THE CROSS GREEN SWALE, ELY CATHEDRAL: ARCHAEOLOGICAL MONITORING

PCA

AUGUST 2014

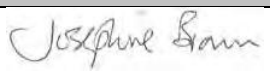
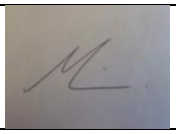
PRE-CONSTRUCT ARCHAEOLOGY
R11831

THE CROSS GREEN SWALE, ELY CATHEDRAL:

ARCHAEOLOGICAL MONITORING

Quality Control

Pre-Construct Archaeology Ltd	
Project Number	K 3587
Report Number	R 11831

	Name & Title	Signature	Date
Text Prepared by:	Mary-Anne Slater and Aileen Tierney		August 2014
Graphics Prepared by:	Jennifer Simonson		August 2014
Graphics Checked by:	Josephine Brown		August 2014
Project Manager Sign-off:	Mark Hinman		August 2014

Revision No.	Date	Checked	Approved

Pre-Construct Archaeology Limited
The Granary
Rectory Farm
Brewery Road
Pampisford
Cambridgeshire
CB22 3EN

The Cross Green Swale, Ely Cathedral, Cambridgeshire:

Archaeological Monitoring

Local Planning Authority:	**N/A (ecclesiastical land administered by Dean and Chapter of Ely Cathedral)**
Planning Reference:	**N/A**
Central National Grid Reference:	**TL 54082 80280**
Site Code:	**CECS14**
Report No.	**R11831**
Written and researched by:	**Mary-Anne Slater & Aileen Tierney** **Pre-Construct Archaeology Ltd**
Project Manager:	**Mark Hinman**
Commissioning Client:	**Philip Dixon Associates**
Contractor:	**Pre-Construct Archaeology Ltd** **Central Office** **The Granary** **Rectory Farm** **Brewery Road** **Pampisford** **Cambridgeshire** **CB22 3EN**
Tel:	**01223 845522**
E-mail:	**mhinman@pre-construct.com**
Website:	**www.pre-construct.com**

August 2014

CONTENTS

ABSTRACT

This report describes the results of archaeological monitoring carried out by Pre-Construct Archaeology at The Cross Green Swale, Ely Cathedral, Cambridgeshire between 25th June and 11th July 2014. The archaeological monitoring was commissioned by Philip Dixon Associates. The aim of the work was to assess the character, extent, date, state of preservation and significance of any features or archaeological deposits in the area affected by the construction of a replacement drain, and to preserve any such archaeological remains 'by record'.

The monitoring identified twenty inhumation burials dating to the post-medieval period and three potential walls and multiple demolition layers which appear to relate to the 14th-century parish church of Holy Cross (later Holy Trinity). Eighteen of the burials were recorded and then lifted for reburial elsewhere within the cathedral precinct. Deposits of disarticulated charnel material were also recovered for reburial.

1 INTRODUCTION

1.1 Archaeological monitoring was undertaken by Pre-Construct Archaeology Ltd (PCA) at The Cross Green Swale, Ely Cathedral, Cambridgeshire, CB7 4JY (centred on Ordnance Survey National Grid Reference (NGR) TL 54082 80280) between 25th June and 11th July 2014 (Figures 1-2; Plates 1-2).

1.2 Cross Green is located adjacent to Ely Cathedral and was the burial ground of the parish church of Holy Trinity until the middle of the 19th century. The monitoring occurred along the north wall of the nave (Trench 1) and west side of the north transept (Trench 2) (Figure 2). The north side of the nave was the site of the medieval parish church of Holy Cross, which lay between the third and fifth bays of the nave. The church was constructed in *c.* AD 1340 and was demolished in the *c.* 1560s (Figure 3).

1.3 The archaeological work was commissioned by Philip Dixon Associates in response to a programme of groundworks to improve the drainage on the north side of Ely Cathedral. The ground reduction consisted of machine-excavating a *c.* 2m-wide, 20° gradient sloping down into the existing Victorian drain. As the groundworks involved the excavation of a slope, the ground reduction was uneven across the area monitored and archaeological features and deposits were seen at different levels.

1.4 The monitoring was carried out in accordance with a Written Scheme of Investigation (WSI) prepared by Philip Dixon of Philip Dixon Associates (Dixon 2014a).

1.5 The aim of the monitoring was to characterise the nature, extent, date, state of preservation and significance of any archaeological features or deposits within the areas affected by the new drain, to record any such remains prior to their destruction, and (after recording) to remove any human burials/ charnel material for reburial elsewhere within the cathedral grounds.

1.6 Two trenches were excavated between 25th June and 11th July 2014: Trench 1, measuring 36m long and aligned along the north wall of the nave, and Trench 2, measuring 10.5m long and aligned alongside the west elevation of

the north transept. The archaeological monitoring revealed large charnel pits and one inhumation burial in Trench 2 and nineteen inhumation burials and the foundations and demolition layers associated with the 14th-century church of Holy Cross in Trench 1.

1.7 This report describes the results of the archaeological monitoring in Cross Green. The site archive will be deposited at Ely Cathedral.

2 GEOLOGY AND TOPOGRAPHY

2.1 The geology of the site is Woburn Sands Formation Sandstone, a sedimentary bedrock formed approximately 100 to 125 million years ago in the Cretaceous Period (British Geological Survey 2014; Website 1).

2.2 The site is at an elevation of approximately 20m above Ordnance Datum. Ely occupies the highest land in the fens and, before fen drainage, was an 'island' surrounded by low-lying wetlands. The cathedral complex occupies some of the highest ground of the island, with land falling away fairly sharply to the east towards the River Ouse.

3 ARCHAEOLOGICAL BACKGROUND

3.1 The following material has been derived from the Assessment of the Archaeological Implications for this site (Dixon 2014b), as well as from the report on a recent archaeological excavation on the site of an extension to the Almonry Restaurant (Boyer and Woolhouse 2013), and from Cambridgeshire Historic Environment Record (HER MCB16885).

3.2 A monastery was established in Ely by St Æthelthryth in AD 673. It was destroyed by the Danes in the late 9th century and re-founded as a Benedictine Abbey for men in *c*. 970. Following the creation of the Diocese of Ely, it became a cathedral in AD 1109, with construction work continuing throughout the 12th century. Developments within the main cathedral building and elsewhere in the precinct continued throughout the medieval period. The cathedral suffered minor damage during the Dissolution in AD 1539, but was re-founded in AD 1541 and further modifications and additions were made during the 17th to 19th centuries, with major restoration work being carried out towards the end of the 20th.

3.3 The area of Cross Green to the north of Ely Cathedral was the burial ground of the parish church of Holy Cross from the Middle Ages until the mid 19th century. The parishioners of Holy Cross (later renamed Holy Trinity) used the nave of Ely Cathedral until the 14th century, when the construction of a building against the north wall of the north aisle was begun in *c*. AD 1341-2 (Figure 3). It was completed by *c*. AD 1459-60 and served the congregation until *c.* AD 1566, when the use of the Lady Chapel was given to the parish of Holy Trinity until 1938. The 14th-century church appears to have been demolished as soon as it went out of use and the cathedral north aisle was then re-faced in 1662.

4 METHODOLOGY

4.1 The archaeological monitoring comprised a 36m long, 2m wide trench along the north aisle (Trench 1) and a 10.5m long, 2m wide trench along the west face of the north transept (Trench 2) (Figure 2).

4.2 Ground reduction was carried out under archaeological supervision using a 5-ton tracked mechanical excavator fitted with a 1.6m-wide toothless ditching bucket. Topsoil and subsoil deposits were removed down to the level of the slope required for the swale. Certain areas across the site where there was a high level of archaeological activity resulted in two phases of soil stripping. These two phases can be seen in Figure 5, which illustrates the skeletons uncovered during the initial and secondary soil strips. Exposed surfaces were cleaned by trowel as appropriate and all further excavation was undertaken manually using hand tools.

4.3 The limits of excavations, heights above Ordnance Datum (m OD) and the locations of archaeological features and interventions were recorded using a Leica 1200 GPS rover unit with RTK differential correction, giving three-dimensional accuracy of 20mm or better.

4.4 Deposits or the removal of deposits judged by the excavating archaeologist to constitute individual events were each assigned a unique record number (often referred to within British archaeology as 'context numbers') and recorded on individual pre-printed forms (Taylor and Brown 2009). Archaeological processes recognised by the deposition of material are signified in this report by round brackets (thus), while events constituting the removal of deposits are referred to here as 'cuts' and signified by square brackets [thus]. The record numbers assigned to cuts and deposits are entirely arbitrary and in no way reflect the chronological order in which events took place. All features and deposits recorded during the evaluation are listed in Appendix 2. Artefacts recovered during excavation were assigned to the record number of the deposit from which they were retrieved.

4.5 Metal-detecting was carried out during the topsoil and subsoil stripping and throughout the excavation process. Archaeological features and spoil heaps

were scanned by metal-detector.

4.6 High-resolution digital photographs were taken of all relevant features and deposits, and were used to keep a record of the excavation process.

5 ARCHAEOLOGICAL RESULTS

5.1 Overview

5.1.1 The works monitored beside Ely Cathedral transept and nave revealed the foundations and demolition layers associated with the 14th-century parish church of Holy Cross (later Holy Trinity), 20 east- to west-aligned inhumation burials postdating the demolition of the church and numerous post-medieval to modern charnel pits. Dating is tentative and based on a combination of stratigraphy and the known history of the site.

