. Dumped deposits and widespread layers were first explored by hand and then removed using a tracked mini excavator which was lowered into the trench by use of the larger machine.
- 6.3 Upon reaching a depth of 1.20m below the ground surface, steel sheet piles were installed along the edges of the trench and secured using interlocking hydraulic frames. The sheet piles were lowered in one metre intervals to allow all sections to be recorded prior to being obscured by the shoring. Two access and egress points were established; one in the northwest corner of the trench and one in the southeast corner.
- 6.4 All features were marked during the machining. A total station was used to plot the limits of excavation and survey in the trench baselines. A Temporary Bench Mark (TBM) was established on the kerb next to the western boundary of the trench (value 4.04m OD) by using a leica dumpy level to traverse from a known benchmark on the northern of the two west towers of the abbey.
- 6.5 The recording system used was the single context recording system, with individual descriptions of all archaeological strata and features excavated and exposed entered onto pro-forma recording sheets. All plans and sections of archaeological deposits and features were recorded on polyester based drawing film, the plans being drawn at a scale of 1:20 and the sections at 1:10. The OD height of all principal strata was calculated and indicated on the appropriate plans, sections and context sheets. Features that were evidently modern were not given context numbers, and were recorded as modern intrusions in plan and section.

- 6.6 Photographs, on colour slide, black and white print film and in digital format were taken of the archaeological features where relevant. Site staff used 35mm and digital cameras on a day to day basis.
- 6.7 A total of 6 bulk samples were taken during the excavation in order to recover environmental information. After processing, these were transferred to Quaternary Scientific (QUEST), University of Reading, for assessment.

7 THE ARCHAEOLOGICAL SEQUENCE

7.1 Introduction

7.1.1 The following description of the stratigraphy details the main characteristics of each context and its position within the phased stratigraphic matrix.

7.2 Phase 1: Natural

7.2.1 The earliest deposit observed was a horizon of loosely compacted moderately coarse light yellowish grey sand [158] containing frequent inclusions of very small rounded pebbles and horizontal lenses of yellowish red sand with occasional manganese staining. This deposit was observed at a maximum height of -0.01m OD in a small 1m square hand excavated sondage through the base of Trench 1.

7.2.2 It was overlain by a layer of soft mid yellowish red clay [157] containing occasional small rounded pebbles. This deposit was recorded at a maximum height of +0.40m OD in the southwest corner of the trench and sloped down towards the west where it was encountered at a height of +0.24m OD.

7.2.3 Sealing the layer of clay was [152], a horizon of loosely compacted moderately coarse mid reddish brown sand with very occasional rounded and sub-rounded pebbles. Like the layer below [152] sloped from east to west from +0.61m OD to +0.41m OD.

7.2.4 Overlying [152] was a deposit of slightly organic moderately loose mid grey to greenish brown mottled clayey sand [134]. This horizon contained occasional small rounded and sub-rounded pebbles as well as occasional patches of decomposed organic material, and exhibited signs of root disturbance. The layer sloped from +0.92m OD in the west to +0.64m OD in the east.

7.2.5 At the eastern end of Trench 2 c. 40m to the northeast of Trench 1 mid brownish yellow sandy gravel was observed at a height of +2.92m OD.

7.3 Phase 2: Late Iron Age/Early Roman (Fig. 3)

7.3.1 This phase comprised a single pit [132], the earliest evidence for human activity observed on site, cut into layer [152]. Unfortunately the feature extended east beyond the limits of the trench, so its overall size could not be discerned. As observed the pit appeared sub-circular in plan measuring 1.00m north-south by 0.36m east-west by 0.45m in depth; it was first seen at a height of 0.78m OD. The sides of the feature sloped steeply, almost vertically, with a gradual transition with the concave base; at the top the break of slope was sharp.

7.3.2 The pit contained a single fill, [131], which comprised moderately firm dark brown silty clay containing occasional patches of decomposed organic material. Excavation of the fill yielded two sherds of pottery dating either to the late Iron Age or early Roman period.

7.4 Phase 3: Early medieval (Mid- to late 12th century)

7.4.1 Pit [132] was sealed by a layer of moderately organic greyish brown to greenish brown friable silty clay [133] containing very occasional small rounded pebbles. This deposit sloped from 1.02m OD in the east to 0.77m OD in the west. Context [133] contained cultural material including animal bone, burnt flint, ceramic building material and three sherds of coarse medieval sandy ware pottery (1140-1300).

7.5 Phase 4: Early medieval (Late 12th/early 13th century) (Figs. 4 & 5)

7.5.1 This horizon was overlain by a layer of redeposited alluvium [118] covering the entire trench in plan. Context [118] comprised very firm light yellowish brown mottled slightly silty clay containing very occasional small sub-rounded pebbles and charcoal flecks. It was first encountered at 1.31m OD in the centre of the trench and was seen to slope both to the east and west to 1.27m OD and 1.14m OD respectively. Excavation of the deposit yielded fragments of ceramic building material and worked stones.

7.5.2 Towards the southwest corner of the trench a hearth formed from a shallow circular cut [129] partially truncated layer [118]. The base and sides of the cut were lined with a layer of burnt clay [128] comprised of mid brownish grey material. On top of the lining, in the centre of the feature, was a circular patch of reddish brown burnt soil [127] containing large quantities of charcoal, burnt animal bone, and sherds of pottery. A 100% sample was collected of both the burnt soil [127] and the clay lining [128] (Environmental Samples 5 and 6 respectively) for environmental analysis. The hearth had survived to a maximum height of 1.28m OD.

- 7.5.3 A group of eight possible stakeholes [130] formed a circle around the hearth. The individual stakeholes were extremely small and measured on average 40mm in diameter and only the lower 40mm had survived.
- 7.5.4 In the southeastern portion of the trench layer [118] was overlain by layer [121]/[126]. This deposit was initially treated as two deposits, but as excavation progressed it became evident that both contexts were identical and formed a single layer. The layer consisted of mid greenish grey to mid brownish grey soft sandy silt containing moderate amounts of charcoal and shell fragments. Unlike the lower layers, [121]/[126] only occupied the southeast quadrant of the trench, where it was first observed at a height of 1.34m OD.
- 7.5.5 To the north layer [121]/[126] was truncated by an east-west aligned ditch [120]. Three slots were excavated by hand through the eastern, western, and central portions of the ditch. The sides of the feature were moderately steep gradually transitioning into a concave base whilst the top the break of slope was sharp. Towards the east the ditch was at its widest measuring 2.00m while it was narrower towards the west where it measured only 1.20m. Ditch [120] extended beyond the confines of the trench to both the east and west. At the top it was first seen at 1.30m OD in the east and at 1.14m OD in the west. The base of the feature sloped slightly from 1.06m OD in the east to 0.84m OD in the west.
- 7.5.6 To the east the feature contained a single fill [119] consisting of soft dark greyish brown sandy silt containing moderate amounts of charcoal flecks. Excavation of this fill yielded fragments of animal bone and ceramic building material as well as 11 sherds of pottery. The pottery recovered from this fill included an intrusive sherd of Central Italian tin-glazed ware (1450-1550) together with early medieval gritty ware (1080-1200), Kingston-type ware (1240-1400), South Hertfordshire-type greyware (1170-1350), and shelly-sandy ware (1140-1220).
- 7.5.7 The second slot, excavated through the central portion of ditch [120], revealed two fills; [135] lining part of the base and [123] above it. Fill [135] comprised soft dark grey organic silty clay with frequent inclusions of charcoal flecks and shell fragments. The fill measured 0.48m north-south by 0.83m east-west by 60mm in thickness.
- 7.5.8 Sealing [135] was a fill [123] identical in composition to [119] seen in the easternmost slot. Removal of this fill yielded fragmented animal bone and a few fragments of glass as well as nine sherds of pottery. The pottery assemblage comprised sherds of South Hertfordshire-type greyware (1170-1350) and shelly-sandy ware (1140-1220). In addition to the aforementioned finds one whetstone fragment was also recovered from fill [123] (sf 10).

7.5.9 Excavated towards the west the third slot revealed a single fill [124] identical to the lower fill [135] in the central slot albeit more substantial. Fragments of ceramic building material, animal bone and sherds of pottery were retrieved from the fill. The 36 pottery sherds recovered from the fill included early Surrey ware (1050-1150), coarse London-type ware (1080-1200), London-type ware (1080-1350), South Hertfordshire-type greyware (1170-1350), South Hertfordshire-type flint-tempered ware (1170-1350), and shelly-sandy ware (1140-1220).

7.5.10 Environmental samples were extracted from three of the ditch fills, [119] (Environmental Sample 2), [123] (Environmental Sample 3), and [124] (Environmental Sample 4).

7.6 Phase 5: Medieval (13th century)

7.6.1 Sealing the ditch [120] and hearth [129] was a layer of soft mid greyish brown sandy silt [122] containing frequent charcoal flecks and shell fragments. This layer was first observed at a height of 1.49m OD to the east and 1.22m OD to the west. Excavation of the deposit yielded fragments of metal, ceramic building material, and animal bone as well as nine pottery sherds including early medieval gritty ware (1080-1200), early South Hertfordshire-type coarseware (1050-1200), South Hertfordshire-type greyware (1170-1350), and shelly-sandy ware (1140-1220).

7.6.2 Overlying this deposit, but occupying only part of the southwest quadrant of the trench, was a layer of loosely compacted mid yellowish brown gravel [125]. It sloped from 1.50m OD in the east to 1.41m OD in the west. No finds were recovered from this deposit.

7.6.3 Above the gravel spread was a layer of loose to moderately compact mid- to dark greyish green silty sand [117]. It covered the entire trench in plan and was first encountered at 1.89m OD to the southwest and at 1.54m OD to the northeast. Unlike the lower layers, which generally sloped down from east to west, the top of this deposit sloped down from the southwest towards the northeast. Metal fragments and animal bone were recovered from this context. In addition 32 pottery sherds were also recovered including early medieval sand- and shell-tempered ware (1000-1150), coarse London-type ware (1080-1200), London-area greyware (1050-1170), London-type ware (1080-1350), South Hertfordshire-type greyware (1170-1350), South Hertfordshire-type flint-tempered greyware (1170-1350), and shelly-sandy ware (1140-1220).

7.6.4 Overlying [117] in the northeastern part of the trench was a layer of demolition debris [116] consisting predominantly of cobbles of ragstone and green sandstone and soft pale yellow sandy mortar. Metal, animal bone and ceramic building material fragments and a few pieces of worked stone were recovered from the deposit as were 25 sherds of pottery including Kingston-type ware (1240-1400), London-type ware (1080-1350), highly decorated London-type ware (1240-1350), and South Hertfordshire-type greyware (1150-1350). A 2 litre sample (Environmental Sample 1) of the mortar was retained for further analysis. The maximum height of the layer varied from 1.65m OD to the north to 1.60m OD to the south.

7.6.5 Sealing [116] and extending across the entire trench was a layer of organic dark brownish grey sandy silt [115] with occasional horizontal lenses of charcoal staining. Occasional inclusions of rounded and sub-rounded pebbles and, especially in the area immediately above [116], cobbles were observed. The top of the layer sloped from 2.01m OD in the east and 1.96m OD in the west to 1.87m OD in the central part of the trench, and also towards the north where the lowest point was at 1.63m OD. Shells, animal bone, ferrous metal nails, ceramic building material fragments and sherds of pottery were recovered from the deposit. The pottery assemblage consisted of 95 sherds including sherds of Kingston-type ware (1240-1400), London-type ware (1080-1350), highly decorated London-type ware (1240-1350), and South Hertfordshire-type greyware (1150-1350). A single silver coin of Henry III (sf 9) was also recovered from the lower part of the deposit immediately over [116].

7.7 Phase 6: Late medieval (15th century) (Fig. 6)

7.7.1 A mottled layer of mid yellowish green to brownish green moderately coarse sand spread across the entire trench effectively sealing horizon [115]. It contained occasional pebbles, chalk fragments and flecks, and very occasional blocks of worked stone. Finds collected from [97] included ferrous metal fragments, ceramic building material, animal bone, flint and 16 sherds of pottery including sherds of early medieval sandy ware with calcareous inclusions (1000-1150), early medieval flint-tempered ware (970-1100), early medieval sandy ware (970-1100AD), Kingston-type ware (1240-1400), late London-type ware (1400-1500), late London-type slipware (1400-1500), London-type ware (1080-1350), London-area post-medieval slip-decorated redware (14800-1600), South Hertfordshire-type greyware (1170-1350).

- 7.7.2 Four pits ([101], [103], [107], and [112]) cut layer [97]. The largest of these, [112], extended beyond north and west beyond the confines of the trench. It contained two fills ([110] and [111]) and measured at least 2.08m east-west by at least 1.58m north-south by 0.18m in depth. The lower fill [111] of the pit consisted of a deposit of moderately loose black silty sand and charcoal. It was only seen along the southern edge of the feature and contained ceramic building material and ferrous metal fragments, animal bone, shell and 10 pottery sherds. The ware types represented in the pottery assemblage included Kingston-type ware (1240-1400), Kingston-type ware in the highly decorated style (1240-1300), London-type ware (1080-1350), London-type ware in the highly decorated style (1240-1350), and South Hertfordshire-type greyware (1170-1350).
- 7.7.3 The upper fill [110] of pit [112] comprised moderately loose mid yellowish brown silty sand with a moderate amount of small sub-angular pebbles and very occasional chalk flecks. This fill yielded no finds.
- 7.7.4 The remaining pits measured between 0.47m east-west by 0.22m north-south by 0.22m in depth and 1.15m east-west by 1.25m north-south by 0.20m in depth and were all sub-rectangular in shape. They were all encountered at heights between 1.96m OD and 2.06m OD. The westernmost portion of pit [107] had been truncated by a later posthole, [109]. All of these pits contained similar fills comprising friable mid greyish brown sandy silt with inclusions of small rounded pebbles and larger sub-rounded pebbles. Fragments of ceramic building material and animal bone were recovered from all of the pits. In addition, fill [102] of pit [103] also yielded fragments of ferrous metal and three pottery sherds including Mill Green ware (1250-1370), coarse Surrey-Hampshire border ware (1270-1500) and early medieval grog-tempered ware (1050-1150). Three sherds of Mill Green ware were also recovered from fill [106] of pit [107].
- 7.7.5 Along the southern boundary of the trench two shallow postholes, [105] and [109], had been cut into [97]. Both were circular in shape with [105] measuring 0.14m and [109] 0.45m in diameter and were 0.3m and 0.2m in depth respectively. Posthole [105] was first observed at a height of 2.01m OD while [109] was first seen at 2.05m OD. Excavation of the fill [108] of the latter yielded ceramic building material fragments, animal bone and a single sherd of early medieval sandy ware (970-1100), while fill [104] of [105] yielded only fragmented animal bones.

7.7.6 Extending across the entire trench and sealing the group of postholes and pits was a layer of organic loose brownish grey silty sand [88] containing occasional small rounded pebbles and charcoal flecks. The top of the horizon sloped slightly from 2.64m OD in the southwest corner of the trench to 2.56m OD in the northeast corner. Fragments of ferrous metal and ceramic building material, animal bone, shell and 19 sherds of pottery were recovered from [88]. Coarse Surrey-Hampshire border ware (1270-1500), Central Italian tin-glazed ware (1450-1550), early medieval chalk-tempered ware (1050-1150), Kingston-type ware (1240-1400), Langerwehe/Raeren stoneware (1450-1500), late London-type ware (1400-1500), late medieval Hertfordshire glazed ware (1340-1450), London-type ware (1080-1350), late Saxon shelly ware (900-1050), Mill Green ware (1270-1350), and London-area early post-medieval redware (1480-1600) were represented in the pottery assemblage.

7.8 Phase 7: Early post-medieval (Early to mid 16th century) (Fig. 7)

7.8.1 Cutting [88] towards the eastern boundary of the trench was a large northwest-southeast aligned rectangular pit [90]. The sides of the pit were almost vertical breaking sharply at both the top and base of the feature. It measured 1.90m northwest-southeast by 1.00m northeast-southwest by 1.00m in depth and was first seen at a height of 2.52m OD. Two fills were observed within the cut; the primary fill [89] and a secondary fill [39]. Fill [89] comprised loose greenish grey to brownish grey mottled silty sand filling the base of the pit to a depth of 0.85m. Excavation of [89] yielded metal and ceramic building material fragments, animal bone, worked stone fragments and 20 sherds of pottery including coarse Surrey-Hampshire border ware, (1270-1500), early Surrey-Hampshire border whiteware (1480-1550), Kingston-type ware (1240-1400), late London-type ware (1400-1500), late London-type slipware (1400-1500), London-area early post-medieval redware (1480-1600), London-area post-medieval slipped redware with clear (yellow) glaze (1480-1650), Saintonge ware with mottled green glaze (1250-1650) and Siegburg stoneware (1300-1630).

7.8.2 The secondary fill [39] of the pit consisted of loose greenish grey to yellowish grey mottled moderately coarse sand with occasional inclusions of burnt clay. It also contained ceramic building material fragments, animal bone and 2 sherds of London-area early post-medieval redware (1480-1600).

- 7.8.3 Two postholes, [94] and [99], also cut into layer [88] in the western portion of the site. Posthole [94] was truncated to the north by a later intrusion [41] and posthole [99] extended west beyond the limits of the excavation. Both features appeared circular or sub-circular in shape measuring 0.31m ([94]) and 0.17m ([99]) in diameter by 0.62m and 0.74m in depth respectively. The fill, [93], of posthole [94] comprised friable greyish brown silty clay with occasional small rounded pebbles while the fill, [98], of posthole [99] consisted of soft mid brownish green sandy silt with occasional charcoal and chalk flecks; fragments of ceramic building material were recovered from fill [98]. Both features were recorded at a level of 2.58m OD.
- 7.8.4 Approximately 0.50m east of the postholes was a shallow northwest-southeast aligned cut [96] extending beyond the northern and southern limits of excavation. The sides of the feature were slightly concave with a sharp break of slope at the top and a gradual transition into a flat base at the bottom. It measured at least 8.00m northwest-southeast by 2.35m northeast-southwest by 0.10m in depth and contained a single fill of compacted crushed green sandstone with occasional chalk flecks and tile fragments [95]. The cut was first seen at a level of 2.55m OD to the south and 2.52m OD to the north.
- 7.8.5 This was directly overlain by a shallow layer of compacted crushed green sandstone and pale yellow crushed lime mortar [87] containing occasional small rounded pebbles. Although the layer appeared to be confined within the extent of cut [96] its boundaries were diffuse and could not be accurately defined. The top of the mortar layer was first observed at a height of 2.60m OD towards the south and slightly lower at 2.53m OD to the north.
- 7.8.6 Immediately above [87], and following the same diffuse boundaries, was a layer of fragmented tiles set in soft pale yellow fine grained lime mortar [86] containing very occasional small rounded pebbles and chalk flecks. It was first recorded at a height of 2.68m OD to the south and 2.55m OD to the north. A representative sample of the fragmented tiles was retained for further analysis.
- 7.8.7 Deposits [95], [87], and [86] were all truncated towards the northern edge of the trench by the cut of a later brick culvert [13].

7.8.8 Sealing the tile surface [86], pit [90] and the two postholes, [94] and [99], and extending across the entire trench was a layer of loosely compacted dark yellowish brown organic silty sand [63] containing frequent small rounded pebbles and occasional charcoal and chalk flecks. Glass fragments, 225 sherds of pottery, ferrous metal fragments, ceramic building material, burnt flint, animal bone, shell and fragments of worked stone were recovered from the layer. In addition, the excavation of the layer yielded a lead object (sf 7) and a brass rivet (sf 8). The top of the layer sloped slightly from 2.78m OD in the southeast corner of the trench to 2.72m OD in the northwest.

7.8.9 The pottery assemblage comprised coarse Surrey-Hampshire border ware (1270-1500), Central Italian tin-glazed ware (1450-1550), Cistercian ware (1480-1600), Dutch slipped red earthenware with sgraffito decoration (1450-1550), Dutch slipped red earthenware (1300-1650), early Surrey-Hampshire border whiteware (1480-1550), late London-type ware (1400-1500), late London-type slipware (1400-1500), London-area early post-medieval redware (1480-1600), London-area post-medieval slip-decorated redware (1480-1600), London-area post-medieval slipped redware with green glaze (1480-1650), London-area post-medieval slipped redware with clear (yellow) glaze (1480-1650), Raeren stoneware (1480-1610), Siegburg stoneware with iron wash, (1450-1550), and 'Tudor green' ware, (1350-1500).

7.9 Phase 8: Early post-medieval (Mid to late 16th century) (Fig. 8)

7.9.1 Overlying [63] was a layer of friable mid greenish grey sandy silt [26] with localised inclusions of chalk and charcoal flecks and small sub-angular pebbles, especially towards the north and east. Glass, metal and ceramic building material fragments, animal bones, worked stone fragments and 31 sherds of pottery were recovered from the layer. The pottery assemblage comprised Frechen stoneware (1550-1700), London-area early post-medieval redware (1480-1600) and Raeren stoneware (1480-1610). A copper alloy metal object (sf 6) and a copper alloy lace chape (sf 4) were also collected from [26]. The layer sloped slightly from 3.04m OD in the northeast to 2.95m OD in the west.

7.9.2 Cutting layer [26] were four pits ([59], [81], [85], and [92]). Pit [92] contained a single fill [91] while the two other features each contained two fills. Fill [91] comprised soft light yellowish brown sandy silt with occasional charcoal flecks. It also contained fragments of ceramic building material, animal bones, and shells. The pit, which it filled, measured 0.65m in diameter by 0.95m in depth and had slightly concave sides with a sharp break of slope at the top and a gradual break at the base, which showed signs of root disturbance. Pit [59] continued beyond the limit of excavation and measured 0.54m by 0.26m by 0.34m deep and was filled with a dark grey sandy clay, [58].

7.9.3 The two remaining pits were quite similar in shape and composition; both were sub-rectangular and oriented roughly north-south. Pit [81] measured 1.50m north-south by 0.95m east-west by 0.60m in depth while [85] was slightly smaller measuring 0.68m north-south by 0.59m east-west by 0.58m in depth. Both pit [81] and [85] consisted of a basal fill, [82] and [84] respectively, and a secondary fill, [80] and [83] respectively. The lower fill of both features comprised loose reddish yellow sandy silt with frequent small rounded flint pebbles and occasional ragstone fragments. In addition, fill [82] contained ceramic building material fragments, animal bone, one sherd of coarse Surrey-Hampshire border ware (1270-1500) and one sherd of London-area early post-medieval redware (1480-1600). Fill [84] also contained animal bone and, in addition, one sherd of Beauvais green-glazed ware (1500-1600) and one sherd of Central Italian tin-glazed ware (1450-1550). Fills [80] and [83] consisted of loose greyish brown sandy silt with occasional small rounded pebbles.

7.10 Phase 9: Early post-medieval (Mid to late 16th century) (Fig. 9)

7.10.1 Overlying the pits was a series of dumped deposits [62] comprised of seven individual layers ([10], [64], [65], [66], [71], [72], and [75]). With the exception of [65], which extended across the entire trench, each layer covered only a portion of the trench. These ranged in composition from gravel to mortar to silty clay and in colour from dark brownish grey to greenish grey. Only one of the layers, a gravel rich deposit [10] towards the base of the sequence, yielded any finds. These consisted of animal bones, fragments of ceramic building material and 3 sherds of pottery including Kingston-type ware (1240-1400) and London-type ware (1080-1350). The top of the dumped deposits sloped slightly from 3.18m OD in the west to 2.94m OD in the east.

7.10.2 Sealing the sequence of dump layers at a maximum height of 3.30m OD to the west and 2.95m OD to the east was a metalled gravel surface [3]. Ferrous metal fragments were recovered from the surface including a horseshoe (sf 2) and an unidentified object (sf 3); small unidentified copper alloy fragments (sf 1) were also recovered from the deposit.

7.10.3 Five pits or postholes ([19], [32], [50], [55], and [57]) cut the metallated surface. These were either circular or oval in shape and ranged in diameter from 0.60m to 0.95m and in depth from 0.25m to 0.63m. With the exception of [32], which was located towards the centre of the northwest quadrant of Trench 1, they were aligned along the northern and western boundaries of the trench. The fills ranged from mid brownish grey sandy silt to dark brown silty clay.

7.10.4 Fill [31] of feature [32] yielded glass fragments, a sherd of Cistercian ware (1480-1600) and one sherd of Frechen stoneware (1550-1700AD) while fill [49] of posthole [50] yielded one sherd of Post-medieval Essex black-glazed redware (1580-1700) and a sherd of Raeren stoneware (1480-1610). Fragments of metal and ceramic building material, a sherd of Frechen stoneware (1550-1700), one sherd of London-area early post-medieval redware (1480-1600) and two copper alloy pin fragments (sf 5) were recovered from fill [54] of posthole [55]. The excavation of the two remaining fills ([18] and [32]) yielded no finds.

