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External drainage at Gloucester Cathedral

An Archaeological Watching Brief Report
for Antony Feltham-King on behalf of
Dean and Chapter, Gloucester Cathedral

Chiz Harward BA MIfA

Archaeological Watching Brief Report

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Client:	Antony Feltham-King on behalf of Dean and Chapter, Gloucester Cathedral
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Front cover: view west along Trench 2, north of the Lady Chapel

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Non Technical Summary

Urban Archaeology was commissioned by the Dean and Chapter of Gloucester Cathedral to carry out an archaeological watching brief during the excavation of trenches for the replacement of external drainage at Gloucester Cathedral. The watching brief took place during January and February 2018.

Trench 1 was located to the south of the South Ambulatory, the external foundation of the South Ambulatory and its southeast and southwest chapels was exposed and recorded. Externally, made ground was overlain by modern landscaping.

Trench 2 was located to the north of the Lady Chapel and North Ambulatory, and east of the Chapter House and Kings' School Gymnasium. Made ground was observed to a depth of up to 1.9m below modern ground level. Human remains were recovered from the backfill of the existing drainage trench and were reburied within the trench. Architectural fragments recovered from made ground in the road to the boiler house include fragments of at least one medieval parapet, probably from the mid 15th century tower. The tower parapet had been repaired between 1878 and 1890 and again between 1961–4, shortly before the new boiler house road was constructed in 1970.

The results of the watching brief have met the aims of ensuring that an adequate archaeological record has been made of the remains disturbed, exposed or destroyed by the trenching. The drainage trenches largely followed the route of the existing external drainage trenches and therefore disturbance of archaeological deposits was minimal, although there was some new excavation at the south of the South Ambulatory. The results of the watching brief are of local significance only and no further work is recommended on the site archive.

1 Introduction and planning background

1.1 During January and February 2018 Urban Archaeology carried out an archaeological watching brief on behalf of Antony Feltham-King of St Ann's Gate Architects for the Dean and Chapter of Gloucester Cathedral, at Gloucester Cathedral, Gloucestershire, SO 83147 18773 (Fig. 1).

1.2 The architect's drawing dated October 2017 outlined the proposed works, which was to replace the existing drainage pipes on the north and south side of the ambulatory where these were known to be damaged, to replace, rebuild or construct inspection chambers along those drainage trenches, and to investigate and potentially replace further drainage trenches as required (St Annes' Gate Architect, 2017).

1.3 Gloucester Cathedral is an active cathedral in daily use as a place of worship and prayer. The cathedral and its core claustral buildings are under Ecclesiastical Exemption as defined by the Care of Cathedrals Measure 2011. This area is bounded by the 'Red Line'. The wider precinct (within the 'Green Line') is under the direct control of the cathedral, but does not have Ecclesiastical Exemption under the Care of Cathedrals Measure 2011, and is subject to Planning Control. The current works are located within the Green Line, but outside the Red Line and as such are monitored by both Richard K Morriss, Cathedral Archaeologist, and Andrew Armstrong, City Archaeologist.

1.4 As the works were for the like-for-like replacement of drainage, Ecclesiastical Approval was not required. A detailed methodology for the archaeological watching brief of the site was set out in the Written Scheme of Investigation (Harward 2018). The fieldwork followed the *Standard and Guidance for Archaeological Watching Briefs* (CIfA 2014a), and the *Management of Research Projects in the Historic Environment(MORPHE): Project Manager's Guide* (EH 2006).

2 Site background

2.1 Gloucester Cathedral and its precinct occupy a position in the northwest of the historic core of the City of Gloucester. The main cathedral buildings are surrounded by a series of open areas, to the south of the cathedral Upper College Green has recently been extensively landscaped as part of the Project Pilgrim works.

2.2 Immediately south of the South Ambulatory is an area of grass which has been subject to landscaping at least once since the 18th century. To the north of the Lady Chapel and North Ambulatory is another area of grass which has been recently landscaped to install hardstanding for fire service vehicles. A tarmac road runs along the east side of the Chapter House and Gymnasium.

2.3 The geology of the site is mapped as Blue Lias Formation and Charmouth Mudstone Formation, there are no recorded superficial deposits (British Geological Survey 2018).

2.4 The Site Code for the watching brief is GCED2018.

3 Archaeological and historical background

3.1 The detailed archaeological background of the site is set out in the Gloucester Cathedral Conservation Management Plan (2015).

