WREN'S CHAPTER HOUSE
ST PAUL'S CATHEDRAL
CITY OF LONDON

ASSESSMENT OF AN ARCHAEOLOGICAL INVESTIGATION

SPP 13

MAY 2014

PRE-CONSTRUCT ARCHAEOLOGY

DOCUMENT VERIFICATION

WREN'S CHAPTER HOUSE
ST PAUL'S CATHEDRAL
CITY OF LONDON

EXCAVATION

Quality Control

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Archaeological Assessment of Investigations at Wren's Chapter House, St Paul's Cathedral, City of London, EC4

Site Code:	**SPP13**
National Grid Reference:	**Centre - TQ 32017 81187**
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1 ABSTRACT

1.1 This assessment details the results and working methods of archaeological investigations conducted at Wren's Chapter House, St Paul's Cathedral in the City of London. The archaeological work was funded by the Dean and Chapter of St Paul's Cathedral and was undertaken to discharge conditions attached to planning permission (Application Number 10/00426/LBC) granted in September 2010.

1.2 The archaeological investigations detailed in this document were centred at National Grid Reference TQ 32017 81187 and constituted an archaeological excavation in the proposed position of a new lift pit and an archaeological watching brief on associated drainage beneath the basement slab. The archaeological excavation took place between 21st October and 1st November 2013 and the watching brief was completed on the 4th November 2013.

1.3 The archaeological investigations encountered the uppermost archaeological horizon at *c.*14.50m OD and demonstrated the presence of a stratified archaeological sequence measuring more than *c.*0.80m thick. Natural deposits were not encountered on the site due to the restrictions of the project depths.

1.4 The archaeological sequence in the Chapter House lift pit excavation showed early medieval garden soil succeeded by several layers of sand and silt containing a large amount of burnt material. These deposits were truncated by the remains of two wall footings and a potential cellar wall, structures which could relate to the medieval Hall of Minor Canons, that were in turn truncated by the construction cut for the current post-medieval Chapter House walls and modern drainage.

1.5 The archaeological sequence encountered during the watching brief consisted of a potential post-medieval brick floor beneath the concrete basement slab in the drainage excavation to the east of the lift pit excavation and modern made ground beneath the concrete slab to the west of the lift pit excavation.

1.6 It is proposed that the results of this archaeological investigation be published as an article in either the *Transactions of the London and Middlesex Archaeological Society* or *London Archaeologist*.

2 INTRODUCTION

2.1 This assessment details the results and working methods of archaeological investigations conducted at Wren's Chapter House, St Paul's Cathedral in the City of London. The archaeological work was funded by the Dean and Chapter of St Paul's Cathedral and was undertaken to discharge conditions attached to planning permission (Application Number 10/00426/LBC) granted in September 2010.

2.2 The archaeological investigations detailed in this document were centred at National Grid Reference TQ 32017 81187. The site lies within the basement of Wren's Chapter House; a Grade II* building that lies to the north of St Paul's Cathedral and partially defines the southern boundary of Paternoster Square. The site lies within the St Paul's Cathedral Conservation Area as designated by the City of London in June 2007 (Figure 1).

2.3 The site has previously been the subject of an assessment report (Schofield 2010).

2.4 The proposed mitigation for the site concentrated on two elements: archaeological excavation of a new lift pit and an archaeological watching brief on associated drainage beneath the basement slab (Figure 2).

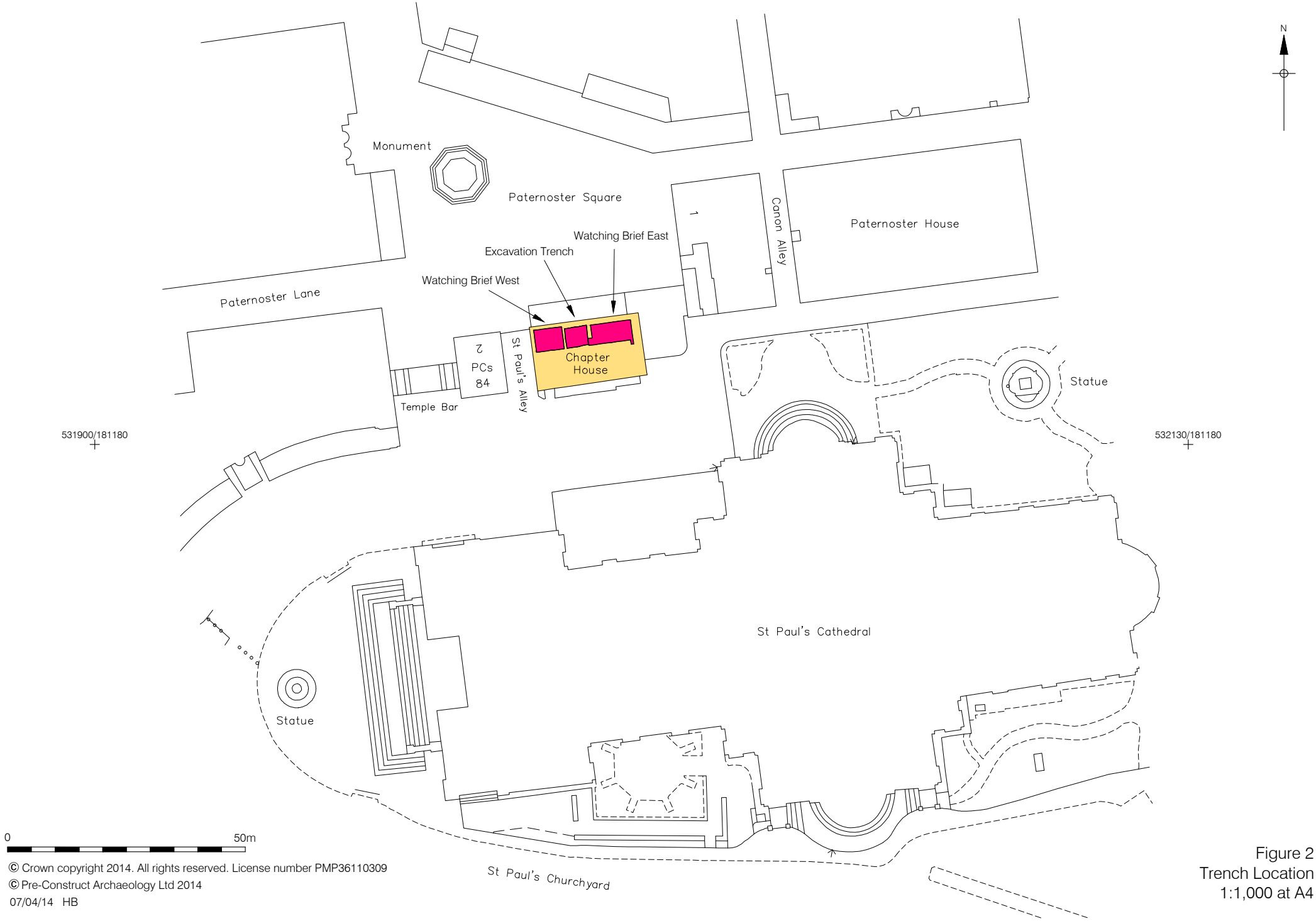
2.5 The archaeological site work was supervised by James Langthorne under the project management of Helen Hawkins, John Schofield (Cathedral Archaeologist) acted as archaeological advisor to the Dean and Chapter of St Paul's Cathedral and the progress of the archaeological investigations were monitored by Kathryn Stubbs (Assistant Director Historic Environment, City of London).

2.6 This document presents a post-excavation assessment of the stratigraphic record, finds and environmental data from the fieldwork.

2.7 The completed archive will be deposited at the London Archaeological Archive and Research Centre (LAARC) under the site code SPP13. The deposited archives will comprise artefactual material and written, drawn and photographic records.

08/04/14 HB

Figure 1
Site Location
1:20,000 at A4



07/04/14 HB

Figure 2
Trench Location
1:1,000 at A4

3 PLANNING BACKGROUND

3.1 National Planning Policy Framework (NPPF)

3.1.1 The National Planning Policy Framework (NPPF) was adopted on 27 March 2012, and now supersedes the Planning Policy Statements (PPSs). The NPPF constitutes guidance for local planning authorities and decision-takers both in drawing up plans and as a material consideration in determining applications.

3.1.2 Chapter 12 of the NPPF concerns the conservation and enhancement of the historic environment, with the following statements being particularly relevant to the proposed development:

> *128. In determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes or has the potential to include heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation.*

> *129. Local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal (including by development affecting the setting of a heritage asset) taking account of the available evidence and any necessary expertise. They should take this assessment into account when considering the impact of a proposal on a heritage asset, to avoid or minimise conflict between the heritage asset's conservation and any aspect of the proposal.*

3.1.3 Additionally:

> *141. Local planning authorities should make information about the significance of the historic environment gathered as part of plan-making or development management publicly accessible. They should also require developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in*

a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible. However, the ability to record evidence of our past should not be a factor in deciding whether such loss should be permitted.

3.1.4 In considering any planning application for development the local planning authority will now be guided by the policy framework set by the NPPF.

3.1.5 The NPPF also states that:

214. For 12 months from the day of publication, decision-takers may continue to give full weight to relevant policies adopted since 2004 even if there is a limited degree of conflict with this Framework.

215. In other cases and following this 12-month period, due weight should be given to relevant policies in existing plans according to their degree of consistency with this framework (the closer the policies in the plan to the policies in the Framework, the greater the weight that may be given).

3.1.6 As such the local planning authority will continue to also be guided by the existing London Plan and the City of London's Development Plan, and by other material considerations.

3.1.7 The relevant Development Plan framework is provided by the City of London Unitary Development Plan adopted in April 2002. This Unitary Development Plan aims to:

- ***Protect and promote the conservation, preservation in situ and enhancement of ancient monuments and archaeological remains of national importance and their settings.***

- ***Assess and evaluate sites of archaeological potential prior to a decision on a planning application.***

- ***Ensure the proper investigation, recording and publication of evidence of ancient monuments and archaeological remains as an integral part of a development programme.***

POLICY STRAT 11A

To recognise the archaeological importance of the City as the historic centre of the capital and to seek the adequate safeguarding and investigation of ancient monuments and archaeological remains.

Para 11.7: *Strategic Guidance states that account should be taken of the desirability of preserving ancient monuments and their settings and of the Secretary of State's guidance in PPG 16, Archaeology and Planning.Archaeological remains are an irreplaceable resource and often the only evidence of past development. These remains are a finite and non-renewable resource, in many cases highly fragile and vulnerable to damage and destruction. They contain irreplaceable information about our past and the potential for an increase in future knowledge.*

Para 11.8: *Where nationally important archaeological remains, whether scheduled or not, and their settings are affected by proposed development there is a presumption in favour of their physical preservation in situ. Some monuments and archaeological remains are protected as scheduled ancient monuments under Part I of the Ancient Monuments and Archaeological Areas Act 1979. Applications for works which may affect a scheduled ancient monument are determined by the Secretary of State for Culture, Media and Sport, with advice from English Heritage. This procedure is different from any consents that may be necessary under Town Planning legislation. Due to the potentially complex nature of archaeological remains in the City, the Corporation will expect applications for scheduled monument consent and planning permission to be prepared and considered in parallel.*

Para 11.9: *Not all important remains are scheduled, and in some cases, remains of more local importance will be considered worthy of preservation. PPG 16 gives criteria for assessing the national importance of an ancient monument and considering whether scheduling is important. Development schemes should be designed to incorporate the preservation in situ of important monuments and archaeological remains, and respect and enhance their settings.*

Para 11.10: *On sites where archaeological remains of lesser importance exist, and it is considered by the Corporation that preservation in situ is not appropriate, investigation, recording and publication will be required. This is to ensure preservation by record, placing those remains in a wider context, and adding to our understanding and interpretation of the historic landscape.*

Para 11.11: *Where development groundworks are proposed that are permitted development under the Town and Country Planning (General Permitted Development) Order 1995, account should be taken of policies in the UDP. Developers and statutory undertakers are encouraged to*

discuss the proposals with the Corporation in order that an appropriate mitigation study can be put in place.

LOCAL POLICIES

Requirement for Assessment and Evaluation of Sites of Archaeological Potential

POLICY ARC 1
To require planning applications which involve excavation or groundworks on sites of archaeological potential to be accompanied by an archaeological assessment and evaluation of the site including the impact of the proposed development.

Para 11.12: *All of the City is considered to have archaeological potential unless it can be demonstrated that archaeological remains have been lost, due to basement construction or other groundworks. The Corporation will indicate the potential of a site, its relative importance, and the likely impact to a developer at an early stage so that the appropriate assessment and design development can be undertaken.*

Para 11.13: *On sites of archaeological potential, which may be affected by development schemes or groundworks, an archaeological assessment will be required to be submitted with the application. This will set out the archaeological potential of the site and impact of the proposals. Where appropriate, this should be supplemented by evaluation, carrying out trial work in specific areas of the site to provide more information and inform consideration of the development proposals by the Corporation, prior to a decision on that application.*

Preservation in Situ and Recording of Ancient Monuments and Archaeological Remains

POLICY ARC 2
To require development proposals to preserve in situ, protect and safeguard important ancient monuments and important archaeological remains and their settings, and where appropriate, to require the permanent public display and/or interpretation of the monument or remains.