7.11 Phase 10: Post-medieval (Post-16th century) (Fig. 10)

7.11.1 With the exception of posthole [32] and pit [57] all of the features described in Phase 9 were truncated by later cuts ([17], [44], [46], and [52]). Excavation of these yielded one clay tobacco pipe stem fragment (1580-1910A) from fill [45] of pit [46]; one sherd of Raeren stoneware (1480-1610), a sherd of English tin-glazed ware (1570-1846), and one clay tobacco pipe stem fragment from the upper fill [51] of posthole [52]; and two sherds of London-area post-medieval redware (1580-1900) from the lower fill [53] of cut [52]. Ceramic building material fragments were also recovered from fills [45] and [53] and animal bones from fills [51] and [53].

7.11.2 Sealing postholes [19] and [57], and covering most of the eastern half of the trench, was a horizon of mid to dark greyish brown organic silty sand [2]. This layer had been heavily truncated by later activity in the western half of the trench, but it appears to have extended across this area as well. It was encountered at a height of 3.39m OD. Animal bones and fragments of ceramic building material were recovered during the removal of the context.

7.11.3 With few exceptions the remaining features in this phase consist of a sequence of intercutting postholes representing the replacement of earlier fence posts around the north and west periphery of the trench and successive dump layers ultimately raising the ground level to its current height.

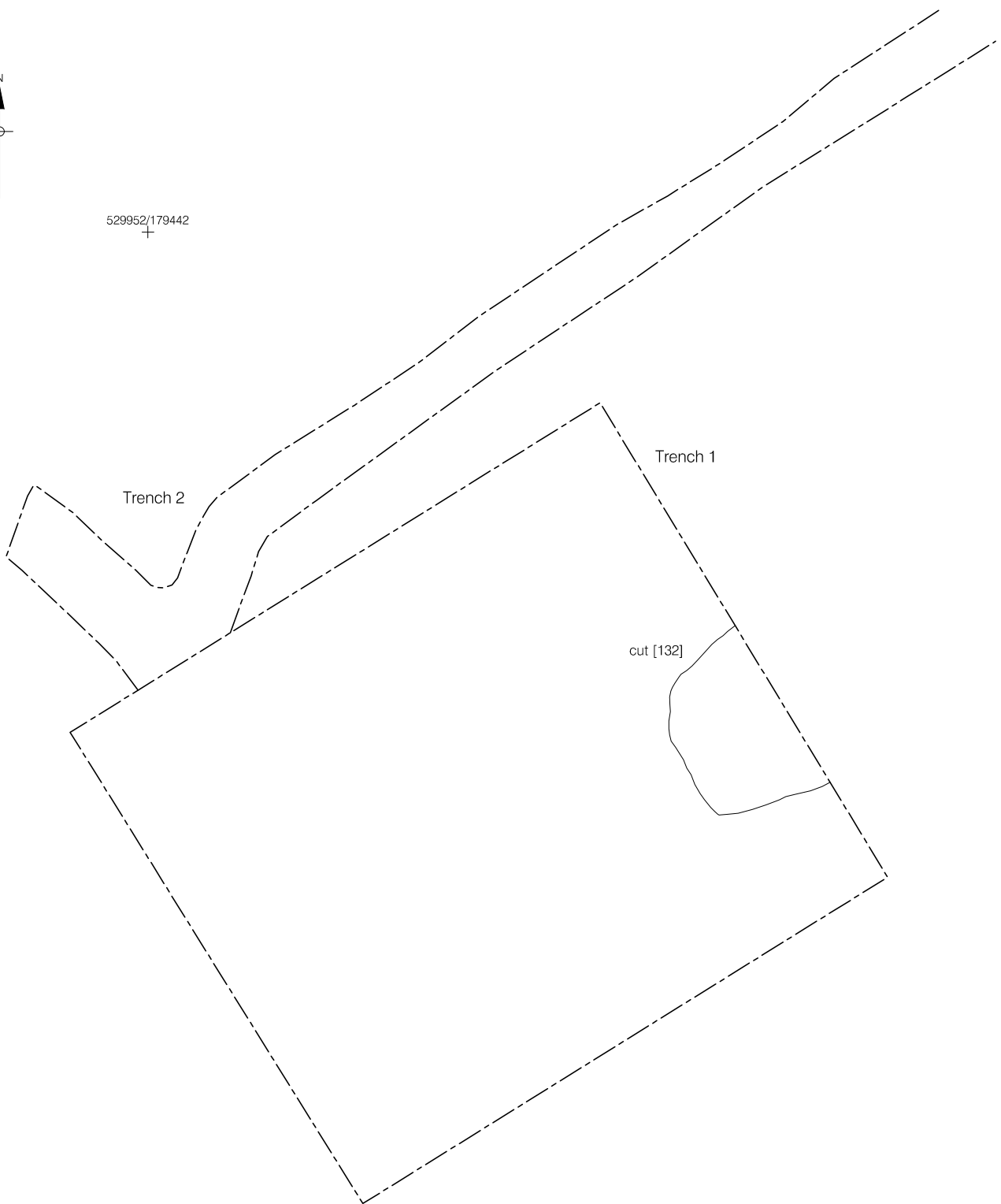
7.11.4 A brick-lined well [7] observed in the southwest corner of the excavation at a maximum height of 3.20m OD. It had been constructed using red bricks measuring

230-235mm by 105mm by 65mm laid in a circular header bond. The well measured approximately 1.70m in diameter (external) and extended below the base of the excavation at -0.01m OD.

- 7.11.5 In the northwest corner of the trench a southwest-northeast aligned vaulted brick culvert [12] was recorded at a maximum height of 2.91m OD. It was constructed using unfrosted red and yellow bricks measuring 230-240mm by 105mm by 60-63mm laid in an irregular pattern and set in a light grey hard mortar with frequent chalk and crushed shell fragments.



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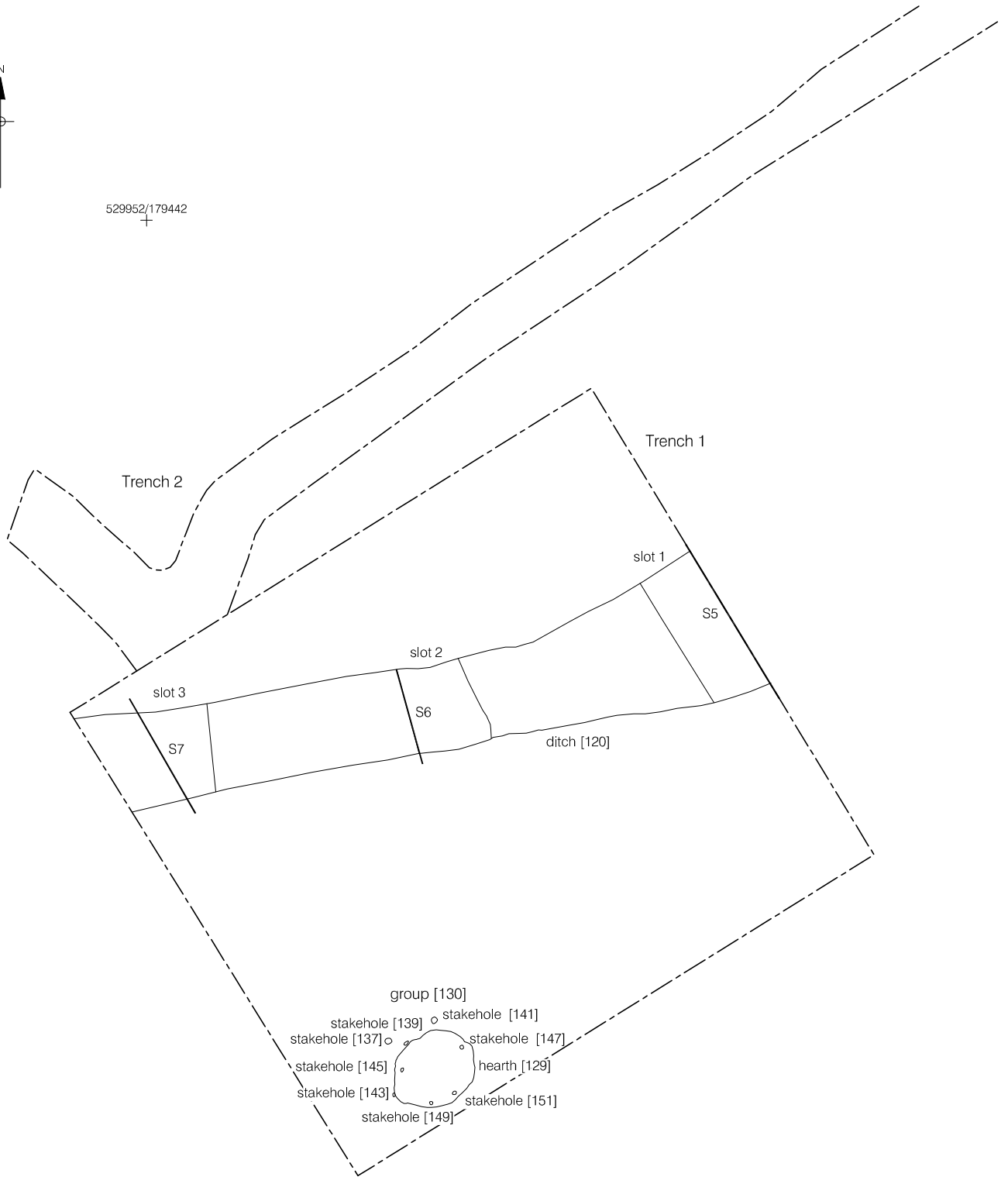


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Figure 3
Phase 2: Late Iron Age/Early Roman
1:75 at A4



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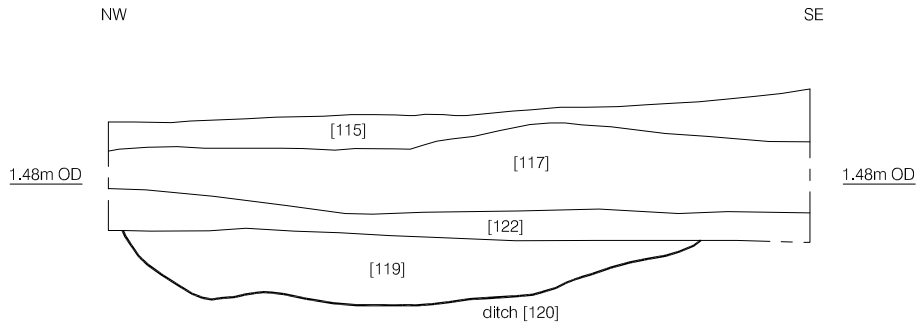


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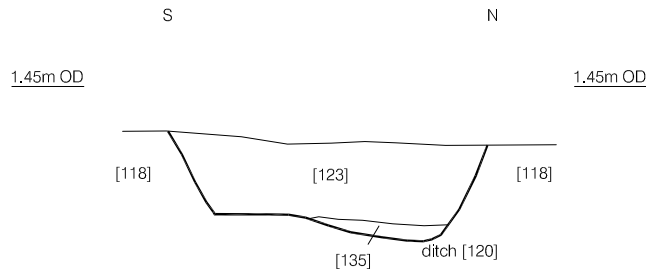


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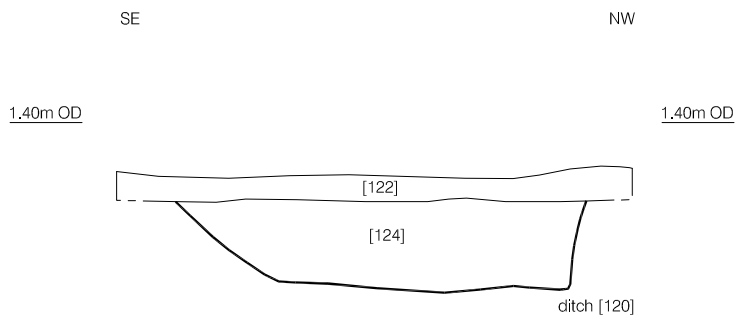
Figure 4
Phase 4: Early Medieval (Late 12th - Early 13th century)
1:75 at A4



Section 5
Trench 1
Southwest Facing



Section 6
Trench 1
East Facing



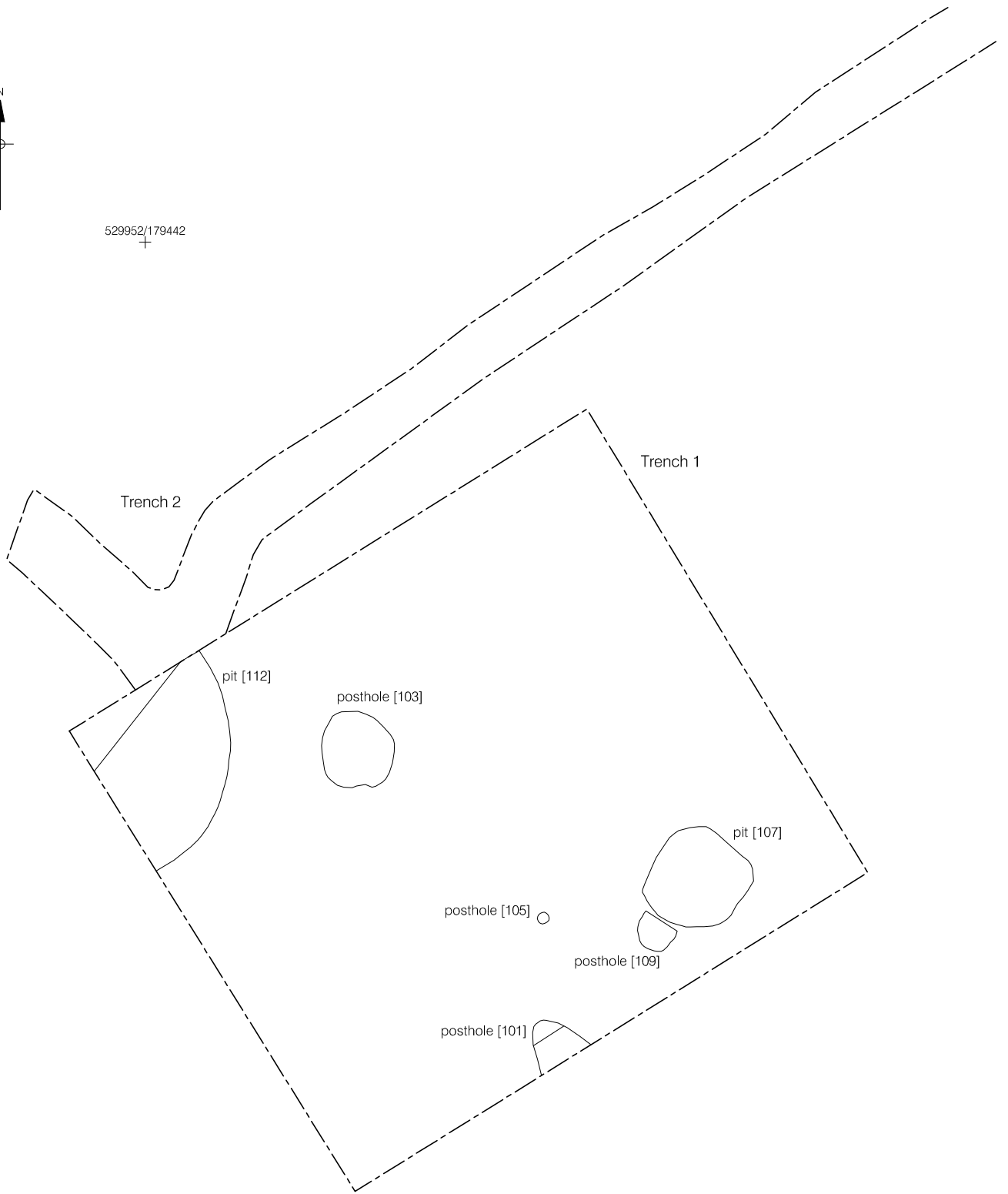
Section 7
Trench 1
Northeast Facing



Figure 5
Sections 5 - 7
1:25 at A4



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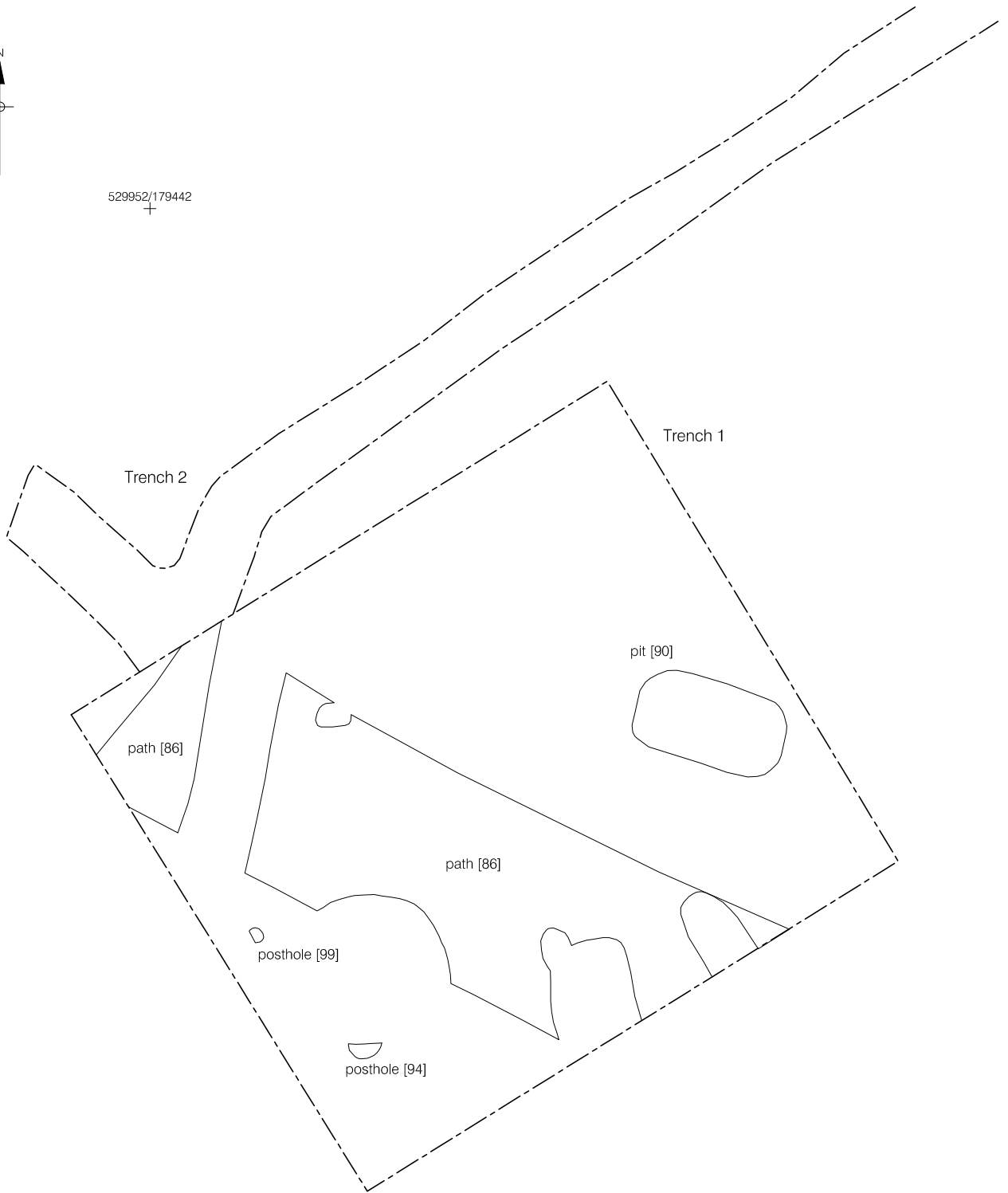


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Figure 6
Phase 6: Late Medieval (15th century)
1:75 at A4



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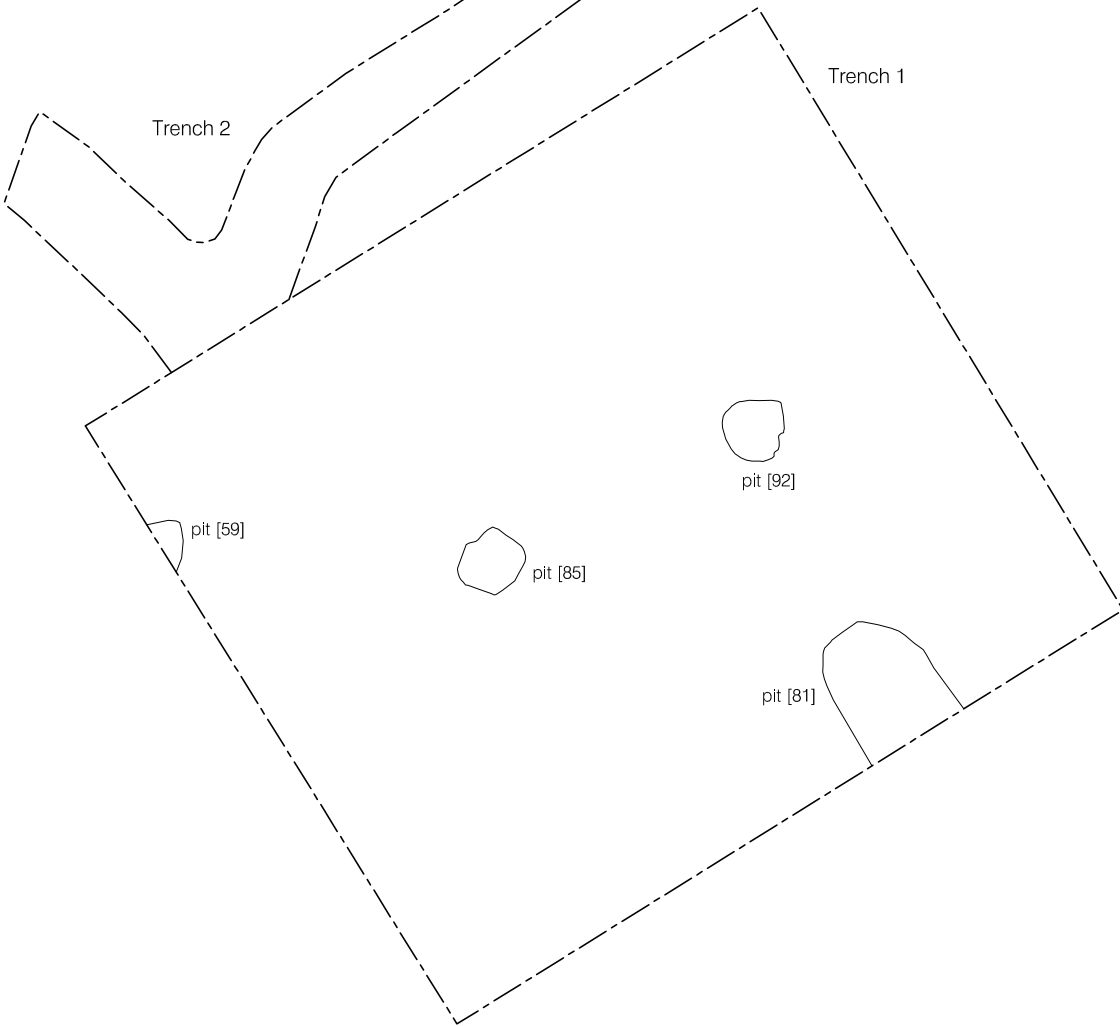
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Figure 7
Phase 7: Early Post-Medieval (Early - Mid 16th century)
1:75 at A4