3.2 The site lies in the northwest corner of the north-western corner of the Roman administrative centre of Colonia Nervia Glevensis which was founded between AD 96–98. The north wall of the Roman settlement runs northwest–southeast north of the Lady Chapel and north Ambulatory.

3.3 The origins of the cathedral lie in the Anglo-Saxon minster of 678–9 said to have been founded by Osric. The minster was probably reformed under the Benedictine rule in the 10th or early 11th century. The first Norman abbot, Serlo, founded a new church which was started in 1089 and dedicated in 1100. The areas to the north and south of the east end of the church were parts of the Monk's cemetery by 1460, and were bounded by a wall on the east side, whilst a wall running south from the corner of the south transept divided the monk's cemetery from the lay cemetery to the west (Welander 1991, 305).

3.4 The abbey church and cloisters were converted to a cathedral in 1541. The area north of the Lady Chapel was laid out as gardens in the late 17th century and was known as The Grove (Welander 1991, 425, Heighway 1991); this area was later used by the King's School as a playground. The area to the south of the Lady Chapel, formerly the monk's cemetery, was increasingly built over from the 17th century. A detailed history of the development of the site is to be found in Welander 1991.

3.5 An area north of the Lady Chapel was reduced by up to 0.4m in 1998 to allow the installation of hardstanding for firefighting appliances; as part of these works a large quantity of mixed human remains were uncovered, apparently backfilled into a mid –late 19th century drainage trench (Donel 2000).

4 Aims of the watching brief

4.1 The objectives of the watching brief were to minimise disturbance to archaeological remains and to record, as far as was reasonably possible, the location, extent, date, character, condition, significance and quality of any surviving archaeological remains that were exposed or would be destroyed by the proposed works. Attention was given to sites and remains of all periods (including evidence of past environments).

5 Methodology

5.1 All work was carried out in accordance with the relevant S*tandards and Guidance* produced by the Chartered Institute for Archaeologists (CIfA 2014a–d).

5.2 The watching brief took place between 9th January and 28th February 2018 and was carried out on work to replace existing, damaged, drainage pipes. Two trenches were excavated: Trench 1 to the south of the South Ambulatory, and Trench 2 to the north of the Lady Chapel and North Ambulatory (Fig. 2).

5.3 Archaeological recording work was carried out in accordance with the Written Scheme of Investigation (Harward 2018) and the methodologies described and referred to in that document.

5.4 Levels were taken relative to the OS benchmark on the north-eastern external buttress of the King's School Gymnasium, value 15.75m OD.

5.5 The Site Code for the archaeological work is GCED2018.

6 Results

6.1 This section provides an overview of the evaluation and watching brief results; summaries of the recorded contexts and a Harris matrix are to be found in Appendices 1 and 2.

Trench 1

6.2 Trench 1 was located south of the south ambulatory and consisted of a new trench running east-west between two existing inspection chambers, the re-excavation of a series of trenches connecting to downpipes on the cathedral, and the re-excavation of a trench to take a French Drain running along the external side of the cathedral foundations. The trench was excavated to a maximum depth of 0.75m (15.01m OD); natural ground was not observed.

6.3 The external foundation of the South Ambulatory and its southeast and southwest chapels was exposed in the French Drain trench. The lower foundation [7] of the southeast Ambulatory chapel extends up to 0.46m out beyond the line of the superstructure (Fig. 3, Fig. 4). The top of the foundation lay at 15.36–38m OD. The lower foundation for the southeast Ambulatory chapel [7] consists of large Painswick, Lias, Red Sandstone and Brockhampton Stone blocks bonded with a soft very sandy mid orange-brown lime mortar.

6.4 The lower foundation [7] is overlain by foundation [4] which extends around the southeast chapel, South Ambulatory and southwest chapel. The foundation to the South Ambulatory was slightly curved, contrasting with the straight lines of the superstructure built on top (Fig. 5). The foundation to the southwestern Ambulatory chapel and the South Ambulatory, [4], is

built with large Painswick, Lias, and Red Sandstone blocks bonded with a sandy light-mid yellow-grey lime mortar (Fig. 6).

6.5 The top of the foundation of the southwestern ambulatory chapel [4] lay at 15.54m OD, the top of the South Ambulatory foundation [7] was at 15.34–15.38m OD. There was a slight change in angle between the ambulatory foundation and its superstructure, perhaps reflecting a refinement in setting out once the main foundations had been built, probably caused by the curving apsidal shape of the east end; there is a similar slight difference between the foundation of the southeastern chapel and its superstructure.