5.2 Medieval (14th Century?): Structures 125, 173 and 193 and Layer (126)

5.2.1 This period was dominated by the construction of the parish church of Holy Cross in the 14th century. Deposits of mortar, a limestone wall perpendicular to the nave at the west end of the Trench 1, a robbed-out wall perpendicular to the nave in the centre of the same trench and a mortar and stone wall, also perpendicular to the nave, at the east end of this trench, appeared to relate to this phase (Figure 4).

5.2.2 A distinct layer of mortar (126) measuring *c*. 7m+ long and 0.75m+ wide was seen towards the west end of Trench 1. The mortar consisted of a mid orange/ yellow chalky sand, which appeared to be a foundation layer for the construction of a north- to south-aligned limestone wall. This wall, Structure 125, extended 1m north of the 1860s drain and measured 1.7m wide and 0.4m deep (Plate 5). The stones forming the wall were mainly roughly finished, with some straight, squared edges on the larger blocks; smaller rubble stones were mixed in with the larger blocks.

5.2.3 A second wall, Structure 173, extended northwards from the north wall of the cathedral, from the middle of the fifth bay of the nave. It measured 0.6m+ long and 0.49m wide and was made of whitish-yellow chalky sand mortar (Plate 6). It appeared to be a robbed-out wall or foundation layer associated with the parish church of Holy Cross.

5.2.4 At the eastern end of Trench 1, a mortar and stone wall, Structure 193, was seen on a north to south alignment extending for 0.8m+ north of the 1860s drain and measuring 0.8m+ wide. The full extent of the wall was not seen or

excavated as it lay below the level of construction impact for the new drain. Structure 193 was of different construction to Structure 125, being comprised of smaller, unfinished stones bonded with pale yellow mortar, rather than the relatively large limestone blocks used for Structure 125. Nevertheless, both walls may relate to the construction of the 14th-century parish church.

5.3 Post-Medieval Phase I (Late 16th Century?): Layers (116), (117), (172), (174), (199), (191), (194), (198) and (200) and Robber Trench [196]

5.3.1 After the construction of the church of Holy Cross, the next 'phase' represented in the archaeological record consisted of numerous deposits seemingly related to its demolition, which is documented as having occurred from AD 1566 onwards, after the parishioners moved into the Lady Chapel.

5.3.2 The demolition layers were mainly seen in the eastern half of Trench 1 and consisted of either an orangey-yellow sandy mortar layer containing chalk rubble (e.g. (116), (117), (172), (174) and (199)) (Plates 3 and 4) or a yellowish-/ greenish- brown silty clay (e.g. (191), (194), (198) and (200)). Fragments of 12th-/13th- century columns and a 13th-century carved tombstone (Plate 8) were recovered from one of the demolition layers (116).

5.3.3 Extending north from the middle of the fifth bay of the nave in Trench 1 was a robber trench ([196] (197)) on a north to south alignment, overlying Structure 173. Apart from small pieces of chalk rubble and the fragments of columns and tombstone, the demolition layers were remarkably empty of large rubble, suggesting that a lot of the stone from the church was robbed and reused elsewhere. However, [196] was the only direct evidence of robbing seen during the monitoring.

5.4 Post-Medieval Phase II (Post- 16th Century?): Graves [179] and [182]

5.4.1 Two graves, [179] and [182], both located at the eastern end of Trench 1 (Figure 5), have been tentatively assigned to this next phase on the basis of the appearance of their backfills. These consisted of very concentrated rubble and chalk, deriving from the layers of demolition rubble from the 14th-century church, and potentially indicating that they were dug shortly after the structure was demolished and the ground cleared. These two graves were

revealed in the secondary strip of Trench 1. Grave [179] contained the remains of a mature male (SK180). This grave had been truncated both by Grave [182] and Structure 163 (see below) (Figure 5). Grave [182], directly north of [179], contained the remains of an unsexed subadult (SK183). The mature skeleton showed evidence of osteoarthritis, and various dental pathologies such as extreme calculus, dental caries, extreme tooth wear and tooth loss resulting in resorption of the alveolar bone. There were no pathologies evident on the bones of SK183 (Appendix 3, Table 2).

5.5 **Post-Medieval Phase III (18th-19th Century?): Graves [201], [203], [121], [133], [129], [144], [155], [136], [178], [149], [146], [205], [207], [211], [156], [137], [185] and [209]**

5.5.1 During this period, large numbers of burials were being interred in the area of Cross Green. The graves uncovered from this period were found during two separate soil strips, shown on separate plans (Figure 5). These later graves, while still being cut into the presumed demolition layers associated with the 14th-century parish church, had darker fills with fewer inclusions, contrasting with Graves [179] and [182]. Of the eighteen definite graves identified, only sixteen graves were excavated. Graves [149] and [209] were left unexcavated, with the latter located at the southern end of Trench 2 (Figure 6). Two of the sixteen excavated graves, [144] and [211], contained highly disturbed remains. These highly disturbed remains were not allocated skeleton numbers or analysed in the same degree of detail as the articulated skeletons.

5.5.2 In addition to the identified graves, a further eight features of approximately the right size and shape to be additional human burials were recorded in plan (Figure 5) but not excavated as they were below the construction impact level.

5.5.3 The fourteen excavated graves (excluding the highly disturbed remains) contained skeletons of all age groups, with seven females, two males, three adolescents and two unsexed adults. All the adult skeletons displayed varied levels of age-related pathologies, but with with no major illnesses or diseases noted. Dental pathologies were consistent with the time period,

with prevalent calculus and tooth decay. Linear enamel hypoplasia (LEH) was noted in three individuals. The hypoplastic lines ranged from slight to moderate grooves encircling the tooth crown at the same level. These deficiencies in enamel thickness can be caused by a variety of factors: systematic metabolic stress, hereditary anomalies and localised trauma.

5.5.4 Only five individuals exhibited evidence of osteoarthritis, with one case of eburnation of the dens of the second cervical vertebra. One individual displayed evidence of Diffuse Idiopathic Skeletal Hyperostosis (DISH), both on the spine and some of the long bones. While the etiology of DISH is unknown, it is a common disease in middle – mature individuals. For the full osteological report, see Appendix 3.

5.5.5 Frequent disarticulated remains were retrieved from below this layer of skeletons, the two main concentrated areas of bone being (118) and (175). The quantity of disarticulated remains which were recovered is to be expected in view of the high level of activity during the period of usage of this cemetery, and the degree of subsequent disturbance to this localised part of it, particularly when the existing drain was constructed in the 1860s. .

5.6 19th Century: Structure 163, Drain [195], Layer (161), Charnel Pit [142] and other disarticulated bone (108), (110), (111), (120)

5.6.1 This period saw the general silting-up of this section of the cemetery prior to the insertion of the north aisle and north transept drains and culverts in the 1860s/1870s and the levelling of the cemetery, which resulted in a reduction of the ground level by *c.* 1m.

5.6.2 The silting-up of this area of the cemetery, (161), was seen overlying the graves across the majority of Trench 1 (Figure 4). Layer (161) consisted of a mid orangey-brown clayey sandy silt with charcoal, chalk flecks and CBM inclusions.

5.6.3 Extending along the length of the north aisle and beside the north transept was Structure 163, measuring *c.* 70m long, *c.* 2m wide and *c*. 0.5m deep. Structure 163 comprised a stone, brick and tile drain, wall and covered culverts inserted alongside the cathedral in the 1860s/1870s. A north to

south orientated feature ([195]), which may have been a drainage channel, may also have been associated with this period of construction. It was only seen in section and was not excavated as it lay below the slope of the new swale drain. The cut for Structure 163 ([164]) was seen along the majority of the north aisle trench, truncating Structures 125 and 193, Skeletons SK114, SK177 and SK180, and also unexcavated graves which were below the impact level of the swale.

5.6.4 Areas of charnel were seen along the length of both trenches. Charnel Pit [142] was seen in the south-west corner of the Trench 2 and extended south and west out of the limit of excavation. Concentrated areas of disarticulated human bones: (108), (110), (111) and (120), were also seen along the length of Trench 1.

5.7 Modern: Structure 104, Charnel Pit [105] and disarticulated bone (102), (103), (106) and (107)

5.7.1 The major feature of this period was the insertion of a concrete footing parallel to the north aisle, and areas of disturbed, disarticulated bone and charnel pits in both trenches.

5.7.2 A steel-reinforced concrete foundation plinth, Structure 104, was seen running parallel to the north wall of the cathedral for *c*. 30m. It measured *c*. 0.35m wide and 0.23m deep. Disarticulated human bones were seen under the concrete and also within it. The foundation is thought to be a temporary footing for scaffolding erected during repairs to the cathedral roof in the 1980s. Regularly-spaced square holes cut into the mortar foundation of the north wall of the Cathedral probably also relate to this repair work.

5.7.3 Areas of disarticulated human bone (102), (103), (106) and (107) were seen within Trench 1 and presumably relate to the truncation of graves or already disarticulated bones by Structure 104. A large charnel pit [105] was revealed at the northern end of Trench 2, measuring 1.2m long and 0.9m wide.

6 THE FINDS

6.1 Glass

6.1.1 A small quantity of glass was found during excavation of Trench 1 of the Swale. The fragments of glass are small and thin, varying in thickness from 1.18-2.9mm. Some fragments appear to be coated in a pearlescent substance, which in some instances has flaked off. The coated fragments of glass are slightly thicker than the non-coated fragments. The thinnest fragment, which came from Grave [155], appears to have a reddish colour, completely different from the other fragments. The glass itself, where visible, varies between a pale green to a deep green-purple colour (Plate 12).