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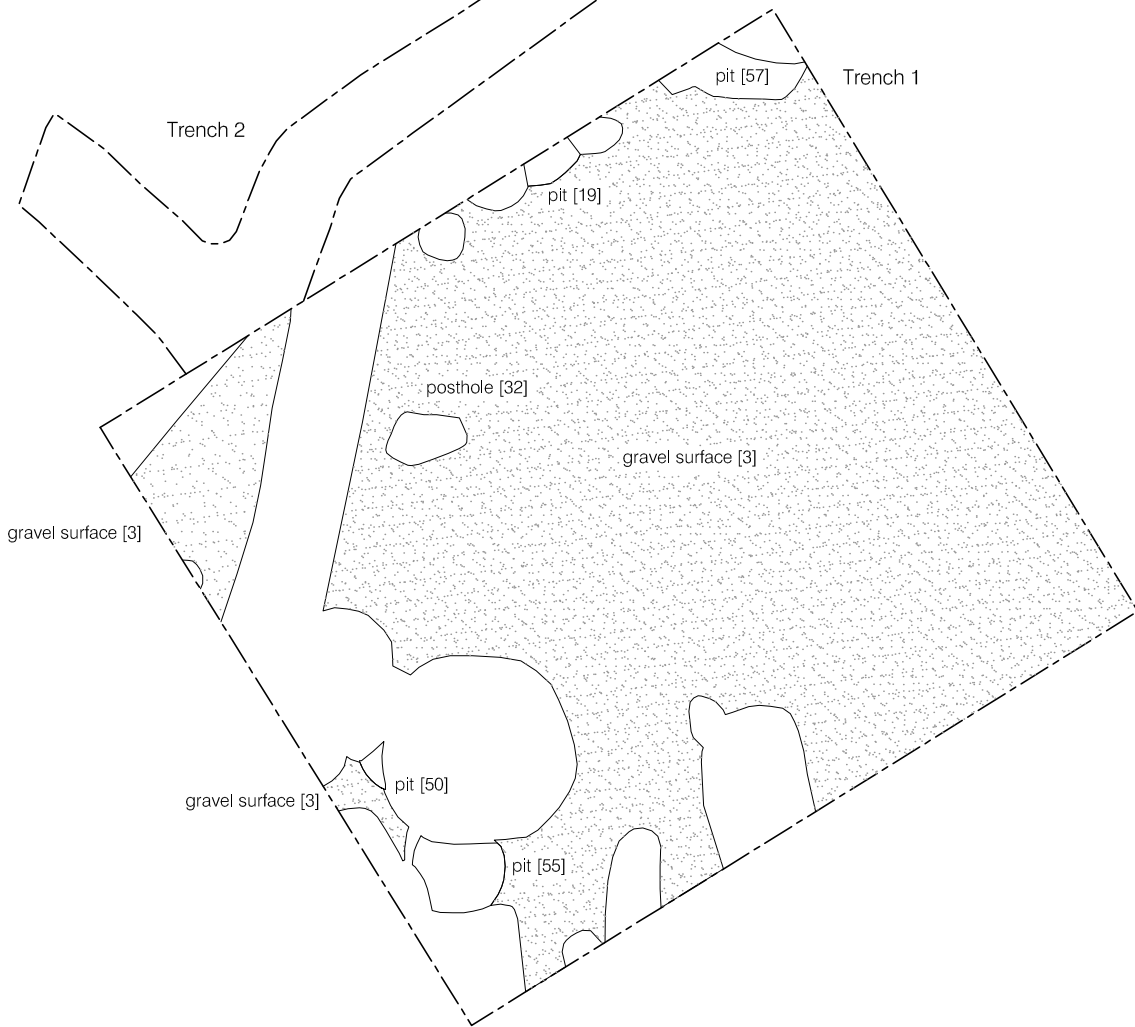
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Figure 8
Phase 8: Early Post-Medieval (Mid - Late 16th century)
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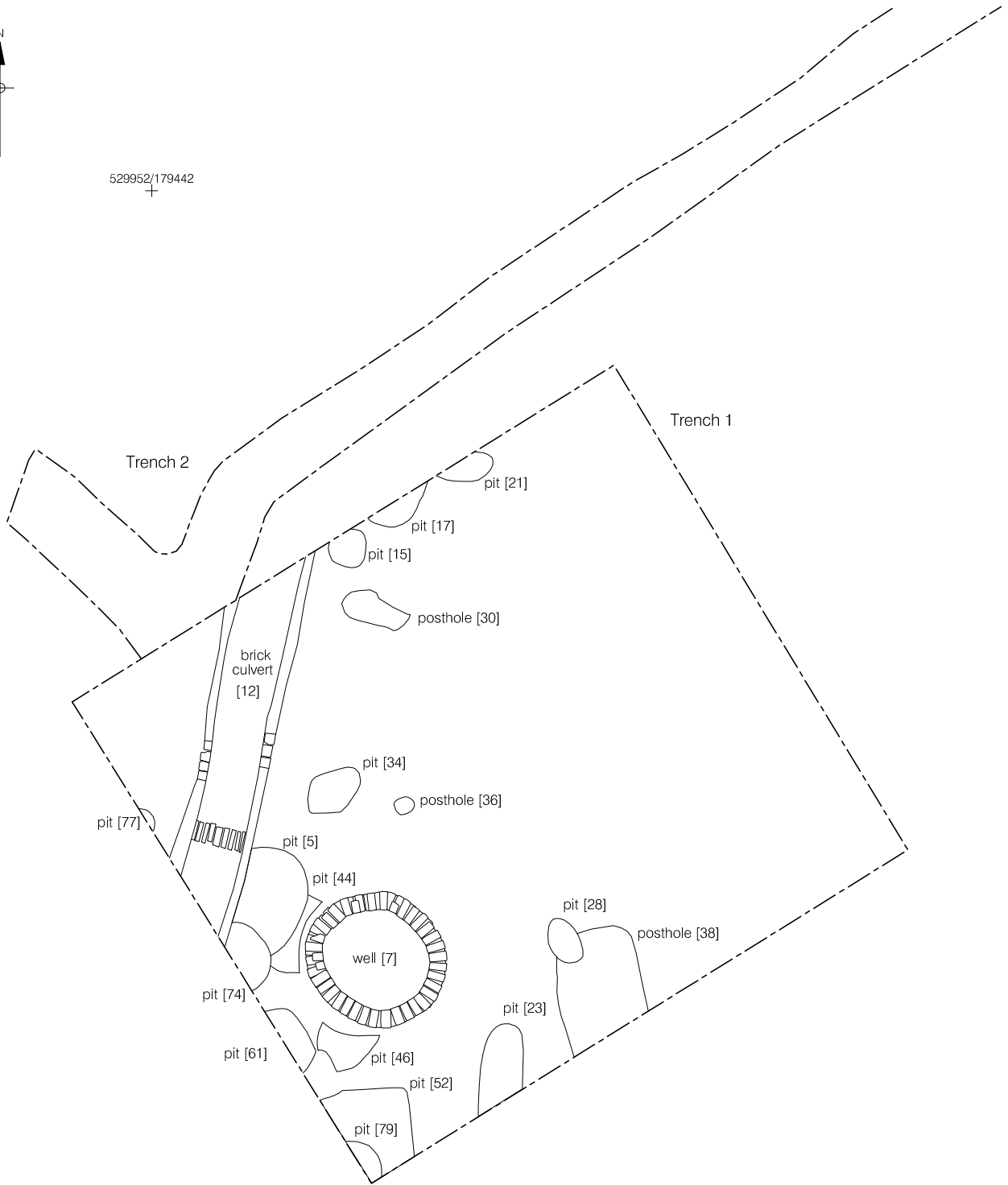


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Figure 9
Phase 9: Early Post-Medieval (Mid to Late 16th century)
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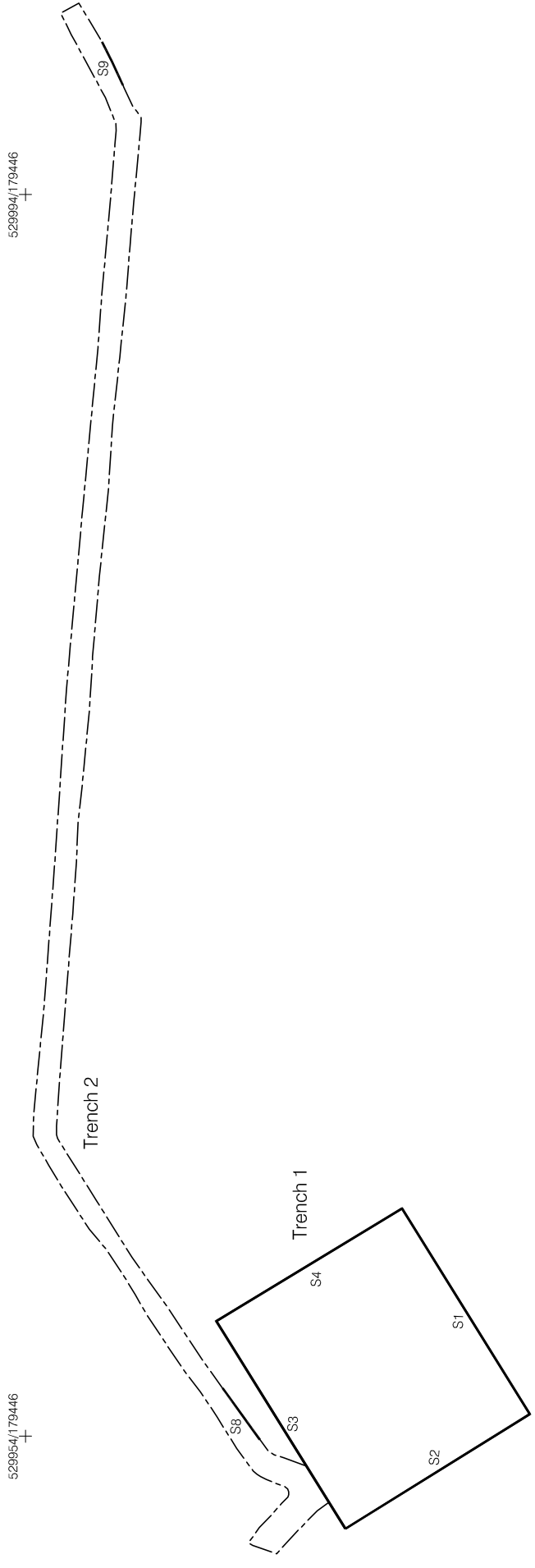


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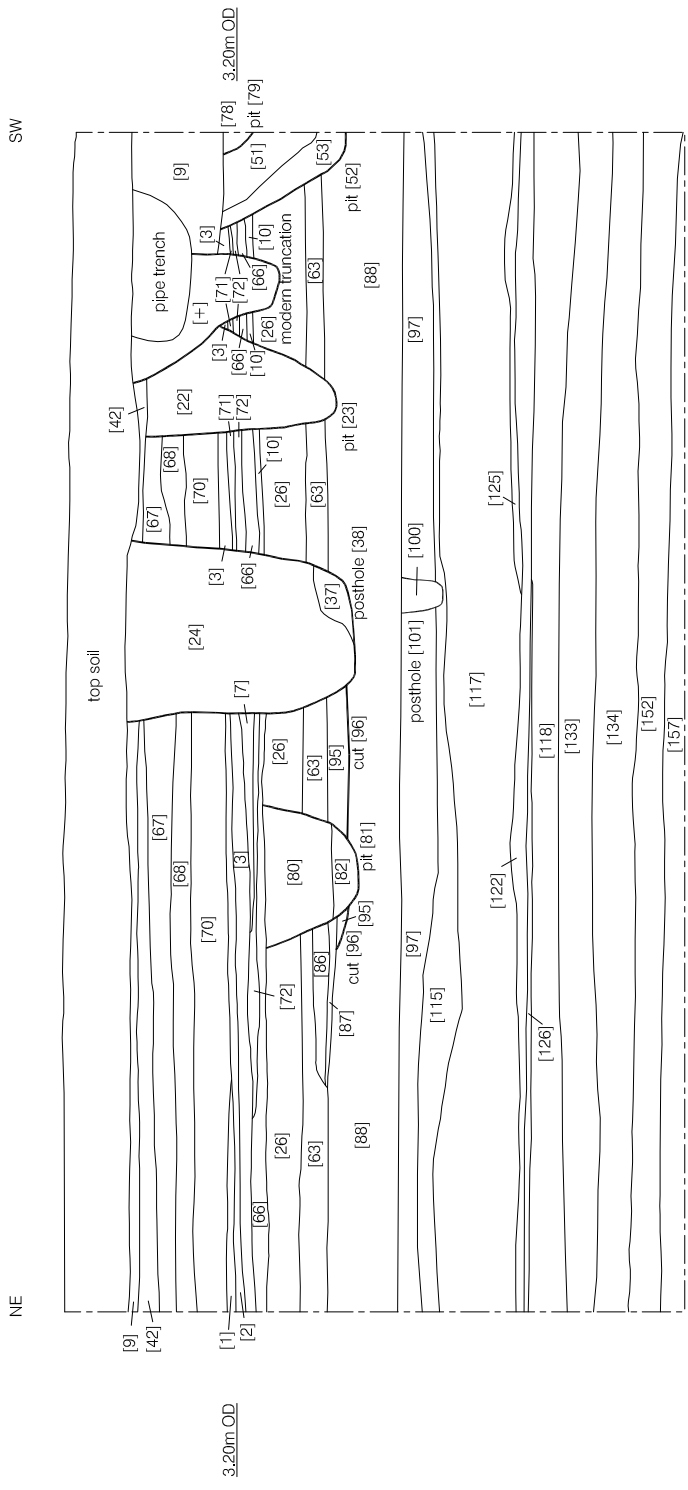
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Figure 10
Phase 10: Post Medieval - Modern (Post 16th century)
1:75 at A4

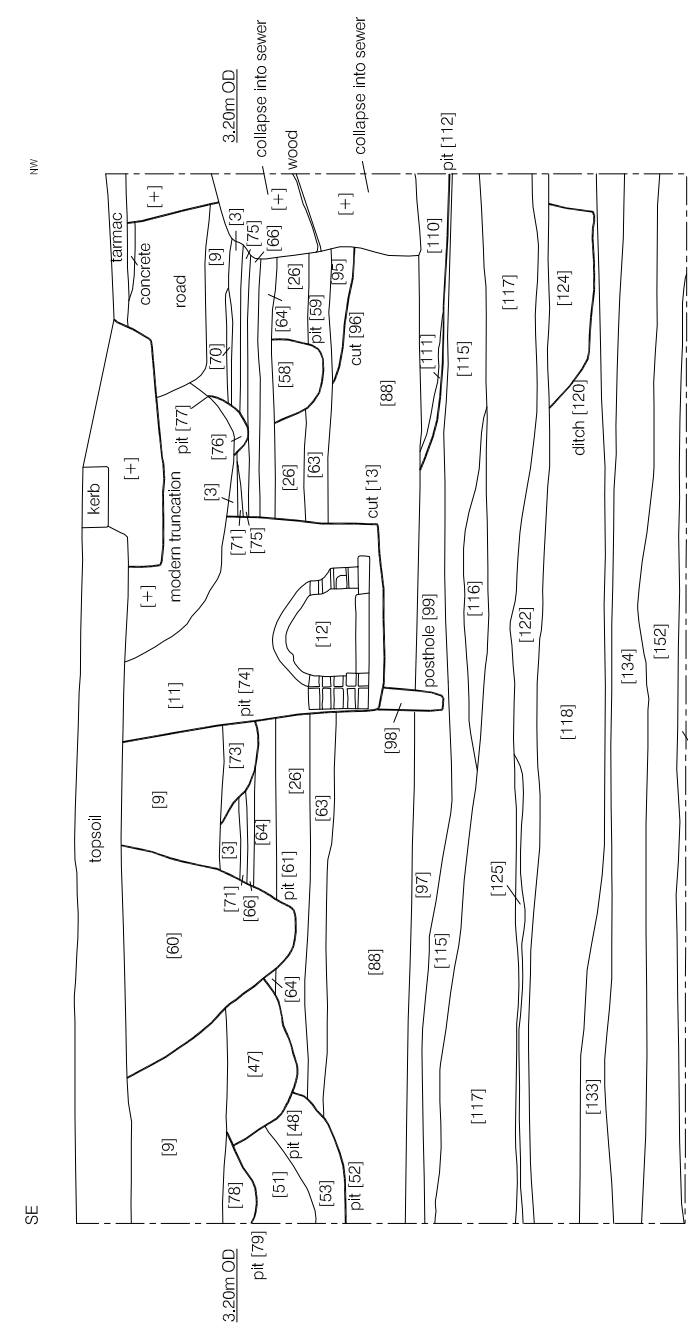


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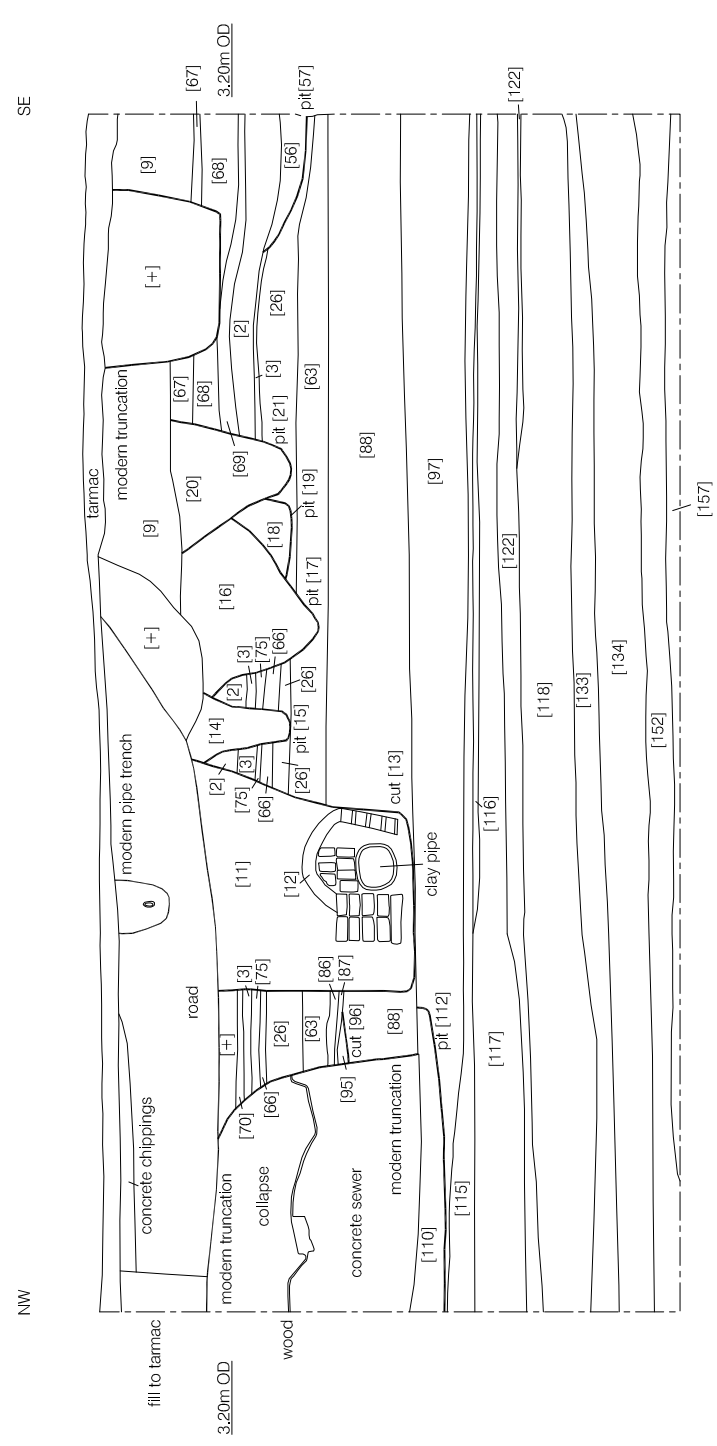
Figure 11
Section Location
1:200 at A4



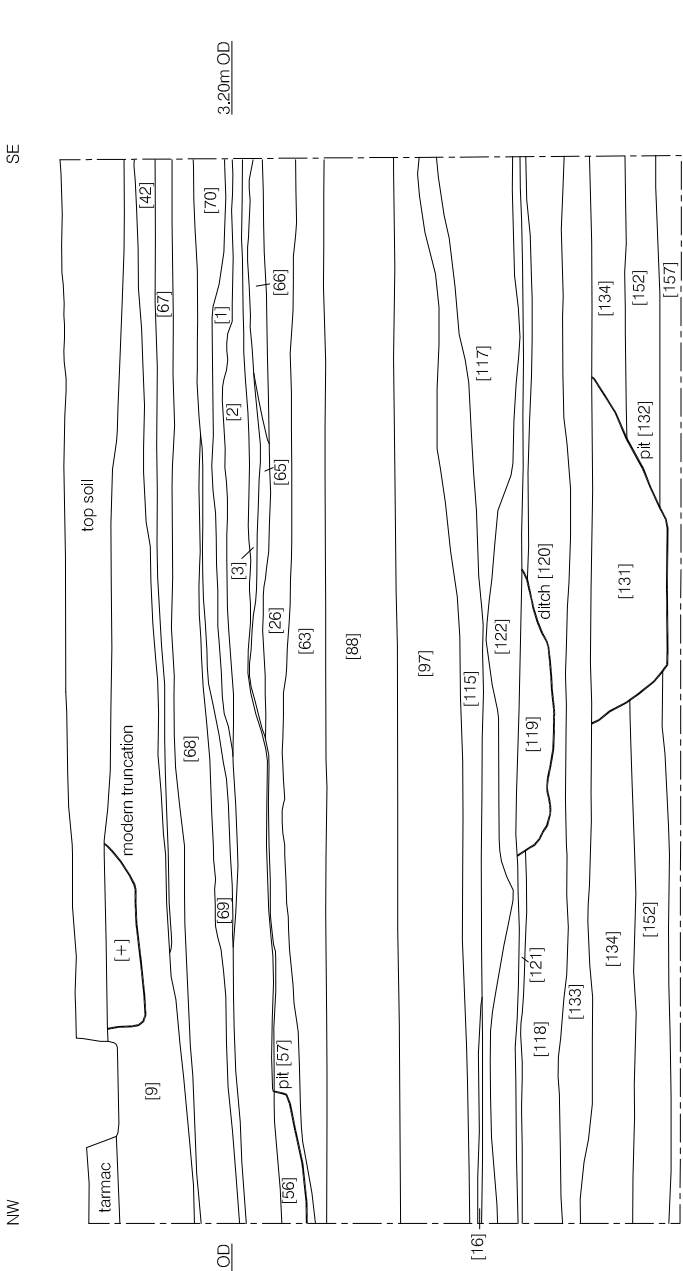
Section 1
Trench 1
Northwest Facing



Section 2
Trench 1
Northeast Facing



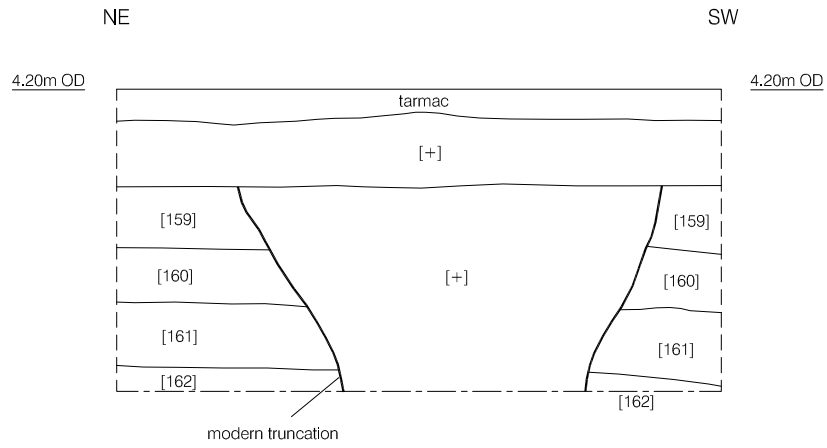
Section 3
Trench 1
Southeast Facing



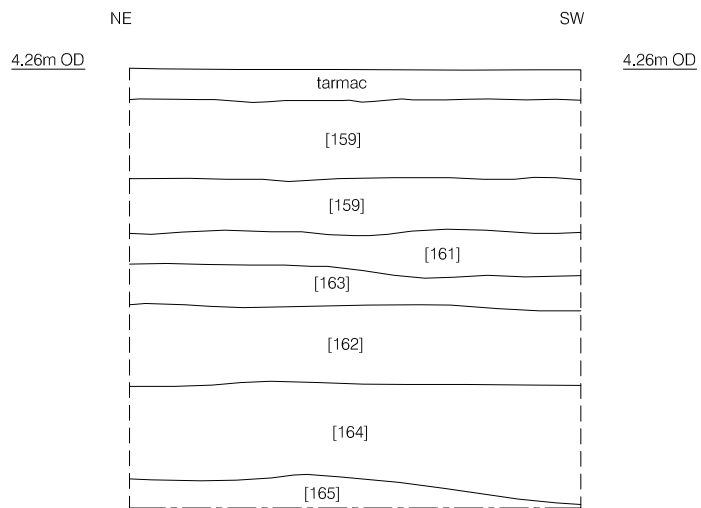
Section 4
Trench 1
Southwest Facing



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Section 8
Trench 2
Northwest Facing



Section 9
Trench 2
Northwest Facing

8 INTERPRETATION

8.1 Phase 1: Natural

8.1.1 The natural stratigraphy encountered during the excavation comprised layers of sand and gravel and is consistent with natural strata recorded elsewhere on the island. The deposits generally sloped down from the east to the west towards the River Tyburn.

8.2 Late Neolithic/Early Bronze Age

8.2.1 A struck flint of possible Later Neolithic or Early Bronze Age date was recovered from the top of the natural sand. This can be added to the major activity of that period previously found especially in the Cromwell Green area and the foreshore of Thorney Island (Thomas *et al* 2006, 23-28).