6.6 The Ambulatory superstructure was built directly off the foundations, with ashlar blocks forming an external chamfer at the transition to foundation (top of chamfer at 15.80–15.88m OD). The superstructure was pierced by deeply set windows which direct light into the crypt under the east end of the church and into the southern ambulatory chapels.

6.7 A layer of homogenous mixed soil (3) abutted foundation [4]; where observed away from the foundation it was sealed by a 0.12m thick buried soil horizon (5) which had a surface at 15.58m OD. The existing pipe trenches (not contexted) were cut through this layer.

6.8 A trench had previously been dug along the side of the ambulatory foundation to carry a water pipe and electric cable, the face of the base of the superstructure had been rendered with a hard grey Portland cement render [8], presumably to waterproof the wall. The trench had then been backfilled with redeposited mixed soil (6) from which a single sherd of 13th century pottery was recovered. The new French Drain was largely contained within this disturbed ground.

6.9 The area had been landscaped in the late 20th century, with a 0.13m thick dumped reddish brown sandy silt layer (2) laid directly over the turf and topsoil layer (5); the existing pipe trenches (not contexted) were sealed by this layer. A topsoil and turf layer (1) formed the modern land surface at between 15.57 and 15.63m OD (Fig. 7).

Trench 2

6.12 Trench 2 was located alongside the north of the Lady Chapel and North Ambulatory, then running east of the Chapter House and Gymnasium. The trench was located on the line of the existing drainage trench throughout. The trench was excavated to a maximum depth of 1.9m (13.61m OD) and natural ground was not observed.

6.13 Made ground (12) was observed in the trench sections to the full depth of the trench. No buried soil horizons, surfaces or cuts were observed, and the made ground appeared to be fairly homogenous soilly dumps (Fig 8–9). No dating material was recovered from the made ground.

6.14 The made ground had been cut by the existing pipe trench [11], this was up to 1.9m deep and had been backfilled, largely with limestone rubble (10). Sixty-nine fragments of human bone were recovered from a discrete area of this backfill. The trench was sealed by a 0.4m thick layer of modern made ground (9) with a surface at between 15.12 and 15.16m OD. Twelve architectural fragments were recovered from a discrete area of backfill (see below).

7 The Finds

The ceramic assemblage

Dr Jane Timby

7.1 The archaeological work recovered a single handle from a medieval jug from context (6). The solid-round-section handle has a single vertical external groove and is covered with patches of clear glaze with green (copper) speckles. The dense sandy fabric is characteristic of the Brill-Boarstall potteries, Buckinghamshire and this is likely to be product imported from that area. The ware equates with Gloucester type fabric (TF) 83 (Vince 1983) and Oxford fabric OXAW/AM (Mellor 1994). The vessel dates to the 13th century and is probably a baluster-type jug based on the handle shape.

The architectural fragments

Chiz Harward

Introduction and methodology

7.2 Twelve architectural fragments were recovered from the watching brief at Gloucester Cathedral. The architectural fragments were all recovered from deposit (9), the hardcore make up for the north–south aligned road east of the Gymnaseum and Chapter House; the twelve fragments were all found within a discrete area and almost certainly relate to disposal of material from repair work on the cathedral. No other worked fragments were observed.

Architectural fragment no	Context	Description	Recorded and Assessed
<AF1>	(9)	Mullion	CH
<AF2>	(9)	Mullion	CH
<AF3>	(9)	Mullion	CH
<AF4>	(9)	Mullion	CH
<AF5>	(9)	Mullion with slate fixing tenon and keying grooves in bed	CH
<AF6>	(9)	Chamfered plinth	CH
<AF7>	(9)	Mullion with start of splay into arch	CH
<AF8>	(9)	Mullion	CH
<AF9>	(9)	Mullion with start of splay into arch	CH
<AF10>	(9)	Chamfered block	CH
<AF11>	(9)	Parapet tracery	CH
<AF12>	(9)	Parapet tracery	CH

Table 1 The architectural fragments: general summary

7. 3 Each fragment was cleaned and inspected. The stones were photographed, and an annotated scale drawing made of each fragment, with 1:1 or 1:2 profile drawings made where appropriate.

Petrology

74 Formal stone-typing has not been undertaken at this point, however all fragments were inspected with a x10 hand lens and the majority of fragments were of a hard, shelly limestone, most likely a Minchinhampton Weatherstone which is widely used in the medieval and Tudor abbey buildings.