6.1.2 It is recommended that the glass is looked at in more detail by a suitably qualified specialist. The Stained Glass Museum at Ely Cathedral is the ideal candidate for this work.

6.2 Pottery by Berni Sudds

Context	Type	Date (AD)
U/S	Glazed red earthenware x 2	1500 - 1900
153	Medieval peg tile x1	1180 - 1500
161	Medieval Ely ware jug x1	1200 - 1400
161	Glazed red earthenware x 1	1500 – 1900 (probably early p-med 1500 – 1700)
161	Medieval peg tile x2	1180 – 1500 (1x locally produced)
161	Decorated roof tile/ furniture x1	1180 – 1500 (Looks like an Ely fabric. Green glazed. Crenellated ridge tile?)
176	Medieval Ely ware jug x1	1200 - 1400
181	Medieval Ely ware x2	1200 – 1400 (1x jug)
181	?Roman sandy coarseware x 1	43 - 400 (small sherd, abraded)

Table 1: Pottery spot dates

6.3 Metalwork

6.3.1 During excavation of the skeletons, a number of dress pins were uncovered. Three pins and a small quantity of textile were retrieved during the excavation of SK130 (Grave [129]), two pins and a small quantity of textile came from SK122 (Grave [121]), four pieces (possibly two pins) and possible

textile fragments came from SK132 (Grave [156]) and one pin came from SK183 (Grave [182]) (Plate 11).

6.3.2 The preservation of these possible dress pins, and their associated fabric/ textile, is quite good, with some of the pins merely bent and not broken. The presence of these dress pins suggests that the deceased were clothed when they were buried.

6.3.3 The dress pins appear to have been manufactured by machine. It is recommended that further analysis be carried out on these dress pins and the fabric/ textile remnants.

7 DISCUSSION

7.1 The earliest features seen during archaeological monitoring of the Cross Green Swale were the foundation layers and north to south aligned walls in Trench 1, which appear to relate to the construction of the parish church of Holy Cross. Construction work began in AD 1341-2 and was completed by AD 1459-60. Structures 125 and 173, both on a north to south alignment, appear to correspond fairly closely with the documented location of the church, which is believed to have lain between the third and fifth bays of the nave (Figure 3). An additional feature, Structure 193, which may be another wall on a north to south alignment, was seen in the eastern end of Trench 1. This does not appear to correspond with the documented location of the church. It may relate to a small external wall around the parish church or an additional structure or extension which is not documented. Unfortunately, further excavation of the walls was not possible as they were below the impact level of the swale works.

7.2 Documentary sources detail that the parish church was a lean-to against the north wall of the north aisle, without sun or cross-ventilation, and it seemed to be unsatisfactory from its completion in AD 1459-60 (Website 2). The church was subsequently demolished after the parishioners moved into the Lady Chapel in around 1550 and this was seen across site, with a robber trench and multiple layers of demolition.

7.3 Activity on the site following the demolition of the church comprised the inhumation of at least twenty burials on an east to west alignment. The location of the church of Holy Cross had previously been used as the lay cemetery in the 13th century and, after the demolition of the church around 1566, it reverted to this previous use.

7.4 The Cross Green cemetery went out of use in the mid 19th century and this was followed by a reduction in ground level by *c.* 1m and the insertion of drains along the foot of the wall of the north aisle and the west elevation of the north transept, both measures intended to solve problems with damp on the inside of the nave wall.

7.5 During initial machining, a reinforced concrete foundation was revealed running parallel to the nave. This is believed be a plinth for scaffolding for maintenance work to the nave roof carried out in the 1980s. The holes in the base of the wall of the north aisle are also thought to relate to this repair work.

8 CONCLUSIONS

8.1 Archaeological monitoring of the Cross Green Swale identified six broad phases of activity alongside the wall of the north aisle and west face of the north transept. Dating of these phases is tentative, being based on the known history of Ely Cathedral and stratigraphic relationships.

8.2 The earliest phase recorded comprised three walls, aligned north to south, which were potentially part of the church of Holy Cross, constructed during the 14th and 15th centuries as a lean-to against the north side of the cathedral. Unfortunately, the 1860s drain system had removed any evidence to determine whether the walls continued to the nave. Since so little of these features were seen or excavated during the monitoring, it is unclear what the exact function of the walls was and how they relate to each other and to the nave. These features were all left in situ as they were at or below the impact level of the new swale drain.

8.3 The next 'phase' relates to the demolition of the church in around AD 1566. This was seen across the site in various demolition layers. Fragments of 12th- or 13th-century columns were seen in demolition layer (116) as was a 13th-century tombstone (Plate 8).

8.4 Following the demolition of the church in the late 16th century, the site returned to its previous use as a cemetery, with two burials clearly cutting the walls (Plate 7) and a further twelve cutting the demolition layers of the earlier church. Sixteen burials and numerous deposits of disarticulated charnel material were recorded and then carefully lifted for reburial elsewhere within the cathedral grounds.

8.5 Cross Green cemetery went out of use in the mid 19th century and a silty layer (161) was seen overlying the graves in the north aisle trench (Trench 1). Drains and culverts were put in along the length of the north aisle and the west face of the north transept in the 1860s-70s and the ground level was reduced by *c*. 1m in response to damp on the inside of the north nave wall.

8.6 Areas of disarticulated human bone and charnel pits were seen in several phases on this site. Graves were truncated by later graves while the cemetery was still in use, but also by later phases of activity such as the construction of the drainage system and the concrete footings for the scaffolding erected in the late 1980s during maintenance work to the nave roof.

9 ACKNOWLEDGEMENTS

9.1 Pre-Construct Archaeology Ltd would like to thank Philip Dixon Associates for commissioning the work. Further thanks are extended to Vicki Roulinson, Clerk of Works at Ely Cathedral, for her help in a number of aspects of the project. The author would like to thank the site team: Natalia Greed, Matthew Jones, Sîan O'Neil and Aileen Tierney for all their hard work for the duration of the project, under the supervision of Mary-Anne Slater. Machining was carried out by Flanders Brothers Ltd. Figures accompanying this report were prepared by Jennifer Simonson of PCA's CAD Department. Pottery was commented on by Berni Sudds. On-site osteological analysis was carried out by Aileen Tierney. This report was edited by Tom Woolhouse.

10 BIBLIOGRAPHY

10.1 Printed Source

Boyer, P. and Woolhouse, T. 2013 Archaeological Excavation on the Site of the Almonry Restaurant Extension, Ely Cathedral, Cambridgeshire (unpublished, Pre-Construct Archaeology Ltd)

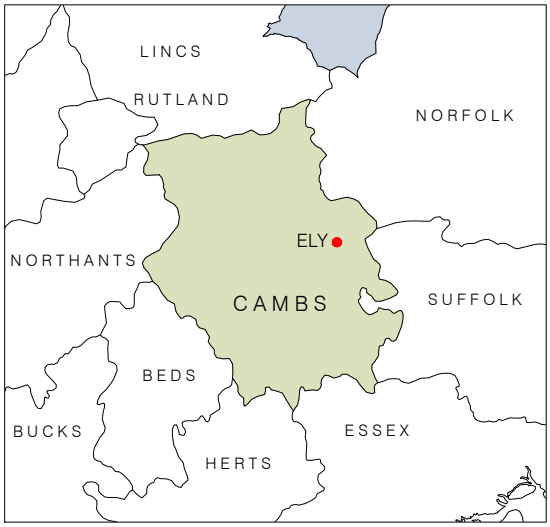
Dixon, P. 2014a The Cross Green Swale, Ely. Project Specification for Excavation and Supervision of the Proposals for a Swale at Cross Green Together with Specifications for Archaeological Monitoring and Recording (unpublished, Philip Dixon Associates)