8.3 Phase 2: Late Iron Age/Early Roman

8.3.1 Limited evidence for human occupation of the site in this period was seen during the excavation in form of a single pit in the eastern part of Trench 1. Finds from this period are relatively rare on Thorney Island sites. It has been argued that this could be a result of erosion rather than indicative of human absence; especially along the periphery of the island (Thomas *et al* 2006).

8.4 Middle Saxon

8.4.1 A few sherds of residual Saxon pottery was collected from later features and may indicate activity during this period in the vicinity of the trench. This can be added to the other chance find spots and residual material found in later contexts beneath Westminster Abbey (Thomas *et al* 2006, 45).

8.5 Phase 3: Early Medieval (12th century)

8.5.1 Edward the Confessor's abbey was probably mostly completed by the consecration in 1065 while it is likely that the claustral ranges are believed to have been completed by Abbot Gilbert Crispin between the late 11th and early 12th century. No evidence directly pertaining to either the earlier abbey or the claustral ranges was observed during the excavation (Thomas *et al* 2006). It is likely that the location of these structures correspond roughly to the location of the present day church and cloisters. During the early 12th century the ground level towards the western extreme of Dean's Yard was at approximately 0.77m OD and sloped up towards the current site of the Abbey. The buried ground horizon [133] yielded a number of cultural material including pottery sherds, ceramic building material, and animal bones, which suggests casual discard of domestic refuse was taking place across the area.

8.6 Phase 4: Early Medieval (Late 12th/early 13th century)

- 8.6.1 During the late 12th or early 13th century the ground level was raised to approximately 1.34m OD through the deposition of a layer of silty clay followed by a layer of organic silty clay. An east-west aligned ditch was then cut through these horizons. The purpose of this ditch was likely to serve as a drainage system from the claustral buildings to the west. A large quantity of fish and small animal bones were recovered from the fills of the feature. While the reason for the raising of the ground is not known it is possible that the area was used as a dumping ground for spoil generated by works elsewhere on the island, i.e. the rebuilding of the choir, which started in 1250.
- 8.6.2 To the south of the ditch the remains of a hearth or oven were recorded. No structural remains were uncovered in the vicinity of the feature, which could suggest that it had been constructed for external use. It is also possible that a temporary 'lean-to' type structure covered it, but due to the low level of impact caused by such a structure it left no archaeological trace.

8.7 Phase 5: Medieval (13th century)

- 8.7.1 Throughout the 13th century material was continuously being deposited ultimately raising the ground level in the northwestern part of the yard from 1.34m OD to 2.01m OD. It is possibly that the ground raising during this period represents an attempt of taking advantage of the restricted flow of the Tyburn caused by the 1236 piping of the Tyburn Springs to create a more favourable landscape along the relatively steeply sloping sides of the island while at the same time providing a convenient area for dumping spoil generated by the large scale reconstruction of the abbey by Henry III in the mid 13th century.
- 8.7.2 The ultimate height of the ground level during the 13th century was at 2.01m OD. Compared to the base of the surviving portal (Cheyney Gate) leading to the cloisters in the northeast corner of Dean's Yard, which is located at approximately 4.00m OD it becomes apparent that Dean's Yard must have sloped down relatively steeply towards the bank of the Tyburn to the west.

8.8 Phase 6: Late Medieval (15th century)

- 8.8.1 Despite large scale development of the areas immediately north, south, and east of Dean's Yard in the 14th century archaeological evidence for activity in this period was virtually non-existent during the excavation. What little evidence there was for 14th century activity came in form of a few residual sherds of pottery recovered from later

deposits. It is possible that some of the upper levels of land reclamation discussed in Phase 5 were deposited in the 14th century although it would be unlikely based on the complete lack of 14th century artefacts from these deposits.

- 8.8.2 In the 15th century the ground level was once again raised. This was achieved through the deposition of a layer of yellowish brown sand to a maximum height of 2.14m OD. Before it was sealed by a layer of organic soil a group of pits were excavated through the sand. It is likely that this was done in order to recover some of the sand for use elsewhere on site. The two postholes cutting the layer in the southern of the site may represent a north-south aligned fence or temporary structure.
- 8.8.3 Towards the later part of the 15th century a layer of dark, organic soil was present sealing the site and raising the ground level to 2.64m OD. This likely represents the remains of the late 15th century ground level.

8.9 Phase 7: Early Post-medieval (Early to mid 16th century)

- 8.9.1 During the first half of the 16th century a path was cut into the late medieval ground horizon; the cut was then filled with a mixture of crushed green sandstone and mortar which was compacted to provide a traversable surface. Later, possibly towards the end of the first half of the century, the path was resurfaced using broken tiles set in lime mortar. Two postholes recorded west of and roughly parallel to the path may represent the remains of a fence along the crushed sandstone, and later tile, surface.
- 8.9.2 By the end of the first half of the 16th century a new ground horizon had been deposited raising the surface level to 2.78m OD.

8.10 Phase 8: Early Post-medieval (Mid to late 16th century)

- 8.10.1 Towards the end of the 16th century the ground was once again raised; this time to a height of 3.05m OD. Three postholes forming a roughly northwest-southeast aligned line were then excavated through the newly raised ground. They appeared to roughly follow the alignment of the path discussed in Phase 7 and it is possible that they represent a later fence lining a passage through the green of Dean's Yard.

8.11 Phase 9: Early Post-medieval (Mid to late 16th century)

- 8.11.1 It appears that the possible Phase 8 fence only survived for a short time before the ground was once again raised. This likely occurred towards the end of the 16th century and the activity was here represented by a series of dumped deposits, the top of which was at 3.26m OD. After the ground was raised a metalled gravel surface was laid down and posts were installed creating a roughly rectangular courtyard. A plan of

the buildings adjoining Dean's Yard (dated 1715) describes the central area as being "Gravel'd and Posted and Rail'd". It is likely that the gravel surface encountered during the excavation is the one mentioned on the 1715 plan and the postholes seen during this phase represent the post and rail barrier around the central area.

8.12 Phase 10: Post-medieval (Post-16th century)

- 8.12.1 The deposition of material continued throughout the 17th century and the posts of the "post and rail" type fence were periodically being replaced. During the early part of the century a brick lined well was constructed near the southwest corner of the trench. There does not appear to be any mention of this in any of the records consulted, but it is possible that documents pertaining to its construction could be found amongst the primary sources kept at the Abbey. Material recovered from the backfill of the well suggests that it was no longer in use by the mid 18th century.
- 8.12.2 Following the demolition of the old granary and brewhouse in 1756 some of the material was used to lay out "the green" in Dean's Yard. This refers to the northern portion of the current quadrangle and would have included the area of the excavated trench. It is possible that the ground level was raised to around 3.81m OD as suggested by a sequence of dumped deposits topped with organic soil at this height.
- 8.12.3 In the early 19th century the ground level was raised to 4.09m OD; near its current level. It appears that a version of the "post and rail" fence continues to exist throughout most of the 19th century. Towards the end of the century a vaulted brick culvert was constructed through the northwest corner of the yard. This appeared to be feeding into the sewer built in response to the cholera epidemic of 1848-49.
- 8.12.4 The final deposition of material was made in either the late 19th or early 20th century and raised the ground level to its current height of 4.34m OD.

9 CONTENTS OF THE ARCHIVE

9.1 Paper Records

• Contexts		165 sheets
• Plans	70 plans	141 sheets
• Sections	9 sections	32 sheets
• Environmental Sheets		6 sheets

9.2 Finds

• Pottery		4 boxes
• Building Material		17 boxes & 1 crate
• Glass		1 box
• Clay Tobacco Pipe		1 box
• Lithics		1 box
• Animal Bone		12 boxes
• Fishbone		1 box
• Small Finds		130 objects

9.3 Samples

• Environmental Bulk Samples		6
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9.4 Photographs

• Black and White Prints		36
• Colour Slides		36
• Digital shots		26

10 IMPORTANCE OF RESULTS, FURTHER WORK AND PUBLICATION OUTLINE

10.1 Importance of the Results

10.1.1 Previous archaeological work ahead of the Jubilee Line extension collected data pertaining to the changing topography of the island; however, this work was restricted to the eastern part of the island. No archaeological work had previously been carried out within Dean's Yard although a geophysical study was undertaken in 2005. Therefore the work detailed in this report provides the first information regarding the evolution of the topography of Dean's Yard and *ipso facto* the western portion of Thorney Island. The archaeological sequence suggests that the topography of this part of the island change drastically during the medieval period.

10.1.2 A struck flint of possible Later Neolithic or Early Bronze Age date was recovered from the top of the natural sand and adds to the corpus of prehistoric finds from the area and suggests that extensive occupation of Thorney Island may have occurred at that time. The presence of pottery dating to either the late Iron Age or early Roman period supports the already existing evidence for at least transient use of the land during this period. Material dating to both of these periods is relatively rare on Thorney Island due to later erosion of the late Iron Age and early Roman deposits (Thomas *et al* 2006).

10.1.3 The medieval remains consisted largely of ground raising dumps together with a possible drainage ditch and a hearth, whilst the post-medieval remains also largely consisted of made ground, a path and surfaces associated with the area, latterly known as Dean's Yard. The importance of these deposits lies in the artefacts that were recovered from them, most notably building material which was originally used in the abbey buildings, the pottery which was supplied to the monastic site and the animal and fish bone which can provide a insight into the monastic diet. This can be compared with other assemblages from sites within the abbey precinct and also from other monastic sites in London.

10.2 Further work

10.2.1 Research Framework for London (Nixon *et al* 2002) has established a number of key issues and objectives when dealing with archaeology within this region, a number of which have implications for further work in relation to the site in Dean's Yard.

10.2.2 The existence of a complete archaeological stratigraphic sequence from the early medieval period through the late 19th or early 20th century provides information about the evolution of the landscape through cultural manipulation of the land.

10.2.3 Another importance aspect to consider is the lack evidence for 14th century activity, particularly given the documented activity in the area immediately surrounding the site. Is it possible that truncation rather than deposition occurred during this period and if so what was the reason for this?

10.2.4 A documentary study of the development of the area immediately surrounding the site may provide information about the activity taking place within the confines of the site as seen through the deposition of material over a period of almost an entire millennium. Is the raising of the land simply a result of the need to deposit spoil generated by the redevelopment of the Abbey and the surrounding buildings or a deliberate attempt to prevent flooding caused by climatic changes from at least the late 11th century through to at least the 13th century leading to rising water levels?

10.2.5 Listed below are the recommendations for future work identified in the specialist assessments (see appendices):

- **Pottery assessment**

The main potential of the medieval assemblage is to demonstrate what types of pottery were supplied to Westminster Abbey and the properties on Dean's Yard. Documentary evidence for the land use of the properties at Dean's Yard may be useful for determining if the functions of the pottery vessels have any significance for the land use.

The main interest from post-medieval period is the late 15th and 16th century pottery groups and whether they relate to specific properties. The influence of the Renaissance can be seen in some of these pottery groups and therefore infer upon the supply of pottery to the period before the Dissolution of the Abbey or the middle or upper socio economic groups residing in the locality. Documentary evidence for the land use of the properties the pottery was recovered from will aid in the interpretation of the significance of the pottery from this period.

A short pottery report is required for the publication of the site and it is recommended that six vessels are illustrated and a photograph of the Central Italian tin-glazed ware sherds is used to supplement the text.

- **Clay Tobacco Pipe assessment**

The West Country bowl merits illustration and comment upon. A short publication report is recommended and the West Country pipe requires illustrating to supplement the text.

- **Building Material assessment**

The rich and diverse array of dumped medieval to post-medieval stone and ceramic building material from Dean's Yard very much reflects the development of the Abbey itself over 1000 years and as such warrants further analysis and publication. Comparison with building material assemblages from existing studies at Westminster Abbey (e.g. Thomas *et al* 2006) and other important 11th-12th century ecclesiastical sites (e.g. Merton Priory; Bermondsey Abbey) would ascertain how unique this assemblage is. Furthermore, comparison with the fabric collection and *in-situ* building material from the Abbey itself may help to determine more precisely from where and from what period of the Abbeys development each material type came from.

In addition to this the quantity (9kg) of early Roman building material (especially brick) recovered was high and for this reason its origin or even function needs to be explored in greater detail. Again comparison with existing studies needs to be made in order to understand more fully the development and reclamation of Thorney Island in the Roman and post-Roman period. Thin-section comparative analysis of the Taynton stone moulding from medieval reclamation [118] with the 4th century Westminster Sarcophagus may help establish whether or not this was a Roman funerary monument. Finally, the identification of unstratified Alabaster statuary may warrant further investigation into the medieval use of this material at Westminster Abbey.

- **Metal and Small Finds assessment**

The metal finds from Dean's Yard form an integral part of the material recovered during excavation and should, where relevant, be included in any further publication of the site. This is particularly relevant for the 16th-century assemblage, which represents a period that is still relatively poorly represented in the archaeological material. For this purpose, x-ray is required for the majority of metal objects to enable further identification. Parallels should be sought for the

possible copper-alloy wire brush (sf 18), while the stone hone (sf 10) should be further determined by a stone specialist. The silver penny (sf 9) should be closer identified to type and mint.

- **Glass assessment**

Other than mentioning in the text the presence of the window glass fragments, no further work is required. No illustrations are required.

- **Lithics assessment**

The assemblage is small and beyond indicating a prehistoric and a medieval or post-medieval presence, is of little further interpretational value. It is therefore recommended that mention should be made of the flintwork in any published account of the investigations but that no further work is warranted.

- **Animal Bone assessment**

The potential value of this assemblage lies in the reasonable quantity of bones represented by each of the medieval and early post-medieval phases as well as the generally good condition of these collections. There is sufficient data to comment on the relative status of the assemblage, at least in the earliest levels, here concerning the sturgeon and the small cetacean. In addition, noted changes in the abundance of the major domesticates can be seen to follow local (initially) and then more general animal usage patterns. The high pig counts in the early medieval phase reflects the large proportion of pig bones found within 11th century levels at Westminster Abbey Undercroft (Pipe 1995; Rackham 1994, 132). It is conceivable that a major usage of pork may have some bearing on the local monastic diet and/or indicate the presence of piggeries attached to the monastic buildings. The increasing importance of the woollen trade in the medieval period tends not to be shown in the bone assemblages until the later medieval period, with most of the earlier sites demonstrating, as here, a dominance of cattle. A typical example of this change from cattle to sheep or cattle/sheep parity, accompanied by a general decline in pig usage, is shown at Carroone House (Rielly in prep). Other similarities with the general pattern include the generally adult nature of the cattle and sheep collections, irrespective of phase. However, here as elsewhere, there is a notable rise in the proportion of veal calves by the late medieval period. This has been related to a contemporary rise in the importance of cattle dairy production (Albarella 1997).

In conclusion, there is clearly some potential regarding further study of the medieval and early post-medieval collections, these adding to the general picture

of animal usage at contemporary sites in London. The earliest collections will form a major part of this study, in particular as they appear to show monastic traits. These levels were extensively sampled, providing a wealth of fishbones as well as some poultry and game. Thus it should be possible to compare and contrast the early medieval data with similarly large and well recovered collections from other monastic sites, as for example from St John Clerkenwell and St Mary Spital (Sidell and Fitzgerald 2004; Pipe 1997). Later comparisons will include the late medieval and early post-medieval assemblages from the nearby site at Westminster Station (Rielly 2006).

- **Fishbone assessment**

The assemblages of fish bones from Phases 4 and 5 were recognised as kitchen/table waste, which clearly reflected/indicated high status diet owing to the presence of the wide variety of freshwater species and the highly prized sturgeon.

There are a range of further research questions which may be addressed by analysing in more detail the Phase 4 & 5 assemblages (e.g. to determine whether the marine species were obtained by the inhabitants fresh or in preserved form). It would be instructive to compare the Dean's Yard assemblages with those from the Misericorde of Westminster Abbey (analysed by Jones 1976). Reference should also be made to the range of fish known from historical records to have been eaten by the Westminster Abbey monks (see Harvey 1995, 46-51). Comparative analyses with fish bone assembles from other urban monastic sites is also recommended.

In summary, it is considered that the Dean's Yard material has the potential of making a useful contribution to our understanding of high status medieval dietary preferences/consumption patterns, with special reference to the contribution made by fish.

- **Environmental assessment**

Analytical work is recommended for charcoal from samples <2>, <3> and <4> from contexts [119], [123] and [124]. Any further work undertaken should integrate context information to establish whether the charcoal assemblages are directly related to the use or infilling of the features. The final selection of samples for analysis should be determined through consultation with the site supervisor and available context records as well as taking into account spot

dates for the features. This will help establish whether further work will contribute to the interpretation of the features or site as a whole.

10.3 Publication outline

10.3.1 The recommendation is for the archaeological results to be published in a local journal either the *Transactions of the London and Middlesex Archaeological Society* or *London Archaeologist*. The publication will concentrate on the medieval and early post-medieval periods and consider the activity on the site in relation to the monastic buildings. The building materials that were discarded from construction work and demolition and the diet of the monks of the abbey as evidenced by analysis of the animal and fish bones will be given prominence. An outline for the publication is detailed below:

Archaeological Investigations in Dean's Yard, Westminster Abbey,

- Introduction to the Project
- Historical and Archaeological Background
- Archaeological findings
- Specialist reports (esp pottery, clay tobacco pipe, building material, animal bone and fishbone)
- Discussion
- Acknowledgements
- Bibliography
- Accompanying illustrations

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APPENDIX 1: CONTEXT INDEX

Site Code	Context No.	Plan	Section / Elevation	Type	Description	Date	Phase
DYR09	1	1		Layer	Metalled surface	1580-1910	10
DYR09	2	N/A		Layer	Buried ground horizon		10
DYR09	3	3		Layer	Gravel surface		9
DYR09	4	N/A		Deposit	Fill of pit [5]	1630-1846	10
DYR09	5	5		Cut	Pit	1630-1847	10
DYR09	6	7		Deposit	Backfill of well [7]		10
DYR09	7	7		Masonry	Brick well		10
DYR09	8	41		Deposit	Backfill of construction cut [41] for well [7]	Early 17th century	10
DYR09	9	N/A		Layer	Mid-brownish grey dump layer	Early 19th century	10
DYR09	10	10		Layer	Gravel layer, same as [64]. Part of group [62]	1240-1350	9
DYR09	11	N/A		Deposit	Backfill of [13]	1680-1910	10
DYR09	12	12		Masonry	Vaulted brick drain	1680-1910	10
DYR09	13	13		Cut	Construction cut for [12]	1680-1910	10
DYR09	14	N/A		Deposit	Fill of pit [15]		10
DYR09	15	15		Cut	Small pit		10
DYR09	16	N/A		Deposit	Fill of pit [17]	1580-1900	10
DYR09	17	17		Cut	Small pit	1580-1900	10
DYR09	18	N/A		Deposit	Fill of pit [19]		9
DYR09	19	19		Cut	Small pit		9
DYR09	20	N/A		Deposit	Fill of pit [21]		10
DYR09	21	21		Cut	Small pit		10
DYR09	22	N/A		Deposit	Fill of pit [23]	1640-1660	10
DYR09	23	23		Cut	Oval pit	1640-1660	10
DYR09	24	N/A		Deposit	Fill of [38]	1580-1910	10
DYR09	25	VOID	VOID	VOID	VOID	VOID	VOID
DYR09	26	26		Layer	Levelling layer	1580-1600	8
DYR09	27	N/A		Deposit	Fill of pit [28]	1580-1910	10
DYR09	28	28		Cut	Small pit	1580-1910	10
DYR09	29	N/A		Deposit	Fill of posthole [30]	1630-1910	10
DYR09	30	MC 1		Cut	Posthole	1630-1910	10
DYR09	31	N/A		Deposit	Fill of posthole [32]	1550-1600	9
DYR09	32	MC 1		Cut	Posthole	1550-1600	9

DYR09	33	N/A		Deposit	Fill of pit [34]		10
DYR09	34	MC 1		Cut	Shallow pit		10
DYR09	35	N/A		Deposit	Fill of posthole [36]		10
DYR09	36	MC 1		Cut	Posthole		10
DYR09	37	N/A		Deposit	Fill of posthole [38]	1580-1700	10
DYR09	38	38		Cut	Posthole	1580-1700	10
DYR09	39	90		Deposit	Upper fill of pit [90]	1480-1600	7
DYR09	40	VOID	VOID	VOID	VOID	VOID	VOID
DYR09	41	41		Cut	Construction cut for well [7]		10
DYR09	42	N/A		Deposit	Dump layer		10
DYR09	43	N/A		Deposit	Fill of pit [44]		10
DYR09	44	44		Cut	Pit		10
DYR09	45	N/A		Deposit	Fill of pit [46]	1580-1910	10
DYR09	46	46		Cut	Pit	1580-1910	10
DYR09	47	N/A		Deposit	Fill of pit [48]	1805-1900	10
DYR09	48	48		Cut	Pit	1805-1900	10
DYR09	49	N/A		Deposit	Fill of pit [50]	1580-1610	9
DYR09	50	50		Cut	Pit	1580-1610	9
DYR09	51	N/A		Deposit	Upper fill of pit [52]	1700-1910	10
DYR09	52	52		Cut	Pit	1700-1910	10
DYR09	53	N/A		Deposit	Lower fill of pit [52]	1580-1900	10
DYR09	54	N/A		Deposit	Fill of pit [55]	1550-1600	9
DYR09	55	55		Cut	Pit	1550-1600	9
DYR09	56	N/A		Deposit	Fill of pit [57]		9
DYR09	57	57		Cut	Pit		9
DYR09	58	N/A		Deposit	Fill of pit [59]	1550-1700	8
DYR09	59	59		Cut	Pit	1550-1700	8
DYR09	60	N/A		Deposit	Fill of pit [61]		10
DYR09	61	61		Cut	Pit		10
DYR09	62	N/A		Group	Group of dumped deposits. Associated contexts: [10], [64-66], [71], [72], [75]		9
DYR09	63	63		Layer	Buried ground horizon	1500-1550	7
DYR09	64	64		Layer	Dump layer, same as [10], part of [62]	1240-1350	9
DYR09	65	65		Layer	Dump/levelling layer, part of [62]		9
DYR09	66	66		Layer	Dump/levelling layer, part of [62]		9

DYR09	67	N/A		Layer	Dump layer		10
DYR09	68	N/A		Layer	Buried ground horizon	1580-1910	10
DYR09	69	N/A		Layer	Dump layer		10
DYR09	70	N/A		Layer	Buried ground horizon		10
DYR09	71	N/A		Layer	Dump/levelling layer, part of [62]		9
DYR09	72	N/A		Layer	Dump/levelling layer, part of [62]. Same as [75]		9
DYR09	73	N/A		Deposit	Fill of pit [74]		10
DYR09	74	74		Cut	Pit		10
DYR09	75	75		Layer	Dump/levelling layer, part of [62]. Same as [72]		9
DYR09	76	N/A		Deposit	Fill of pit [77]		10
DYR09	77	77		Cut	Pit		10
DYR09	78	N/A		Deposit	Fill of pit [79]		10
DYR09	79	79		Cut	Pit		10
DYR09	80	N/A		Deposit	Upper fill of pit [81]		8
DYR09	81	81		Cut	Pit	1480-1500	8
DYR09	82	N/A		Deposit	Lower fill of pit [81]	1480-1500	8
DYR09	83	N/A		Deposit	Upper fill of pit [85]		8
DYR09	84	N/A		Deposit	Lower fill of pit [85]	1500-1630	8
DYR09	85	85		Cut	Pit	1500-1630	8
DYR09	86	86		Layer	Masons floor or tile pathway		7
DYR09	87	87		Layer	Bedding layer for [86]		7
DYR09	88	88		Layer	Buried ground horizon	1580-1910	6
DYR09	89	N/A		Deposit	Lower fill of pit [90]	1480-1500	7
DYR09	90	90		Cut	Pit	1480-1600	7
DYR09	91	N/A		Deposit	Fill of pit [92]		8
DYR09	92	92		Cut	Pit		8
DYR09	93	N/A		Deposit	Fill of posthole [94]		7
DYR09	94	94		Cut	Posthole		7
DYR09	95	N/A		Deposit	Fill of construction cut [96]		7
DYR09	96	96		Cut	Construction cut for [86]		7
DYR09	97	97		Deposit	Dump/levelling layer	1400-1500	6
DYR09	98	99		Deposit	Fill of posthole [98]		7
DYR09	99	99		Cut	Posthole		7
DYR09	100	N/A		Deposit	Fill of posthole [101]		6
DYR09	101	101		Cut	Posthole		6