The moulded stone

7.5 The architectural fragments are illustrated in Fig. 10.

<AF1–3> are mullions with the same cross-section:
<AF1> [9] Mullion. Minchinhampton Weatherstone. 82 x 166 x 93mm. Broken fragment of mullion, no glazing groove, weathered. Mid-15th century?

<AF2> [9] Mullion. Minchinhampton Weatherstone. 86 x 166 x 93mm. Broken fragment of mullion, no glazing groove, weathered. Mid-15th century?

<AF3> [9] Mullion. Minchinhampton Weatherstone. 114 x 166 x 93mm. Broken fragment of mullion, no glazing groove, weathered. Mid-15th century?

<AF4 and 5> are of similar cross-section to <AF1–3>, but of smaller dimensions and proportionally less broad:

<AF4> [9] Mullion. Minchinhampton Weatherstone. 87 x 127 x 49mm. Broken fragment of mullion, no glazing groove, weathered. Mid-15th century?

<AF5> [9] Mullion. Minchinhampton Weatherstone. 77 x 127 x 49mm. Broken fragment of mullion, no glazing groove, weathered. One bed joint survives, with chiselled keying grooves cut into the base. A square sawn slate fixing tenon set in the bed joint with Portland cement. The slate tenon measures 14 x 15mm, extending from the bed 26mm. Late Victorian.

<AF6> [9] Chamfered plinth. Vertically bedded Minchinhampton Weatherstone. 83 x 70 x 91mm. Corner of chamfered plinth, weathered with eroded sand pockets. Medieval?

<AF7> [9] Splayed mullion. Painswick Stone. 112 x 126 x 54mm. Mullion fragment, no glazing groove, weathered; same basic cross-section and dimensions as <AF4–5> but with the remains of the start of a splay into an arch on one side. Portland cement used to fill eroded sand pockets. Mid-15th century? Repaired in late 19th century.

Fragments <AF8 and 9> have the same cross-section:
<AF8> [9] Mullion. Minchinhampton Weatherstone. 160 x 215 x 154mm. Mullion fragment, no glazing groove, weathered. Mid-15th century?

<AF9> [9] Splayed mullion. Minchinhampton Weatherstone. 170 x 215 x 154mm. Mullion fragment, no glazing groove, weathered; there are the remains of the start of a splay into an arch on one side. Mid-15th century?

<AF10> [9] Chamfered block. Shelly Painswick. 170 x 250 x 195mm. Corner of a block chamfered on two sides, possibly from the top of a parapet. Very weathered on one side but probably originally symmetrically chamfered. Repaired with Painswick Stone insert set in Portland cement and eroded sand pockets filled with Portland cement. Medieval, repaired in late Victorian period.

<AF11 and 12> share the same shaft cross-section, both splaying into arches on either side. The cross-section is the same as <AF4–5, 7>.
<AF11> [9] Parapet tracery. Minchinhampton Weatherstone. 163 x 127 x 122mm. Weathered fragment of mullion shaft splaying on either side to the start of arches. Mid-15th century?

<AF12> [9] Parapet tracery. Minchinhampton Weatherstone. 163 x 236 x 104mm. Weathered fragment of mullion shaft splaying on either side to arches. Lower bed joint survives with squared cut slate fixing tenon (15mm x 14mm, snapped off flush with bed) inserted into bed using Portland cement, setting out scribe mark and possible keying survives on bed. Late Victorian.

7.6 The architectural fragments are mostly in Minchinhampton Weatherstone, a stone which was extensively used on the medieval and Tudor abbey buildings in positions exposed to weathering. Minchinhampton Weatherstone was also used in repairs during the Victorian period. Shelly Painswick stone was used in relatively exposed situations where Minchinhampton Weatherstone was either not available or not suitable, especially in Victorian repairs. Painswick Stone is used for the majority of medieval ashlar and fine carving, including parapets, on the medieval and Tudor abbey buildings. The extensive weathering of all the fragments supports an external setting.

7.7 Fragments <AF4, 5, 7, 11, 12> form a discrete set of fragments which share a common cross-section and form. The use of Minchinhampton Weatherstone and Painswick Stone indicates an external position on the abbey buildings, the absence of any glazing grooves indicates none of the mullions or tracery was glazed, and indicates these fragments are from a parapet.