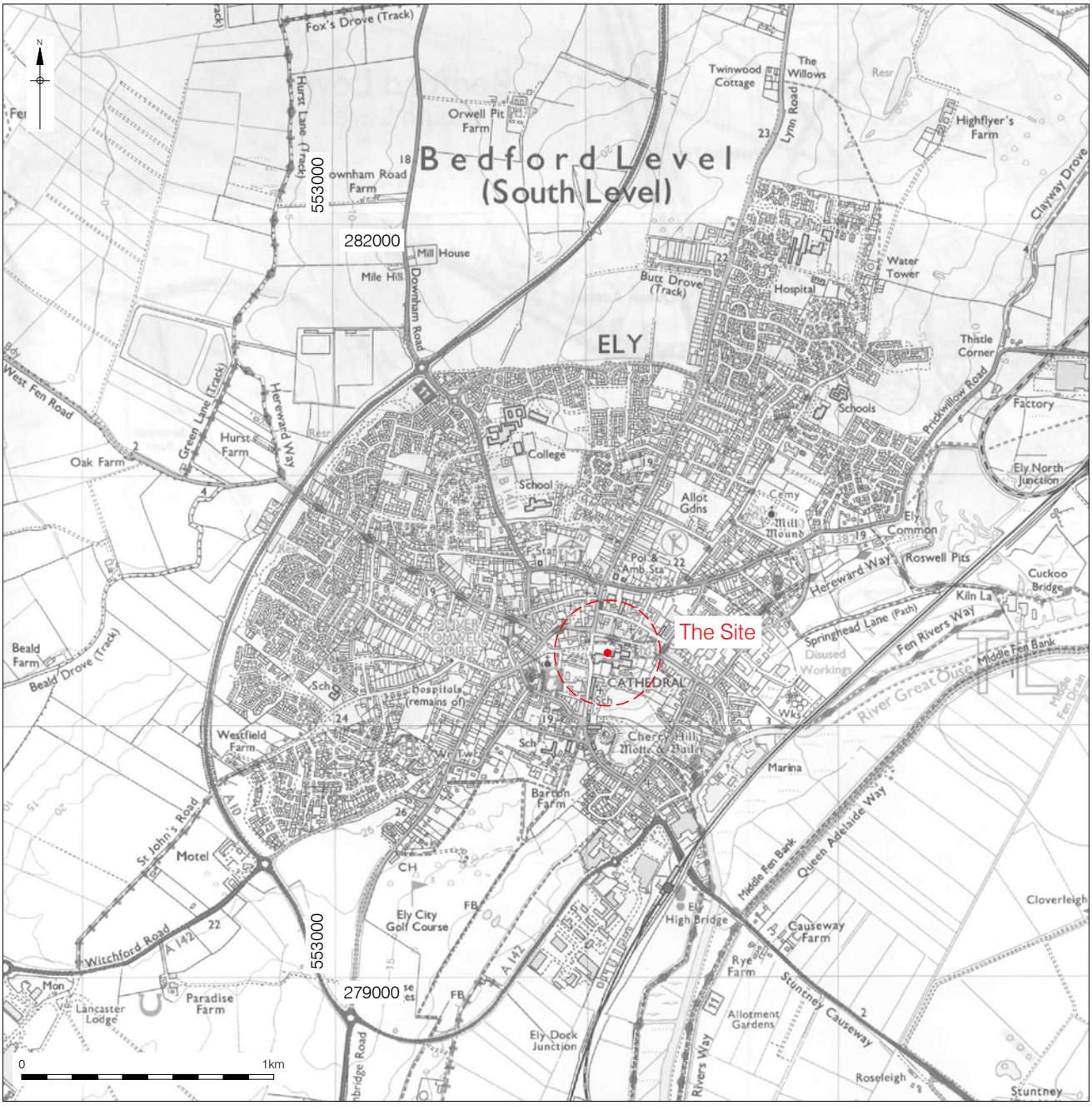
Dixon, P. 2014b An Assessment of the Archaeological Implications of the Swale at Cross Green, Ely (unpublished, Philip Dixon Associates)

10.2 Websites

1) British Geological Survey 2014 Geology of Britain Viewer http://mapapps.bgs.ac.uk/geologyofbritain/home.html?location=IP9%203DG.Date accessed 20 February 2014

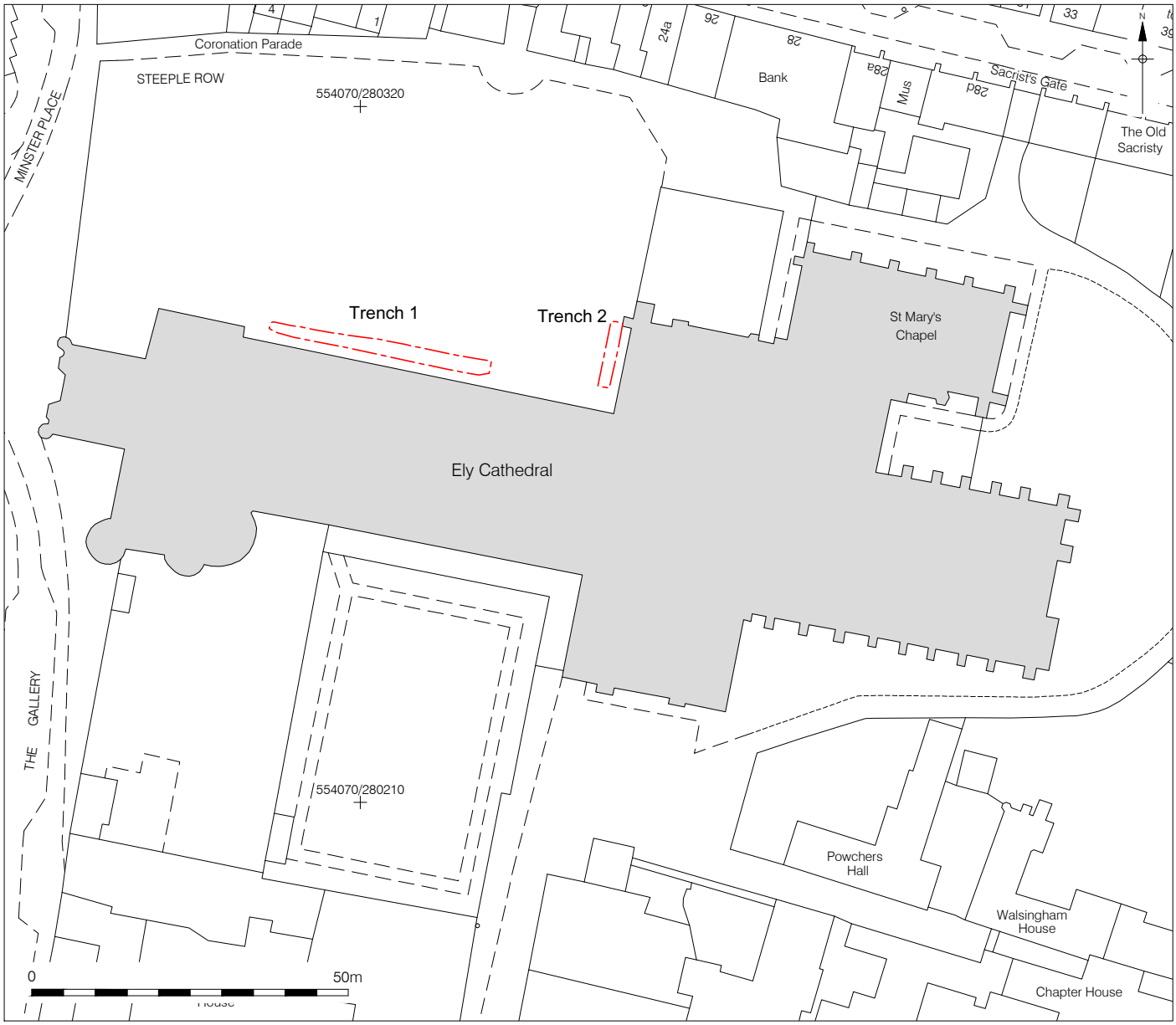
2) British History Online http://www.british-history.ac.uk/report.aspx?compid=21893#n13. Date accessed 16 July 2014