DYR09	102	N/A		Deposit	Fill of posthole [103]	1250-1370	6
DYR09	103	103		Cut	Posthole	1250-1370	6
DYR09	104	105		Deposit	Fill of posthole [105]		6
DYR09	105	105		Cut	Posthole		6
DYR09	106	N/A		Deposit	Fill of pit [107]	1270-1350	6
DYR09	107	107		Cut	Large shallow pit	1270-1350	6
DYR09	108	N/A		Deposit	Fill of posthole [109]	970-1100	6
DYR09	109	109		Cut	Posthole	970-1100	6
DYR09	110	N/A		Deposit	Upper fill of pit [112]		6
DYR09	111	N/A		Deposit	Lower fill of pit [112]	1250-1300	6
DYR09	112	112		Cut	Pit	1250-1300	6
DYR09	113	113		Deposit	Fill of gully [114]		6
DYR09	114	113		Cut	Basal portion of gully		6
DYR09	115	115		Layer	Buried ground horizon	1240-1300	5
DYR09	116	116		Layer	Dump/levelling layer	1240-1300	5
DYR09	117	117		Layer	Levelling layer	1170-1200	5
DYR09	118	118		Layer	Redeposited alluvium/levelling layer		4
DYR09	119	120		Deposit	Fill of ditch [120] (slot 1)	1240-1350	4
DYR09	120	120		Cut	Ditch		4
DYR09	121	121		Layer	Buried ground horizon, same as [126]		4
DYR09	122	122		Layer	Levelling layer	1170-1220	5
DYR09	123	120		Deposit	Fill of ditch [120] (slot 2)	1170-1220	4
DYR09	124	120		Deposit	Fill of ditch [120] (slot 3)	1170-1220	4
DYR09	125	125		Layer	Loosely compacted gravel layer		5
DYR09	126	126		Layer	Buried ground horizon, same as [121]		4
DYR09	127	N/A		Deposit	Burnt fill of [129]		4
DYR09	128	N/A		Deposit	Clay lining of [129]		4
DYR09	129	N/A		Cut	Hearth		4
DYR09	130	130		Group	Group of stakeholes around hearth [129]		4
DYR09	131	N/A		Deposit	Fill of pit [132]	Late Iron Age / Early Roman	2
DYR09	132	132		Cut	Pit	Late Iron Age / Early Roman	2

DYR09	133	133		Layer	Buried ground horizon	1140-1300	3
DYR09	134	134		Layer	Alluvial sand		1
DYR09	135	N/A		Deposit	Lower fill of ditch [120] (slot 2)		4
DYR09	136	120		Deposit	Fill of stakehole [137], part of [130]		3
DYR09	137	130		Cut	Stakehole, part of [130]		3
DYR09	138	N/A		Deposit	Fill of stakehole [139], part of [130]		3
DYR09	139	130		Cut	Stakehole, part of [130]		3
DYR09	140	N/A		Deposit	Fill of stakehole [141], part of [130]		3
DYR09	141	130		Cut	Stakehole, part of [130]		3
DYR09	142	N/A		Deposit	Fill of stakehole [143], part of [130]		3
DYR09	143	130		Cut	Stakehole, part of [130]		3
DYR09	144	N/A		Deposit	Fill of stakehole [145], part of [130]		3
DYR09	145	130		Cut	Stakehole, part of [130]		3
DYR09	146	N/A		Deposit	Fill of stakehole [147], part of [130]		3
DYR09	147	130		Cut	Stakehole, part of [130]		3
DYR09	148	N/A		Deposit	Fill of stakehole [149], part of [130]		3
DYR09	149	130		Cut	Stakehole, part of [130]		3
DYR09	150	N/A		Deposit	Fill of stakehole [151], part of [130]		3
DYR09	151	130		Cut	Stakehole, part of [130]		3
DYR09	152	152		Deposit	Natural sand		1
DYR09	153	VOID	VOID	VOID	VOID	VOID	VOID
DYR09	154	VOID	VOID	VOID	VOID	VOID	VOID
DYR09	155	VOID	VOID	VOID	VOID	VOID	VOID
DYR09	156	VOID	VOID	VOID	VOID	VOID	VOID
DYR09	157	157		Deposit	Natural clay		1
DYR09	158	157		Deposit	Alluvial sand		1
DYR09	159	N/A	S.8, S.9	Layer	Bedding layer for current road surface		6
DYR09	160	N/A	S.8, S.9	Layer	Buried ground horizon		5
DYR09	161	N/A	S.8, S.9	Layer	Levelling layer	1630-1846	5
DYR09	162	TR 2	S.8, S.9	Layer	Buried ground horizon	1480-1600	4
DYR09	163	N/A	S.9	Layer	Dumped deposit		4
DYR09	164	TR 2	S.9	Layer	Levelling layer		4
DYR09	165	TR 2	S.9	Layer	Natural gravel		1

APPENDIX 2: POTTERY ASSESSMENT

By Chris Jarrett

INTRODUCTION

A small sized assemblage of pottery was recovered from the site (4 boxes). The pottery dates from the prehistoric to post-medieval periods. Very few sherds show evidence for abrasion and were probably deposited fairly rapidly after breakage. The fragmentation of the pottery ranges from sherd material to identifiable forms and a very small number of vessels have a complete profile. Pottery was recovered from 42 contexts and individual deposits produced small to large groups of pottery (under 30 sherds or over 100 sherds).

All the pottery (361 sherds and none are unstratified) was examined macroscopically and microscopically using a binocular microscope (x20), and recorded in an ACCESS 2007 database, by fabric, form, decoration, sherd count and estimated number of vessels (ENV's). The classification of the pottery types is according to the Museum of London Archaeological Service. The pottery is discussed by types and its distribution.

THE POTTERY TYPES

Late Iron Age- Early Roman

Prehistoric-Early Roman shell-tempered ware (SHEL), two sherds, form: unidentified.

Middle Saxon

North French greyware, fine sandy (NFGWB), 600-850, one sherd, form: unidentified, but present as an inturned rim of a closed vessel.

Late Saxon

Late Saxon shelly ware (LSS), 900-1050, one sherd, form: unidentified.

Medieval

Early medieval

Early medieval sandy ware with calcareous inclusions (EMCALC), 1000-1150, one sherd, form: unidentified.

Early medieval chalk-tempered ware (EMCH), 1050-1150, one sherd, form: unidentified.

Early medieval flint-tempered ware (EMFL), 970-1100, one sherd, form: unidentified.

Early medieval grog-tempered ware (EMGR), 1050-1150, one sherd, form: unidentified.

Early medieval gritty ware (EMGY), 1080-1200, seven sherds, form: jar.

Early medieval sandy ware (EMS), 970-1100, three sherds, form: unidentified.

Early medieval sand- and shell-tempered ware (EMSS), 1000-1150, one sherd, form: unidentified.

Early south Hertfordshire-type coarseware (ESHER), 1050-1200, two sherds, form: jar.

Early Surrey ware (ESUR), 1050-1150, one sherd, form: jar.

London-area greyware (LOGR), 1050-1170, one sherd, form: pitcher.

Local glazed wares

Coarse London-type ware (LCOAR), 1080-1200, 24 sherds, form: jug; early rounded.

Late London-type ware (LLON), 1400-1500, nine sherds, form: pitcher.

Late London-type slipware (LLSL), 1400-1500, three sherds, form: unidentified.

London-type ware (LOND), 1080-1350, 27 sherds, form: jug.

London-type ware in the highly decorated style (including anthropomorphic/zoomorphic) (LOND HD), 1240-1350 34 sherds, form: jug.

Non-local glazed wares

Late medieval Hertfordshire glazed ware (LMHG), 1340-1450, one sherd, form: jug.

Mill Green ware (MG), 1270-1350, five sherds, form: jug.

Surrey whitewares

Cheam whiteware, (CHEA), 1350-1500, three sherds, form: bowl, jug.

Coarse Surrey-Hampshire border ware, (CBW), 1270-1500, 14 sherds, form: jug.

Coarse Surrey-Hampshire border ware cooking pot with bifid rim, (CBW BIF), 1380-1500, one sherd.

Kingston-type ware, (KING), 1240-1400, 12 sherds, form: jug.

Kingston-type ware in the highly decorated style, (KING HD), 1240-1300, three sherds, form: jug.

'Tudor green' ware, (TUDG), 1350-1500, two sherds, form: jug.

Wheel-thrown coarsewares

Coarse medieval sandy wares (MCS), 1140-1300, three sherds, form: jar.

South Hertfordshire-type greyware (SHER), 1170-1350, 97 sherds, form: jar; rounded, jug.

South Hertfordshire-type flint-tempered greyware (SHER FL), 1170-1350, 14 sherds, form: jar; rounded.

Shelly-sandy ware (SSW), 1140-1220, 22 sherds, form: jar; rounded.

Imported pottery

France

Saintonge ware with mottled green glaze, (SAIM), 1250-1650, two sherds, form: jug.

Germany

Langerwehe/Raeren stoneware, (LARA), 1450-1500, one sherd, form: unidentified.

Siegburg stoneware with iron wash, (SIEB), 1450-1550, two sherds, form: jug, Trichterhalskrug.

Siegburg stoneware (SIEG), 1300-1630, one sherd, form: drinking jug.

Low Countries

Dutch slipped red earthenware (DUTSL), 1300-1650, two sherds, form: chaffing dish.

Post-medieval

Local red earthenwares

London-area post-medieval redware (PMR), 1580-1900, 16 sherds, forms: bowl; flared, rounded, jar.

London-area early post-medieval redware (PMRE), 1480-1600, 135 sherds, form: bowl or dish, cauldron, cauldron or pipkin, dripping dish, jar; rounded. Jug; rounded, pipkin, pitcher, tripod pipkin, watering pot.

London-area early post-medieval calcareous redware (PMREC), 1480-1600, one sherd, form: dripping dish.

London-area early post-medieval redware with metallic glaze (PMREM), 1480-1600, one sherd, form: unidentified.

London-area post-medieval slip-decorated redware (PMSL), 1480-1600, 10 sherds, form:

unidentified.

London-area post-medieval slipped redware with green glaze (PMSRG), 1480-1650, three sherds, form: bowl; flared.

London-area post-medieval slipped redware with clear (yellow) glaze (PMSRY), 1480-1650, three sherds, forms: bowl or dish, bowl; types 1 and 2 carinated, rounded, cauldron, dish; carinated, jug.

Surrey-Hampshire border wares

Surrey-Hampshire border whiteware with green glaze (BORDG), 1550-1700, 12 sherds, forms: drinking jug; rounded, porringer.

Surrey-Hampshire border whiteware with olive glaze (BORDO), 1550-1700, one sherd, forms: mug; rounded.

Surrey-Hampshire border whiteware with yellow glaze (BORDY), 1550-1700, four sherds, forms: chamber pot; type 1, dish.

Early Surrey-Hampshire border whiteware (EBORD), 1480-1550, 35 sherds, forms: drinking jug; rounded.

English tin-glazed ware

English tin-glazed ware (TGW), 1570-1846, three sherds, forms: bowl, dish, plate; FBI.

Tin-glazed ware with external lead glaze (Orton style A) (TGW A), 1612-1650, four sherds, form: Dish; FBB/D.

Tin-glazed ware with manganese-mottled glaze (Orton style B) (TGW B), 1630-1680, one sherd, form: unidentified.

Tin-glazed ware with plain pale-blue glaze (TGW BLUE), 1630-1846, six sherds, forms: chamber pot.

Tin-glazed ware with plain white glaze (Orton style C) (TGW C), 1630-1846, one sherd, form: unidentified.

Tin-glazed ware with external lead glaze/polychrome painted (Orton style D) (TGW D), 1630-1680, one sherd, form: dish; FBB/D.

Tin-glazed ware with pale blue glaze and dark blue decoration (Orton and Pearce style H) (TGW H), 1630-1800, 3 sherds, forms: albarello, plate; type K/L.

Essex red earthenwares

Metropolitan slipware (METS), 1630-1700, one sherd, form: dish.

Post-medieval Essex black-glazed redware (PMBL), 1580-1700, seven sherds, form: chamber pot, jar.

Post-medieval fine redware (PMFR), 1580-1700, three sherds, form: unidentified.

Non-local wares

Cistercian ware (CSTN) 1480-1600, six sherds, forms: cup; rounded, lid.

Staffordshire-type mottled brown-glazed ware (STMO), 1650-1800, one sherd, form: unidentified.

Industrial finewares

Pearl ware with under-glaze transfer-printed decoration (PEAR TR), 1770-1840, one sherd, forms: bowl: carinated.

Plain refined white earthenware (REFW), 1805-1900, one sherd, form: jar; small cylindrical.

Transfer-printed refined whiteware with new colour decoration (type 4) (TPW4), 1825-1900, one sherd, form: plate.

Imported wares

China

Chinese blue and white porcelain (CHPO BW), 1590-1900, one sherd, form: saucer.

France

Beauvais green-glazed ware (BEAG), 1500-1600, two sherds, form: dish.

Germany

Frechen stoneware (FREC), 1550-1700, eight sherds, forms: jug; bartmann, rounded..

Raeren stoneware (RAER), 1480-1610, 22 sherds, form: drinking jug; biconical, rounded.

Italy

Central Italian tin-glazed ware (CITG), 1450-1550, four sherds, form: jug or vase.

Low Countries

Dutch slipped red earthenware with sgraffito decoration (DUTSG), 1450-1550, five sherds, form: chaffing dish.

DISTRIBUTION

Table 1 shows the contexts containing pottery, the number of sherds, the pottery types in the deposit and a spot date for the group. Most contexts only contained post-medieval redware which has a very long period of production; therefore the spot date for such contexts takes into account typological differences in form and decoration (Jarrett 2004).

Context	SC	Date range of pottery types	Latest dated pottery type	Fabric types	Spot date
4	2	1580-1900	1630-1900	PMR, TGW BLUE.	1630-1846
6	10	1480-1900	1680-1900	BORDY, CHPO BW, RAER, TGW BLUE, TGW H	18TH C
8	5	1080-1846	1580-1846	LCOAR, PMFR, PMSRY, TGW	Early 17th C
9	2	1580-1900	1770-1900	PEAR TR, PMR	Early 19TH C
10	3	1080-1400	1240-1400	KING, LOND	1240-1350
11	2	1630-1846	1680-1846	TGW BLUE, TGW H	1680-1800
16	2	1580-1900	1580-1900	PMR	1580-1900
22	2	700-1500	1350-1500	CHEA, NFGWB	1350-1500
24	1	1580-1900	1580-1900	PMR	1580-1900
26	31	1080-1900	1580-1900	FREC, PMRE, RAER	1580-1600
27	4	1480-1700	1550-1700	BORDG BORDO, BORDY, CBW, CBW BIF, CHEA, CSTN, DUTSG, LOND, PMBL, PMFR, PMR, PMRE, PMSRY, RAER, TUDG	1550-1700
29	6	1480-1900	1630-1700	CSTN, METS, PMR, PMSRY, TGW	1630-1700
31	2	1480-1700	1550-1700	CSTN, FREC	1550-1600
37	3	1550-1700	1580-1700	BORDG, FREC, PMBL	1580-1700
39	2	1480-1600	1480-1600	PMRE	1480-1600
47	1	1805-1900	1805-1900	REFW	1805-1900
49	2	1480-1700	1580-1700	PMBL, RAER	1580-1610
51	2	1480-1846	1570-1846	RAER, TGW	1700-1720
53	2	1580-1900	1580-1900	PMR	1580-1900
54	2	1480-1700	1550-1700	FREC, PMRE	1550-1600
58	1	1550-1700	1550-1700	BORDG	1550-1700
63	225	1270-1650	1480-1650	CBW, CITG, CSTN, DUTSG, DUTSL, EBORD, LLON, LLSL, PMRE, PMSL, PMSRG, PMSRY, RAER, SIEB, TUDG	1500-1550
68	1	1550-1700	1550-1700	FREC	1550-1700
82	2	1270-1600	1480-1600	CBW, PMRE	1480-1500
84	2	1450-1600	1500-1600	BEAG, CITG	1500-1630
88	19	900-1600	1480-1600	CBW, CITG, EMCH, KING, LARA, LLON, LMHG, LOND, LSS, MG, PMRE	1480-1500
89	20	1240-1650	1480-1650	CBW, EBORD, KING, LLON, LLSL, PMRE,	1480-1500

Context	SC	Date range of pottery types	Latest dated pottery type	Fabric types	Spot date
				PMSRY, SAIM, SIEG	
97	16	970-1600	1480-1600	EMCALC, EMFL, EMS, KING, LLON, LLSL, LOND, PMSL, SHER	1400-1500
102	3	1050-1500	1270-1500	CBW, EMGR MG,	1270-1350
106	3	1270-1350	1270-1350	MG	1270-1350
108	1	970-1100	970-1100	EMS	970-1100
111	10	1080-1400	1240-1400	KING, KING HD, LOND, LOND HD, SHER	1250-1300
115	95	1080-1400	1240-1400	KING, LOND, LOND HD, SHER	1240-1300
116	25	1080-1400	1240-1400	KING, LOND, LOND HD, SHER	1240-1300
117	32	1000-1350	1170-1350	EMSS, LCOAR, LOGR, LOND, SHER, SHER FL, SSW	1170-1200
119	11	1080-1550	1450-1550	CITG, EMGY, KING, SHER, SSW	1240-1350
122	9	1050-1350	1170-1350	EMGY, ESHER, SHER, SSW	1170-1220
123	9	1140-1350	1170-1350	SHER, SSW	1170-1220
124	36	1050-1350	1170-1350	ESUR, LCOAR, LOND, SHER, SHER FL, SSW	1170-1220
131	2			SHEL	Late Iron Age-Early Roman
133	3	1140-1300	1140-1300	MCS	1140-1300
161	1	1630-1846	1630-1846	TGW C	1630-1846
162	4	1480-1600	1480-1600	PMRE	1480-1600

Table 1. DYR09: Distribution of pottery types showing individual contexts containing pottery, what phase the context occurs in, the number of sherds, the date range of the latest pottery type, the fabrics present and a suggested deposition date. SC: sherd count, WST: waster.

SIGNIFICANCE OF THE COLLECTION

The pottery has some significance at a local level. The assemblage reflects activity on Thorney Island from the Late Iron Age-Early Roman period and Westminster Abbey and its environs from the Middle Saxon period through to the early 19th century.

Prehistoric-early Roman

The sherds of prehistoric pottery are small and non-diagnostic but are probably contemporary with the context they occur in. Prehistoric activity dating from the Mesolithic period has been previously excavated from the area of Thorney Island (Thomas *et al* 2003) and therefore the two sherds of prehistoric pottery from DYR09 fits the known land use history. However, only flint-temped sherds were recovered from the dorter undercroft

at Westminster Abbey (Swain 1995, 80) as was most of the assemblages from the Jubilee Line Extension project and associated excavations, but additionally contained fabrics with clay pellets or voids (Rayner 2005, 179-81). Residual Roman pottery was recovered also from the dorter undercroft but dated AD 70-300 (Waugh 1995, 80).

Middle Saxon

A minster may have been founded as early as the 7th century at Westminster but the earliest historical documentation is a charter dated c.958-61 for the refoundation of the minster as a Benedictine Abbey (Brooks 1992, 22). The sherd of Middle Saxon pottery from DYR09 is residual but together with other pottery from the dorter undercroft of Westminster Abbey (Blackmore 1995, 80) further supports activity for this period in the vicinity. The only imported ware from the aforementioned site was a sherd from Badorf/Walberberg (Blackmore 1995, 80).

Medieval

Edward the Confessor began to rebuild the Abbey around c.1050 and the east end of the church was finished in 1065 (Mills 1995, 69). A range of buildings then fronting the eastern side of Dean's Yard may date from the later 14th century and a range of buildings on the north-eastern side of the Yard was taken over by the Benedictine Abbey's Grammar School in 1461 (Murray 2003, 44). The medieval pottery from DYR09 almost certainly reflects activity associated with this ecclesiastical institution and associated establishment. Much of the medieval pottery fits very well within the London ceramic profile. Other comparative assemblages of medieval pottery have been recovered nearby (Murray 2003; Stephenson and Pearce 2006).

Post-medieval

Pottery recovered from deposit [63] was dated to the late 16th century and contained a good range of contemporary pottery types. The imported wares in this deposit, such as Central Italian tin-glazed ware, Dutch slip and sgraffito wares and Raeren and Siegburg German stonewares reflect the influence of the Renaissance on north European society at this time and the demand for quality, showier table and drinking wares. Henry VIII's Palace at Westminster was heavily influenced by the Renaissance in its architecture and almost certainly in its material culture. The sherds of Beauvais green-glazed ware from deposit [84] also reflect the desire for good quality glazed white-wares in the 16th century. The pottery types post dating c.1600 is typical for the London area and has little significance.

POTENTIAL

The pottery has the potential to date the features in which it was found and to provide a sequence for them and a number of vessels would merit illustration. The main area of ceramic interest is the supply of medieval pottery to Westminster abbey and its environs.

Prehistoric

The prehistoric pottery has little potential except to demonstrate that the sherds fall within the general pattern of land use for this period on Thorney Island.

Middle Saxon

The residual North French greyware sherd only confirms that activity of this period was occurring nearby.

Medieval

The main potential of the medieval assemblage is to demonstrate what types of pottery were supplied to Westminster Abbey and the properties on Dean's Yard. Documentary evidence for the land use of the properties at Dean's Yard may be useful for determining if the functions of the pottery vessels have any significance for the land use.

Post-medieval

The main interest from this period is the late 15th and 16th century pottery groups and whether they relate to specific properties. The influence of the Renaissance can be seen in some of these pottery groups and therefore infer upon the supply of pottery to the period before the Dissolution of the Abbey or the middle or upper socio economic groups residing in the locality. Documentary evidence for the land use of the properties the pottery was recovered from will aid in the interpretation of the significance of the pottery from this period.

Research aims

One research aim is suggested as an avenue of further research.

- What is the land use of the properties the medieval and early post-medieval pottery was recovered from and how does this help in the interpretation of the pottery functions?

Recommendations for further work

A short pottery report is required for the publication of the site and it is recommended that six vessels are illustrated and a photograph of the Central Italian tin-glazed ware sherds is used to supplement the text.

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APPENDIX 3: CLAY TOBACCO PIPE ASSESSMENT

By Chris Jarrett

Introduction

A small sized assemblage of clay tobacco pipes was recovered from the site (1 box). Most fragments are in a fairly good condition, indicating that they had not been subject to much redeposition or were deposited soon after breakage. Clay tobacco pipes occur in thirteen contexts as small groups (under 30 fragments).

All the clay tobacco pipes (40 fragments, of which twelve are unstratified) were recorded in an ACCESS 2007 database and classified by Atkinson and Oswald's (1969) typology (AO) and 18th-century examples by Oswald's (1975) typology and prefixed OS. The pipes are further coded by decoration and quantified by fragment count. The degree of milling has been noted and recorded in quarters, besides the quality of finish. The tobacco pipes are discussed by their types and distribution.

THE CLAY TOBACCO PIPE TYPES

The clay tobacco pipe assemblage from the site consists of ten bowls, 28 stems and two nibs or mouthpart. The clay tobacco pipe bowl types range in date between 1640 and 1780.

1640-60

AO9: two spurred bowls, both with complete milling and of a good or fair quality of finish. Both bowls are taller variants.

AO10: one heeled bowl with full milling of the rim and a fair finish.

1660-80

AO13: a single rounded, heeled bowl with no milling and a fair finish.

AO16: one West Country-type bowl with full rim milling, a very good finish and an incuse gauntlet stamp on the heel.

AO18: a single straight-sided, heeled bowl with a quarter milling and of a fair finish.

1730-1780

OS12: two heeled bowl are present and both are maker marked.

W P: possibly William Pearce, 1754.

B T: possibly Benjamin Turner, 1739–57, St Anne's Lane, Parish of St John the Evangelist.

Undetermined types

Two bowls are present but represented only by heels and could date to between the end of the 17th and 18th century.

DISTRIBUTION

Table 1 shows the distribution of the clay tobacco pipes, showing the number of fragments, the date range of the types and the latest bowl, the types of bowls present, together with a spot date for each context tobacco pipes occur in.

Context	No. Of fragments	Date range of bowl types	Latest dated bowl type	Bowl types (and makers)	Spot date
[1]	4			Stem	1580-1910
[6]	5	1660-1780	1730-1780	AO18, OS12 (W P, BT)	1730-1780
[11]	1			Stem	1580-1910
[22]	2			AO9	1640-1660
[24]	2			Stem	1580-1910
[26]	1			Unidentified	Mid 17th-mid 18th century
[27]	2			Stem	1580-1910
[29]	1			Stem	1580-1910
[37]	5			Stem	1580-1910
[45]	1			Stem	1580-1910
[51]	1			Stem	1580-1910
[68]	2			Stem	1580-1910
[88]	1			Stem	1580-1910

Table 1. DYR07. Distribution of clay tobacco pipes. A spot date of 1580-1910 indicates that only stems were present in the context

SIGNIFICANCE OF THE COLLECTION

The clay tobacco pipes are of little significance at a local level. The forms present are typical for London and the unstratified West Country-type bowl (AO16) may have originated from that area. However, this type of bowl is found frequently in the Westminster area and on riverside locations west of the City and so indicates that possible migrant pipe makers were working in this location.