POLICY ARC 3
To ensure the proper investigation, recording of sites, and publication of the results, by an approved organisation as an integral part of a development programme where a development

incorporates archaeological remains or where it is considered that preservation in situ is not appropriate.

> **Para 11.14:** *On sites where important monuments or archaeological remains exist, development proposals should take this fully into account and be designed to enhance physical preservation and avoid disturbance or loss. This can be done by the sympathetic design of basements, raising ground levels, site coverage, and the location of foundations to avoid or minimise archaeological loss and securing their preservation for the future, although they remain inaccessible for the time being.*
>
> **Para 11.15:** *The interpretation and presentation of a visible or buried monument to the public and enhancement of its setting should form part of the development proposals. Agreement will be sought to achieve reasonable public access. The Corporation will consider refusing schemes which do not provide an adequate assessment of a site or make no provision for the incorporation, safeguarding or preservation in situ of nationally or locally important monuments or remains, or which would adversely affect those monuments or remains.*
>
> ***Para 11.16:*** *In some cases, a development may reveal a monument or archaeological remains which will be displayed on the site, or reburied. Investigation and recording of those features will be required as part of a programme of archaeological work to be submitted to and approved by the Corporation. Where the significance of the remains is considered, by the Corporation, not sufficient to justify their physical preservation in situ and they will be affected by development, archaeological recording should be carried out. A programme of archaeological work for investigation, excavation and recording, and publication of the results, to a predetermined research framework, by an approved organisation, should be submitted to and approved by the Corporation, prior to development. This will be controlled through the use of conditions and will ensure the preservation of those remains by record.*

3.1.8 The fieldwork will also be guided by the stipulations set out in the Corporation of London's *Planning Advice Note 3: Archaeology Guidance* (Corporation of London 2004).

3.1.9 Planning permission for the work was granted in September 2010 (Application Number 10/00426/LBC). This WSI is submitted as a part submission pursuant to Condition 2 of the planning permission:

'Before any works thereby affected are begun the following details shall be submitted to and approved in writing by the Local Planning Authority and all development pursuant to this

permission shall be carried out in accordance with the approved details :(f) details of building recording proposals following opening up and investigative works where evidence of the historic structure, construction or war damage survives.'

4 GEOLOGY AND TOPOGRAPHY

4.1 Geology

4.1.1 The underlying natural geology is the Taplow Gravel Formation which consists of Pleistocene Terrace Gravels which were laid down 128,000-280,000 years ago. The gravel seals the Eocene London Clay Formation. The gravel is locally capped by deposits of the Langley Silt complex, commonly referred to as brickearth.

4.2 Topography

4.2.1 Paternoster Square is located at the highest point in the City of London. The modern topography of the area is fairly level at *c.*17.00m OD, with the ground falling away steeply to the River Fleet to the west, which ran from north to south along what are now Farringdon and New Bridge Street, and the Thames to the south. Two smaller streams, approximately parallel and also flowing south to the Thames, entered the Paternoster area north of the cathedral. They converged in the area of Sudbury House and then continued flowing immediately west of the cathedral.

4.2.2 The level for the present surface outside the south front of the Chapter House has been given as 16.70m OD at the south-west corner (the surface slopes down slightly from east to west). Therefore it is considered highly probable that untruncated archaeological strata could be 4.25m deep.

5 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

5.1 Introduction

5.1.1 The archaeological and historical background for the site is taken from the St Paul's Cathedral Archaeological Assessment for the Chapter House (Schofield 2010).

5.2 Prehistoric

5.2.1 Although occasional prehistoric finds have been made in the City, there is no clear evidence of habitation on the western of the two hills of the City until the arrival of the Romans in AD43 and the foundation of the City of London around AD50. There is no prehistoric material to report from either excavations or observations in the precinct of St Paul's.

5.3 Roman (AD43-AD410)

5.3.1 In the 1st century the centre of *Londinium* lay on the eastern hill now called Cornhill, but roads and some buildings had been laid out on the western hill in the area of St Paul's within twenty years of the establishment of the centre. Although further expansion was initially prevented by the destruction caused by the Boudiccan rebellion in AD60–1, the town continued to grow during the 1st and 2nd centuries. A major Roman road beneath the present Newgate Street, north of the precinct, seems to be one of the original features of the Roman settlement.

5.3.2 A Roman road of pre-Flavian date (i.e. before about AD70) crossed the site of the cathedral from Ludgate, a Roman gate, in the west, to connect with a Roman street beneath the present Watling Street on the east. The evidence for the street or road is slight, being based on undated cambered gravel surfaces seen on the site of the Church of St Augustine Watling Street; and similar surfaces further east are dated to the post-Hadrianic period (mid 2nd century). No excavation has taken place along its projected line, which runs along the axis of the medieval cathedral although not strictly in the same alignment.

5.3.3 In the 1st and 2nd century the churchyard area was used in part as a cremation cemetery, and during the 2nd century had one, perhaps two, complexes of pottery kilns in it. Kilns observed by John Conyers in 1677 were almost certainly beneath the north-east corner of the north transept, and a second kiln may have been seen by Wren's workmen as they dug foundations for the west end of the nave. Around AD200 the city was surrounded by a wall for the first time, and this enclosed the western suburban area. Access points within the wall were provided by gates at Aldersgate, Newgate and Ludgate. Effectively this action incorporated

the site of the cathedral into the town proper and seems to have had the effect of pushing suburban uses such as industry and cemeteries out beyond the new boundary. The Paternoster area became residential, and large masonry buildings became the norm. Evidence for the 3rd and 4th centuries is slight, and comprises several large buildings, some with figured mosaics, and a coin hoard of the late 3rd century. All these buildings were situated on the north side of the churchyard or further north, and there is no clear evidence of any form of occupation for the majority of what would be the site of the churchyard. An excavation immediately north of the Chapter House, contained part of a large Roman building that featured a wall decorated with sea-shells.

5.4 Saxon (AD410-1066)

5.4.1 The first cathedral was founded in AD604, in close proximity to the site of the present cathedral, when St Augustine instituted Mellitus as bishop of London. Mellitus was expelled in AD618 and Christianity was not restored until AD653, when Sigebert king of the East Saxons was converted. Little is known about the form of the Anglo-Saxon cathedral, or even its precise location in relation to the medieval and Wren successors. The cathedral was burnt in AD962 and re-founded in the same year. It is generally considered that by AD1000 the cathedral had a defined precinct, although not in its final form, and that it was important enough to be the burial place of two Anglo-Saxon kings: Aethelred in AD1016 and Edward Aetheling in AD1057. No evidence has been found of the Anglo-Saxon cathedral, but a foundation of 10th- or 11th-century character was recorded in a test pit excavated in 1932 by the north-west door of the Wren building and human burials, of both men and women, were recorded in a drain trench in a corridor on the north side of the cathedral in 1996–7. The human bone has been carbon dated to the 8th-10th centuries.

5.4.2 A study by Museum of London archaeologists of the stream running down the west side of the precinct is in progress, but it seems probable that the stream was re-cut or managed in some way in the late Anglo-Saxon or Norman period.

5.5 Medieval (AD1066-AD1485)

5.5.1 Building of the medieval cathedral commenced in AD1087. Evidence for the cathedral and buildings within the precinct from this date to AD1500 consists of individual sightings of all four arms of the cathedral church, the nave, the choir, and both transepts. Four of these fragments, situated at the east end of the choir, are still extant beneath the ground under manholes.

5.5.2 Although the details are not known exactly, it is fairly clear that the Wren Chapter House is approximately located on the site of the medieval Hall of the Minor Canons. The hall lay on the north side of the Pardon Cloister, though we do not know its precise position or measurements (Schofield 2011, 165-6). It is mentioned in 1353 when bequeathed by a canon to the body of canons. Details of the cloister and this building were obtained by Bob Crayford at Site A (the large excavation for the present works department of 1969). During the recent lowering of the ramp in order to connect the present Works Department with the east side of the Chapter House, a small amount of recording by the Museum of London found a medieval cesspit which may have been from the same complex. North of the Chapter House, on the south side of what would have been Paternoster Row was the precinct boundary and close wall.

5.5.3 In AD1633–40 Inigo Jones re-clad the nave and most of the transepts, and added a classical portico to the west end of the cathedral. His work was interrupted by the Civil War, and went unfinished. The medieval cathedral was destroyed in the Great Fire of AD1666.

5.6 Post-medieval (AD1485-AD1899)

5.6.1 The present cathedral was under construction from AD1675 until AD1714 when the final touches were made, with the exception of the statues on the pediments which were added by AD1722. The railings were constructed in AD1712, and originally their line crossed between the Chapter House and the nave in a diagonal line (i.e. not parallel to either building). The space between the railings and a range of buildings which included the Chapter House after AD1714 were part of the Churchyard, and with occasional rebuilding they remained in this form until the Blitz and post-War demolitions, which removed both the buildings (except the gutted Chapter House) and the railings to their present alignments.

5.6.2 Houses were built against the rising cathedral by AD1676 and became a problem to Wren because they were too close. In AD1690 the Commissioners heard a complaint from Obadiah Blagrave, bookseller, that his lights in his houses on the north side of the church near Paul's Alley had been much diminished by the north nave wall of the new cathedral. By AD1701 it was decided that one block of houses should be removed, and discussion with the owners began and were clearly protracted as they were still in progress in February AD1709. A surviving plan of the west end of the new building and its environs by William Dickinson is dated to a year later, February AD1710. It shows a proposal for the railings coming along the north and south sides, giving way for the north and south doors (now the north door to the crypt and the Dean's Door to the geometric staircase on the south side) and then a tight enclosure round the steps, excluding the proposed statue to Queen Anne (which is not shown

in its correct place; perhaps this was also a suggestion). The north run of railings goes diagonally through the two blocks of houses.

5.6.3 In June AD1710 Richard Billinghurst was paid not only for the foundation of the churchyard railings, as above, but also for 'pulling down 19 houses on the north side of the church, and cleaning the bricks of the same'. One of them was called the Almonry House, and this may refer to a persisting pre-Fire association; but it was demolished with the others.

5.6.4 Crayford recorded the outline of the parts of these buildings that lay within the boundaries of Site A during the excavation for the Works Department in 1969. The brick walls extended up to 1.5m high. Similar walls probably survive in the area immediately west of the western limit of the Works Department, which is roughly in alignment with the west end of the Chapter House.

5.6.5 It is usually stated that the new Chapter House was built in 1712–14 on the site of the cleared group of houses north of the nave after bills were paid to the contractors in the building accounts. The elevation of the foundation of the east end of the Chapter House was exposed during the works on Site A in 1969. A small amount can be gleaned from the building accounts. Several different types of brick are mentioned: place, stocks (grey) and rubbers. The bricklayer Richard Billinghurst made some vault groins in brick, and these must have been in the basement. The room at the south-west corner of the present basement is vaulted, so a strong room was probably part of the original design. Otherwise the 'naked' flooring above the rest of the basement was originally in oak, with similar flooring in fir on the other two original floors. Edward Strong, mason, fitted stone quoins, chimneypieces and other details. There were originally six downpipes, each with the arms of the Dean and Chapter and the date of construction embossed on the hoppers. An unpublished plan of about AD1710 in the cathedral's archive indicates that a drain for rainwater communicated with the main churchyard drain which Wren's workmen had dug to the south after AD1689. This may have included a drain paved with tiles which Billinghurst constructed, presumably in the basement or just outside it. The building is shown in an engraving by John Harris (1756–1846), of unknown exact date but apparently showing its state shortly after completion.

6 ARCHAEOLOGICAL METHODOLOGY

6.1 The archaeological investigation of the Chapter House site was outlined in the Written Scheme of Investigation for the Archaeological Investigations (Hawkins & Matthews 2013). The aim of the archaeological component of the mitigation strategy was to address the following objectives:

- To establish the below ground sequence in the basement of the Chapter House
- To establish if Roman deposits survive within the investigations, and if so to characterise those remains.
- To establish the presence or absence of burials.
- To establish if the natural ground is present in the investigations (though this is unlikely) and if so, characterise it.
- To record and report on the findings of the investigations.

6.2 Archaeological deposits could have been impacted on as the result of two specific sets of groundworks: the excavation of a lift pit in the basement and the installation of associated drainage beneath the concrete slab of the basement floor.

6.3 Watching Brief (Figure 2)

6.3.1 During the breaking and removal of the basement drainage, groundworks were undertaken in accordance with the client's contractor's accepted scheme of work, under archaeological supervision. The contractor broke out and removed the slab along the drainage run area to a depth of *c*.0.30m in the eastern watching brief and at varying depths between *c*. 0.30-0.60m in the western watching brief. After this procedure had been completed the attending archaeologist cleaned and recorded the deposits that had been revealed and planned the extent of the groundworks.

6.4 Excavation (Figure 2)

6.4.1 In the lift pit trench, once the slab and post war drains had been removed under archaeological supervision, the trench was then cleaned using appropriate hand tools in order to discern the presence and identity of extant archaeological deposits.