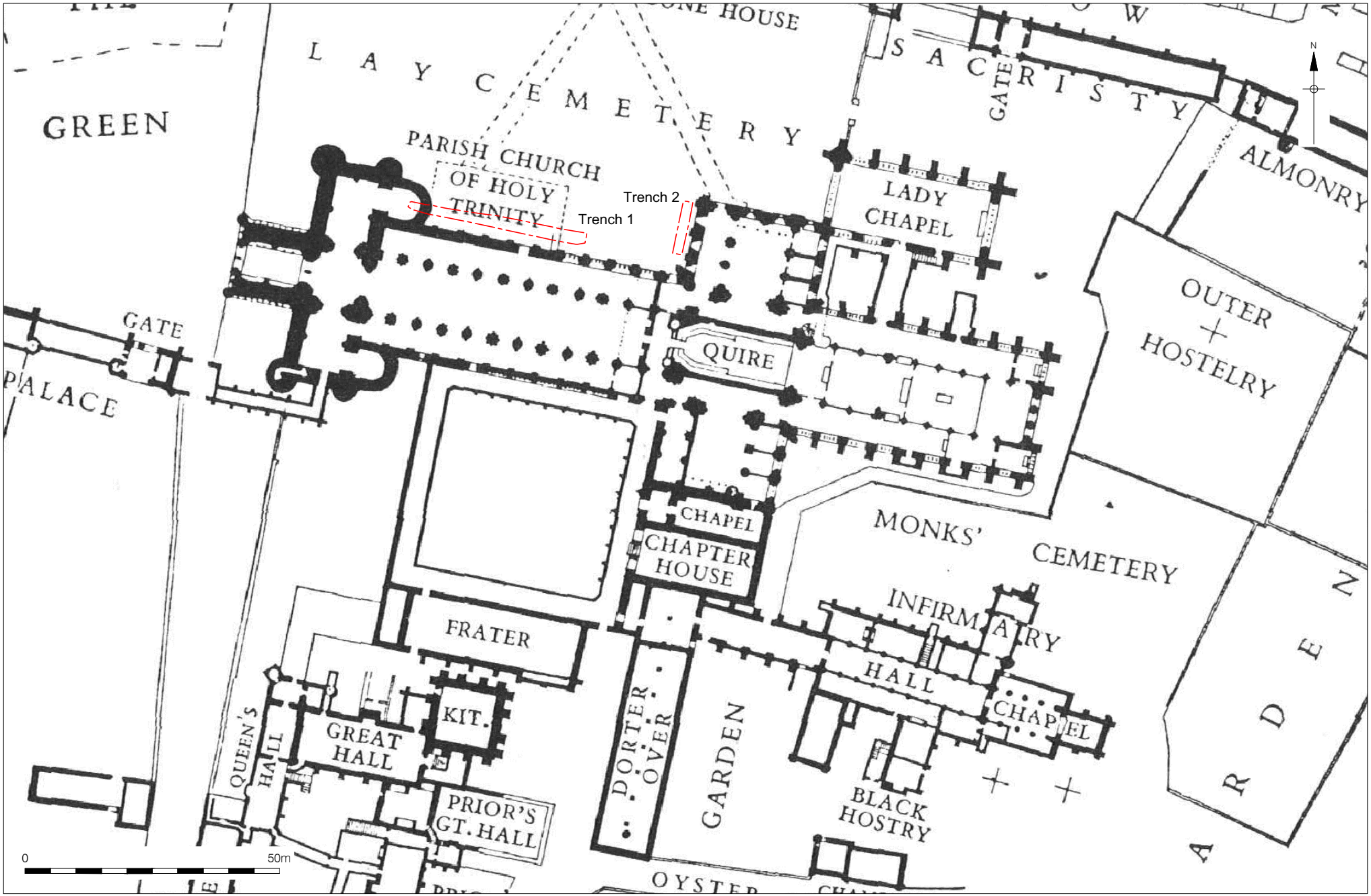
07/08/14 JS

Figure 1
Site Location
1:2,000,000 and 25,000 at A4



07/08/14 JS

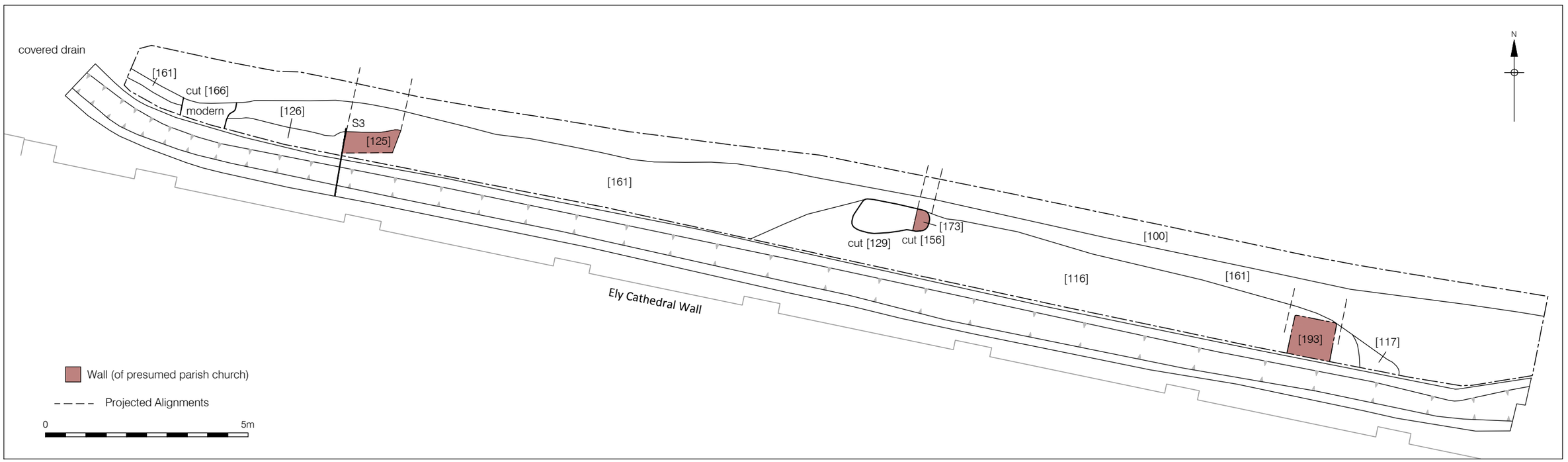
Figure 2
Trench Location
1:1,000 at A4



After T D Atkinson, VCH, taken from Maddison, 2000 (with additional map information to the east from Ordnance Survey 1903)