7.8 The parapet was clearly repaired in the late Victorian period. The larger mullions <AF1–3> are likely to be from master mullions or from a larger order of parapet. The remaining fragments are likely to be from the capping of a parapet, <AF10>, and the base of the parapet, <AF6, 7> and from an upright at the corner of the parapet.

7.9 Inspection of the existing cathedral fabric suggests that the only parapets of similar size and form are on the pinnacles of the mid-15th century tower, which was extensively repaired in 1878–90 by FS Waller (Fig. 11).

7.10 The use of Portland cement to repair eroded sand pockets, and to fix a new piece of limestone into AF<10> demonstrates that the parapet was repaired or partially replaced in the late Victorian period, retaining some medieval stones but carving new pieces. The use of slate tenons and Portland cement has been noted elsewhere on the cathedral in the late Victorian period and suggests these fragments were newly carved in the late Victorian period. The parapet was presumably repaired again with the replaced stones being kept in the Cathedral yard until they were used as hardcore when the road was constructed.

Potential and discard/retention

7.11 As a single sherd the assemblage has no potential for further work and it may be discarded as it is from a modern drainage context rather than a secure archaeological context.

7.12 Although found in a redeposited context the assemblage of architectural fragments has the potential to add to our understanding of the appearance and form of the medieval abbey church, and to the campaigns of repair and restoration. No further work is recommended for the assemblage of architectural fragments. The annotated drawings of the fragments will allow them to be compared to existing parapet designs as these are recorded in future. The architectural fragments have been recorded and may be discarded following standard Cathedral practice.

7.13 Finds catalogue

Context	Description	Count	Weight (g)	Spot date
6	Pottery	1	64	13th century
9	Architectural fragments: mullions and parapet tracery	12		Medieval/ Victorian

Table 2: Finds catalogue

8 The human remains

8.1 Human remains were recovered from the backfill of the existing drainage trench within Trench 2. A total of 69 fragments were recovered from within a discrete spatial section of backfill 12). The bones were scanned for obvious pathologies, counted, photographed and reinterred within the excavations.

Context	Quantity	Comments
(10)	13	Skull fragments
(10)	1	Mandible fragments
(10)	51	Long bones
(10)	4	Pelvic fragments

Table 3: The human remains

9 Documentary evidence

9.1 The Gloucester Cathedral Chronicles of Repair set out an illustrated history of repairs to the cathedral fabric in the period 1953–83 (Gloucester Cathedral 1983, 42–47). The Chronicles describe how some stones of the tower pinnacles were loose and needed repair, investigation revealed that although much of the stonework was sound, the parapets were in poor repair and needed replacement. This was carried out on successive pinnacles under the direction of architect SJ Ashwell between 1961–4. Drawings survive of each pinnacle showing the stones which were replaced using Clipsham Stone, with some Minchinhampton Stone used on the southwest pinnacle (Fig. 12).

9.2 The Chronicles include an account of the previous repairs, in 1878–90 'when they were taken down stone by stone and re-erected using only Minchinhampton Stone for the necessary replacements' by the cathedral team under direction of the architect FS Waller. The stone probably came from the Crane quarry at Minchinhampton, the total cost of the works was £3,447 1s 6d. The chronicle speculates on the poor repair of the parapet, compared to other areas of the pinnacles, and suggests a sandy bed was used that weathered to a far worse degree than the medieval stone:

'This is the dilemma of the Architect – if the probable medieval source is available (as it was in 1878, but NOT in 1960) can he be satisfied that the bed now being worked is of equal quality with its predecessor, or should he try a different stone which has been proved over a comparatively short period. Time alone will show whether the decision to use Clipsham for this work in 1960 was sound (Gloucester Cathedral 1983, 45)'.

9.3 The new boiler house was built in 1970, with heating ducts to the Lady Chapel and other parts of the cathedral. It is likely that the road from the boiler house past the Chapter House and Gymnasium was upgraded at this time (Gloucester Cathedral 1983 Vol 2, 20–21).

10 Conclusions and statement of significance

10.1 The watching brief largely followed existing drainage trenches and therefore caused little impact on surviving archaeological deposits, however it did provide the opportunity to observe and record sections through the deposits on both the north and south of the Cathedral as well as the foundation of the crypt.

10.2 No evidence was found for any remains that might date to the Roman period, and no artefacts of Roman date were recovered. This is despite the Trench 2 being excavated over the line of the Roman city wall and defensive circuit, Roman deposits are known to survive at between 1m and 3m below present ground level (Gloucester Cathedral 2015).