6.4.2 These deposits and structures were then removed in reverse stratigraphic order to the project depth 1.10m beneath the basement slab for the majority of the trench and by a further 0.15m in a 1.80m by 1.80m sondage in the centre of the trench. The sondage was excavated in

order to accommodate specific design aspects of the lift shaft. Once these project depths were achieved the archaeological excavation ceased.

6.5 All deposits were recorded on pro forma context sheets. Plans were drawn at a scale of 1:20 and sections were drawn at a scale of 1:10. Due to the restrictive environment of the basement preventing the use of a Total Station Theodolite all plans were made from an east-west running baseline whose position was established with reference to scale plans of the building. A photographic record was also kept of all the trenches in a digital format. Finds, environmental samples and brick samples were collected according to standard retrieval methods.

6.6 An Ordnance Survey benchmark upon the north-west face of the north transept of St Paul's Cathedral was used for levelling within both the excavation and watching brief areas. This benchmark was at a height of 17.248m OD.

7 THE ARCHAEOLOGICAL SEQUENCE

7.1 Introduction

7.1.1 The deposits and structures encountered during the investigations have been ascribed to broad phases, and the results are presented below in chronological order. Three phases of activity were defined across the site. The phasing is provisional and site-specific. It may however be refined in the light of evidence produced from a detailed analysis of the dataset.

- Phase 1 Medieval (Burnt Deposits)
- Phase 2 Medieval (Hall of the Minor Canons)
- Phase 3 Post-Medieval (Chapter House Structures/Deposits)

7.2 Phase 1: Early Medieval (Burnt Deposits) (Figures 3 & 6 and Plate 1)

7.2.1 No natural deposits or deposits dating to a prehistoric period were found during the archaeological investigation.

7.2.2 The earliest deposit [28] encountered at project depth in the northern part of the trench during the excavation was a fairly compact mid grey brown silty clay with occasional animal bone and shell fragments, sub-rounded and sub-angular pebbles and a sherd of Gaulish ware pottery dated to AD50-300. This layer was encountered at a maximum height of 13.99m OD. Layer [28] appeared to be a layer of garden soil possibly dating to the Roman period. However, as the layer could not be fully excavated, because project depth had been achieved, the fact it was dated by a single Roman pot sherd and residual Roman pottery was encountered throughout the archaeological sequence, deposit [28] has been attributed to the medieval period together with the majority of the archaeological deposits that were encountered on site.

7.2.3 Furthermore a garden soil deposit was encountered in the southern part of the trench: a fairly compact mid grey brown layer of clay silt with similar inclusions [29]. However, the pottery recovered from this deposit consisted of a redeposited amphora fragment and early Surrey ware which dated to AD1050-1150. Encountered at a maximum height of 13.87m OD this layer was also not fully excavated due to project depth having been attained. It is likely that [28] and [29] were the same layer and therefore [28] dates to the early medieval period (Figure 3).

7.2.4 Sealing garden soil [28] was a 0.10m thick layer of fairly compact mid yellow brown clay silt with mid grey brown silt lenses [27]. Occasional sub-angular and sub-rounded pebbles, charcoal flecks and animal bone were found within this brickearth slab. It was encountered at a maximum height of 13.99m OD. No dating evidence was recovered

7.2.5 Brickearth layer [27] was succeeded by the first of a series of deposits that showed evidence of burning (Section 6 & Plate 1). Deposit [26] was a 0.14m thick layer of loose, black sandy silt contained frequent charcoal, moderate amounts of animal bone and occasional chalk pebbles, CBM and possible daub flecks. Small quantities of unsourced coarse ware and early Surrey ware pottery were also retrieved from this deposit giving a date of AD1050-1150. Layer [26] was encountered at a maximum height of 14.10m OD.

7.2.6 Layer [26] in the northern part of the trench and garden soil [29] in the southern part of the trench were sealed by deposits [25] and [21] respectively. Layers [25] and [21] are considered to be the same layer and both consisted of fairly firm but friable mid reddish brown silty sand with occasional mid grey and black mottling. Both contained occasional lenses of charcoal, small sub-angular pebbles and small lumps of chalk. The table below summarises the dimensions and heights of the two components of this layer:

Context	**N-S (m)**	**E-W (m)**	**Maximum Depth (m)**	**Height (m OD)**
21	1.10	3.24	0.24	14.16
25	1.08	1.52	0.18	14.19

Of the finds from these contexts the only dateable material was redeposited CBM dated to AD55-160.

7.2.7 Occasional animal bone was also found in layer [25] while [21] appeared to contain a small amount of cremated bone. The cremated bone was well oxidised (whiteish grey in colour) and was highly fragmented such that no individual elements could be identified. Despite not being found within a discrete feature the level of burning suggests that this material was cremated human bone albeit redeposited. Potentially the cremated bone originated from the 1st-2nd century cremation burials seen in the churchyard area (Schofield 2010).

7.2.8 Layer [21] was environmentally sampled principally in an attempt to discern whether the burning was a result of a large fire such as occurred within the vicinity of St Paul's Cathedral in AD1135 or whether the material had been dumped after it resulted from domestic or

industrial activities. Sampling also served to try and recover further dating evidence as pottery was very sparse within the majority of the archaeological deposits. Unfortunately there was insufficient carbon within the charred wheat or barley seed recovered from the sample to enable carbon dating to work. As well as the wheat or barley seed mature oak was identified during environmental analysis.

7.2.9 Truncating layer [21] was a small oval shaped pit [20] of dimensions 0.85m north-south by 0.60m east-west, it could not be bottomed as it extended beyond project depth. The fill of pit [20] was a firm but friable mid greyish brown slightly clay sandy silt [19] which contained small amounts of animal bone, a single human right first metacarpal and frequent inclusions of charcoal and mortar fragments. CBM recovered from the fill again appeared to be redeposited as it dated to AD55-160.

7.2.10 Sealing both pit [20] in the southern part of the trench and layer [25] in the northern part was the third deposit that had clear indications of containing burnt material. Designated as [18] in the southern part of the site and [24] in the north this layer comprised a fairly loose dark blackish brown sandy silt with moderate charcoal and occasional animal bone, pea grit and small pebble inclusions. The layer varied in thickness between 0.06m in the north and 0.10m in the south and was encountered at a maximum height of 14.25m OD. As well as redeposited Roman CBM a single sherd of coarse medieval sandy ware pottery was retrieved from context [24] which dated to AD1140-1300. This layer was also environmentally sampled for the same reasons as layer [21]/[25], the results of which indicated the presence of 4 *taxa* of plant in addition to wheat or barley seeds. These *taxa* included oak, beech, field maple and maloideae, a large family of trees that includes apple and pear.

7.2.11 Carbon dating of the seeds from context [18] indicated that they were deposited between AD1050 and 1260 which would tie in with the large fire of AD1135.

7.2.12 The final deposit of burnt material was recorded in the southern part of the trench: a 0.06m thick layer of firm but friable mid-light reddish brown clay silt with mid grey brown mottling [17]. Only occasional flecks of charcoal and animal bone were found within this deposit and it was encountered at 14.25m OD.

7.3 Phase 2: Medieval (Hall of the Minor Canons) (Figures 4 & 6 and Plates 1 & 2)

7.3.1 Two successive layers of a different character were then recorded in the northern part of the trench sealing deposit [24]: layers [23] and [22]

7.3.2 The earlier layer [23] was a 0.15m thick friable spread of sandy mortar containing a very small amount of redeposited Roman CBM which had subsequently been sealed by layer [22] a compact mid grey brown deposit of sandy silt. This 0.13m thick made ground deposit contained a single piece of redeposited human bone, specifically a moderately well preserved radius shaft, and CBM that dated to AD1240-1450. Mortar spread [23] and made ground [22] were encountered at maximum heights of 14.31m OD and 14.38m OD respectively. These deposits are possibly the remnants of ground preparation works prior to the construction of the structures to be described in the following part of this section, however as these deposits were rather small and isolated this interpretation is uncertain.

7.3.3 The most significant archaeological features encountered during this phase are considered to relate to the medieval Hall of Minor Canons itself or to possible ancillary buildings. In the north of the trench truncating burnt layer [24] and made ground [22] were two construction cuts, the east-west aligned with a north-south return [11] and north-south aligned [10] while burnt layer [17] to the south was truncated by construction cut [16] which was aligned north-south. The dimensions of these construction cuts are summarised in the following table:

Context	N-S (m)	E-W (m)	Depth seen (m)	Height (m OD)
10	1.69	0.98	0.66	14.37
11	0.40	1.50	0.33	14.14
16	1.00	0.50	0.32	14.25

7.3.4 All three construction cuts were linear, heavily truncated by later activity on site, had vertical sides and were not bottomed due to the restrictions of the project depth. The construction cuts were dug to accommodate three fairly sizeable chalk masonry walls: [10] contained wall [8], [11] contained wall [9] and [16] contained wall [15] (Figure 4 & Plate 1). The dimensions of the walls are shown in the table below:

Context	N-S (m)	E-W (m)	Depth seen (m)	Height (m OD)
8	1.69	0.56	0.74	14.45
9	0.76	1.58	0.37	14.32
15	0.84	0.36	0.30	14.23

7.3.5 All three walls were constructed of angular chunks of chalk, some up to 150mm across, set within a hard tuffaceous light brown gravel mortar. Mortars of this type are considered to be

common of medieval structures dated approximately between AD1000-1500 within London. Further refinement to the dating of wall foundation [9] at least was provided by a single fragment of medieval peg tile retrieved from the matrix of the masonry that was considered to have post-dated AD 1180.

7.3.6 The bulk of these chalk blocks from all of these walls appeared to be roughly shaped although those of wall [8], the most complete of all three structures, were faced (Figure 6 & Plate 2). Since these walls are below ground structures as witnessed by the construction cuts it is possible that the area to the east of wall [8] was the internal space of a cellar. Certainly wall [8] can be clearly seen to be turning from a north-south alignment to an east-west alignment at its northern end essentially forming the north-west corner of the putative cellar. However, cut [4], the construction cut for the current basement wall, truncated wall [8] at this point and as the base of the wall could not be reached before project depth was achieved no evidence of a cellar floor could be found.

7.3.7 Construction cut [10] was backfilled by a firm but friable dark grey brown slightly clay sandy silt [7] with occasional fragments of animal and redeposited human bone and CBM that dated to AD1350-1600.

7.3.8 Walls [9] and [15] were seen to be sealed by layers [6] and [14] respectively both of which were deposits of demolition rubble containing a large quantity of chalk and mortar fragments, essentially collapse from the aforementioned walls. Layer [6] was found at a height of 14.23m OD and layer [14] was encountered at a height of 14.36m OD. A single fragment of plain green glazed Westminster floor tile recovered from deposit [14] dated to AD1225-AD1275.

7.3.9 Cutting demolition rubble [14] was a possible pit, or given its proximity to wall [15], robber cut [13]. A sub-circular feature measuring 0.93m east-west by 0.57m north-south it extended beyond the project depth and was found at a height of 14.31m OD. Cut [13] was backfilled with fairly firm mid grey brown slightly clay sandy silt [12] which contained animal bone and residual Saxon-medieval pottery (dated to AD970-1100) and CBM (dated to AD1180-1220).

7.3.10 Due to later truncation on site it is uncertain whether walls [8], [9] and [15] were definitively part of the same structure. Furthermore walls [9] and [15] do not appear to be running along quite the same alignments as wall [8] which may potentially indicate that they are part of an earlier phase of building.

7.4 Phase 3: Post-Medieval-Modern (Chapter House Structures/Deposits) (Figures 2, 5 & 6 and Plate 4)

7.4.1 A dumped deposit [5] was recorded sealing demolition rubble [6] in the northern part of the trench. This 0.12m thick dumped layer comprised fairly firm light grey brown sandy silt with occasional chalk, mortar and CBM fragments and was encountered at a height of 14.22m OD. A fragment of English stoneware found within this deposit dated to the 18th-19th centuries.

7.4.2 Truncating dumped deposit [5] and backfill [7] in the northern part of the trench and pit fill [12] in the south was construction cut [4]. Cut [4] was the internal part of the construction cut for the current walls of the Chapter House and was seen to run around the perimeter of the entire trench except where it had been truncated by later drainage works to the east and west (Figures 5 & 6). A linear cut with vertical sides, varying between 0.30m-0.52m in width it ran 4.16m north-south by 4.00m east-west and was at least 0.54m depth. The cut was encountered at a height of 14.39m OD.