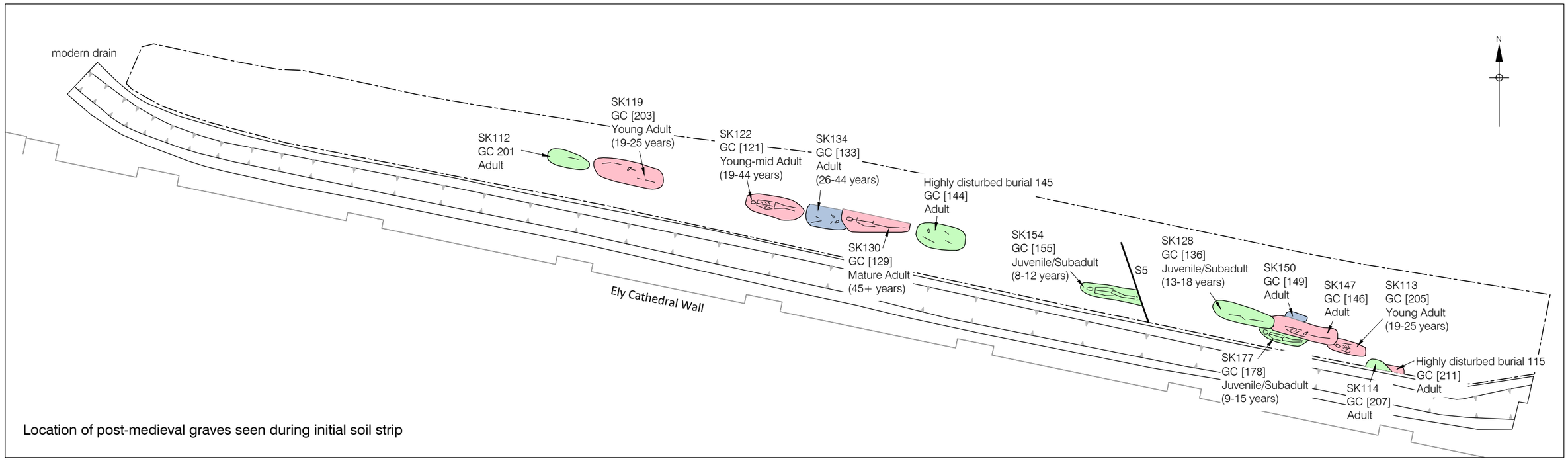
07/08/14 JS

Figure 3
Detail of location of parish church of Holy Trinity
1:1,000 at A4



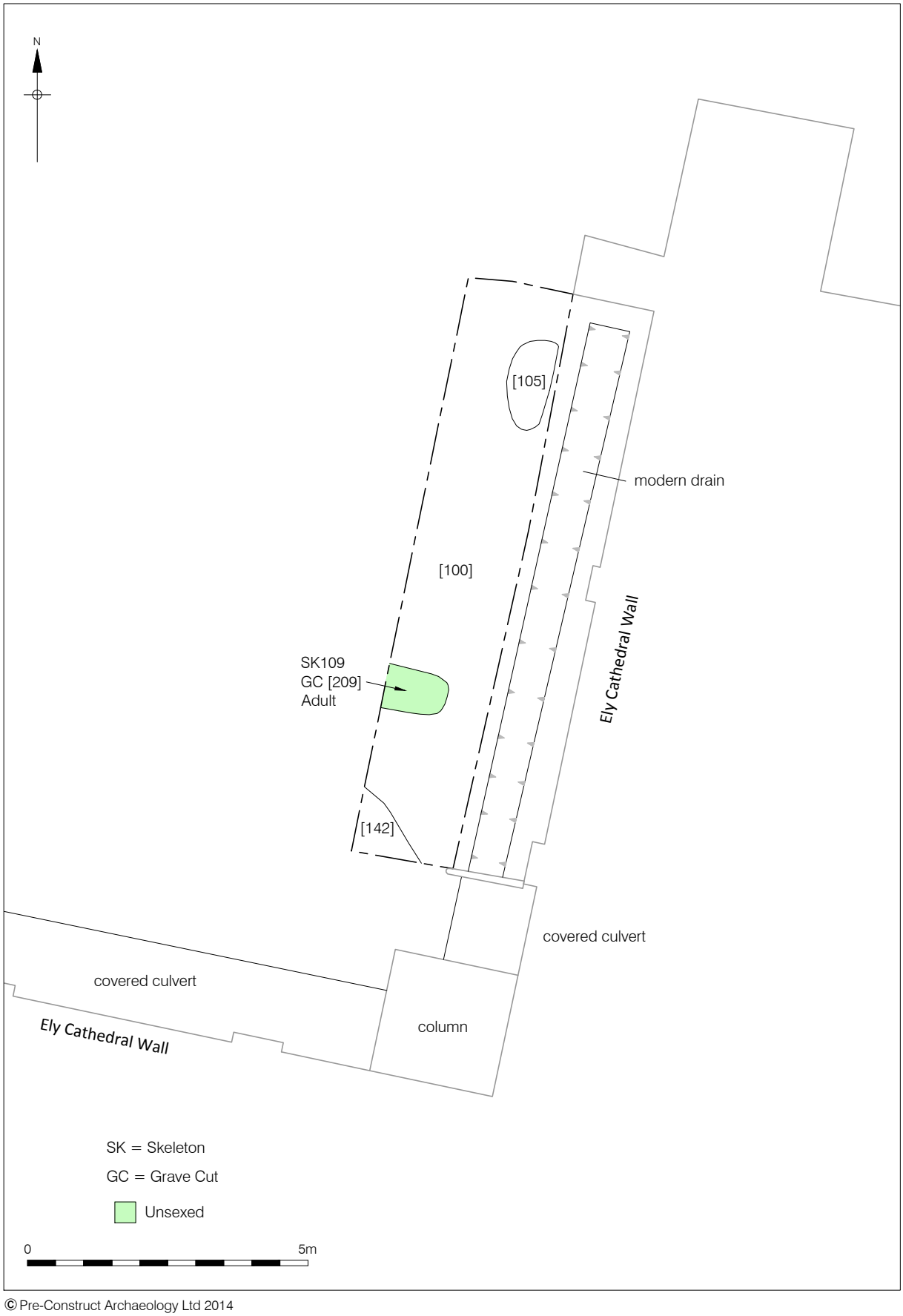
07/08/14 JS
20/08/14 Revision _JS

Figure 4
Trench 1 Plan showing the Masonry
1:100 at A3



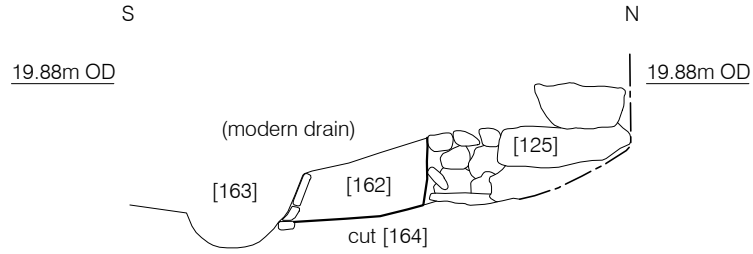
07/08/14 JS

Figure 5
Trench 1 Plan showing the Burials and Unexcavated Features
1:100 at A3

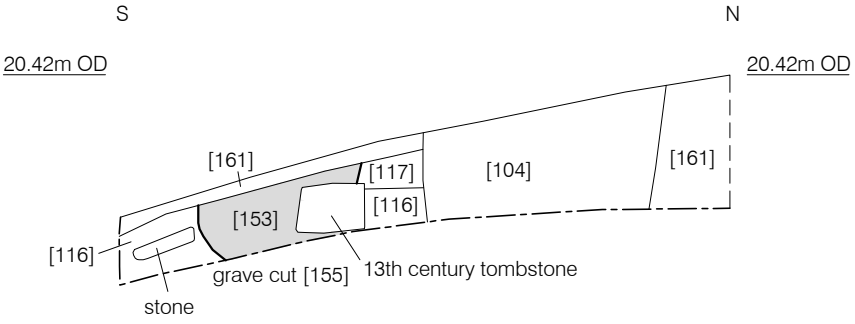


07/08/14 JS

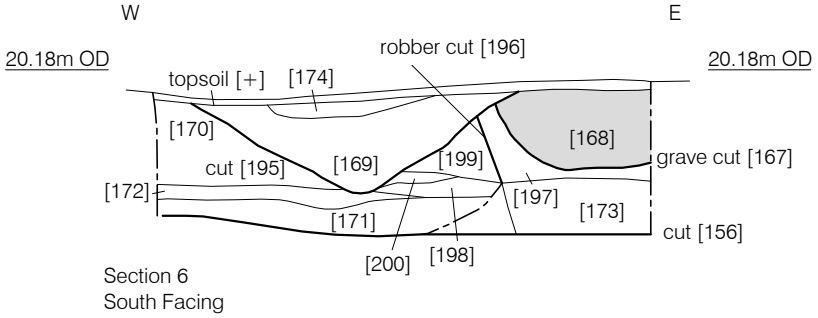
Figure 6
Plan of Trench 2
1:100 at A4



Section 3
East Facing



Section 5
East Facing



Section 6
South Facing

0 1m

07/08/14 JS
20/08/14 Revision 2_JS

Figure 7
Sections 3, 5 & 6
1:20 at A4

11 APPENDIX 1: PLATES

Plate 1: The site, view east

Plate 2: The site, view west

Plate 3: Trench 1, view east showing extent of sandy mortar demolition layers from parish church

Plate 4: Trench 1, view north-west showing extent of demolition layers from parish church

Plate 5: Structure 125, view north

Plate 6: Structure 173, view east

Plate 7: SK132 [156] cutting Structure 173, view north

Plate 8: SK154 [155] above 13th-century tombstone found in demolition layer (116), view north

Plate 9: Working shot with SK180 [179] and SK183 [182], view south

Plate 10: Working shot of on-site survey, view south-west

Plate 11: Dress pins

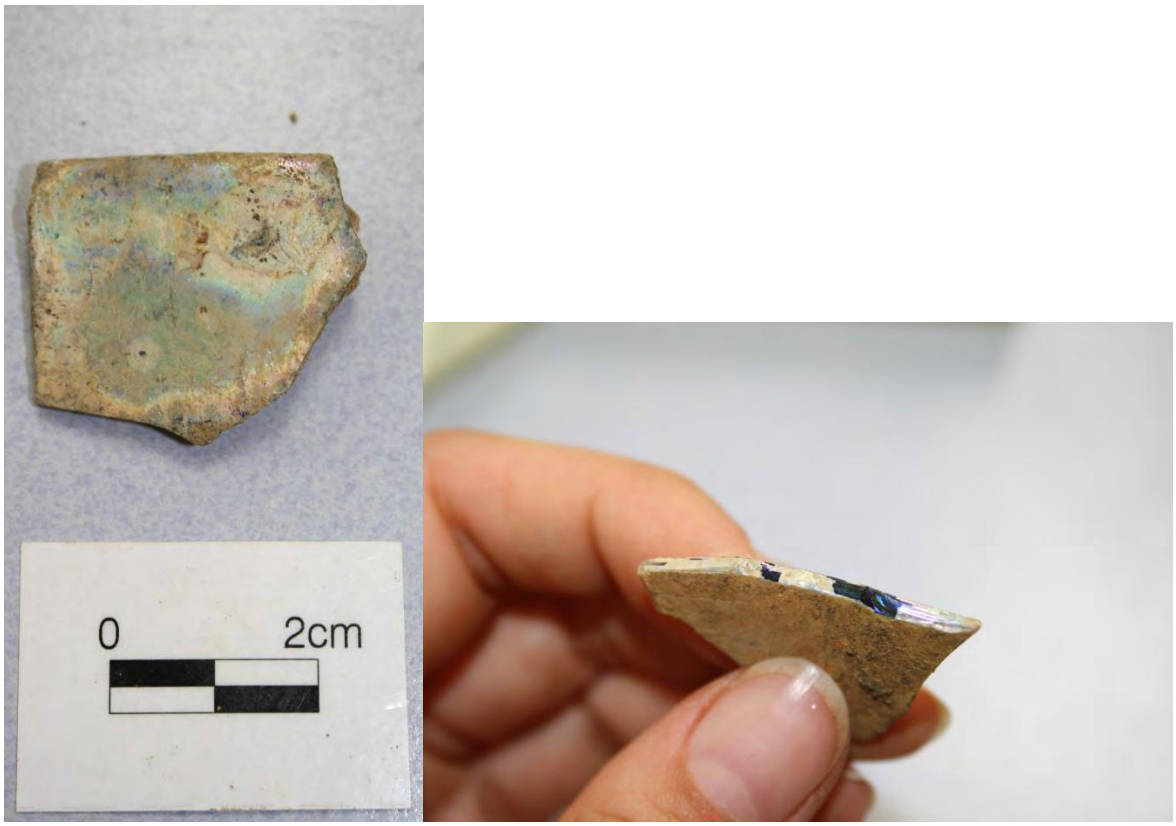


Plate 12: Glass fragments

12 APPENDIX 2: CONTEXT INDEX

Context	Cut	Type	Category	Period
100	n/a	Layer	Overburden	
101	n/a	Layer	Overburden	1860s/70s
102	n/a	Fill	HSR	
103	n/a	Fill	HSR	
104	n/a	Layer	Structure	
105	n/a	Fill	HSR	
106	n/a	Fill	HSR	
107	n/a	Fill	HSR	
108	n/a	Fill	HSR	
109	n/a	Fill	Skeleton	
110	n/a	Fill	HSR	
111	n/a	Fill	HSR	
112	n/a	Fill	Skeleton	
113	n/a	Fill	Skeleton	
114	n/a	Fill	Skeleton	
115	122	Fill	HSR	
116	n/a	Layer	Deposit	
117	n/a	Layer	Deposit	
118	n/a	Fill	HSR	
119	n/a	Fill	Skeleton	
120	n/a	Fill	HSR	
121	121	Cut	Grave	
122	121	Fill	Skeleton	
123	121	Fill	Coffin	
124	121	Fill	Grave	
125	n/a	Layer	Structure	14th c?
126	n/a	Layer	Layer	14th c?
127	n/a	Fill	HSR	
128	136	Fill	Skeleton	
129	129	Cut	Grave	
130	129	Fill	Skeleton	
131	129	Fill	Grave	
132	156	Fill	Skeleton	
133	133	Cut	Grave	
134	133	Fill	Skeleton	
135	133	Fill	Grave	
136	136	Cut	Grave	
137	137	Cut	Grave	
138	137	Fill	Skeleton	
139	137	Fill	Grave	
140	129	Fill	Coffin fill	
141	129	Fill	Coffin	
142	n/a	Fill	Charnel pit	
143	136	Fill	Grave	
144	144	Cut	Grave	
145	144	Fill	Grave	
146	146	Cut	Grave	