10.3 The foundations of the South Ambulatory, its southeast and southwest chapels were exposed for some distance in Trench 1. The late 11th century ambulatory foundations were clearly distinct from the superstructure, with slight but visible changes in alignment between the foundation and the ashlar superstructure. The foundation represents the lower part of the crypt's southern wall, and the level of the transition from foundation to superstructure suggests that modern ground level remains approximately at the medieval level. The top of the South Ambulatory's foundation was at 15.54m OD, with an impressively small tolerance of just 10mm along the observed entire east–west length of this foundation.

10.4 Natural ground was not observed in either trench, the made ground observed south of the South Ambulatory may be a 'cemetery soil' associated with the medieval monks' cemetery, although no human remains were recovered. The relationship between the soils and the foundation had been removed by an earlier pipe trench, however it is likely that the soils had been extensively reworked since the construction of the foundation in any case. The recovery of a single sherd of 13th century pottery from the made ground does not provide a reliable date other than a *terminus post quem* for the latest reworking of the area.

10.5 The made ground observed in Trench 2 extended to at least 1.9m below present ground level (lowest observation at 13.61m OD). No Evidence for Roman deposits or structures was observed in the trench. No surfaces, buried soil horizons or cuts were observed in the sections, and the level of the whole area appears to have been raised in one event through a series of homogenous dumps. Given the present ground level is approximately the same as the medieval ground level -as shown by the crypt window sills and the plinth course and doorways on the north side of the Lady Chapel and Ambulatory chapel- this suggests the possibility that the monks' cemetery may have been cleared at some point after the foundation of the Cathedral.

10.6 Despite the trenches crossing both the northern and southern parts of the medieval monk's cemetery, no evidence for *in situ* burials was observed in any of the sections, or the base of either trench. A total of 69 fragments of human bone were recovered from a short stretch of the existing backfill within Trench 2. The human remains may relate to those disturbed during watching brief in 1998 which were believed to be within the backfill of a mid-late 19th century drainage trench, and to originally have come from the cathedral crypt (Donel 2000). The human remains were reinterred within Trench 2 beneath a concrete drain run in

the hope that they will not be disturbed again. The backfill of the trench in this area included large quantities of limestone rubble and it is also possible that the human remains were imported with the rubble and are not originally from the vicinity of the trench, although this seems less likely.

10.7 The architectural fragments are mainly from a section of medieval parapet with tracery and mullions of two orders carved in Minchinhampton Weatherstone. Some of the fragments had clearly been repaired with Portland cement and a limestone piecing, whilst other fragments appear to be new Victorian work -the use of slate tenons is known from late 19th century repairs on the Lady Chapel.

10.8 The parapet sections are almost certainly from the small parapets at the top of the mid 15th century tower pinnacles. The medieval parapet was repaired by FS Waller between 1878 and 1890, using Minchinhampton Weatherstone. The new work appears to have weathered badly and was again repaired between 1961–4. The twelve architectural fragments were all recovered from a discrete section of modern made ground for a tarmac road overlying the existing drainage trench. The fragments were probably stored in the Works Department yard until the construction of the new roadway, probably in 1970, meant they could be usefully employed as hardcore.

10.9 The results of the watching brief have met the aims of ensuring that an adequate archaeological record has been made of the remains disturbed, exposed or destroyed by the groundworks. Although the results of the watching brief add to the corpus of information on the development of the medieval priory buildings, the results are of local significance only and no further work is recommended on the site archive.

11 Acknowledgements

11.1 The author would like to thank Antony Feltham-King of St Ann's Gate Architects for commissioning the work and for his help in providing information on the scheme, Richard Morriss for his advice and assistance during the watching brief, Pascal Mychalysin for his thoughts on the architectural fragments, and Rebecca Phillips for her assistance with archive research. We would also like to thank Neil and his team at Three Counties Drainage for their assistance on site. The watching brief was carried out by the author, the pottery report was by Dr Jane Timby.

12 Archive

12.1 The site code GCED2018 has been allocated to the excavation.

12.2 The archive from the watching brief is currently held by Urban Archaeology at their offices in Stroud. The site archive will comprise all artefacts, written, drawn and photographic records and will be deposited with Gloucester Cathedral Library and/or the Archaeology Data Service (ADS).

12.3 The archive will be prepared in accordance with Guidelines for the preparation of excavation archives for long-term storage (UKIC 1990), specifically complying with Gloucestershire Museums Service and OASIS/ADS guidelines. The archive will be presented to the receiving archive repository within six months of the completion of the fieldwork (unless alternative arrangements have been agreed in writing with the Diocese). The archive will then become publicly accessible.