7.4.3 Within construction cut [4] in the western part of the trench were two additions to the wall footings of the Chapter House (Figure 5). Both were constructed of fabric 3039 unfrogged place brick a type commonly manufactured prior to AD1700, however the brick sample retrieved from footing [1] was high fired, fairly narrow and not dissimilar in appearance to the transitional 3032 nr3033 types which would date these bricks later in the 17th century potentially into the early 18th century. Place bricks were typically used in the unseen components of a building such as the foundations or internal partition walls. Given that Wren's Chapter House was not built until AD1712-14, it was considered that the brick may have been stock-piled as part of the ongoing refurbishment and rebuilding of the Cathedral complex. The dimensions of the foundations are summarised below:

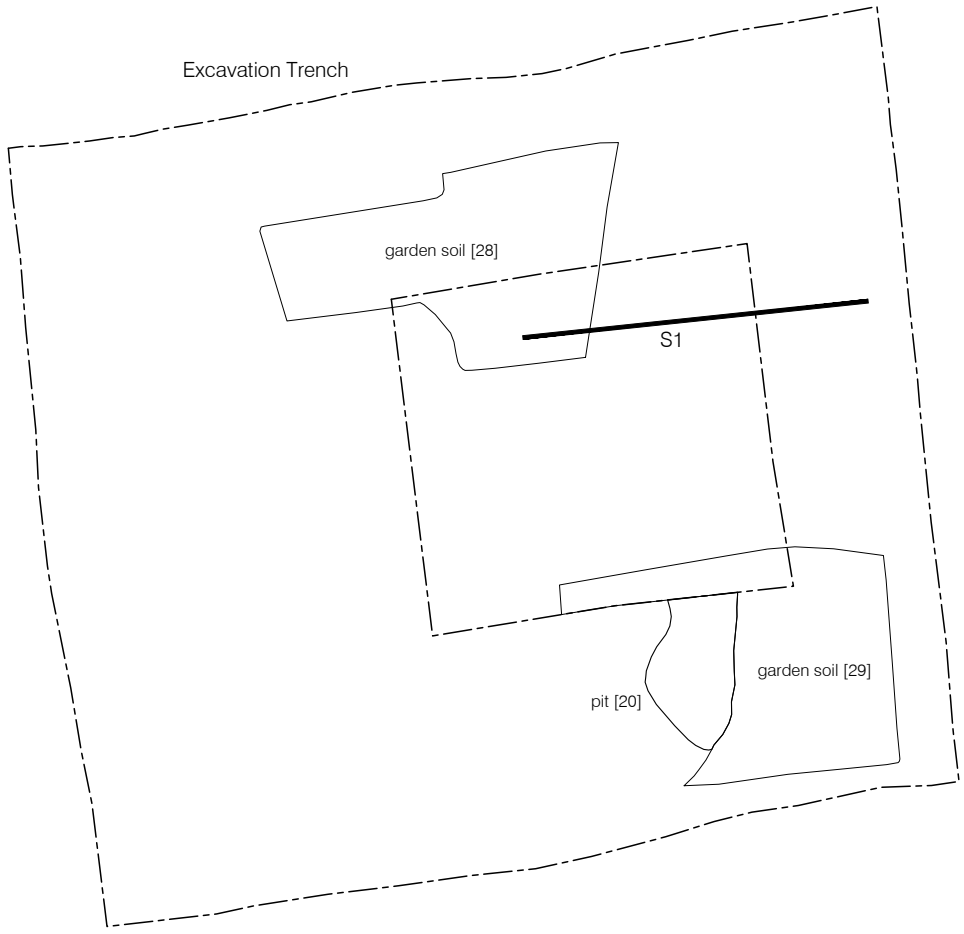
Context	N-S (m)	E-W (m)	Depth seen (m)	Height (m OD)
1	1.00	0.50	0.10	14.05
2	1.50	0.50	0.40	14.35

7.4.4 Construction cut [4] was backfilled with fairly loose mid-dark grey brown silty sand with occasional small sub-rounded pebbles, chalk and CBM fragments, and a sizeable amount of animal and fairly well preserved human bone. Finds from fill [3] included a composite bone plate from a brush, a small amount of clay tobacco pipe dated to AD1580-1740, a sherd of London-area early post-medieval redware and a sherd of red-painted ware with olive fabric pottery which together dated to AD1480-1600 and CBM fragments dating from AD1480-1900.

7.4.5 A further potential post-medieval feature was highlighted during the watching brief on drainage to the east of the lift pit trench (Figure 5 & Plate 4). An unfrogged red brick floor with concreted light grey lime mortar [31] was seen at a height of 14.78m OD beneath the modern concrete basement floor slab.

7.4.6 Truncating all the archaeological deposits in the lift pit trench were several late modern drains that were backfilled by made ground [+]. The made ground contained a variety of redeposited finds including a rare 18th-century *chine de blanc* china lion, a silver plated copper-alloy teaspoon and the disarticulated remains from at least two human skeletons.

7.4.7 Beneath the concrete slab to the west of the lift pit trench only modern made ground [30] was seen (Figure 5).



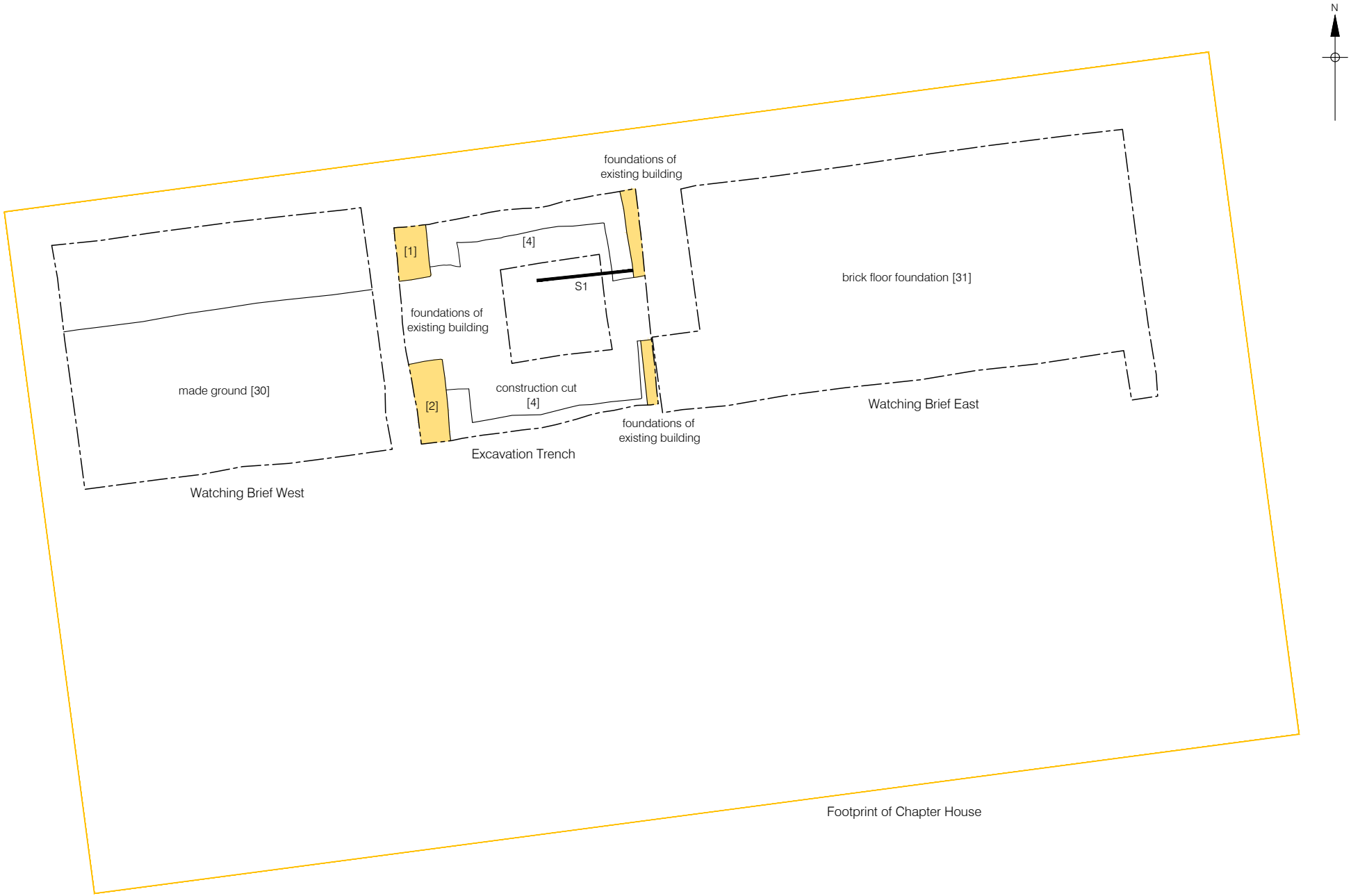
0 2m

07/04/14 HB

Figure 3
Phase 1
Garden Soil Deposits
1:40 at A4

07/04/14 HB

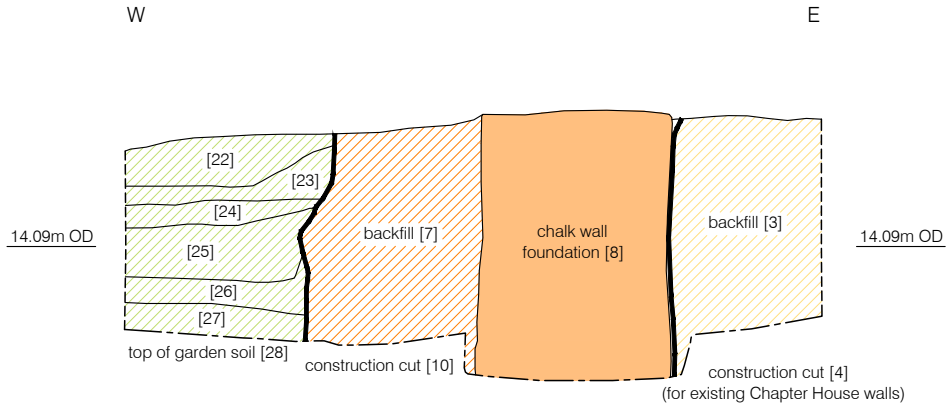
Figure 4
Phase 2
Masonry Structures relating to the
Hall of Minor Canons
1:40 at A4



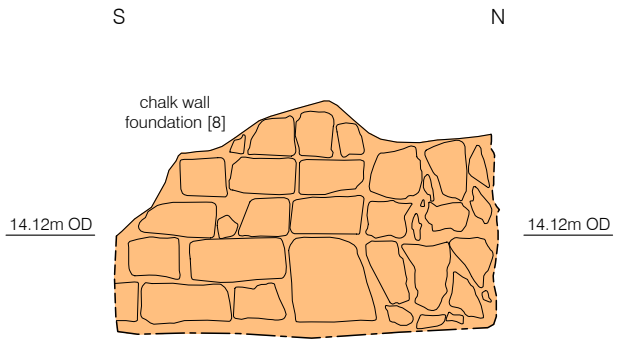
0 5m

07/04/14 HB

Figure 5
Phase 3
Construction cut of Chapter House walls & masonry footings
1:100 at A4



Section 1
South facing
Excavation Trench



Section 2
East facing
Excavation Trench

Phase 1 deposits

Phase 2 masonry & construction cut

Phase 3 construction cut

0 1m

07/04/14 HB

Figure 6
Sections 1 & 2
1:20 at A4

Plate 1 – North-east facing view of lift pit trench (1m scale)

Plate 2 – East facing view of chalk wall [8]

Plate 3 – West facing view of lift pit trench post-excavation (1m scale)

Plate 4 – East facing view of watching brief to the east of the lift pit trench (1m scale)

8 PHASED DISCUSSION

8.1 Phase 1: Medieval (Burnt Deposits)

8.1.1 The earliest archaeological deposits were two layers of garden soil, one in the northern part of the trench the other in the south, which could potentially have been the same layer of garden soil dated to AD1050-1150. Sealing the garden soil in the northern part of the trench was a thin brickearth layer from which no dating evidence was recovered.

8.1.2 The brickearth was subsequently overlain by a successive series of sand and silt layers which contained substantial evidence of burning specifically large volumes of charcoal. Redeposited cremated human bone possibly originating from 1st-2nd-century burials was also found within one of these layers. The layers were dated to AD1140-1300 by material evidence and to AD1050-1260 by carbon dating and may be dumped deposits resulting from a large fire such as occurred within the vicinity of St Paul's Cathedral in AD1135 or perhaps the product of domestic or industrial activities.

8.2 Phase 2: Medieval (Hall of the Minor Canons)

8.2.1 In the northern part of the trench sealing the final burnt deposit was a spread of sandy mortar succeeded by a layer of sandy silt which appeared to represent ground preparation works prior to the construction of the Hall of the Minor Canons. However, as these deposits were rather small and isolated this interpretation was uncertain.

8.2.2 The most significant archaeological features encountered during this phase were considered to relate either to the medieval Hall of Minor Canons itself or to possible ancillary buildings. The Phase 1 deposits in the south of the trench and the made ground deposits in the north were truncated by three construction cuts containing the remains of sizeable medieval footings and the corner of a potential cellar.

8.2.3 The mortar of all three masonry structures dated approximately between AD1000-1500. However, due to later truncation on site it was unclear whether the walls were definitively part of the same structure. These wall footings do not appear to be running along quite the same alignments as the cellar wall which may indicate that they are part of an earlier phase of building.

8.2.4 Both wall footings were seen to be sealed by layers of demolition rubble containing a large quantity of chalk and mortar fragments; essentially collapse from the aforementioned walls. A

possible pit or robber cut was recorded as cutting the demolition rubble in the southern part of the trench.

8.3 Phase 3: Post-Medieval-Modern (Chapter House)

8.3.1 A dumped deposit sealed the demolition rubble deposit in the northern part of the trench. Pottery found within this deposit dated to the 18th-19th centuries.