147	146	Fill	Skeleton	
148	146	Fill	Grave	
149	149	Cut	Grave	
150	149	Fill	Skeleton	
151	149	Fill	Grave	
152	152	Cut	Pit	
153	155	Fill	Grave	
154	155	Fill	Skeleton	
155	155	Cut	Grave	
156	156	Cut	Grave	
157	156	Fill	Grave	
158	156	Fill	Coffin fill	
159	156	Fill	Coffin	
160	152	Fill	Pit	
161	n/a	Layer	Overburden	
162	164	Fill	Drain	1860s
163	164	Layer	Drain wall	1860s
164	164	Cut	Drain	1860s
165	166	Fill	Modern	Modern
166	166	Cut	Modern	Modern
167	167	Cut	Grave	
168	167	Fill	Grave	
169	195	Fill	Fill	
170	n/a	Fill	Fill	
171	n/a	Fill	Fill	
172	n/a	Fill	Fill	
173	n/a	Fill	Fill	
174	n/a	Fill	Fill	
175	n/a	Fill	HRS	
176	178	Fill	Grave	
177	178	Fill	Skeleton	
178	178	Cut	Grave	
179	179	Cut	Grave	
180	179	Fill	Skeleton	
181	179	Fill	Grave	
182	182	Cut	Grave	
183	182	Fill	Skeleton	
184	182	Fill	Grave	
185	185	Cut	Grave	
186	185	Fill	Skeleton	
187	185	Fill	Grave	
188	179	Fill	Coffin	
189	n/a	Fill	Coffin	
191	n/a	Layer	Layer	
192	192	Cut	Wall	
193	192	Layer	Structure	
194	n/a	Layer	Layer	
195	195	Cut	Ditch	
196	196	Cut	Robber trench	
197	196	Fill	Robber trench	

198	n/a	Fill	Demolition	
199	n/a	Fill	Demolition	
200	n/a	Fill	Demolition	
201	201	Cut	Grave	
202	201	Fill	Grave	
203	203	Cut	Grave	
204	203	Fill	Grave	
205	205	Cut	Grave	
206	205	Fill	Grave	
207	207	Cut	Grave	
208	207	Fill	Grave	
209	209	Cut	Grave	
210	209	Fill	Grave	
211	211	Cut	Grave	

13 APPENDIX 3: OSTEOLOGICAL REPORT – AILEEN TIERNEY

Introduction

This report is an analysis of the inhumations recovered during archaeological monitoring at Ely Cathedral. On-site osteological analysis was carried out on twenty inhumations discovered during this work. Where possible, all skeletal elements were examined to allow for ageing and sexing of the individuals, in addition to noting pathological changes on the bone. Following this on-site analysis, the remains were given back to the Cathedral to be reburied.

Of the twenty inhumations analysed, two of the remains were quite disturbed and two were left unexcavated. The two unexcavated bodies were below the level of impaction and as such could be left in-situ. The remaining sixteen inhumations ranged from partially truncated to completely undisturbed remains.

Methodology

The remains were excavated in accordance with the IFA guidelines (McKinley and Roberts, 1993). Cut numbers were allocated even when a grave cut was not visible. Highly disturbed remains were allocated a cut and fill number (i.e. no skeleton number) and the remains were briefly analysed once lifted. For remains which did not appear articulated, a deposit number was allocated to them and the material was photographed and lifted. These deposits were not analysed.

Articulated or partially articulated skeletons did undergo on-site analysis. General methods used in the osteological evaluation of all the human skeletal material are those of Buikstra and Ubelaker (1994). An assessment of age was based on the stages of dental development and eruption (Bass, 1995) and epiphyseal union. Cranial sutures were also consulted where applicable. The age categories used in this report are:

infant	0-4 years
juvenile	5-12 years
subadult	13-18 years
young adult	19-25 years
middle adult	26-44 years
mature adult	45 years +

There may be overlaps between categories or a broad category, such as adult, where insufficient evidence was present. In addition to this ageing criteria, degenerative diseases have been used to further age human remains and to suggest ‘’middle’’ or ‘’mature’’ as opposed to just identifying fused bone and stating ‘’adult’’. Metrical data was also used in the aging of the immature individuals.

In keeping with standard practice, no attempt was made to sex the immature individuals. The sex of

adult individuals was ascertained where possible from sexually dimorphic traits of the skeleton (Buikstra and Ubelaker 1994) and metrical data.

Each element was identified macroscopically. Identification of elements allowed for completeness of skeleton to be ascertained.

Material

The inhumations will be discussed in order of skeleton number and will reference the associated cut number. As the work was being carried out on a slope, cuts were not always visible but were allocated numbers to assist in the identification of skeletons and their graves. The highly disturbed remains are briefly discussed following the main skeleton summary.

SK109 [209]

This individual was the only skeleton from Trench 2. The skeleton was sufficiently below the level of impaction and therefore was not excavated. Both tibiae and fibulae were visible and therefore can tentatively be aged as adult. No sex can be assigned.

SK112 [201]

This left leg and foot was allocated a skeleton number as it was articulated and therefore part of a highly disturbed grave. The partial skeleton can be aged as adult, but no sex can be assigned.

SK113 [205]

Skeleton 113 was another partial skeleton, which had been truncated by a later feature. All that remained were the skull, torso and upper limbs. This individual is a probable female aged between 19 and 25 years of age (young adult). Her teeth showed evidence for linear enamel hypoplasia (LEH) which can reflect health status and diet quality. The hypoplastic lines form in the enamel surface of teeth when the normal process of tooth growth stops, most likely caused by disease or nutrition. In addition to this, she has a number of accessory teeth; two extra upper canines, one on each side of the dental arcade.

SK114 [207]

This partial skeleton had been truncated a number of times, the most obvious truncation due to the construction of Structure 163. The remains of the left torso and partial humerus have aged this individual as adult. No sex can be assigned.

SK119 [203]

While disturbed, survival of the pelvis allowed for the sexing of this individual. This individual is probable female aged between 19 and 25 years of age (young adult). There was evidence of a coffin (189) associated with this skeleton.

SK122 [121]

This possible female has been allocated the broad category of young – middle adult. This is based on fusion of certain bones but also takes into account marginal lipping on her vertebrae. This lipping may be a result of occupational related activity. This individual's teeth showed evidence of caries ranging from mild to extreme. Her left lower third molar has been completely obliterated by caries, leaving only the root, while her lower left first and second molar are both absent and their sockets resorbed, suggesting that both those teeth had been missing for a long time in her life to allow for that level of bone growth in the alveolar bone. Two dress pins and remnants of fabric/textile were found beneath the skull of this individual.

SK128 [136]

All that remained of this skeleton were the right arm and leg (including hand and foot) and a left femur fragment. Consultation of epiphyseal fusion data resulted in this individual being aged as subadult (13 - 18 years of age).

SK130 [129]

This grave was truncated by SK132 [156]. As a result of this, only the right half of the skeleton was present, including the skull. The left humerus retrieved from above the skeleton and believed to belong to SK130 was, however, from another individual and not part of the disturbed skeleton. Evidence of osteoarthritis (OA) and degenerative joint disease (DJD) were noted on a number of bones of this possible female. These age related pathologies, in addition to a mandible with no tooth sockets remaining, has allowed this individual to be aged as mature adult (45+ years of age). Three dress pins and remnant of fabric/textile were found by the cranium of this individual.

SK132 [156] Plate 7

With only four remaining tooth sockets and evidence of marginal lipping on her cervical vertebrae in addition to anterior fusion of T6 and T7, this individual is a mature adult (45+ years of age) possible female. Her vertebrae also displayed the beginning stages of Diffuse Idiopathic Skeletal Hyperostosis (DISH) with flowing calcification and ossification occurring on the right side of the lumbar vertebrae. Symmetrical enthesopathy of the olecranon supports this diagnosis of DISH. Two dress pins and remnants of fabric/textile were found by the cranium and cervical vertebrae.

SK134 [133]

This grave was highly disturbed with only a small quantity of bones from the upper half of the body in articulation. All sexually dimorphic elements of the skull stated male for this individual, however the pelvis was absent. While no significant lipping was noted on the bones, the majority of his teeth show extreme wear, with lower left and right first and second molars absent and their sockets resorbed. Extreme caries has also been noted on a number of teeth and this may explain the tooth loss. This probable male has been aged as middle adult (26 – 44 years of age).

SK138 [137]

This individual is a possible female. Evidence of Schmorl's nodes on her lumbar vertebrae show this individual suffered from Degenerative Joint Disease (DJD). This has aged this individual as mature adult (45 + years of age). This grave was truncated by [136], Structure 104 and the lightning conductor trench.

SK147 [146]

This skeleton also suffered a degree of truncation, with the skull, the left arm and left leg missing. The generally gracile nature of the skeleton, in addition to the sciatic notch allowed for a probable female assessment. A broad age category of adult is all that can be assigned to this individual. There was a green stain on this individual's cervical vertebrae which suggests the presence of a dress pin.

SK150 [149]

This grave was highly truncated with only a small quantity of bone remaining. The pelvis was present which allowed for the individual to be sexed as male. A broad age category of adult has been assigned to this individual.

SK154 [153] Plate 8

This individual was aged as juvenile/subadult (8 – 12 years of age) using metrical data and tooth eruption data. There were also coffin fittings associated with this burial. A 13th century tombstone was found directly beneath the skeleton in the demolition layer of the parish church.