POTENTIAL

The clay tobacco pipes have the potential to date the contexts they were found in. The West Country bowl merits illustration and comment upon.

RESEARCH AIMS

One research aim is suggested as a further avenue of research.

- Has the West Country type-bowl been found previously in London?

RECOMMENDATIONS FOR FURTHER WORK

A short publication report is recommended and the West Country pipe requires illustrating to supplement the text.

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APPENDIX 4: BUILDING MATERIAL ASSESSMENT

By Dr Kevin Hayward

Introduction and Aims

Seventeen shoe boxes of ceramic building material and stone and an additional crate consisting of larger pieces of worked stone were retained at excavation from the site at Dean's Yard, Westminster.

This moderate sized assemblage (830 examples 171.4kg) was assessed in order to:

- Identify (under binocular microscope) the fabric and forms of the ceramic building material.
- Identify the fabric and form of the medieval building material, in particular the Westminster Penn and Early Flemish Calcareous Floor Tile Fabrics as well as early medieval peg roof tiles.
- Identify the fabric and form of the post-medieval building material used to construct the post-medieval well [41] and culvert [16].
- Identify the fabric and geological source of the moulded stone fragments from the medieval and post-medieval occupation layers and whether these in any way relate to the types of materials being used (or reused) in the construction of Westminster Abbey.

Methodology

The building material was examined using the London system of classification with a fabric number allocated to each object. The application of a 1kg mason's hammer and sharp chisel to each example ensured that a small fresh fabric surface was exposed. The fabric was examined at x20 magnification using a long arm stereomicroscope or hand lens (Gowland x10).

Ceramic Building Material

Given at least 1000 years of occupation at Thorney Island it is not surprising that the assemblage contains a rich and diverse assemblage of Roman, medieval and post-medieval tile and brick. Of particular interest is the glazed medieval floor tile assemblage with examples of Penn, Westminster, Flemish Silty and Flemish Calcareous glazed tile.

Roman

Quantities of Roman ceramic building material amount to 39 examples (9 kg). These are all highly fragmentary and show signs of reuse, concentrating within the periods of early medieval ground reclamation (Phases 3-5). It is likely that much of this material would have been salvaged from Roman London and brought upstream from the River Thames for ground consolidation in the early medieval period (W. Rodwell pers. comm.)

Brick 7.8kg

Early London Sandy Fabric Group 2815 including 2452; 2459a; 3006 (AD50-160)

Early Radlett Iron Oxide Fabric Group 3023; 3060 (AD50-120)

Sussex Group 3054; 3057 (AD 70-140)

Nearly all of the Roman Brick accumulates in Phases 3, 4 and 5 early medieval ground reclamation layers [115] [116] [118] [119] [122] [123]. The exception being the Phase 2 pit [133]. All are made from early (mid first to mid second century) Roman fabrics, especially the Early Iron Oxide Group (AD50-120) and local London Group 2815 (AD50-160) and to a much lesser extent to Grog tempered Hampshire fabrics [118] (AD70-140). Bricks represented by the earliest fabric of all 3023 (50-120) are the most heavily reused, and are often chaff-tempered. One example from a Phase 4/5 (early 13th century) levelling layer [122] is thickly coated in kiln glaze and was probably used in a kiln/hearth to manufacture tile or pottery on Thorney Island during its earlier medieval occupation. A likely candidate would have been a hearth from Phase 4 [129]. Some brick, especially the grog tempered examples from [118] are especially thick indicating a brick the size of a *lydion* or a *sesquipedalis*.

Tegula and Imbrex 1.2kg

Early London Sandy Fabric Group 2815; including 2452; 2459a; 3004; 3006 (AD50-160)

Early Radlett Iron Oxide Fabric Group 3023 (AD50-120)

Late Calcareous Fabric 3013

Small quantities of intermixed broken Roman tile are of a fabric type and date that is broadly consistent with the Roman Brick (AD50-160), the exception being an example of the iron oxide rich later Roman calcareous fabric 3013 (AD180-350) from [117].

Tessera 16g

Early London Sandy Fabric Group 3004

A single whole tessera (20mm square) made from the early Roman sandy fabric 3004 (AD50-160), is the sum total of the Roman decorated floor assemblage from Dean's Yard.

Opus signinum 1kg

3104 (AD100+)

Chunks of the pale red Roman concrete *opus signinum* have been reused in Phase 5 (13th century) consolidation dumps [115] [116].

Daub 168g

3102

Tiny quantities of burnt daub from Phase 2 pit [133] and Phase 4 [123] reclamation may represent traces of Roman wattle and daub structures although the daub is similar to burnt clay and may represent the late 12th/13th century hearth lining [129].

To summarise this assemblage may represent salvage from a single or group of early Roman masonry structures for medieval land reclamation on Thorney Island. The preference for Roman brick over tile and imbrex for this purpose is understandable given their flat even surface.

Medieval

Fragmentary examples of medieval roofing (bat and peg) tile and floor tile are common constituent of the assemblage at Dean's Yard. This is to be expected given the proximity of Westminster Abbey and attest to the numerous phases of rebuild (and therefore discard) of ceramic building material.

Floor Tile 1.5kg 16 examples

Although examples of the large Late Saxon/Early Norman glazed tile (a feature of the 11th century Pyx Chamber) could not be identified there is ample evidence for later medieval floor embellishment from the Abbey from four fabric groups.

Westminster Tile Fabrics 2195; 2199 (1225-1275)

Penn Tile Fabrics 1811; 3076 (1330-1390)

Flemish Calcareous Fabrics 1678; 2323 (1300-1500)

Flemish Sand Fabric 2505 (1300-1500)

The earliest group, the glazed Westminster Floor Tiles (1225-1275) are represented by four fragmentary examples (179g) from Phase 4 (late 12th to early 13th century) [119] and Phase 5 (13th century) the [115] [117] reclamation dumps. They are named Westminster Tiles as they occur in the muniment room in St Faith's Chapel at Westminster Abbey (Crowley 1997) Both are very fine sandy fabrics 2195; 2199, probably manufactured in Clerkenwell (Crowley 1997). Examples are plain glazed and thin 24mm rather than patterned.

Fragments (7 examples 672g) of 14th century Decorated Penn Tiles, manufactured in Buckinghamshire are also present at Dean's Yard. Unlike the Westminster Tiles, examples in

both the silty 3076 (1350-1390) and sandy 1811 (1330-1390) have decoration. Only one of these, however, could be compared with a pattern from the Eames catalogue EAM 2230/31 [162] a floral design with a fleur-de-lys in the centre. These are found further up the sequence at Dean's Yard Westminster redeposited in Phase 8 to 9 (early post-medieval early-mid 16th century).

Thicker (28-34mm) and larger plain glazed calcareous Flemish fabrics 1678 and 2323 (1300-1500) are represented by three tiles [63] [89] in Phase 7 (early-mid 16th century levels).

A rare example of a glazed sandy Flemish fabric 2505 (1300-1500) was retained from late post-medieval layer [9].

Peg Tiles 11.6kg

A sizeable part of the assemblage consists of medieval peg tiles, designated by their fabric, glaze and form (very thin (8-10mm) or thick (15-22mm)). The five fabrics were recovered from 12th and 13th reclamation dumps (Phases 4 and 5) or later early post-medieval dumps (Phases 7-9).

Sandy Fabric 2271 (1180-1800)

Coarse sandy Fabrics 2272; 2273 (1135-1220)

Iron Oxide Fabrics 2587 (1240-1450)

Iron Oxide Fabrics 2586 (1180-1800)

The earliest fabrics consist of thick (18-22mm) glazed very coarse sandy 2272 (6 examples 543g) or shelly 2273 (44 examples 3.2kg) fabrics that were manufactured between 1135-1220. Like the Westminster Floor Tiles, they concentrate in the Phase 4 (late 12th-early 13th century) and 5 (13th century) reclamation dumps especially [116] and [117] and represent earlier roofing from Westminster Abbey.

Prominent too are glazed irregular, thin examples of the iron oxide fabric 2587 (1240-1450) (1.3kg) and a narrow sandy fabric 2271 (3.3kg) (manufactured after 1180). Both are often found abraded or reused in both early Phase 4 [115] (where 2.8kg) accumulate later reclamation Phases 8 and 9 (early post-medieval). Some of the iron oxide fabric 2586 (1180-1800) is also medieval and comes from the Phase 4 and 5 reclamation layers [115] [116].

Bat Tile 934g

Coarse sandy fabric 2273 (1135-1220)

Narrow fine sandy fabric 2271 (1180-1500)

Thick (18mm) curved bat roofing tiles (also called shouldered peg tile) made from the coarse shelly 2273 (1135-1220) are found only in Phase 5 reclamation deposits [122]. Thinner bat tiles made from the fine sandy fabric 2271 are present from a Phase 4 (late 12th-early 13th century) reclamation deposit and like the peg tiles represent dumping from an earlier roofing phase.

Post-Medieval

Floor Tile

<i>Flemish Silty tiles 2850</i>	Unglazed (1600-1800)
2850	Glazed (1465/1500-1600)
1977	Unglazed (1600-1800)

A solitary glazed very thick (35mm) silty Flemish floor tile was recovered from a late post-medieval phase. Unglazed Flemish silty fabrics, manufactured after 1600 are rare with only two examples, the very silty 1977 and the coarser 2850, both from 18th and 19th century deposits [1] [6], present, indicating how little fabric from the later medieval period is present in this assemblage.

Peg Tile 27.9kg

Sandy Fabric 2276 (1480-1900)

Iron Oxide Fabrics 2586 (1180-1800)

Large dumps [42] [63] [86] [88] [89] of the common fine sandy peg tile 2276 (24.9kg), manufactured after 1480 were recovered. Most were uneven, some with a shallow ridge with medium to coarse moulding sand indicating earlier (1480-1700) manufacture. Those recovered from Phase 10 tend to have a finer moulding sand and were manufactured after 1700. In addition, examples of the iron oxide fabric 2586 with the finer moulding sand are also post-medieval.

Pan Tile 1.2kg

Sandy Fabric 2279 (1630-1850)

Sandy Fabric 2271 (1630-1800)

The near absence of pan tile from this site is a good indication that much of the assemblage predates 1630. Nearly all of it was recovered from unstratified or Phase 10 layers

Brick 11.7kg (35)

Early brown sandy fabric 3030 (1400-1660)

Red fine sandy fabric 3033 (1450-1700)

Red orange sandy fabric 3046 (1450-1700)

Post-Great Fire 3032 (1666-1900)

Yellow London Brick 3035 (1780-1940)

A range of transitional to early post-medieval brown 3030 and red sandy 3033 3046 brick fabrics have been recovered, including examples from as early as early post-medieval (16th century) Phase 7.

The earliest bricks, chocolate brown earthy 3030 (1400-1660) found just in Phase 7 (early-mid 16th century) [26] [63] are narrow 97mm shallow 55mm with sunken margins. This is quite a rare late medieval/early post-medieval brick for London.

Early post-medieval red bricks 3033 and 3046 (1450-1700) are more common with examples appearing in Phase 7 and 8 (16th century) [26] [39] [63] [91]. The earliest 3033 bricks from [26] are poorly made, chaff tempered and typically very shallow (47mm) and wide (104mm). The sandier 3046 [63] bricks are also very shallow (45mm).

A few clinker rich post-Great Fire bricks 3032 (1666-1900) are found, all in the latest post-medieval (1600+) Phase 10.

Finally, the Phase 10 brick culvert structure [12] consists of complete examples of the transitional yellow London stock fabric 3032nr3035 and a clinker rich post-Great Fire 3032. As the former were manufactured after 1770 in a hard shelly brick mortar typical of late 18th-mid 19th century manufacture a date of between 1770 and 1850 should be given.

Stone

Well over half (99.4kg) of the assemblage consists of worked stone, represented by as many as 15 rock types (their geological character and source listed below). This was to be expected given that each addition/repair and renovation since the building of the existing Abbey in 1055 was marked by the use of different types of stone (Hayward pers. obs.)¹. Most of the material is discarded ashlar and walling rubble with occasional examples of moulding and even statuary. Concentrations of large blocks of medieval stone include over 16.5kg of ashlar from [116] and 7.3kg of ashlar from [97] in Phase 5 (13th century reclamation deposits), 5kg of rubble from [37] (Phase 10). Nearly all of this is either Reigate stone (used at Westminster Abbey in the Pyx Chamber since 1055) or Kentish ragstone.

Sandstone, calcareous sandstone, silicified rocks

¹ For example over 20 rock types used in the refractory wall and the Pyx Chamber.

3105 Kentish ragstone – Lower Cretaceous (Lower Greensand) Maidstone Kent

3106 Hassock stone – Lower Cretaceous (Lower Greensand) Maidstone Kent

3107 Reigate stone – Lower Cretaceous (Upper Greensand) Mertsam-Reigate Surrey

3117 Flint – Upper Cretaceous (Chalk) Thames Basin

3120 Malmstone variant of 3107 Farnham-Leatherhead.

3120 York stone – Upper Carboniferous Yorkshire

Limestone

3109 Taynton stone – Middle Jurassic (Bathonian) West Oxfordshire

3110 Portland Whit Bed, Portlandian Upper Jurassic, Isle of Portland, Dorset

3112M Purbeck marble – Purbeckian (Lower Cretaceous) Isle of Purbeck, Dorset

3116 Chalk – Upper Cretaceous Thames Basin

3119 Hard White Caen, Middle Jurassic (Bathonian) Normandy

Other sedimentary

3120 Kimmeridge Oil Shale – Upper Jurassic (Kimmeridgian) Dorset

3120 Alabaster – Permian Nottinghamshire/Staffordshire/Derbyshire

Igneous

3120 Basalt – Igneous intrusion northern and western Britain

3125 Granite – Igneous intrusion northern and western Britain

Geological summary

This suite of rocks consists of many materials used within the fabric of medieval Westminster Abbey especially Kentish ragstone/Hassock sandstone, Reigate stone, Caen stone, Taynton stone, Purbeck marble, flint and chalk.

Most common are materials quarried from the North Downs including Reigate stone (40kg), Kentish ragstone and Hassock stone (13kg), all quarried for ashlar and mouldings at Westminster Abbey since 1055. Other than that different types of freestone (Caen stone, Taynton stone, Purbeck marble) from the Jurassic ridge of south-central England have been identified in addition to the local flint and chalk from the Thames Valley. It is likely that some unstratified alabaster statuary from Derbyshire was also medieval as it was a common material during the late medieval period (Cheetham 2005).

Post-medieval materials are represented by Portland Whit Bed ashlar [+], Kimmeridge Oil shale [+], York stone paving [26] and Granite [+] and basalt [27] for cobbles.

This range of materials from Dean's Yard is merely a snapshot of the range of fabrics used at Westminster Abbey. It shows what a draw on resources the Abbey had both on outcrops in the British Isles and northern France.

The following pieces merit special attention

- Taynton stone slightly curved very degraded large moulding (35kg) from Phase 3 medieval reclamation [118] this could either be early medieval (given its use as an architectural element in the arches of the Pyx Chamber or the refectory wall – Hayward pers. obs.) or even Roman. The 4th century Westminster sarcophagus (Hayward in prep.) has been identified in thin-section as coming from the quarries of Taynton in West Oxfordshire and this fragment may represent part of a funerary monument from this period.
- Purbeck marble bevelled edge moulding from Phase 5 (13th century) reclamation [116]. This most probably is medieval given its widespread use at Westminster Abbey but could also conceivably be Roman.
- Caen stone (white version) moulding (possible) statuary is found in Phase 7 (16th century) [26] and rubble [24]. This whiter, harder version of the yellow Caen stone is found used in corbels at Westminster Abbey (Hayward pers. obs.) and Whitefriars Canterbury (Samuel in prep.)
- Reigate stone roll/holl mouldings and shaft fragments [63] [116] [124].

Phase Summary

Early Roman

It is likely that some of the reused (9kg) Roman ceramic building material used as reclamation in early medieval Phases 3 to 5 came originally from this period. Nearly all of it is of early Roman fabric (AD50-160) dominated by brick. The preference for Roman brick over tile and imbrex for the purpose of reclamation is understandable given their flat even surface.

Phases 3-6 Medieval

Alluvial clay [118] from the early medieval Phase 3 (before late 12th century) consisted of abraded Roman tile and brick and a large chunk of worked Taynton stone. This material may also be Roman given its use in the 4th century Westminster sarcophagus (Hayward in prep.). Another possibility, however, is that it is early medieval given its use as ashlar in the 11th century Pyx Chamber. Fired clay from [122] may have been used in the lining to the hearth [129] that was active at this time. As would have the glazed Roman brick from [122]. The fill of the ditch [120] from Phase 4 contained an admixture of 2.8kg of abraded and reused Roman

brick as well as Reigate stone (present in the Abbey from 1055), early peg tile (1135-1220) and Westminster floor tile (1225-1275) which fits with the Late 12th early 13th century date assigned to this phase.

Later medieval (13th century) dump deposits [122] [125] [117] [116] [115] and [97] consisted of very large quantities (48.2kg) of medieval stone, floor and roof tile and residual Roman material that were used to raise the level of the ground by nearly a metre. Significant fabrics from this group of deposits were very large quantities of Reigate stone and Kentish ragstone ashlar and mouldings (roll/holl) from [116] and Purbeck marble moulding. These were common earlier medieval construction fabrics at Westminster Abbey (e.g. Pyx Chamber and Refectory Wall) and here clearly represent the demolition of some structure in the vicinity. The dumping of large quantities of 2273 peg and bat tile may represent the roofing materials from this (these) same structure(s).

The Phase 6 (15th century) pits and postholes that cut into the dump deposits contain small quantities (1.6kg) of both early and later medieval peg tile and some residual Roman material.

Phases 7-9 Early Post-medieval (16th century)

The character of the assemblage changes in a couple of ways from the earliest post-medieval linear features and pits. First the accumulation in large quantities of roofing peg tile fabric 2276 (manufactured after 1480) in [88] [95] [86]. Next the dumping of later medieval Penn Tiles (1330-1390) and calcareous Flemish fabrics (1300-1500) rather than Westminster floor tiles (1225-1275). The hiatus (soil horizon) [88] may represent a phase of prolonged inactivity, followed by dumped high quality later medieval floor tile representing a new phase of building in the vicinity of Dean's Yard. Of interest too is the green crushed Reigate mortar identified from [87], this has been identified from a recent excavation (Wessex/Time Team) lining a burial from the nearby sanctuary area of the Abbey.

It is only towards the top of Phase 7 and into Phase 8 in the buried soil horizon [63] and dump level/raising ground level immediately above [26] that the first post-medieval bricks are found. These consist of three fabrics; the earthy chocolate brown 3030 (1400-1666), the fine red 3033 (1450-1700) and coarser sandy red 3046 (1450-1700). In each the bricks are poorly made very shallow (45-50mm) and often wide (104mm) typical features of early Tudor type bricks. The dump level [26] also yielded some White Caen stone statuary presumably from the Abbey. Whether this dumping is the result in any way of the dissolution of the Abbeys in the 1530s is not clear but is a point of interest. The character of the assemblage remains unchanged into Phase 9.

Phase 10 Post-medieval (17th century – present)

The fill of the 13 post-holes that mark the start of this phase are represented by the first occurrence of post-Great Fire bricks (1666-1900) which means that they cannot pre-date 1666. Other than that the phase is marked by a brick-lined well [41] and a culvert [12]. The latter uses a transitional London yellow brick fabric 3032nr3035 which was only manufactured after 1770. Given the deep frog and Late 18th/Early-mid 19th century shelly brick mortar this feature can be dated with confidence to between 1770 and 1850.

Distribution

Context	Fabric	Form	Size	Date range of material		Latest dated material		Spot date
0	2276; 2279; 2586; 2850; 3033; 3101; 3105; 3107; 3110; 3120	Portland ashlar, Pan Tile, Peg tile, kimmeridge oil shale,, Reigate stone, Granite cobble, Alabaster statuary, Red brick, Flemish unglazed floor	16	1055	1900	1850	1950	1850-1950
1	1977; 2276; 2586; 2587; 3033; 3046	Flem silt unglazed, peg tile, red brick post med	29	1180	1900	1480	1900	1600-1800
2	2950	Flem unglazed floor tile	1	1600	1800	1600	1800	1600-1800
6	2276; 2850	Peg Tile, Flem unglazed silt floor tile	2	1480	1900	1480	1900	1600-1900
9	2276; 2505; 3033;	Flem sand glaze, red brick and peg tile	3	1300	1900	1480	1900	1700-1900
10	1811; 2276; 3107	Penn Floor Tile; Peg Tile; Reigate stone	10	1055	1900	1480	1900	1480-1700
12	3032; 3032nr3035	Complete post- Great Fire and	2	1666	1900	1780	1900	1780-1850

Context	Fabric	Form	Size	Date range of material		Latest dated material		Spot date
	3101	transitional yellow stock brick L18/E19 Mort						
14	2276; 3033	Early post-med peg tile and brick	2	1450	1900	1480	1900	1480-1800
21	3032	Post-Great Fire brick	1	1666	1900	1666	1900	1666-1900
22	2276; 3120	Peg Tile, Burnt Kimmeridge shale	9	50	1900	1480	1900	1600-1900
24	2271; 2276; 2586 3033; 3105; 3120	Peg Tile, Kent Rag, Early post- med brick	14	50	1900	1480	1900	1480-1900
26	2276; 3030; 3033; 3105; 3107; 3120	Early post med brick; med brick; Reigate Ashlar Hard Caen, York stone	15	1055	1900	1480	1900	1700-1900
27	2276; 3032; 3033; 3107;3120	Post Great Fire Brick Peg tile Early post med brick; Reigate basalt cobble	12	1055	1900	1666	1900	1700-1900
31	2276	Peg Tile	1	1480	1900	1480	1900	1480-1900
37	2276; 2459a; 3033; 3105; 3107; 3117	Reigate stone, flint, Kent Rag, Peg Tile, Early post-med brick, Roman Tile	17	50	1900	1480	1900	1480-1900
39	2276; 2586; 3033; 3107	Peg tile, red brick and Reigate stone	14	1055	1900	1480	1900	1480-1900
42	2271; 2276; 2587; 2850;	Roman Tile, peg tile unglazed	39	50	1900	1480	1900	1480-1800

Context	Fabric	Form	Size	Date range of material		Latest dated material		Spot date
	3033	Flemish Tile, early post-med brick						
45	3032	Post-Great Fire Brick	1	1666	1900	1666	1900	1666-1900
53	2586; 3004	Roman tile peg tile	3	50	1800	1180	1800	1180-1800
54	1811; 2271; 2276; 2459a	Penn Tile; Roman Brick, Unglazed peg tile	12	50	1900	1480	1900	1480-1700
63	1678; 2271; 2272; 2276; 2459a; 2587; 3030; 3033; 3046; 3107	Flem calc floor tile, peg tiles glazed/unglazed, early pm bricks, Reigate stone	78	50	1900	1480	1900	1480-1700
68	2276; 2587	Unglazed peg tile	5	1180	1900	1480	1900	1480-1900
69	2276; 2586; 3046; 3076	Penn Tile; Red post-med brick, Peg tile	13	1180	1900	1480	1900	1480-1900
70	2276; 2586; 3033	Post-medieval brick and peg tile	6	1180	1900	1480	1900	1480-1900
82	2271; 2276	Peg Tile	4	1180	1900	1480	1900	1480-1900
86	2273; 2276; 2459b; 2586; 3106	Unglazed and glazed peg tile, Hassock greensand, Roman Imbrex	34	50	1900	1480	1900	1480-1700
88	2271;2273; 2276; 2452 2587; 3006; 3033; 3076;	Unglazed and glazed peg tile, Penn Floor Tile, Roman Imbrex and tile, post- med red brick	77	50	1900	1480	1900	1480-1700

Context	Fabric	Form	Size	Date range of material		Latest dated material		Spot date
89	1678; 2271; 2459a; 2276; 2323; 3105;	Glazed calc Flemish floor tile; glazed peg tile, Kent Rag	39	50	1900	1480	1900	1480-1700
91	2276; 2586; 3046; 3060; 3105; 3106; 3120	Roman brick, post-medieval brick, Peg Tile, Kentish Ragstone; Malmstone	10	50	1900	1480	1900	1480-1700
95	2276; 2586; 2587; 3107	Unglazed peg tile, and Reigate stone	20	1055	1900	1480	1900	1480-1700
97	2271; 2272;; 2273; 2586; 2587; 3107	Early peg tile some glaze and Reigate stone	25	1055	1800	1180	1800	1180-1590
98	2271	Early med Peg Tile unglazed	3	1180	1600	1180	1600	1180-1600
100	3106	Hassock sandstone rubble	1	50	1666	50	1666	1060-1600
102	2271; 2276; 2586	Reused peg tile	8	1180	1900	1480	1900	1480-1700
106	2271; 2586; 2587	Splash glaze and unglazed peg tile	8	1180	1450	1240	1450	1240-1450
108	2587; 2586	Unglazed peg peg tile	3	1180	1800	1180	1800	1180-1500
111	2271; 2273; 2459a; 2586; 3105; 3107	Unglazed early peg tile, Roman tile reused, Reigate stone, Kentish Ragstone	18	50	1590	1055	1590	1180-1590
115	2195; 2271;	Glazed medieval	118	50	1590	1055	1590	1225-1300

Context	Fabric	Form	Size	Date range of material		Latest dated material		Spot date
	2272; 2273; 2452 2586; 2587; 3023; 3104; 3105; 3107; 3117	Peg Tile and BAT tile, Westminster Floor Tile, Early Roman Brick, Kent Rag, Reigate, Flint Tabular						
116	2271; 2273; 2815; 3101; 3104; 3105; 3107; 3112M	Early glazed med peg, op.sg, Roman tile, Kent rag, Reigate and Purbeck marble	39	50	1900	1055	1900	1180-1300
117	3105; 3107; 2199; 2271; 2273; 3013	Kent rag rubble, Reigate, Westminster Tile, Early glazed peg tile. Late Roman calc fab	26	50	1590	1055	1590	1225-1300
118	2459a;3054; 3057; 3109	Early Roman brick and tile, Taynton stone degraded worked	7	50	1800	50	1800	100-400
119	2199; 2273; 3023;3106; 3107	Westminster floor tile, Reigate and Hassock, Early med peg tile, early Roman tile	8	50	1590	1055	1590	1135-1275
122	3102; 2273; 2452, 2459a 3023	Daub, Early Roman brick & Tile, Early med bat roof tile	15	1500BC	1666	1500BC	1666	1135-1250
123	2452; 3006;	Early Roman	5	1500BC	1666	1500BC	1666	50-200

Context	Fabric	Form	Size	Date range of material		Latest dated material		Spot date
	3102;	brick & tile and daub						
124	2273; 2586; 3004; 3016; 3107; 3023; 3116	Peg tile, Early Roman Tile, Reigate mould, Hassock, chalk, Tessera	10	50	1800	1180	1800	1180-1400
133	3102, 3023	Burnt Daub, Early Roman Brick	18	1500BC	1666	50	120	50-200
159	2276; 2279; 3032	Peg tile, Pan tile, post-Great fire brick	3	1180	1900	1664	1900	1664-1850
160	2276, 3120	Peg tile unglazed burnt Kimmeridge oil shale	2	50	1900	1480	1900	1480-1900
161	2586; 2271; 2276	Peg Tile unglazed	5	1180	1900	1480	1900	1480-1700
162	2586,2276 1811	Peg Tile unglazed, Penn Tile	5	1180	1900	1480	1900	1480-1700
163	3076	Penn Tile	1	1350	1390	1350	1390	1350-1400
164	2271	Glazed peg tile	4	1240	1450	1240	1450	1240-1450

Summary

- The building material assemblage at Dean's Yard contains a variety of medieval and post-medieval fabrics and forms, reflecting the longevity of occupation for Westminster Abbey.
- Important too are the varieties of stone types (15) showing the draw on stone resources that a major ecclesiastical project would have required (including subsequent repairs, alterations and extensions). Material as diverse as Alabaster

from Derbyshire and Caen stone from Normandy have all being used in statuary, mouldings, ashlar and rubble before being dumped around the vicinity of the Abbey.