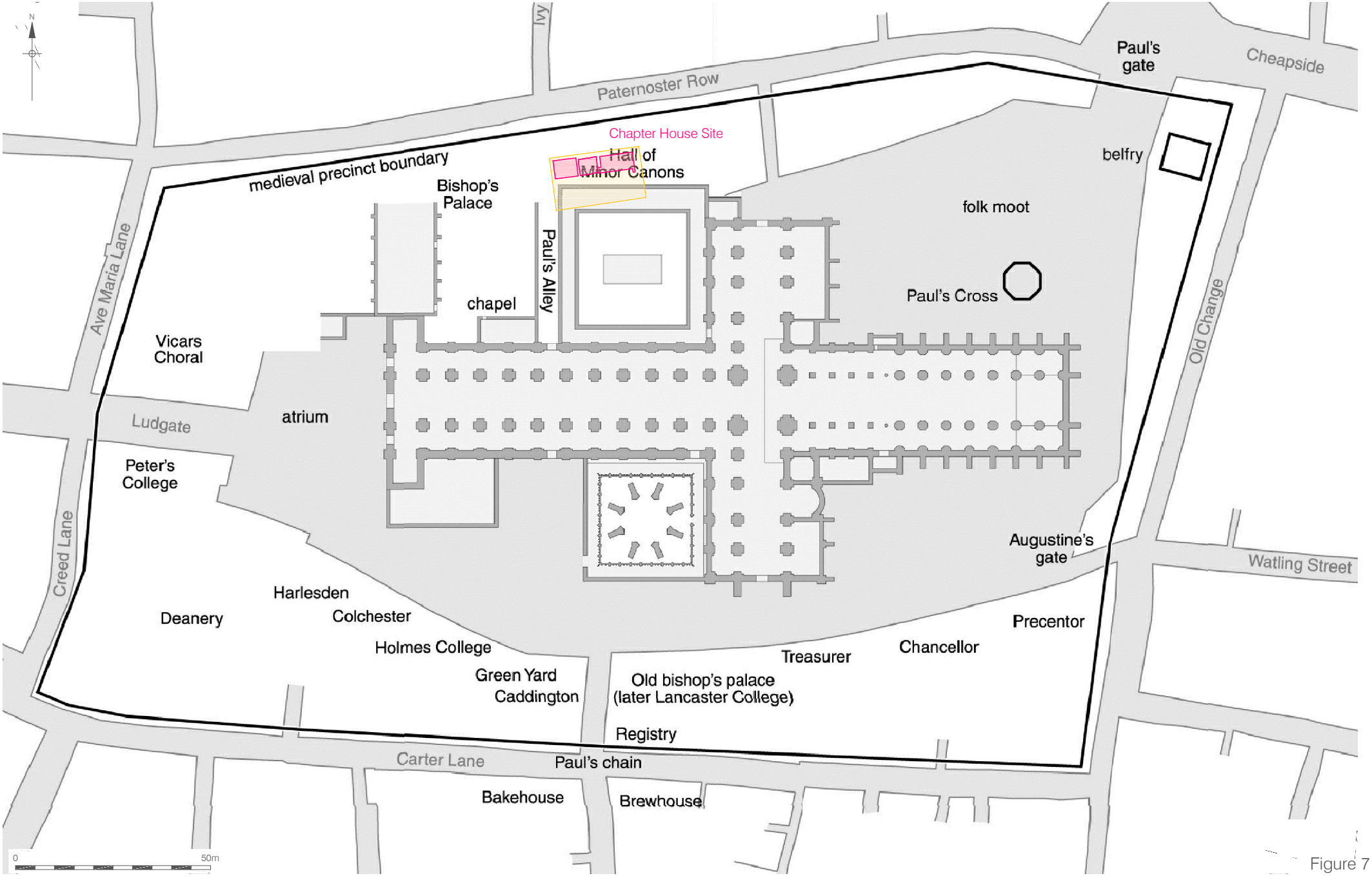
8.3.2 Truncating all of the earlier deposits was the internal part of the construction cut for the current walls of the Chapter House which was seen to run around the perimeter of the entire trench except where it had been truncated itself by later drainage works to the east and west.

8.3.3 Within this construction cut in the western part of the trench were two post-medieval additions to the wall footings of the Chapter House.

8.3.4 Truncating all the archaeological deposits in the lift pit trench were several modern drains that were backfilled by post-medieval/modern made ground.

8.3.5 During the watching brief on drainage to the east of the lift pit trench a potentially post-medieval red brick floor was seen beneath the modern concrete basement floor slab.

8.3.6 Beneath the concrete slab to the west of the lift pit trench only modern made ground was seen.



07/04/14 HB

Figure 7
Chapter House Site in relation to the Bishops Palace in 1450
(after Schofield J. 2011, St Paul's Cathedral before Wren. EH)
1:1,250 at A4

9 RESEARCH OBJECTIVES

9.1 Original Research Objectives

- **To establish the below ground sequence in the basement of the Chapter House**

The archaeological sequence in the Chapter House lift pit trench showed early medieval garden soil succeeded by several layers of sand and silt containing a large amount of burnt material. These deposits were truncated by the remains of two wall footings and a potential cellar wall which were interpreted as being related to the medieval Hall of Minor Cannons and which were in turn truncated by the construction cut for the current post-medieval Chapter House walls and modern drainage.

The archaeological sequence encountered during the watching brief consisted of a potential post-medieval brick floor beneath the concrete basement slab in the drainage excavation to the east of the lift pit trench and modern made ground beneath the concrete slab to the west of the lift pit trench.

- **To establish if Roman deposits survive within the investigations, and if so to characterise those remains.**

The only potential Roman deposit recorded during the lift pit excavation was a layer of garden soil from which a sherd of Gaulish ware pottery was recovered. This sherd dated to AD50-300. However, it is likely that this garden soil is actually medieval in date principally due to a garden soil layer that lay to the south that was of a similar description which contained a residual amphora fragment and early Surrey ware dated to AD1050-1150. The two garden soil layers were likely to be the same deposit truncated by later groundworks; in particular the modern drainage works.

No Roman deposits were found during the watching brief on the drainage.

- **To establish the presence or absence of burials.**

There were no discrete inhumation or cremation burials encountered during either the lift pit excavation or the drainage watching brief. However, a quantity of cremated bone that was potentially human was found within one of the medieval silty sand deposits that contained burnt material. This redeposited cremated bone may have originated from 1st-2nd-century cremation burials which have been previously seen in the churchyard area. Redeposited human bone was found in various contexts including the construction cut for the current

Chapter House walls, the backfill of the possible cellar wall's construction cut and within a medieval pit.

The relatively good condition of the human bone indicated that it had not spent a great deal of time exposed to outdoor conditions potentially indicating that this material had been excavated from contexts further down the archaeological sequence directly beneath the site or within close proximity to it. Certainly the presence of human bone within the extensive construction cuts for the medieval walls and the Chapter House walls, cuts that could not be fully excavated, would support this hypothesis.

- **To establish if the natural ground is present in the investigations (though this is unlikely) and if so, characterise it.**

Natural deposits were not encountered either during the lift pit excavation or during the drainage watching brief.

9.3 Additional Research Questions

9.3.1 General

- Are there opportunities to establish whether the successive layers containing burnt material are the result of a large scale fire such as that which occurred in AD1135 or the result of industrial or domestic activities (such as hearth dumps)?

- Is it possible to further establish the nature of the structures attributed to the Hall of the Minor Canons? For example is there documentary evidence that would show whether the Hall had had a cellar or ancillary buildings?

- Is it possible to establish whether the disarticulated human bone is of a similar date to either the 8th-10th-century burials found to the west of the Chapter House or the late Roman burials found to the north-east of the Chapter House during the Paternoster Square excavations (Watson 2012)?

10 CONTENTS OF THE ARCHIVE

10.1.1 The following comprises the entire contents of the archive for SPP13.

10.1.2 Paper Records

- Context Sheets 31 Sheets
- Environmental Sheets 2 Sheets
- Registers 8 Sheets
- Plans & Sections 27 Sheets

10.1.3 Finds

- Pottery 2 boxes
- CTP 1 box
- Building material 2 boxes
- Animal bone 1 box
- Small finds and metal objects 2 bags
- Shell 1 bag

10.1.4 Photographic Record

- Digital 2 folders

11 IMPORTANCE OF THE RESULTS & FURTHER WORK

11.1 Importance of the Results

11.1.1 Despite the restrictions imposed by the size of the excavation and the project depth the archaeological investigation within the Chapter House basement has permitted some conclusions to be drawn.

11.1.2 An archaeological sequence was revealed that stretched from the medieval period until the post-medieval period. Despite being heavily truncated by later drainage works the survival of these earlier deposits was sufficient to demonstrate an early medieval garden soil horizon succeeded by deposits containing plentiful evidence of burnt materials which were in turn truncated by masonry structures relating to the medieval Hall of Minor Canons and its demolition and finally by the present post-medieval Chapter House. Therefore it is highly probable that earlier archaeological horizons have survived.

11.1.3 The burnt deposits are highly suggestive of the fire of AD1135 or alternatively dumps that resulted from domestic or industrial activity. Carbon dating performed on charred seeds from one of the burnt deposits indicated a date of AD1050-1260 supporting the large fire hypothesis.

11.1.4 The medieval chalk wall footings and possible cellar wall appeared to provide substantive evidence for the character of the construction and speculated position of the Hall of Minor Canons.

11.1.5 The presence of fairly well preserved disarticulated human bone within many of the deeper cut features on site, such as the construction cuts for the Chapter House and the medieval cellar wall, indicated that burials, presumably attributable to either the Roman period (as with those found to the north-east of the site) or the Saxon-early medieval period (as with those found to the west of the site), could be found at lower depths beneath the project level.

11.2 Further work

11.2.1 <u>General</u>

The two most significant events relating to the medieval period encountered during the Chapter House excavation were the successive layers containing burnt material and the masonry structures attributed to the Hall of Minor Canons. Further work should concentrate on refining the dates and clarifying the character of these features. Additionally if the disarticulated human bone could be dated and attributed to either the 8th-10th-century burials

found to the west of the Chapter House or the late Roman burials found to the north-east of the Chapter House during the Paternoster Square excavations (Watson 2012) it may provide a clearer picture of the archaeological horizons extant beneath the project depth of the lift pit trench.

11.2.2 Pottery (Chris Jarrett)

The pottery is generally not abraded and indicates fairly rapid deposition after breakage, although a notable quantity of the Roman pottery appears to be mostly residual, except perhaps the single sherd recovered from context [28]. The pottery types recorded are in keeping with the ceramic profile for London and reflect activity associated with *Londinium* and post-Roman occupation associated with St Paul's Cathedral, established in AD 604, although Middle Saxon pottery is not recorded. The later pottery present dates from the Late Saxon and particularly the early medieval periods, while one sherd each is 1270-1350 and dates to the late medieval period. The post-medieval pottery includes 16th-19th-century dated wares and of particular note is a rare example of an 18th-century lion figurine made in *blanc de Chine* porcelain. No further work was recommended although the results of the assessment should be included in any forthcoming publication work.

11.2.3 Clay Tobacco Pipe (Chris Jarrett)

A total of six stems were recovered from the archaeological work and two of the stems are stratified. The stems can be broadly dated by their thicknesses and bore sizes to the period *c*.1580-1740. There are no recommendations for further work.

11.2.4 Small Finds Assessment (Märit Gaimster)

The metal and small finds form an integral component of the finds and should, where relevant, be included in any further publication of the site. For this purpose, it is recommended that the silver plated spoon [+] sf 2 is x-rayed for further identification.

11.2.5 Ceramic Building Material (Berni Sudds)

The loose assemblage of Roman and medieval brick and tile can be well paralleled locally and as such merits no further analysis. The samples of stone and brick relating to the in-situ medieval masonry remains and the extant Chapter House, whilst also well-paralleled, are

important in further characterising the build heritage of vicinity and the fabric of an architecturally and historically significant building of known date. A discussion of these should be included in any further publication work undertaken.

11.2.6 Animal Bone (Kevin Rielly)

No further analysis of these bone collections is required. However, it is recommended that relevant parts of this assessment report should be used in any forthcoming publication.

11.2.7 Human Bone (James Langthorne)

No further analysis of the disarticulated bone is recommended beyond potentially selecting material for carbon dating to establish whether the bone originated from a Roman or Saxon-medieval context. The results of the assessment should be included in any forthcoming publication.

11.2.8 Environmental Samples (Dan Young and Phil Austin)

The assessment of the charcoal in sample <1> [18] has identified that it is a relatively taxon-rich deposit. If it is deemed necessary from an archaeological perspective, further analysis of this sample may yield additional information on the wood charcoal assemblage.

11.3 Publication Proposal

11.3.1 It is proposed that the results of this assessment and any further analysis will form the basis of a publication report. The results of said publication report could then be published as an article in either the *Transactions of the London and Middlesex Archaeological Society* or *London Archaeologist*. This will be discussed with the Cathedral Archaeologist and a joint proposal made to the Dean and Chapter in due course.

11.3.2 The publication will contain the following sections:

- Background to the Archaeological Investigation
- Historical Background of Wren's Chapter House.
- The Archaeological Sequence
- The results of the environmental analysis
- The results of the finds analyses.
- The results of carbon dating the burnt medieval deposits.