12.4 A copy of this report and a summary of information from this project will be submitted to the OASIS database of archaeological publications (urbanarc1-306010; Appendix 4). A further copy of the report will be submitted to Gloucestershire HER. Shape files of the watching brief trench locations will also be submitted to the HER.

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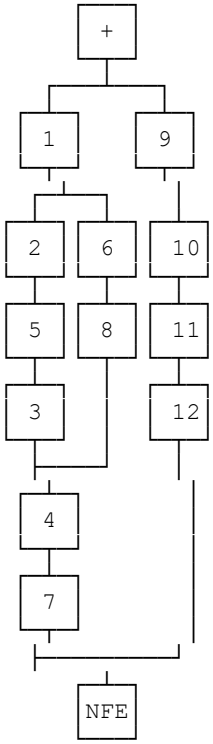
Appendix 1 Context Register

Context no	Type	Description
1	Deposit	Topsoil and turf
2	Deposit	Modern landscaping
3	Deposit	Made ground abutting South Ambulatory foundation
4	Masonry	South ambulatory foundation
5	Deposit	Buried soil horizon
6	Deposit	Made ground redeposited over services, modern
7	Masonry	Foundation of South Ambulatory southeast chapel
8	Masonry	Portland cement render on foundation [7]
9	Deposit	Modern made ground
10	Deposit	Backfill of existing drainage trench [11]
11	Cut	Existing drainage trench
12	Deposit	Made ground in section across Trench 2

Table 4 Context register

Appendix 2 Harris matrix

Harris matrix of GCED2018



Appendix 3 Archive contents

Digital archive

Type	Number	Comments
Digital photographs	27 images	

Table 5 Digital archive

Paper archive

Type	Number	Comments
Context sheets	12	
Trench record sheet	2	
Registers	4	Context, drawing, photo and architectural fragments

Table 6 Paper archive

Drawn archive

Type	Number	Comments
Permatrace	10 sheets	plan sheets, section sheets
Permatrace	3 sheets	Architectural fragment drawings <AF1–12>

Table 7 Drawn archive

Finds archive

Type	Number	Comments
Pottery	1 sherd	Discarded by Gloucester Cathedral
Architectural fragments	12	Discarded by Gloucester Cathedral
Human remains	69	Reburied

Table 8 Finds archive

Appendix 4 OASIS Form

OASIS ID	**urbanarc1-306010**
PROJECT DETAILS	
Project name	Gloucester Cathedral external drainage
Short description of the project	Urban Archaeology was commissioned by the Dean and Chapter of Gloucester Cathedral to carry out an archaeological watching brief during the excavation of trenches for the replacement of external drainage at Gloucester Cathedral. The watching brief took place during January and February 2018. Trench 1 was located to the south of the South Ambulatory, the external foundation of the South Ambulatory and its southeast and southwest chapels was exposed and recorded. Externally, made ground was overlain by modern landscaping. Trench 2 was located to the north of the Lady Chapel and North Ambulatory, and east of the Chapter House and Kings' School Gymnasium. Made ground was observed to a depth of up to 1.9m below modern ground level. Human remains were recovered from the backfill of the existing drainage trench and were reburied within the trench. Architectural fragments recovered from made ground in the road to the boiler house include fragments of at least one medieval parapet, probably from the mid 15th century tower. The tower parapet had been repaired between 1878 and 1890 and again between 1961-4, shortly before the new boiler house road was constructed in 1970. The drainage trenches largely followed the route of the existing external drainage trenches and therefore disturbance of archaeological deposits was minimal, although there was some new excavation at the south of the South Ambulatory.
Project dates	Start: 09-01-2018 End: 28-02-2018
Previous/future work	Yes / Yes
Any associated project reference codes	GCED2018 - Sitecode
Any associated project reference codes	UA182 - Contracting Unit No.
Significant Finds	
Type of project	Recording project
Site status	Conservation Area
Site status	Listed Building
Site status	Scheduled Monument (SM)
Current Land use	Other 4 - Churchyard
Monument type	CATHEDRAL PRECINCT Post Medieval
Monument type	CATHEDRAL PRECINCT Modern
Monument type	CATHEDRAL Post Medieval
Monument type	CATHEDRAL Modern
Monument type	BENEDICTINE MONASTERY Medieval
Significant Finds	ARCHITECTURAL FRAGMENT Medieval
Investigation type	'''''Watching Brief'''''
Prompt	Faculty jurisdiction
PROJECT LOCATION	
Country	England
Site location	GLOUCESTERSHIRE GLOUCESTER GLOUCESTER Gloucester Cathedral
Postcode	GL1 2LR
Study area	0 Square metres
Site coordinates	SO 86147 18773 51.866921948147 -2.20121347513 51 52 00 N 002 12 04 W Point
PROJECT CREATORS	
Name of Organisation	Urban Archaeology
Project brief originator	Contractor (design and execute)
Project design originator	Urban Archaeology