- With nearly 9kg of Roman brick and tile from the site this is a considerably more than in other studies at Westminster (Smith 2006). However, like this study the fabrics recovered from other sites in the area are nearly all early (AD50-160).
- The medieval, early post-medieval and post-medieval groups of phases are marked by the dumping of different floor tile fabrics. Phases 3-6 (12th-15th) have Westminster Floor Tiles (1225-1275), Phases 7-9 (16th century) Penn (1330-1390) and Calcareous Flemish (1300-1500) Fabrics and finally Phase 10 (1600+) both glazed and unglazed Flemish floor tiles (1450-1800). Discrete dumping phases marked by their own assemblage of building materials can thus be identified.
- 12th and 13th century reclamation 2273 shouldered peg tile, Reigate stone, Westminster Tile and residual Roman.
- 16th century reclamations 2276 peg tile; some Tudor Brick Penn and Calcareous Flemish Tile – less stone and Roman material
- 17th-19th century reclamations Glazed and unglazed Flemish Floor Tile, Portland stone, post-Great Fire Brick, Pan Tile.
- Of interest are the quantities of early medieval shouldered tile or bat tile fabric 2273 (1135-1220) used in 13th century reclamation dumps that reflect the demolition of the roofing of an early medieval structure. These fabrics have been identified in quantity elsewhere at Westminster (Smith 2006) and are types associated with monastic buildings in London.

Recommendations

a) Retention

Following consultation with the Cathedral Archaeologists Professor Warwick Rodwell the following recommendations will be acted on.

- Keep all glazed patterned tile (Penn and Westminster Floor Tile)
- Keep complete examples of Glazed Flemish Silt and Calcareous Floor tile
- Keep all unusual fabrics (cbm and stone)
- Keep stone mouldings, statuary or other objects of interest e.g. Taynton stone from [118]
- Keep all Roman cbm.
- Keep all complete peg tile

Discard the remainder (25% retention estimate)

b) Significance

This assemblage contains a number of items of interest that may require further research and comparison.

- Taynton stone slightly curved very degraded large moulding (35kg) from Phase 3 medieval reclamation [118] this could either be early medieval (given its use as an architectural element in the arches of the Pyx Chamber or the refectory wall – Hayward pers. obs.) or even Roman. The 4th century Westminster sarcophagus (Hayward in prep.) has been identified in thin-section as coming from the quarries of Taynton in West Oxfordshire and this fragment may represent part of a funerary monument from this period.
- Purbeck marble bevelled edge moulding from Phase 5 (13th century) reclamation [116]. This most probably is medieval given its widespread use at Westminster Abbey but could also conceivably be Roman.
- Caen stone (white version) moulding (possible) statuary is found in Phase 7 (16th century) [26] and rubble [24]. This whiter, harder version of the yellow Caen stone is found used in corbels at Westminster Abbey (Hayward pers. obs.) and Whitefriars Canterbury (Samuel in prep.)
- Reigate stone roll/holl mouldings and shaft fragments [63] [116] [124].
- The use of greensand mortar at Westminster and its association with the lining of inhumation burials.
- All the Roman cbm is early (50-160)
- Floor tile assemblage contains examples of Westminster, Penn, Flemish Calc and Flemish Silt.

Further Work

The rich and diverse array of dumped medieval to post-medieval stone and ceramic building material from Dean's Yard very much reflects the development of the Abbey itself over 1000 years and as such warrants further analysis and publication. Comparison with building material assemblages from existing studies at Westminster Abbey (e.g. Thomas *et al* 2006) and other important 11th-12th century ecclesiastical sites (e.g. Merton Priory; Bermondsey Abbey) would ascertain how unique this assemblage is. Furthermore, comparison with the fabric collection and *in-situ* building material from the Abbey itself may help to determine more

precisely from where and from what period of the Abbeys development each material type came from.

In addition to this the quantity (9kg) of early Roman building material (especially brick) recovered was high and for this reason its origin or even function needs to be explored in greater detail. Again comparison with existing studies needs to be made in order to understand more fully the development and reclamation of Thorney Island in the Roman and post-Roman period. Thin-section comparative analysis of the Taynton stone moulding from medieval reclamation [118] with the 4th century Westminster Sarcophagus may help establish whether or not this was a Roman funerary monument. Finally, the identification of unstratified Alabaster statuary may warrant further investigation into the medieval use of this material at Westminster Abbey.

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APPENDIX 5: METAL AND SMALL FINDS ASSESSMENT

By Märit Gaimster

Over 130 metal or small finds were retrieved from the excavations; they are listed in the table below. All finds date from the medieval and early modern periods. Although heavily corroded, identifiable objects represent a range of categories including structural fittings, horse and household furnishings, and dress accessories. There is at least one coin in the assemblage.

Medieval (Phases 4-6)

These phases includes an early group of finds, associated with pottery dating from 1170-1200. Among the identifiable finds here are an iron barrel padlock handle (sf 26) and an iron hook (sf 29), possibly part of a flesh hook, a kitchen implement used for lifting pieces of meat out of the cooking pot (cf. Egan 1998, fig. 124 no. 435). There is also a fragment of lava quernstone, and part of a slender stone hone (sf 10). Other objects from these phases include the blade of a large iron knife (sf 30), a complete iron horseshoe (sf 23) and a characteristic so-called fiddle-key horseshoe nail (sf 25). There is also a complete iron staple (sf 24), a structural fitting with the function to hold pieces of wood together (cf. Ottaway 1992, 622-23). A silver penny of Henry III (sf 9) fits neatly with the pot date of 1250-1300. An interesting object is the tight bundle of fine copper-alloy wire (sf 18) that may be residual in Phase 9; it was associated with pottery from 1240-1350. At one end of the bundle, the wire is heavily worn and splayed, suggesting this may be a wire brush (cf. Allan 1984, fig. 194 no. 234). The function of a wire brush could have been to clean cooking pots, but also to clean and polish weapons, armour or other metal objects. An iron horseshoe (sf 31) was also recovered from Phase 6.

Early post-medieval (Phases 7-9)

The largest assemblage of finds was retrieved from Phase 5, where it was associated with pottery from the 16th century. The material is quite fragmented and corroded, but includes also numerous objects of copper alloy such as two incomplete lace-chapes (sf 4 and 11), a probable coin (sf 1) and a book clasp (sf 14). A complete iron buckle (sf 37) is most likely from a horse harness. A iron horseshoe (sf 19) was recovered from Phase 7.

Recommendations

The metal finds from Dean's Yard form an integral part of the material recovered during excavation and should, where relevant, be included in any further publication of the site. This is particularly relevant for the 16th-century assemblage, which represents a period that is still relatively poorly represented in the archaeological material (cf. Egan 2005; Egan and Forsyth 1997). For this purpose, x-ray is required for the majority of metal objects to enable further identification; these are marked in the table below. Parallels should be sought for the possible copper-alloy wire brush (sf 18), while the stone hone (sf 10) should be further determined by a stone specialist. The silver penny (sf 9) should be closer identified to type and mint.

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PHASE 4				
context	sf	description	pot date	recommendation
119		iron nails; two incomplete	1240-1350	
		lead waste; small fragment only	1240-1350	
123	10	stone hone; incomplete	1170-1220	further id
		iron nail; incomplete	1170-1220	
164		iron nail; incomplete	n/a	
PHASE 5				
context	sf	description	pot date	recommendation
115	9	silver coin; Henry III long-cross penny, 1247-72	1240-1300	further id
	24	iron staple; complete; rectangular with broad top; W 80mm	1240-1300	x-ray
	25	iron fiddle-key horseshoe nail; complete and unused; L 55mm	1240-1300	x-ray
		iron nails; seven incomplete	1240-1300	
116		iron ?nails; two incomplete	1240-1300	x-ray
117	26	iron barrel padlock key; handle L 95mm+	1170-1200	x-ray
	27	iron straps/fittings; three	1170-1200	x-ray
	28	iron ?object; flat with thickened ends; L 100mm+; W 30mm	1170-1200	x-ray
122	29	iron hook; possibly part of flesh hook or kitchen implement; L 60mm	1170-1220	x-ray
		iron ?objects; three pieces	1170-1220	x-ray
		lava quern; fragment only	1170-1220	
PHASE 6				
context	sf	description	pot date	recommendation
97		iron ?nail; incomplete	1400-1500	x-ray
102		iron nail; L 60mm	1270-1350	
111	30	iron tanged knife; incomplete tapering blade; W 25-30mm; L 140mm+	1250-1300	x-ray
	23	iron horseshoe; complete with caulkins; W 100mm; L 120mm	1250-1300	x-ray
	22	iron ?hinge; incomplete; W 15mm	1250-1300	x-ray
		lead sheet; neatly cut triangular piece; W 65mm; ht. 30mm	1250-1300	
88	31	iron horseshoe; complete but heavily corroded: W 115mm; L 125mm	1480-1500	x-ray
		iron nails; three incomplete; one L 60mm	1480-1500	
PHASE 7				
context	sf	description	pot date	recommendation
63	7	lead disc/weight; complete with partly rolled edge; diam. 37mm	1500-1550	
	8	copper-alloy rivet with domed head; ?gilded; diam. 7mm	1500-1550	
	11	copper-alloy lace-chape; incomplete	1500-1550	
	12	copper-alloy ring/chain link; incomplete; diam. 7mm	1500-1550	
	13	copper-alloy fitting; flat-sectioned with hooked end: L 25mm	1500-1550	
	14	copper-alloy ?book clasp with splayed end: L 60mm	1500-1550	x-ray
	15	copper-alloy ?pin/handle; incomplete; L 50mm+	1500-1550	x-ray
	16	copper-alloy ?object; 20 x 22mm	1500-1550	x-ray
	17	copper-alloy ?sheet/vessel; four pieces	1500-1550	x-ray

		copper-alloy ?objects/fittings; nine corroded pieces	1500-1550	x-ray
	37	iron buckle; complete but heavily corroded; W 45mm; L 50mm	1500-1550	x-ray
	38	iron ?knife; three pieces	1500-1550	x-ray
	40	iron ?staple; W 40mm	1500-1550	x-ray
	39	iron ?vessel; two pieces	1500-1550	x-ray
	42	iron ?object	1500-1550	x-ray
	35	iron ?sheet/object; two pieces; 65 x 85mm and 40 x 90mm	1500-1550	x-ray
	41	flat iron object; two conjoining pieces; W 35mm; L 70mm+	1500-1550	
	43	iron objects/fitting; four pieces	1500-1550	x-ray
		iron nails; c. 40; mostly complete	1500-1550	
		slag	1500-1550	
89	19	iron horseshoe; incomplete; broad web	1480-1500	x-ray
		iron ?object; two pieces	1480-1500	x-ray
		iron ?strap; incomplete; W 15mm	1480-1500	x-ray
PHASE 8				
context	sf	description	pot date	recommendation
26	4	copper-alloy lace-chape; incomplete	1580-1600	
	6	copper-alloy square-section bar with pointed ends; L 135mm	1580-1600	further id
		iron ?nail; L 65mm	1580-1600	x-ray
	36	iron ?object; three pieces	1580-1600	x-ray
PHASE 9				
context	sf	description	pot date	recommendation
3	1	copper-alloy ?coin; three fragments	n/a	x-ray/clean for id
	2	large horseshoe-shaped iron object; W 160mm; L 145mm	n/a	x-ray
	3	large iron ?pin; L 300mm+	n/a	x-ray
10	18	copper-alloy ? wire brush ; lengths of fine wire wound into bunch with coarser wire; one end splayed and split; L 65mm; diam. 6mm	1240-1350	further id
	34	iron ?vessel; two pieces	1240-1350	x-ray
54	5	copper-alloy pins/wire; three pieces	1550-1600	
		iron ?nails	1550-1600	x-ray
UNSTRATIFIED				
context	sf	description	pot date	recommendation
0	32	iron horseshoe with broad web; incomplete	n/a	x-ray
	33	iron strap/hinge; incomplete; W 15mm	n/a	x-ray

APPENDIX 6: GLASS ASSESSMENT

By John Shepherd

Only six fragments of glass and a few very small splinters were submitted for identification. They are as follows:

Context	Context spot date	No. of frags	Colour	Form	Date
24	1580-1910	1	Natural green	Window glass	Med/post-med
26	1580-1600	3	Natural green	Window glass	Med/post-med
32	1550-1600	1	Natural green	Window glass	Med/post-med
63	1500-1550	1	Dull brown	Vessel	?
123	1170-1220	splinters	Blue	?	?

The splinters from [123], context dated AD 1170-1220, are in a blue glass and might come from a bead. They are, however, very shattered and impossible to reconstruct. The only other vessel fragments, from [63], context dated 1500-1550, comes from a vessel of indeterminate form and date.

The remaining five fragments are all window glass. Four (three from [26] and one from [32]) come from 16th century or later contexts and one (from [24]) comes from a post-medieval context. None of them show any detail and were originally from just plain natural green quarries. They are, however, all thin cylinder blown fragments suggesting a late 15th or 16th century date at the earliest close, therefore, to their respective context dates and not fragments from earlier medieval glazing regimes.

Recommendations

Other than mentioning in the text the presence of the window glass fragments, no further work is required. No illustrations are required.

APPENDIX 7: LITHICS ASSESSMENT

By Barry Bishop

Introduction

Excavations at the above site resulted in the recovery of three struck flints and a small quantity of burnt flint fragments.

Methodology

This report follows the methodology and recommendations encapsulated in both MAP2 and MoRPHE (English Heritage 1991; 2006). Its aims are to quantify and describe the material, assess its significance in terms of its potential to contribute to the stated research aims and objectives, and to recommend any further work needed for the material to achieve its full research potential. All metrical information follows the methodology established by Saville (1980).

Quantification

Context	Ref.	Flake	Burnt Flint (no.)	Burnt Flint (wt:g)
88		1		
97		1		
119	<2>		1	7
123	<3>		3	7
124	<4>		4	23
133			5	86
152		1		

Table 1: Quantification of Lithic material by Context

Burnt Flint

The burnt flint was recovered in small quantities from four separate contexts. It is variably burnt, ranging from exhibiting a slight pinking to being heavily fire-crazed and attaining a grey-white colour. It is indicative of background waste from hearth use in the vicinity although by itself is not dateable.

Struck Flint

The three struck flakes appear to represent both prehistoric flintworking and medieval or post-medieval construction activity.

The piece from natural sand layer [152] consisted of a small flake (41mm max. diam.) of translucent light brown pebble flint and has an edge-trimmed dihedral striking-platform and multi-directional dorsal scars. This is almost certainly prehistoric in date, very tentatively being most typical of Later Neolithic or Early Bronze Age examples. The remaining two flakes are made from a mottled translucent black/opaque grey flint with a thin but rough chalky cortex.

The example from context [97] is large (80mm X 112mm X 20mm) and was hard hammer struck, its striking platform having largely disintegrated but still retaining two well-developed Hertzian cones. It has a single large flake scar on its dorsal surface and is in a very chipped condition. That from context [88] is smaller (max. diam. 27mm) but of a similar raw material to that from context [97] and has a cortical striking platform. Both would be most typical of waste flakes created through trimming and shaping flint nodules used in construction during the medieval or post-medieval periods, and possibly associated with the constructional phases of the Abbey.

Significance and Potential

The prehistoric flake adds further, if only slight, evidence for prehistoric activity on Thorney Island, an area where considerable potential for prehistoric activity has previously been demonstrated (eg see Wilkinson *et al* 2000), although by itself can add little further information on the nature of those activities. The other two flakes almost certainly derive from medieval or post-medieval wall construction or repair although their potential to inform on decorative stone working techniques is limited.

Recommendations

The assemblage is small and beyond indicating a prehistoric and a medieval or post-medieval presence, is of little further interpretational value. It is therefore recommended that mention should be made of the flintwork in any published account of the investigations but that no further work is warranted.

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APPENDIX 8: ANIMAL BONE ASSESSMENT

By Kevin Rielly

Introduction

This site is situated on the central part of the former Thorney Island adjacent to Westminster Abbey, which commands the highest point of this eyot, approximately 2m OD (after Thomas *et al* 2006, 11). The excavation provided a single late Iron Age/Early Roman feature but the major occupation clearly dates to the medieval and post-medieval periods. Beginning in the 12th century, there is a sequence of dumps/soils and cut features culminating with late 18th/19th century brick-lined features including a vaulted drain and the backfill of an early 17th century well. Bones were found throughout the medieval and post-medieval sequence. These were mainly retrieved by hand with the exception of those from a small number of samples taken from the early medieval ditch [120].

Methodology

The bone was recorded to species/taxonomic category where possible and to size class in the case of unidentifiable bones such as ribs, fragments of longbone shaft and the majority of vertebra fragments. Recording follows the established techniques whereby details of the element, species, bone portion, state of fusion, wear of the dentition, anatomical measurements and taphonomic including natural and anthropogenic modifications to the bone were registered. The sample collections were washed through a modified Siraf tank using a 1mm mesh and the subsequent residues were air dried and sorted.

Description of faunal assemblage

The site provided a grand total of 915 animal bones, taken by hand collection and a further 474 (excluding the fishbones, see Armitage, Appendix 9) provided by 5 samples. These have been assigned to their respective Phases (Table 1), the occupation levels divided into: - Phase 1 – Natural; 2 – Late Iron Age/Early Roman; 3 and 4 – Early Medieval, 5 – Medieval, 6 – Late Medieval, 7, 8 and 9 - Early Post-medieval and 10 – Post-medieval. The medieval phases date to the 12th/13th, 13th and 15th centuries, while the post-medieval phases include the 16th and 17th to 19th centuries respectively. Animal bones were limited to the medieval (excluding Phase 3) and later phases with the majority taken from Phases 4 to 7. The sample collection was entirely derived from the Phase 4 ditch (see Table 1 and below).

Most of the bones in these deposits were well preserved and minimally fragmented.

Phase:	4	5	6	7	8	9	10
Cattle	23(1)	41	23	98	11	11	10
Cattle-size	12(31)	34	47	118	12	4	10
Sheep/Goat	13(1)	17	31	76	13	4	12
Sheep	3		14	23	3	1	3
Pig	29(19)	17	13	18	3	1	4
Sheep-size	15(346)	9	31	56	7	1	4
Red deer		1	1				
Roe deer	1		1				
Fallow deer				1		1	
Rabbit	1		1	4			
Small mammal	(32)						
Small cetacean	1						
Dog	2			2			
Cat	1			3			
Chicken	2(11)	1	2	6			
Chicken-size	(16)						
Goose	1(2)	1	1	2			
Goose-size	(1)	1					
Snipe	(1)						
Sturgeon		1					
Haddock	1						
Amphibian	(3)						
Indeterminate	10						
Total	105(474)	123	165	407	49	23	43

Table 1. Hand collected species abundance by phase, with sieved collection results in brackets

Medieval (Phases 4, 5 and 6)

The bones from these phases were taken from a large ditch [120] (Phase 4) overlain by a series of reclamation dumps (Phase 5), which was cut by a number of postholes and pits and then in turn overlain by a buried soil [88] (Phase 6). There appear to be quite dramatic changes in the representation of the major domesticates between these phases (see Tables 1 and 2 and Figure 1), starting with a species order of pig, cattle and then sheep, followed by diminishing pig abundance in Phases 5 and 6 accompanying first cattle and then sheep dominance respectively. All three domesticates are represented by a wide selection of skeletal parts, suggesting the presence of both processing and food

waste. Most of the cattle and sheep bones are from adult individuals, while almost all the pigs are subadult, this clearly showing the value of antemortem cattle and sheep/goat products and the culling of pigs for their meat in their 1st and 2nd year. There is a good range of food species (see Table 1), including poultry and game. The sieved collections, from Phase 4, provided the majority of the poultry bones, mainly chicken. Notable affluence indicators include sturgeon (a dermal scute) in Phase 5, as well as the small whale (a caudal vertebra) and the snipe (sieved) in Phase 4. The cetacean may be a porpoise or a dolphin. Both whale and sturgeon fall into the category of 'royal fish', and would therefore have been the property of the crown (Wilson 1973, 28).

Early post-medieval (Phases 7, 8 and 9)

The ground surface [88] was cut into by a series of pits which in turn were overlain by another buried topsoil [63] (Phase 7). The next two phases provided more pitting and eventually a series of postholes in Phase 9. Most of the bones were taken from the buried topsoil [63]; this with 352 bones out of a Phase 7 total of 407 fragments. Other major contributors include the Phase 7 fills of pit [90] cutting into the Phase 6 layer [88] with 41 bones and the Phase 8 levelling layer [26], overlying [63], with 31 bones.

Phase	Cattle	Sheep/Goat	Pig	N
	%	%	%	
4	33.8	23.5	42.6	68
5	54.7	22.7	22.7	75
6	28.4	55.6	16	81
7	45.6	46	8.4	215
8+9	46.8	44.7	8.5	47

Table 2. Percentage abundance of major domesticates (total fragment counts), where N is the sum of cattle, sheep/goat and pig bones from that phase and % equals sum of individual species/N x 100.

There is a further reduction in the proportion of pig, compared to the previous phases, with a similarly good percentage of cattle and sheep throughout these 16th century phases (see Table 2 and Figure 1). Each of the major domesticates are again represented by a mixture of parts. Other similarities include a wealth of cattle and sheep adults and pig subadults. However, there is also a good proportion of calves, suggesting the consumption of veal. Poultry and game still provide a small part of the meat diet.