- Placing the results of the Chapter House archaeological investigation in context with previous archaeological investigations in the area (such as the MOLA Paternoster Square excavations).
- The report will be fully illustrated with AutoCAD figures and photographs.

12 ACKNOWLEDGMENTS

12.1 PCA would like to thank the Dean and Chapter of St Paul's Cathedral for commissioning the archaeological work at Wren's Chapter House and John Schofield (Cathedral Archaeologist) for monitoring the project and for his advice throughout. In addition thanks are also offered to Kathryn Stubbs (Assistant Director Historic Environment, City of London) for advising on and monitoring the archaeological investigation.

12.2 The site supervisor would like to offer his thanks to the Bakers of Danbury Ltd. ground work team for their help and assistance during the excavation and the watching brief.

12.3 Furthermore, the site supervisor would like to thank Helen Hawkins for her project management, and Jon Butler for his post-excavation management. Further thanks are due to Märit Gaimster, Kevin Hayward, Chris Jarrett, Berni Sudds, Kevin Rielly, David Taylor, Dan Young (QUEST) and Phil Austin (QUEST) for their work in compiling the specialists assessments included in this document. Further thanks are offered to Hayley Baxter for the CAD work.

12.4 Finally the site supervisor would like to offer his gratitude to the Chapter House field team, Stuart Watson and Mike Tunnicliffe, for all their work on site.

13 BIBLIOGRAPHY

Corporation of London, 2004. *Planning Advice Note 3: Archaeology Guidance*.

Hawkins H. & Matthews, C., 2013. Wren's Chapter House, St Paul's Cathedral, City of London, EC4 - Written Scheme of Investigation for Historical Building Recording and Archaeological Investigations. Pre-Construct Archaeology: Unpublished Report.

Schofield J., 2010. St Paul's Cathedral Archaeological Assessment of the Chapter House. Unpublished Report.

Schofield J., 2011. *St Paul's Cathedral before Wren* English Heritage. London

Watson S., 2012. 'St Paul's Cathedral: Evidence for a Saxon Ditch and Medieval Activity from Excavations at Paternoster Square 2000-2001'. *Transactions of the London and Middlesex Archaeological Society* 63, 33-65.

APPENDIX 1: CONTEXT INDEX

Context	Trench	Plan	Section	Type	Description	Details	NS	EW	Depth	High	Low	Prov Date	Phase
1	Excavation	Pre-Ex	-	Masonry	Foundation	Unfrogged red brick wall footing	1.00	0.50	0.10	14.05	-	Post-Medieval	3
2	Excavation	Pre-Ex	-	Masonry	Foundation	Unfrogged red brick wall footing	1.50	0.50	0.40	14.35	-	Post-Medieval	3
3	Excavation	Pre-Ex	-	Fill	Backfill in [4]	Fairly loose, mid-dark grey brown silty sand	4.16	4.00	0.54	14.39	13.94	Post-Medieval	3
4	Excavation	4	-	Cut	Construction cut for current walls	Linear construction cut for current walls	4.16	4.00	0.54	14.39	13.85	Post-Medieval	3
5	Excavation	5	-	Layer	Dumped deposit	Fairly firm light grey brown sandy silt	0.44	0.92	0.12	14.22	-	Medieval	2
6	Excavation	6	-	Layer	Demolition rubble	Fairly loose light-mid yellowish grey brown chalk and mortar fragments in a sandy silt matrix	0.80	0.40	0.08	14.23	14.03	Medieval	2
7	Excavation	Pre-Ex	1	Fill	Backfill in [10]	Firm but friable dark grey brown slightly clay sandy silt	1.69	0.47	0.54	14.22	-	Medieval	2
8	Excavation	8	1; 2	Masonry	Wall foundation	Truncated chalk wall foundation	1.69	0.56	0.74	14.45	13.71	Medieval	2
9	Excavation	9	-	Masonry	Wall foundation	Truncated chalk wall foundation	0.76	1.58	0.37	14.32	13.99	Medieval	2
10	Excavation	10	1	Cut	Construction cut for [8]	Linear truncated construction cut for wall [8]	1.69	0.98	0.66	14.37	-	Medieval	2

Context	Trench	Plan	Section	Type	Description	Details	NS	EW	Depth	High	Low	Prov Date	Phase
11	Excavation	11	-	Cut	Construction cut [9]	Linear construction cut for wall foundation[9]	0.40	1.50	0.13	14.14	13.81	Medieval	2
12	Excavation	Pre-Ex	-	Fill	Fill of [13]	Fairly firm mid grey brown slightly clay sandy silt	0.57	0.93	0.58	14.31	-	Medieval	2
13	Excavation	Pre-Ex; 13	-	Cut	Pit	Sub-circular pit	0.57	0.93	0.58	14.31	13.73	Medieval	2
14	Excavation	Pre-Ex; 14	-	Layer	Made ground	Firm but friable mid grey brown with moderate yellow brown mottling slightly clay sandy silt	1.04	2.00	0.12	14.36	14.31	Medieval	2
15	Excavation	15	-	Masonry	Remnant of N-S wall	Chalk wall foundation	0.84	0.36	0.30	14.23	14.21	Medieval	2
16	Excavation	16	-	Cut	Construction cut for [15]	Linear construction cut [15]	1.00	0.50	0.32	14.25	13.93	Medieval	2
17	Excavation	17	-	Layer	Burnt deposit	Firm but friable mid-light reddish brown with grey brown mottling clay silt	2.10	0.94	0.06	14.25	14.21	Medieval	1
18	Excavation	18	-	Layer	Charcoal layer	Fairly loose friable dark black brown sandy silt	1.00	1.24	0.10	14.22	14.16	Medieval	1
19	Excavation	20	-	Fill	Fill of [20]	Firm but friable mid grey brown clay sandy silt	0.85	0.60	0.31	14.15	13.84	Medieval	1
20	Excavation	20	-	Cut	Pit	Sub-oval pit	0.85	0.60	0.31	14.15	13.84	Medieval	1

Context	Trench	Plan	Section	Type	Description	Details	NS	EW	Depth	High	Low	Prov Date	Phase
21	Excavation	21	-	Layer	Red burnt deposit	Fairly firm but friable mid reddish brown with mid grey and occasional black mottling silty sand	1.10	3.24	0.24	14.16	13.93	Medieval	1
22	Excavation	Pre-Ex; 22	1	Layer	Made ground	Compact mid grey brown sandy silt	0.74	0.44	0.13	14.38	-	Medieval	2
23	Excavation	23	-	Layer	Mortar layer	Friable mid yellow brown sandy mortar	0.78	0.66	0.15	14.31	14.21	Medieval	2
24	Excavation	24	1	Layer	Charcoal layer	Loose dark black grey with traces of red mottling silty sand	0.88	1.60	0.06	14.25	14.14	Medieval	1
25	Excavation	25	1	Layer	Red burnt deposit	Compact but friable mid reddish brown sandy silt	1.08	1.52	0.18	14.19	14.04	Medieval	1
26	Excavation	26	1	Layer	Burnt deposit	Loose black sandy silt	1.00	1.82	0.14	14.1	14.09	Medieval	1
27	Excavation	27	1	Layer	Brickearth	Firm-compact mid yellow brown with mid grey brown mottling clay silt	1.06	1.64	0.10	13.99	13.92	Medieval	1
28	Excavation	28	-	Layer	Garden soil	Fairly compact mid grey brown silty clay	1.12	1.76	0.16	13.91	13.86	Medieval	1
29	Excavation	29	-	Layer	Garden soil	Fairly compact mid grey brown silty clay	1.30	1.56	0.21	13.87	13.76	Medieval	1

Context	Trench	Plan	Section	Type	Description	Details	NS	EW	Depth	High	Low	Prov Date	Phase
30	Watching Brief	WB-West	-	Layer	Made ground	Fairly loose light reddish grey brick rubble and mortar	3.00	5.90	0.62	14.78	-	Post-Medieval	3
31	Watching Brief	WB-East	-	Masonry	Floor foundation	Unfrogged red brick slab	9.35	5.05	0.30	14.78	-	Post-Medieval	3

Appendix 2 Pottery Assessment

Chris Jarrett

Pottery spot dating index

Unstratified

Verulamium region white ware (VRW), 50-160, 1 sherd, 1 ENV, 78g, form: flagon
Mill Green ware (MG) 1270-1350, 1 sherd, 1 ENV, 15g, form: jug
Coarse Surrey-Hampshire border ware cooking pot with flat-topped rim (CBW FT) 1340-1500, 1 sherd, 1 ENV, 30g, form: unidentified
Tin-glazed ware with plain white glaze (Orton style C) (TGW C), 1630-1846, 1 sherd, 1 ENV, 50g, form: ointment pot
Chinese porcelain, blanc de Chine (CHPO BLANC), 1700-1800, 1 sherd, 1 ENV, 98g, form: figurine
Sunderland-type coarseware (SUND), 1800-1900, 1 sherd, 1 ENV, 15 g, form: unidentified

Context [3], spot date: AD1480-1600

London-area early post-medieval redware (PMRE), 1480-1600, 1 sherd, 1 ENV, 50g, form: unidentified
Red-painted ware with olive fabric (REDP OLV), 900-1250, 1 sherd, 1 ENV, 17g, form: unidentified

Context [5], spot date: 18th-19th century

English stoneware (ENGS), 1700-1900, 1 sherd, 1 ENV, 6g, form: tankard

Context [12], spot date: AD970-1100

Unsourced Gaulish samian ware (SAM), 50-300, 1 sherd, 1 ENV, 3g, form: bowl
Ipswich/Thetford-type ware (THET), 900-1100, 1 sherd, 1 ENV, 12g, form: unidentified
Early medieval sandy ware (EMS), 970-1100, 1 sherd, 1 ENV, 8g, form: unidentified

Context [14], spot date: AD900-1050

Late Saxon shelly ware (LSS), 900-1050, 1 sherd, 1 ENV, 78g, form: jar

Context [24], spot date: AD1140-1300

Coarse medieval sandy ware (MCS), 1140-1300, 1 sherd, 1 ENV, 13g, form: lid

Context [26], spot date: AD1050-1150

Unsourced coarse wares (COAR), 40-400, 2 sherds, 2 ENV, 147g, form: bowl
Early Surrey ware (ESUR), 1050-1150, 8 sherds, 2 ENV, 63g, form: unidentified

Context [28], spot date: AD50-300

Unsourced Gaulish samian ware (SAM), 50-300, 1 sherd, 1 ENV, 14g, form: bowl

Context [29], spot date: AD1050-1150

Unsourced amphora fabric (AMPH), 50-400, 1 sherd, 1 ENV, 23g, form: amphora
Early Surrey ware (ESUR), 1050- 1150, 1 sherd, 1 ENV, 34g, form: unidentified

General comments

The archaeological work produced a total of 27 sherds representing 21 estimated number of vessels (ENV), weighing 754g. The pottery was recovered from eight contexts. Furthermore, the pottery can be divided up into three archaeological periods, consisting of Roman (six sherds, 6 ENV, 265g), medieval (sixteen sherds, 10 ENV, 270g) and post-medieval (five sherds, 5 ENV, 265g) material. The pottery is generally not abraded and indicates fairly rapid deposition after breakage, although a notable quantity of the Roman pottery appears to be mostly residual, except perhaps the single sherd recovered from context [28]. The pottery types recorded are in keeping with the ceramic profile for London and reflect activity associated with *Londinium* and post-Roman occupation associated with St Paul's Cathedral, established in AD 604, although Middle Saxon pottery is not recorded. The later pottery present dates from the Late Saxon and particularly the early medieval periods, while one sherd each is 1270-1350 and to the late medieval period. The post-medieval pottery includes 16th-19th-century dated wares and of particular notes is a rare example of an 18th-century lion figurine made in *blanc de Chine* porcelain.

No further work is recommended although the results of the assessment should be included in any forthcoming publication work.

Appendix 3 Clay Tobacco Pipe Assessment

Chris Jarrett

Clay tobacco pipe spot dating index

Unstratified

Two stems with medium/thick circumferences and medium sized diameter bores, *c*.1580-1740

Context [3], spot date: 1580-1740

Four stems with medium/thick circumferences and wide and medium sized diameter bores, *c*.1580-1740

General comments

A total of six stems were recovered from the archaeological work and two of the stems are stratified. The stems can be broadly dated by their thicknesses and bore sizes to the period *c*.1580-1740. There are no recommendations for further work.

Appendix 4 Small Finds Assessment

Märit Gaimster

Two metal finds were retrieved from the excavations; they are listed in the table below. A small rectangular bone brush plate, with the backing fixed with three copper-alloy rivets at each end, came from a Phase 3 context (sf 1). It was associated with pottery from *c.*1480-1600. An unstratified plain copper-alloy teaspoon has a deep pointed bowl and a handle with a plain down-turned oval finial (sf 2). The spoon is heavily corroded but the handle shows it was silver plated; this was a discovery made by Thomas Boulsover, a Sheffield silversmith, in the mid-18th century, and frequently applied to teaspoons (Moore 2005, 37-8).

Recommendations

The metal and small finds form an integral component of the finds and should, where relevant, be included in any further publication of the site. For this purpose, it is recommended that the silver plated spoon is x-rayed for further identification.