SK 177 [178]

The majority of this skeleton was intact, aside from Structure 163 truncating the right proximal tibia and fibula. Aging was carried out tooth eruption and epiphyseal fusion data which resulted in this individual being aged as juvenile/subadult (9 – 15 years).

SK180 [179]

This mature male was slightly truncated by another grave [182] to the north and by Structure 163 to the south. Evidence of OA was identified on a number of bones in addition to slight lipping on the vertebrae.

SK183 [182]

This subadult (12 – 15 years) was aged using tooth eruption and epiphyseal fusion data. This grave appears to have truncated the graves either side of it: [179] and [185]. A dress pin was retrieved from by the leg of this individual.

SK186 [185]

As only the left leg of this individual was uncovered, the broad age category of adult has been

assigned. It was below the level of impact, and therefore was left unexcavated in-situ.

(115) [211]
These highly disturbed adult remains were not allocated a skeleton number as they were borderline disarticulated. Female attributes were noted on the skull, in addition to the general gracile nature of the long bones.

(145) [144]
These highly disturbed adult remains were not allocated a skeleton number as they were borderline disarticulated. Due to the fragmentary nature of this deposit, no sex could be assigned.

Results

Of the twenty inhumations, there were three probable adult males, four probable adult females, with a further four possible adult females, five unsexed adults and four adolescents. The results of the osteological analysis is summarised in the table below (Table 2). The same pathologies were noted across the group. Dental pathologies were consistent of the time period, with prevalent calculus and tooth decay. Linear enamel hypoplasia (LEH) was noted in three individuals. The hypoplastic lines ranged from slight to moderate grooves encircling the tooth crown at the same level. These deficiencies in enamel thickness can be caused for a variety of reasons but tend to reflect systematic metabolic stress which can perhaps give us an insight into health status and diet quality.

Five individuals exhibited evidence of osteoarthritis, with one case of eburnation of the dens of the second cervical vertebra. There was one instance of Schmorl's nodes which result from Degenerative Joint Disease (DJD). These depressions result from herniation of the nucleus pulposus, or slipped disc as it is more commonly referred to.

One individual displayed a case of Diffuse Idiopathic Skeletal Hyperostosis (DISH), both on the spine and some of the long bones. While the etiology of DISH is unknown, it is a common disease in middle – mature individuals. Although DISH frequently affects the spines as was apparent in this individual, other skeletal elements may also be affected. On this individual, enthesophytes (irregular ossifications) were noted on both ulnae and to a lesser extent on both humeri.

Conclusions and Recommendations

This group of individuals analysed range throughout all age groups and all levels of health. While no infants or younger juveniles were found articulated during the works, a significant quantity of their remains were found in the disarticulated bone in the layers above the graves excavated. This shows that a high number of infant graves were disturbed. Understandably as this is a very busy burial ground, truncation did occur through the burial of later individuals, although the visible works carried out in Victorian times and later have also played their part in truncating burials and increasing the quantity of disarticulated bone recovered.

No further work is required on these skeletons. All the skeletal material has been returned to Ely Cathedral for reburial.

References

Bass, W. M. 1995. Human Osteology: a laboratory and field manual Missouri Archaeological Society, Inc.

Brothwell, D.R. 1981 Digging up bones Cornell University Press; 3rd Revised edition

Buikstra, J.E & Ubelaker, D.H. 1994 Standards for data collection from human skeletal remains Arkansas Archaeological Survey Research Series no. 44

McKinley, J.I. & Roberts, C. 1993 Excavation and post-excavation treatment of cremated and inhumed human remains, IFA technical paper No.13

Skeleton Number	Cut Number	Fill Number	Coffin Number	Coffin Fill	Sex	Age	Comments	Lifted?
109	209	210			??	Adult	Unexcavated	N
112	201	202			??	Adult		Y
113	205	206			?F	Young adult (19 - 25 ya)		Y
114	207	208			??	Adult		Y
119	203	204	189		?F	Young adult (19 - 25 ya)		Y
122	121	124	123		??F	Young - mid adult ? (19 - 44 ya)		Y
128	136	143			n/a	Subadult (13 - 18 years)		Y
130	129	131	141	140	??F	Mature adult (45+ ya)		Y
132	156	157	159	158	??F	Mature adult (45+ ya)		Y
134	133	135			?M	Middle adult (26 - 44 ya)		Y
138	137	139			??F	Mature adult (45+ ya)		Y
147	146	148			?F	Adult		Y
150	149	151			?M	Adult		Y
154	153	155			n/a	Juvenile / Subadult (8 - 12 years)		Y
177	178	176			n/a	Juvenile / Subadult (9 - 15 years)		Y
180	179	181	188		?M	Mature adult (45+ ya)		Y
183	182	184			n/a	Subadult (12 - 15 years)		Y
186	185	187			??	Adult	Unexcavated	N
	144	145			??	Adult	Disarticulated	Y
	211	115			?F	Adult	Disarticulated	Y

Table 2: Main osteological table showing age and sex of all skeletons

14 APPENDIX 4: OASIS FORM

OASIS ID: preconst1-185015

Project details

Project name	The Cross Green Swale, Ely Cathedral
Short description of the project	This report describes the results of archaeological monitoring carried out by Pre-Construct Archaeology at The Cross Green Swale, Ely Cathedral, Ely, Cambridgeshire between 25th June and 11th July 2014. The archaeological monitoring was commissioned by Philip Dixon Associates. The aim of the work was to assess the extent, date, state of preservation and significance of any features or archaeological deposits. The monitoring identified and excavated 18 inhumation burials dating to the post-medieval period and three potential walls aligned north-south and multiple demolition layers which appeared to relate to the 14th century parish church of Holy Cross (later Holy Trinity).
Project dates	Start: 25-06-2014 End: 11-07-2014
Previous/future work	No / Not known
Any associated project reference codes	CECS14 - Sitecode
Type of project	Field evaluation
Site status	Listed Building
Current Land use	Other 4 - Churchyard
Monument type	PARISH CHURCH Medieval
Monument type	INHUMATION CEMETERY Post Medieval
Monument type	INHUMATION BURIALS Post Medieval
Monument type	DRAINAGE SYSTEM Post Medieval
Significant Finds	COFFIN FITTINGS Post Medieval
Significant Finds	TOMBSTONE Medieval
Significant Finds	COLUMN Medieval

Significant Finds	WINDOW GLASS Medieval
Significant Finds	DRESS PINS Post Medieval
Methods & techniques	"Survey/Recording Of Fabric/Structure","Targeted Trenches"
Development type	Large/ medium scale extensions to existing structures (e.g. church, school, hospitals, law courts, etc.)
Prompt	Conservation/ restoration
Position in the planning process	Not known / Not recorded

Project location

Country	England
Site location	CAMBRIDGESHIRE EAST CAMBRIDGESHIRE ELY Cross Green Swale, Ely Cathedral
Postcode	CB7 4JY
Study area	0 Square metres
Site coordinates	TL 554068 280287 51.9285827836 0.260502137915 51 55 42 N 000 15 37 E Point

Project creators

Name of Organisation	Pre-Construct Archaeology Ltd.
Project brief originator	Philip Dixon
Project design originator	Philip Dixon
Project director/manager	Mark Hinman
Project supervisor	Mary-Anne Slater
Type of sponsor/funding	Church

body	
Name of sponsor/funding body	Ely Cathedral

Project archives

Physical Archive recipient	Ely Cathedral
Physical Archive ID	CECS14
Physical Contents	"Ceramics","Glass","Human Bones","Metal"
Digital Archive recipient	Ely Cathedral
Digital Archive ID	CECS14
Digital Contents	"none"
Digital Media available	"Database","Images raster / digital photography"
Paper Archive recipient	Ely Cathedral
Paper Archive ID	CECS14
Paper Contents	"none"
Paper Media available	"Context sheet","Drawing","Notebook - Excavation',' Research',' General Notes","Plan","Report","Section"

Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	The Cross Green Swale, Ely Cathedral, Ely, Cambridgeshire: An Archaeological Monitoring
Author(s)/Editor(s)	Slater, M.
Date	2014

Issuer or publisher	Pre-Construct Archaeology Ltd.
Place of issue or publication	Cambridge

P C A

PCA SOUTH
UNIT 54
BROCKLEY CROSS BUSINESS CENTRE
96 ENDWELL ROAD
BROCKLEY
LONDON SE4 2PD
TEL: 020 7732 3925 / 020 7639 9091
FAX: 020 7639 9588
EMAIL: info@pre-construct.com

PCA NORTH
UNIT 19A
TURSDALE BUSINESS PARK
DURHAM DH6 5PG
TEL: 0191 377 1111
FAX: 0191 377 0101
EMAIL: info.north@pre-construct.com

PCA CENTRAL
THE GRANARY, RECTORY FARM
BREWERY ROAD, PAMPISFORD
CAMBRIDGESHIRE CB22 3EN
TEL: 01223 845 522
FAX: 01223 845 522
EMAIL: info.central@pre-construct.com

PCA WEST
BLOCK 4
CHILCOMB HOUSE
CHILCOMB LANE
WINCHESTER
HAMPSHIRE SO23 8RB
TEL: 01962 849 549
EMAIL: info.west@pre-construct.com

PCA MIDLANDS
17-19 KETTERING RD
LITTLE BOWDEN
MARKET HARBOROUGH
LEICESTERSHIRE LE16 8AN
TEL: 01858 468 333
EMAIL: info.midlands@pre-construct.com