Post-medieval (Phase 10)

The latest collections, contributing just 43 bones, were mainly derived from pits (31 bones) with the remainder taken from layers and the brick-lined well [7]. The species abundance follows the earlier post-medieval phase with a small quantity of pig and equal proportions of

cattle and sheep, although now there appears to be no supplementary food species. The age distributions follow a similar pattern, but again with a notable difference - no veal calves. Of interest is the lack of any large domesticates or any sawn fragments, probably signifying the lack of bone bearing deposits dating beyond the start of the 19th century. This period witnessed the initial use of the saw as a butchery implement plus the introduction of improved, generally larger, breeds of domestic stock into the London meat markets (Albarella 2003, 74; Rixson 2000, 215).

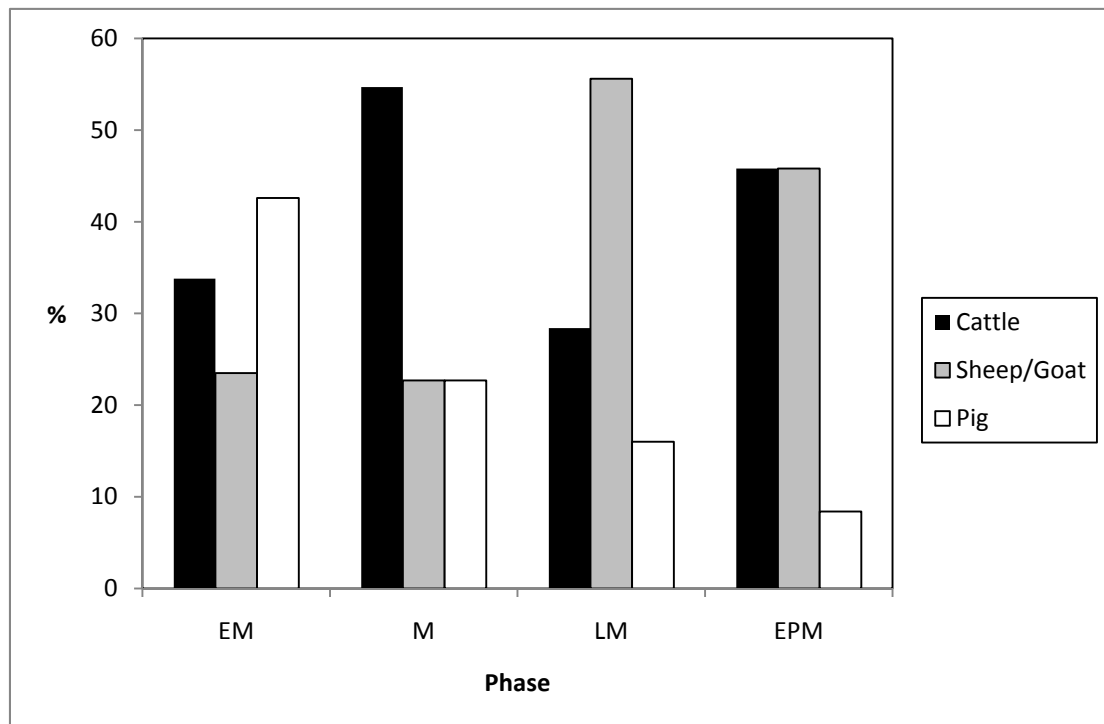


Figure 1. Percentage abundance of cattle, sheep/goat and pig in the Early Medieval (Phase 4), Medieval (Phase 5), Late Medieval (Phase 6) and Early Post-medieval (Phases 7, 8 and 9) eras, with data taken from Table 2.

Conclusion and recommendations for further work

The potential value of this assemblage lies in the reasonable quantity of bones represented by each of the medieval and early post-medieval phases as well as the generally good condition of these collections. There is sufficient data to comment on the relative status of the assemblage, at least in the earliest levels, here concerning the sturgeon and the small cetacean. In addition, noted changes in the abundance of the major domesticates can be seen to follow local (initially) and then more general animal usage patterns. The high pig counts in the early medieval phase reflects the large proportion of pig bones found within 11th century levels at Westminster Abbey Undercroft (Pipe 1995; Rackham 1994, 132). It is conceivable that a major usage of pork may have some bearing on the local monastic diet and/or indicate the presence of piggeries attached to the monastic buildings. The increasing importance of the woollen trade in the medieval period tends not to be shown in the bone

assemblages until the later medieval period, with most of the earlier sites demonstrating, as here, a dominance of cattle. A typical example of this change from cattle to sheep or cattle/sheep parity, accompanied by a general decline in pig usage, is shown at Caroone House (Rielly in prep). Other similarities with the general pattern include the generally adult nature of the cattle and sheep collections, irrespective of phase. However, here as elsewhere, there is a notable rise in the proportion of veal calves by the late medieval period. This has been related to a contemporary rise in the importance of cattle dairy production (Albarella 1997).

In conclusion, there is clearly some potential regarding further study of the medieval and early post-medieval collections, these adding to the general picture of animal usage at contemporary sites in London. The earliest collections will form a major part of this study, in particular as they appear to show monastic traits. These levels were extensively sampled, providing a wealth of fishbones as well as some poultry and game. Thus it should be possible to compare and contrast the early medieval data with similarly large and well recovered collections from other monastic sites, as for example from St John Clerkenwell and St Mary Spital (Sidell and Fitzgerald 2004; Pipe 1997). Later comparisons will include the late medieval and early post-medieval assemblages from the nearby site at Westminster Station (Rielly 2006).

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APPENDIX 9: FISHBONE ASSESSMENT

By Philip L. Armitage

Methodology

Over 1,393 fish bone elements/fragments, mainly from sieved samples but also including a few hand collected specimens, were examined under low power (10X magnification) using a Motic binocular microscope. Identifications of the *cyprinidae* (roach, chub & barbal) pharyngeal bones/teeth were made using the author's comparative collections and with reference to Wheeler (1978), Libois & Hallet-Libois (1988) and Radu (2005, 62-63). Bone elements of plaice (*Pleuronectes platessa*) and flounder (*Platichthys flesus*) were distinguished using the criteria of Wouters, Muylaert, & van Neer (2007) and also compared against modern reference material. Other species identifications were based on the author's comparative collections.

Where individual species could not be determined in certain of the smaller *gadidae* (cod family) bones, these were categorised as "small gadids", which probably comprised mostly immature whiting and cod. Similarly, the categories "plaice/flounder" and "*cyprinidae*" were applied for recording purposes when the precise species identification was uncertain for bones belonging to the carp family. Excluded from analysis were quantities of highly fragmented fin rays/ribs/spines (contexts [119], [123] & [124]), which could not be readily assigned to taxa/species.

Results

Of the 1,393 specimens examined, 1,093 (78.5% of the total) were identified to species and anatomy (part skeleton).

Table 1 provides summarised counts of the numbers of identified specimens present (nisp) for each species represented, grouped according to site phase/context. Phase 4 samples produced evidence for the presence of a wide range of fish, which included marine, freshwater and migratory species. The most common marine species were herring, whiting and the flatfishes (plaice & flounder). The freshwater group was predominated by eel, but there was also a significant representation of cyprinids. Although the Phase 5 contexts yielded only two bones, the presence of sturgeon (context [115]) was particularly noteworthy.

For archive purposes the complete sets of recorded anatomical distributions for each species by phase/context/sample (skeletal element nomenclature followed Wheeler & Jones 1989, 122-124) were recorded in spreadsheet format. Overall, vertebrae predominated (forming

89.6% of the total nisp) with noticeably much smaller quantities of cranial elements, apart from the otic bullae of herrings.

Interpretation & Discussion

The assemblages of fish bones from Phases 4 and 5 were recognised as kitchen/table waste, which clearly reflected/indicated high status diet owing to the presence of the wide variety of freshwater species and the highly prized sturgeon.

There are a range of further research questions which may be addressed by analysing in more detail the Phase 4 & 5 assemblages (e.g. to determine whether the marine species were obtained by the inhabitants fresh or in preserved form). It would be instructive to compare the Dean's Yard assemblages with those from the Misericorde of Westminster Abbey (analysed by Jones 1976). Reference should also be made to the range of fish known from historical records to have been eaten by the Westminster Abbey monks (see Harvey 1995, 46-51). Comparative analyses with fish bone assembles from other urban monastic sites is also recommended.

In summary, it is considered that the Dean's Yard material has the potential of making a useful contribution to our understanding of high status medieval dietary preferences/consumption patterns, with special reference to the contribution made by fish.

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Fish bones from Dean's Yard, Westminster Abbey, City of
Westminster

Table 1: Summarised counts of the identified fish bones from sieved & hand
collected samples.

	Site Phase	4	4	4	5	5	7	Totals
	Context	119	123	124	115	122	63	
Species								
herring <i>Clupea harengus</i>		204	403	108				715
cod <i>Gadus morhua</i>			6	5				11
small gadids <i>Gadidae</i>		3	18	19		1		41
whiting <i>Merlangius merlangus</i>		17	15	19				51
haddock <i>Melanogrammus aeglefinus</i>		3	1					4
sea bass <i>Dicentrarchus labrix</i>			2					2
mackerel <i>Scomber scombrus</i>			2					2
plaice <i>Pleuronectes platessa</i>		11	35	4				50
flounder <i>Platichthys flesus</i>		2	1					3
plaice/flounder		3	19	8				30
sole <i>Solea solea</i>			3					3
flatfish				1				1
thornback ray (or roker) <i>Raja clavata</i>		10	2					12
tub gurnard <i>Trigla lucerna</i>			1					1
grey gurnard <i>Eutrigla gurnardus</i>				1				1
gurnard (sp.indeterminate)			1	1			1	3

cf.trout <i>Salmo trutta</i>		1											1
<i>Salmonidae</i>		1											1
sturgeon <i>Acipenser sturio</i>							1						1
smelt <i>Osmerus eperlanus</i>		6	11		8								25
freshwater eel <i>Anguilla anguilla</i>		29	52		6								87
pike <i>Esox lucius</i>		1	8		3								12
perch <i>Perca fluviatilis</i>					2								2
roach <i>Rutilus rutilus</i>			2										2
chub <i>Leuciscus cephalus</i>		1											1
barbal <i>Barbus barbus</i>			2										2
<i>Cyprinidae</i> (carp family)		10	16		3								29
indeterminate		114	87		99								
Totals		416	687		287		1		1		1		1393

Key to Site Phases:

Phase 4 - Early medieval (late 12th/early 13th century)

Phase 5: Medieval (13th century)

Phase 7: Early post-medieval (early to mid 16th century)

APPENDIX 10: ENVIRONMENTAL ASSESSMENT

By Lucy Allott & Dan Young

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INTRODUCTION

This report summarises the findings arising out of the environmental archaeological assessment undertaken by Quaternary Scientific (University of Reading) in connection with the proposed development of Dean's Yard, Westminster Abbey (site code: DYR09). During recent archaeological investigations at the site undertaken by Pre-Construct Archaeology Ltd, five bulk samples were obtained from a single ditch dated to 1170-1220 (Phase 4). The samples were processed by flotation for environmental archaeological assessment and possible future analysis.

The aims of the environmental archaeological assessment was to evaluate the potential of the samples for reconstructing the past economy and diet, and general environmental context, of the site. In order to achieve this aim, the environmental archaeological assessment consisted of:

1. Rapidly assessing the preservation and concentration of charred plant remains (seeds and wood), Mollusca and bone from 5 bulk samples
2. Detailed assessment of the preservation and concentration of charred and waterlogged plant macrofossils (seeds and wood), and identification of the main taxa, from 2 selected bulk samples to provide further information regarding the site economy, activities undertaken, natural use of resources and the past vegetation at the site, while also informing the selection of further samples for processing
3. Detailed assessment of the concentration of Mollusca, and identification of the main taxa, from 2 selected bulk samples to provide an indication of the potential of Mollusca for providing information on the local environment.

METHODS

Rapid assessment of the bulk samples

Five bulk samples were processed by flotation by Pre-Construct Archaeology Ltd using a 1mm and 300-micron mesh sizes. The dried flots and residues were sorted 'by eye'. Flots and were scanned under a stereozoom microscope at magnifications of x7-45 and an overview of the concentration of charcoal, seeds, Mollusca, bone and artefacts recorded (Table 1). Those samples with a moderate to high concentration of remains underwent a detailed assessment (highlighted in bold).

Macrobotanical assessment

Flots and residues containing charred macrobotanical remains and wood charcoal from five bulk samples were submitted for post excavation assessment. Samples were taken from contexts [119], [123], [124], [127] and [128].

Flots were measured, weighed and scanned under a stereozoom microscope at magnifications of x7-45. Table 2 documents the contents of each. Preliminary identifications were made by comparing the macroplant remains with modern reference material held at the Institute of Archaeology, University College London and with specimens documented in reference manuals (Cappers *et al* 2006; Jacomet 2006; NIAB 2004).

Up to 10 fragments from each context were fractured along three planes (TS – transverse, TLS – tangential longitudinal and RLS – radial longitudinal sections) following standardised methodology (Gale and Cutler 2000) to help establish the range of taxa present, preservation of internal anatomical features and their potential for further analytical work. The fractured surfaces were viewed using both a stereozoom Leica EZ4D microscope at 8-45x magnifications (for preliminary sorting) and an incident light Olympus BHMJ microscope at 50, 100, 200 and 400x magnifications (for taxonomic identifications). The presence of roundwood fragments and vitrified charcoal are recorded where evident.

Table 3 records the abundance of charcoal recovered from the residues including preliminary identifications. Identifications have been made through comparison with modern reference material at University College London, Institute of Archaeology, and with taxa documented in identification manuals (Hather 2000; Schweingruber 1990; Schoch *et al* 2004). Nomenclature used follows Stace (1997).

Mollusca assessment

Mollusca remains from two selected flots and residues were submitted for assessment. The Mollusca fragments were scanned under a low powered stereo-microscope with a magnification range of 10 to 40x. Identification and interpretation was based on reference to Kerney (1999) and Kerney and Cameron (1979) and by comparison with reference material.

RESULTS AND INTERPRETATION OF THE RAPID ASSESSMENT

Five samples from a range of features including waterlain deposits and pits were rapidly assessed to establish the nature of the environmental archaeological remains present. The samples highlighted in bold were recommended for detailed assessment (Table 1). Charred plant macrofossils (seeds and wood) were preserved in all samples. Mollusca fragments were preserved in two samples.

Table 1: Rapid assessment of bulk samples from Dean's Yard, Westminster Abbey (site code: DYR09)

Sample number	Context number	Phase	Feature	Sample volume	Volume processed	Volume remaining	Percentage of whole context	Flots					Residues		
								Charcoal/ Wood	Seeds	Mollusca	Bone	Charcoal	Mollusca	Bone	
<2>	[119]	4	Fill of ditch [120] (slot 1)	20	19	1	5-25	2	2	1	2	3	2	0	
<3>	[123]	4	Fill of ditch [120] (slot 2)	20	19	1	5-25	2	1	1	2	3	2	0	
<4>	[124]	4	Fill of ditch [120] (slot 3)	20	19	1	5-25	2	1	1	0	3	1	0	
<5>	[127]	4	Burnt fill of hearth [129]	20	19	1	5-25	2	0	1	0	2	0	0	
<6>	[128]	4	Clay lining of hearth [129]	50	48	2	100	2	1	1	1	2	0	0	

Key: 0 = Estimated Minimum Number of Specimens (MNS) = 0; 1 = 1 to 25; 2 = 26 to 50; 3 = 51 to 75; 4 = 76 to 100; 5 = 101+

RESULTS AND INTERPRETATION OF THE MACROSCOPIC PLANT REMAINS ASSESSMENT

Charred Macrobotanical Remains

Samples <2> and <3>, contexts [119] and [123] respectively, contained small quantities (<10/flot) of charred cereal grain fragments including some possible oat (cf. *Avena* sp.) and bread wheat (*Triticum* cf. *aestivum*) grains. These samples also contained occasional charred seeds of campion/stitchwort (*Silene/Stellaria* sp.), a possible pea/bean (*Pisum/Vicia/Lathyrus* sp.), an indeterminate fruit/nut shell fragment and a seed from the Asteraceae (Daisy) family.

The flot from sample <4>, [124] produced small wood charcoal fragments only while sample <5>, [127] contained fragments of indeterminate charred plant remains in addition to a small quantity of charcoal fragments. The residue from sample <4> was particularly rich in charcoal fragments (Table 3).

Sample <6>, [128] contained an indeterminate cereal grain, wild grass (Poaceae) seeds and a possible buttercup (*Ranunculus* sp.) seed.

Wood Charcoal

Although charcoal fragments were relatively scarce in the flots from these samples, the residues were far richer in charcoal and fragments were extracted and submitted for assessment. The following taxa have been identified:

Fagaceae	<i>Quercus</i> sp. (deciduous oak)
	<i>Fagus sylvatica</i> (beech)
Oleaceae / Caprifoliaceae	<i>Ligustrum</i> / <i>Lonicera</i> (privet/ honeysuckle)
Rosaceae (sub-fam. Maloideae)	<i>Malus</i> / <i>Pyrus</i> / <i>Crataegus</i> / <i>Sorbus</i> sp. (apple/pear/ hawthorn/ whitebeam)
(sub-fam. Prunoideae)	<i>Prunus</i> sp. (cherries/sloe)

Very little variation in the range of taxa recorded was evident in this preliminary assessment. Charcoal fragments from deciduous oak (*Quercus* sp.) were present in all of the samples and beech (*Fagus sylvatica*) was recorded in all but one sample (<6>, [128]). Several other taxa including privet/honeysuckle (*Ligustrum/Lonicera*), hawthorn/ whitebeam/ apple (Maloideae) and sloe/ cherry (*Prunus* sp.) were also evident in samples <3>, <4> and <5> respectively.

Table 2: Flot quantification and preliminary identifications of charred macrobotanical remains from selected bulk samples from Dean's Yard, Westminster Abbey (site code: DYR09)

Sample Number	Context	Flot volume ml	Uncharred %	Sediment %	Seeds uncharred	Charcoal >4mm	Charcoal <4mm	Charcoal <2mm	Crop seeds charred	Identifications	Preservation	Weed seeds charred	Identifications	Preservation	large mammal bone	Fish bone	LSS
<2>	[119]	10	30	10	**	*	**	**	*	indet. cerealia frags, cf. <i>Avena</i> sp. (oats)	+	*	<i>Silene/Stellaria</i> (campion/stitchwort) cf. <i>Pisum/Vicia/Lathyrus</i> (pea/bean)	++		** *	
<3>	[123]	12	10	60	*	*	*	***	*	indet. cerealia frags, <i>Triticum</i> cf. <i>aestivum</i> (bread wheat)	++	*	indet fruit/ nut shell fragment, Asteraceae (daisy family)	++		**	
<4>	[124]	11	90	8	*		*	**									
<5>	[127]	3					*	*				*	indet.	+			
<6>	[128]	22	<5	60		*	**	***	1	indet. cerealia frag	+	*	Poaceae (grass), <i>Ranunculus</i> sp. (buttercup), & other weed/wild seeds	++	1		*

Key: estimated number of individuals: (* = 1-10, ** = 11-50, *** = 51-250, **** = >250)

Table 3: Charcoal quantification and preliminary identifications from selected bulk samples from Westminster Abbey (site code: DYR09)

Sample Number	Context	Charcoal >4mm	Charcoal <4mm	Charcoal <2mm	Identifications	Common name
<2>	(119)	**	****	****	<i>Quercus</i> sp. (9), <i>Fagus sylvatica</i> (1)	oak beech
<3>	(123)	**	***	**	<i>Quercus</i> sp. (5), <i>Fagus sylvatica</i> (4), <i>Ligustrum/Lonicera</i> sp. (1)	oak beech privet/ honeysuckle
<4>	(124)	**	***	****	<i>Quercus</i> sp. (7), <i>Fagus sylvatica</i> (1), Maloideae (2, including 1 roundwood)	oak beech hawthorn/ whitebeam/ apple
<5>	(127)	*	**		<i>Quercus</i> sp. (5), <i>Fagus sylvatica</i> (1), <i>Prunus</i> sp. (1 roundwood)	oak beech sloe/cherry
<6>	(128)	*	**		<i>Quercus</i> sp. (10)	oak

Key: estimated number of individuals: * = 1-10, ** = 11-50, *** = 51-250, **** = >250

RESULTS AND INTERPRETATION OF THE MOLLUSCA ASSESSMENT

Samples from all contexts contained Mollusca remains recommended for further assessment. However, due to the fragmented nature of the shells it was not possible to make any identifications.

SIGNIFICANCE AND POTENTIAL

Charred macrobotanical remains were extremely scarce in these samples and therefore hold no potential to characterise the agricultural economy associated with the land use at Dean's Yard. The taxa currently recorded provide limited evidence for cultivation or use of cereals and non-cereal crops. The wild plants indicated are common grassland taxa and may also have occurred as arable weeds.

Charcoal fragments were moderately well preserved in each of the samples included in the assessment. Although only a small range of taxa were identified, samples <2>, <3> and <4> from contexts [119], [123] and [124] contain sufficient fragments for further analysis. The

current assemblage suggests that oak and beech may have been important fuel woods while wood from other taxa including fruit trees may also have been used.

The Mollusca remains contain no potential for further work.

RECOMMENDATIONS FOR FURTHER WORK

Analytical work is recommended for charcoal from samples <2>, <3> and <4> from contexts [119], [123] and [124]. Any further work undertaken should integrate context information to establish whether the charcoal assemblages are directly related to the use or infilling of the features. The final selection of samples for analysis should be determined through consultation with the site supervisor and available context records as well as taking into account spot dates for the features. This will help establish whether further work will contribute to the interpretation of the features or site as a whole.

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APPENDIX 11: OASIS FORM

OASIS ID: preconst1-73257

Project details

Project name Dean's Yard, Westminster Abbey

Short description of the project The majority of the strata recorded pertained to the formation and evolution of the yard although occasional pitting activity was also observed, especially throughout the earlier deposits. A struck flint of Late Neolithic/Early Bronze Age date was recovered from the top of the natural sand. A single pit containing a few sherds of late Iron Age or early Roman period was observed cutting the natural sand. A few sherds of residual Saxon pottery collected from later features may indicate activity during this period in the vicinity of the trench. A ditch and the remains of a hearth or oven of medieval date were also recorded near the base of the excavation. With the exception of a tiled path and gravel yard surfaces the majority of the archaeological deposits on site dated to the medieval and post medieval periods and consisted of ground raising dumps.

Project dates Start: 18-03-2009 End: 25-04-2009

Previous/future work No / Not known

Any associated project reference codes DYR09 - Sitecode

Type of project Recording project

Site status World Heritage Site

Current Land use Vacant Land 2 - Vacant land not previously developed

Monument type PIT Late Iron Age

Monument type PITS Medieval

Monument type PITS Post Medieval

Monument type POSTHOLES Medieval

Monument type	POSTHOLES Post Medieval
Monument type	PATH Medieval
Monument type	WELL Post Medieval
Monument type	CULVERT Post Medieval
Monument type	YARD SURFACE Post Medieval
Significant Finds	POTTERY Late Iron Age
Significant Finds	POTTERY Medieval
Significant Finds	POTTERY Post Medieval
Significant Finds	COIN Medieval
Significant Finds	HORSESHOE Medieval
Significant Finds	HORSESHOE Post Medieval
Significant Finds	POTTERY Early Medieval
Significant Finds	LITHIC Late Neolithic
Significant Finds	ANIMAL BONE Medieval
Significant Finds	FISH BONE Medieval
Investigation type	'Full excavation'

Project location

Country	England
Site location	GREATER LONDON CITY OF WESTMINSTER WESTMINSTER Dean's Yard, Westminster Abbey
Postcode	SW1P 3JS
Study area	56.00 Square metres
Site coordinates	TQ 2997 7941 51.4981695342 -0.127396603016 51 29 53 N 000 07 38 W Point

Height OD / Depth Min: 0.64m Max: 0.92m

Project creators

Name of Pre-Construct Archaeology Ltd
Organisation

Project brief Westminster Abbey
originator

Project design Warwick Rodwell
originator

Project Chris Mayo
director/manager

Project supervisor Paw Jorgensen

Type of Utility Company
sponsor/funding
body

Name of EDF
sponsor/funding
body

Project archives

Physical Archive Westminster Abbey Museum
recipient

Physical Contents 'Animal Bones','Ceramics','Metal','Worked stone/lithics'

Digital Archive Westminster Abbey Museum
recipient

Digital Media 'Database','Spreadsheets','Survey','Text'
available

Paper Archive Westminster Abbey Museum
recipient

Paper Media 'Context sheet','Matrices','Photograph','Plan','Report','Section'
available

Project
bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	Assessment of an Archaeological Excavation in the Northwest Corner of Dean's Yard, Westminster Abbey, City of Westminster
Author(s)/Editor(s)	Jorgensen, P.
Date	2010
Issuer or publisher	Pre-Construct Archaeology Limited
Place of issue or publication	Brockley
Description	Unpublished client report

Entered by	Jon Butler (jbutler@pre-construct.com)
Entered on	8 April 2010

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