Bibliography

Moore, S., 2005. *Spoons 1650-2000*. Shire Album 211, Shire publications Ltd.

context	sf	description	pot date	recommendation
+	2	silver plated copper-alloy teaspoon; deep pointed bowl and handle with down-turned oval finial; L 128mm; heavily corroded	n/a	x-ray
3	1	composite bone brushplate with five regular rows of holes for bristle; decorative incised line on all edges of the perforated plate; plain backing plate with three copper-alloy rivets for fixing at each end; W 23mm; L 88mm	1480-1600	

Appendix 5 Ceramic Building Material Assessment

Berni Sudds

A small assemblage of ceramic and stone building material was retrieved from excavations within Wren's Chapter House amounting to 39 fragments, weighing 23.5kg. The assemblage includes material of Roman, medieval and post-medieval date and is comprised of both masonry samples taken from in-situ structures and loose fragments derived from backfill and layer deposits.

Methodology

Conforming to the Museum of London system of classification the material was examined under magnification (x20) and quantified by context, fabric, form, number, weight and measurement. A database cataloguing these attributes has been generated using Microsoft Access and appears with the archive. Samples of the fabrics can be found at the Museum of London. Common fabrics and forms were discarded once recorded, with the exception of samples taken from in-situ or dated structures. Any unusual pieces, or fragments requiring further analysis or publication, were also retained.

Roman

A total of 9 fragments of Roman ceramic building material, weighing 5.5kg, were recovered although most, if not all, is likely to be redeposited, providing residual evidence of Roman activity in the locality as evidenced across the City. The range of fabrics and forms identified is typical, comprised of local 2815 sandy group (fabrics 2452, 2459A, 3006) bricks and roof tiles and a single early yellow brick from Eccles in Kent (fabric 3022). Of some interest is the fragment of tegula mammata (Brodribb Type A) from burnt deposit [21] (fabric 2452), which is essentially a brick with lumps of clay attached to the surface, intended to aid with bonding when used in walls or a floors (Brodribb 1987, 62). It has been suggested that these specialised bricks are likely to have been restricted to buildings with a public or civic function (Pringle 2009, 187).

Medieval

The medieval material recovered, amounting to 22 fragments weighing just over 15kg, is predominantly comprised of sampled building stone and loose roof tile, although a single fragment of glazed floor tile was identified in dump deposit [14].

The samples taken from walls [8] and [9] consist of angular chunks of chalk, some up to 150mm across, set within a hard tuffaceous light brown gravel mortar. Such mortars are typical of medieval structures throughout London, dated anytime between *c*.AD 1000-1500 (K. Hayward pers comm). A single fragment of medieval peg tile in a commonly occurring

local sandy fabric (2586), post-dating *c*.AD 1180, was also sampled from the foundation ([9]), reused as building rubble.

The majority of the loose roof tile is of the peg type in fabric 2271, representing the most frequently identified type in London. Smaller numbers of sandy and iron oxide rich examples were also identified (fabrics 2586 and 2587), the latter dated from *c*.AD 1240 to 1450, both of which can also be well-paralleled locally. One early medieval roof tile in fabric 2273, dated from *c*.AD 1135 to 1220 was also recovered. The fragment is non-diagnostic but the thickness would indicate it is from a flanged or shouldered peg tile.

Finally, a single fragment of plain green glazed Westminster floor tile was recovered from layer [14], dated from *c*.AD 1225 to 1275. The floor tile may have originated from a phase of renovation of medieval St Paul's Cathedral, or in fact from any one of the high status medieval buildings in the vicinity including the houses of the canons, the archdeacon or the deanery (Schofield 2011). The Bishop's Palace was located to the north of the medieval cathedral, in the vicinity of site and beyond it the precinct wall. It is possible the chalk rubble foundations relate to such a structure, or possibly to another building outside the cathedral precinct. The roof tile could also have derived from one of these ancillary structures in the churchyard or indeed a secular building beyond.

Post-medieval

The small post-medieval assemblage recovered is comprised of a single brick sample from the foundation of the extant Chapter House building and a few fragments of post-medieval peg tile.

The sample is an unfrogged place brick in fabric 3039 with a partial sunken margin to one edge. The fabric and form would suggest the brick was made pre-1700 but the example is high fired, fairly narrow and not dissimilar in appearance to the transitional 3032 nr3033 types. This would suggest a manufacture date later in the 17th century, or even around the turn of the century. Place bricks were of lesser quality (placed on ground to dry rather than being stacked in the covered stocks) and were commonly utilised in the unseen elements of a building such as the foundations or internal partition walls. Given that Wren's Chapter House was not built until 1712-14, the brick may have been stock-piled as part of the ongoing refurbishment and rebuilding of the Cathedral complex.

The peg tile fragments are all in fabric 2276, representing the most commonly identified type in London in the post-medieval period.

Context	Masonry	Total number	Total weight (g)	Date range of the material		Latest dated type		Context considered date
0	No	8	965	1180	1900	1480	1900	-
1	Yes	1	2429	1450	1700	1450	1700	1600 – 1700
3	No	4	427	1180	1900	1480	1900	1480 – 1900
7	No	3	289	55	1800	1180	1800	1350 – 1600
9	Yes	1	199	1180	1800	1180	1800	1180 - 1600
12	No	3	521	50	1800	1180	1800	1180 – 1220+
14	No	3	1195	50	1800	1180	1800	1225 – 1275
15	No	1	137	50	1950	50	1950	1000 – 1500
19	No	2	140	50	160	55	160	55 – 160
21	No	3	3283	50	1950	55	160	55 – 160
22	No	2	62	1180	1800	1240	1450	1240 – 1450
23	No	1	537	55	160	55	160	55 – 160
24	No	1	182	50	160	50	160	50 – 160

Table 1: Dating table

Recommendations

The loose assemblage of Roman and medieval brick and tile can be well paralleled locally and as such merits no further analysis. The samples of stone and brick relating to the in-situ medieval masonry remains and the extant Chapter House, whilst also well-paralleled, are important in further characterising the build heritage of vicinity and the fabric of an architecturally and historically significant building of known date. A discussion of these should be included in any further publication work undertaken.

Bibliography

Brodribb, G., 1987. *Roman Brick and Tile*. Alan Sutton Publishing. Gloucester.

Pringle, S., 2009. 'Building Material', in C. Cowan, F. Seeley, A. Wardle, A. Westman and L. Wheeler *Roman Southwark: settlement and economy. Excavations in Southwark 1973-1991*. MOLA Monograph 42.187-205.

Schofield, J., 2011. *St Paul's Cathedral Before Wren*. English Heritage.

Appendix 6 Animal Bone Assessment

Kevin Rielly

Introduction

This small excavation took place within the Chapter House of St Paul's Cathedral. The earliest level may represent a garden soil, possibly dating to the Roman period as suggested by the associated finds. However, these could represent redeposited items from lower strata. This was sealed by a series of burnt horizons which are clearly medieval and may represent evidence for the fire which destroyed the cathedral in AD1135. Further deposits overlying these strata, also medieval, including a pit and a wall foundation, are likely to date to the construction and use of the Hall of Minor Canons. This in turn is overlaid by further construction work, here dating to the early post-medieval era, related to the building of the Chapter House within the present cathedral structure.

Animal bones were found throughout this depositional sequence, the various deposits providing a generally well preserved and moderately fragmented collection.

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.

Description of faunal assemblage by phase

The site provided a hand-collected total of 66 bone fragments from phased deposits. At present the phases have been broadly divided as follows: Phase 1 – Possible Roman through to early medieval, phase 2 – medieval construction and phase 3 - post-medieval.

Phase 1 (?Roman and Medieval)

The animal bones in this phase were recovered from a lower, potentially Roman (although based on just one sherd) deposit underlying a series of burnt horizons. This lower level, a possible soil layer, provided 19 bone fragments, comprising a variety of cattle, sheep/goat and pig meat-bearing bones as well as a goose radius. One of the cattle bones was from a juvenile individual, possibly a veal calf. These clearly represent a small dump of consumer waste i.e. no head or feet bones. The upper layers continue the consumer waste pattern

although pig is here mainly composed of foot bones (2 out of 3). Such foot bones, in contrast to those from cattle or sheep/goat can be regarded as food waste – pigs' trotters being a recognised delicacy. There are further indications of choice meats with three of the sheep bones from one or more juvenile individuals as well as a single bone from a large wader, possibly a curlew. Notably, while clearly burnt, none of these horizons provided burnt bones, with the single example from this phase, a cattle humerus burnt black, taken from the lower 'Roman' soil layer.

Phase:	**1**	**2**	**3**
Species			
Cattle	3	2	3
Cattle-size	4	4	4
Sheep/Goat	8	2	4
Pig	4	2	
Sheep-size	14	1	6
Chicken	1		
Goose	1		2
Large wader	1		
Grand Total	**36**	**11**	**19**

Table 1. Total fragment counts of species represented in the phased hand and sieved collections.

Phase 2 (medieval)

A small number of bones were found in the fill [12] of pit [13] and also in fill [7] of wall foundation cut [10]. It was mentioned that these may relate to the construction and use of the Hall of the Minor Canons. There is again a consumer element to the cattle, sheep/goat and pig bones from this phase, with the exception of a cattle horncore fragment from the pitfill [12].

Phase 3 (post-medieval)

Nineteen bone fragments were derived from the fill [3] of construction cut [4], this no doubt related to the building of the Chapter House. This collection consists of a mixture of cattle, sheep/goat and goose consumer waste, mainly from adult animals with the exception of a cattle scapula possibly representing a veal joint. The two goose bones, a radius and an ulna may be from the same adult bird.

Conclusion and recommendations for further work

This is a rather small collection but is nevertheless of some interest. The phase collections are in good condition and clearly derive, considering the absence (or near absence) of head and foot parts, from one or more households/kitchens. There is also a subtle indication of wealth – the curlew and perhaps the veal. The derivation of these bones is problematic, considering their location. They could conceivably represent redeposited waste from pre-cathedral levels. This is perhaps indicated by the presence of human bone fragments throughout the occupation sequence. However, it is difficult to equate this level of disturbance with the condition of the bones and perhaps the described nature (consumer waste) of these collections. The good preservation of the curlew bone is also at odds with this scenario although it is perhaps notable that no other bird bones were recovered. Another and perhaps more plausible explanation is that these collections, tending to coincide with building works, may therefore represent food waste related to the builders or perhaps the opportunistic tipping of refuse from nearby households.

No further analysis of these bone collections is required. However it is recommended that relevant parts of this assessment report should be used in the forthcoming St Paul's Cathedral publication.

Appendix 7 Human Bone Assessment

James Young Langthorne

The following report details the results of an assessment of the disarticulated human remains from the archaeological investigation at Wren's Chapter House in the vicinity of St Paul's Cathedral.

Disarticulated human bone was found within several contexts including backfills [3] and [7] within construction cuts, pit fill [19] and layers [21] and [22]. All human bone in whatever condition appear to have been redeposited from earlier deposits presumably either Roman burials that have been seen to the north-east of the Chapter House site or Saxon-early medieval burials that were encountered to the west.. No articulated burials or cremation burials were encountered during the excavation.

Disarticulated bone

The following table summarises the results of the human bone assessment:

Table of disarticulated bone from SPP13

Context no.	Skeletal Element	No. of fragments	Condition	MNI for each context	Sex	Age	Pathology/Comments
3	Skull (x 1)	22	Good-Moderate	1	Male?	Young-Mid Adult	Caries. Possible infection of cranial vault - cortex of parietals and frontal appears to be 'swollen'. But preservation makes this unclear.
3	Foot (MT I right)	1	Good-Moderate	1	?	Adult?	None visible.
3	Humerus (shaft fragment)	1	Moderate-Poor	1	?	?	None visible.
3	Fibula (proximal shaft)	1	Moderate	1	?	?	None visible.
3	Pelvis (ilium & ischium fragment right)	1	Good-Moderate	1	?	Adult	None visible.
3	Unidentifiable fragments	15	Poor	1	?	?	None visible.
3	Pelvis (fragment)	1	Moderate-Poor	1	?	?	None visible.
3	Humerus (proximal shaft-distal epicondyles left)	1	Moderate-Poor	1	?	?	None visible.

Context no.	Skeletal Element	No. of fragments	Condition	MNI for each context	Sex	Age	Pathology/Comments
7	Long bone (shaft fragments)	4	Poor	1	?	?	None visible.
7	Ulna (proximal shaft right)	1	Moderate-Poor	1	?	?	None visible.
19	Hand (MC I right)	1	Good	1	?	?	None visible.
21	Cremated bone (fragments)	100+	Poor	1	?	?	None visible.
22	Radius (shaft)	1	Moderate	1	?	?	None visible.
+	Clavicle (shaft right)	1	Moderate	2	?	?	None visible.
+	Tibia (shaft fragment)	1	Moderate	2	?	?	None visible.
+	Femur (shaft fragments)	2	Moderate	2	?	?	Lamellar bone on one shaft fragment
+	Long bone (shaft fragments)	2	Moderate-Poor	2	?	?	None visible.
+	Rib (shaft fragment)	1	Moderate	2	?	?	None visible.
+	Skull (fragments)	2	Moderate	2	?	?	None visible.
+	Foot (Metatarsal)	1	Good	2	?	Neonate-Infant	None visible.

Recommendations for further work

No further analysis of the disarticulated bone is recommended beyond potentially selecting material for carbon dating to establish whether the bone originated from a Roman or Saxon-medieval context. The results of the assessment should be included in any forthcoming publication.

Appendix 8 Environmental Assessment

Dan Young and Phil Austin Quaternary Scientific (QUEST)

Introduction

This report summarises the findings arising out of the environmental archaeological assessment undertaken by Quaternary Scientific (University of Reading) of samples from Wren's Chapter House, St Paul's Cathedral, City of London, EC4 (Site Code: SPP13; National Grid Reference TQ 32017 81187). Bulk samples for environmental archaeological assessment were collected during archaeological excavation at the site, undertaken by Pre-Construct Archaeology Ltd during October and November 2013. Structures and deposits associated with three Phases of activity were identified at the site, including Phase 1 Medieval (Burnt Deposits), Phase 2 Medieval (Hall of the Minor Canons) and Phase 3 Post-Medieval (Chapter House Structures/Deposits).

Two samples from Phase 1 (<1>, context [18] and <2>, context [21]) were submitted for environmental archaeological assessment and radiocarbon dating. The aim 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.

Methods

Rapid assessment

Both samples were processed by flotation by Pre-Construct Archaeology Ltd using 1mm and 300-micron mesh sizes, producing a flot from each sample. Both samples were rapidly assessed for macrofossil remains using a low power zoom-stereo microscope at x7-45 magnification, and the quantities and preservation of each class of macrofossil in each sample recorded (Table 1). Preliminary identifications of the charred seeds were made using modern comparative material and reference atlases (e.g. Cappers *et al.* 2006). Nomenclature used follows Stace (2005).

Charcoal assessment

Following the results of the rapid assessment, both samples were recommended for a more detailed assessment of the charcoal remains. Both samples were examined to assess the potential for further investigation, and to identify fragments suitable for C14 dating. Standard procedures for the identification of wood charcoal were used, as described in Hather (2000). Ten fragments per sample were examined in an attempt to gain an insight into the range of taxa represented in each sample. The results of the assessment are listed in Table 2.

Radiocarbon dating

Charred seeds of Hordeum/Triticum type (wheat/barley) were extracted from each sample and submitted for radiocarbon dating. Both samples were submitted to the Scottish Universities Environmental Research Centre (SUERC), East Kilbride, Glasgow. The results have been calibrated using OxCal v4.1.7 Bronk Ramsey (2010) and the IntCal13 atmospheric curve (Reimer *et al.* 2013). Unfortunately, insufficient carbon was found following pre-treatment of the fragment of charred seed from sample <2> [21]. As stated below, no other material suitable for radiocarbon dating was found within this sample. The results of the radiocarbon dating are displayed in Table 3.

Results of the rapid assessment of flots and residues

Both samples from Phase 1 were assessed for the preservation and concentration of macrofossil remains (Table 1). Both samples contained high quantities of identifiable charcoal (greater than 2mm in diameter). In addition, three seeds of *Hordeum*/*Triticum* type (wheat/barley) were recorded in sample <1> [18], whilst a fragment of the same type was recorded in sample <2> [21]. No waterlogged macrofossils, Mollusca, bone or insects were found during the assessment.

Table 1: Results of the rapid assessment of flots and residues from Wren's Chapter House, St Paul's Cathedral, City of London, EC4 (Site Code: SPP13)

								Charred					Uncharred		Bone			Mollusca			
Sample number	Context number	Phase	Context description	Size of context sampled (%)	Total volume processed (l)	Flot weight (g)	Fraction (e.g. flot, residue, >300µm)	Charcoal (>4mm)	Charcoal (2-4mm)	Charcoal (<2mm)	Seeds	Chaff	Wood	Seeds	Large	Small	Fragments	Whole	Fragments	Insects	Pottery
<1>	[18]	1	Charcoal layer	?	?	70	Flot	5	5	5	1	-	-	-	-	-	-	-	-	-	-
<2>	[21]	1	Red burnt deposit	?	?	60	Flot	5	5	5	1	-	-	-	-	-	-	-	-	-	-

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 charcoal assessment

The detailed findings for each sample assessed are presented in Table 2. Both samples contained mostly well preserved charcoal and of sufficient size for identification. Whereas only oak (*Quercus* sp.) was identified from sample <2>, context (21), 4 distinct taxa were identified from sample <1>, context (18). Most of the unexamined fragments in sample <2> appeared 'oak-like' in character and it is possible that oak is in fact the only taxon represented in this sample. If necessary, further analysis would establish if this is so. The apparent diversity of sample <1> suggests a relatively taxon-rich deposit which may, if studied further, yield yet more taxa.

Taxa for potential ^{14}C dating were identified only in sample <1>. None of the oak fragments identified in sample <2> are suitable for dating, and it is recommended that these are not used for dating purposes.

Table 2: Wood charcoal identifications from Wren's Chapter House, St Paul's Cathedral, City of London, EC4 (Site Code: SPP13)

Context	Sample	Identification	Qty	Weight (g)	^{14}C	Remarks
(18)	<1>	*Quercus* sp. *Fagus sylvatica* sp. *Acer campestre* Maloideae	6 2 1 1	0.649 0.703 0.112 0.035	N N 1 1	- - - C14 samp.
(21)	<2>	*Quercus* sp.	10	1.673	N	All mature wood, not recommended for dating.

Results and interpretation of the radiocarbon dating

As stated above, charred seeds of Hordeum/Triticum type (wheat/barley) were extracted from each sample and submitted for radiocarbon dating (Table 3). The radiocarbon dating of sample <1> [18] returned an age of 1260-1050 cal AD (690-900 cal BP), placing the sample within the Anglo-Norman period.

Unfortunately, insufficient carbon for dating was found following pre-treatment of the fragment of charred seed from sample <2> [21].

Table 3: Results of the radiocarbon dating of the samples from Wren's Chapter House, St Paul's Cathedral, City of London, EC4 (Site Code: SPP13)

Laboratory code/Method	Material	Sample/Context	Uncalibrated radiocarbon years before present (yr BP)	Calibrated age BC/AD (BP) (2-sigma, 95.4% probability)	δ13C (‰)
SUERC-51349 (GU33119)	Charred seed (*Hordeum*/*Triticum* type)	<1> [18]	854 ± 32	1260-1050 cal AD (690-900 cal BP)	-22.7
Failed sample (GU33120)	Charred seed (*Hordeum*/*Triticum* type)	<2> [21]	N/A	N/A	N/A

Discussion and Conclusions

The aim 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. Both samples were also submitted for radiocarbon dating, returning an age of 1260-1050 cal AD (690-900 cal BP) for sample <1> [18] (Anglo-Norman). However, insufficient carbon was present in the fragment of charred seed from sample <2> [21], and no other material suitable for radiocarbon dating was found during the assessment.

Both samples contained mostly well preserved charcoal, with only oak (Quercus sp.) identified in sample <2> [21]. Sample <1> [18] contained 4 distinct taxa, including Quercus sp., Fagus sylvatica (beech), Acer campestre (field maple) and Maloideae (a large family including apple and pear). Seeds of Hordeum/Triticum type (wheat/barley) were recorded in both samples.

Recommendations

The assessment of the charcoal in sample <1> (18) has identified that it is a relatively taxon-rich deposit. If it is deemed necessary from an archaeological perspective, further analysis of this sample may yield additional information on the wood charcoal assemblage.

Bibliography

Bronk Ramsey, C., Dee, M., Lee, S., Nakagawa, T., and Staff, R., 2010. 'Developments in the calibration and modelling of radiocarbon dates'. *Radiocarbon* 52(3): 953-961.

Cappers, R.T.J., Bekker R.M. & Jans J.E.A., 2006. *Digital Seed Atlas of the Netherlands*. Groningen Archaeological Series 4. Barkhuis, Netherlands

Hather, J., 2000. *The Identification of the Northern European Woods. A guide for archaeologists and conservators*. London: Archetype.

Reimer, P. J., Bard, E., Bayliss, A., Beck, J. W., Blackwell, P. G., Bronk Ramsey, C., Grootes, P. M., Guilderson, T. P., Haflidason, H., Hajdas, I., Hatte, C., Heaton, T. J., Hoffmann, D. L., Hogg, A. G., Hughen, K. A., Kaiser, K. F., Kromer, B., Manning, S. W., Niu, M., Reimer, R. W., Richards, D. A., Scott, E. M., Southon, J. R., Staff, R. A., Turney, C. S. M., & van der Plicht, J., 2013. 'IntCal13 and Marine13 Radiocarbon Age Calibration Curves 0-50,000 Years cal BP'. *Radiocarbon* 55(4).

Stace, C., 2005. *New Flora of the British Isles*. 3rd edition. Cambridge: Cambridge University Press.

Appendix 9 OASIS Form

OASIS ID: preconst1-176877

Project details

Project name	Archaeological Assessment of Investigations at Wren's Chapter House, St Paul's Cathedral, City of London, EC4
Short description of the project	The archaeological investigations at the Chapter House constituted an archaeological excavation in the proposed position of a new lift pit and an archaeological watching brief on associated drainage beneath the basement slab. The archaeological sequence in the Chapter House lift pit excavation showed early medieval garden soil succeeded by several layers of sand and silt containing a large amount of burnt material. These deposits were truncated by the remains of two wall footings and a potential cellar wall, structures which could relate to the medieval Hall of Minor Canons, that were in turn truncated by the construction cut for the current post-medieval Chapter House walls and modern drainage. The archaeological sequence encountered during the watching brief consisted of a potential post-medieval brick floor beneath the concrete basement slab in the drainage excavation to the east of the lift pit excavation and modern made ground beneath the concrete slab to the west of the lift pit excavation. Natural deposits were not encountered on the site due to the restrictions of the project depths.
Project dates	Start: 21-10-2013 End: 04-11-2013
Previous/future work	Yes / Not known
Any associated project reference codes	SPP13 - Sitecode
Type of project	Recording project
Site status	Listed Building
Site status	Conservation Area
Current Land use	Other 2 - In use as a building
Monument type	GARDEN SOIL Roman
Monument type	BRICKEARTH Early Medieval
Monument type	BURNT DEPOSITS Early Medieval
Monument type	PIT Early Medieval
Monument type	MADE GROUND Medieval
Monument type	WALL FOOTINGS Medieval
Monument type	CELLAR WALL Medieval

Monument type	CONSTRUCTION CUTS FOR MASONRY Medieval
Monument type	PIT Medieval
Monument type	DEMOLITION RUBBLE Medieval
Monument type	CONSTRUCTION CUT Post Medieval
Monument type	ROBBER CUT Post Medieval
Monument type	WALL FOOTINGS Post Medieval
Monument type	DUMPED DEPOSIT Post Medieval
Monument type	MADE GROUND Modern
Significant Finds	POTTERY Roman
Significant Finds	ANIMAL BONE Early Medieval
Significant Finds	POTTERY Early Medieval
Significant Finds	ANIMAL BONE Medieval
Significant Finds	CBM Medieval
Significant Finds	CREMATED HUMAN BONE Early Medieval
Significant Finds	POTTERY Medieval
Significant Finds	DISARTICULATED HUMAN BONE Medieval
Significant Finds	POTTERY Post Medieval
Significant Finds	CBM Post Medieval
Significant Finds	DISARTICULATED HUMAN BONE Post Medieval
Significant Finds	SILVER PLATED TEASPOON Post Medieval
Significant Finds	CLAY TOBACCO PIPE Post Medieval
Investigation type	"Part Excavation","Watching Brief"
Prompt	Planning condition

Project location

Country	England
Site location	GREATER LONDON CITY OF LONDON CITY OF LONDON Wren's Chapter House, St Paul's Cathedral
Postcode	EC4

Study area	35.00 Square metres
Site coordinates	TQ 32017 81187 51.513664976 -0.0972555111422 51 30 49 N 000 05 50 W Point

Project creators

Name of Organisation	Pre-Construct Archaeology Ltd.
Project brief originator	Dean and Chapter of St Paul's Cathedral
Project design originator	Helen Hawkins and Charlotte Matthews
Project director/manager	Helen Hawkins
Project supervisor	James Langthorne
Type of sponsor/funding body	Dean and Chapter
Name of sponsor/funding body	Dean and Chapter of St Paul's Cathedral

Project archives

Physical Archive recipient	LAARC
Physical Archive ID	SPP13
Physical Contents	"Animal Bones","Ceramics","Human Bones","Metal"
Digital Archive recipient	LAARC
Digital Archive ID	SPP13
Digital Media available	"Images raster / digital photography"
Paper Archive recipient	LAARC
Paper Archive ID	SPP13
Paper Contents	"other"
Paper Media available	"Context sheet","Drawing","Plan","Section","Unpublished Text"

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	Archaeological Assessment of Investigations at Wren's Chapter House, St Paul's Cathedral, City of London, EC4
Author(s)/Editor(s)	Langthorne, J.
Date	2014
Issuer or publisher	Pre-Construct Archaeology Ltd.
Place of issue or publication	London
Description	A4 soft cover unpublished grey literature assessment report.
Entered by	archivist (archive@pre-construct.com)
Entered on	10 April 2014

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