Project director/manager	Chiz Harward
Project supervisor	Chiz Harward
Type of sponsor/funding body	Diocese
Name of sponsor/funding body	Dean and Chapter Gloucester Cathedral
PROJECT ARCHIVES	
Physical Archive Exists?	No
Physical Archive notes	
Digital Archive recipient	OASIS
Digital Contents	''Stratigraphic''
Digital Media available	''Images raster / digital photography''
Paper Archive recipient	Gloucester Cathedral
Paper Contents	''Stratigraphic''
Paper Media available	''Context sheet'',''Drawing'',''Matrices'',''Plan'',''Report'',''Section''
Project bibliography 1	
Publication type	Grey literature (unpublished document/manuscript)
Title	External drainage at Gloucester Cathedral, an Archaeological Watching Brief Report
Author(s)/Editor(s)	Harward, C.
Date	2018
Issuer or publisher	Urban Archaeology
Place of issue or publication	Stroud
Description	Illustrated typescript report

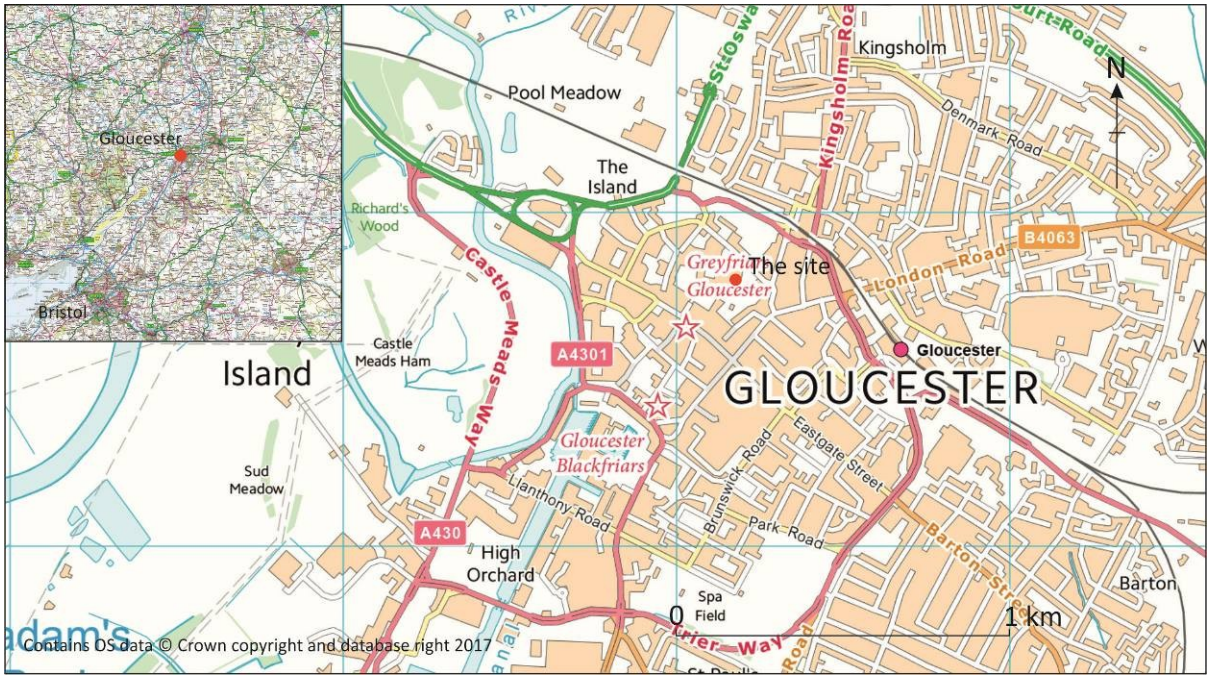


Fig. 1 Site location

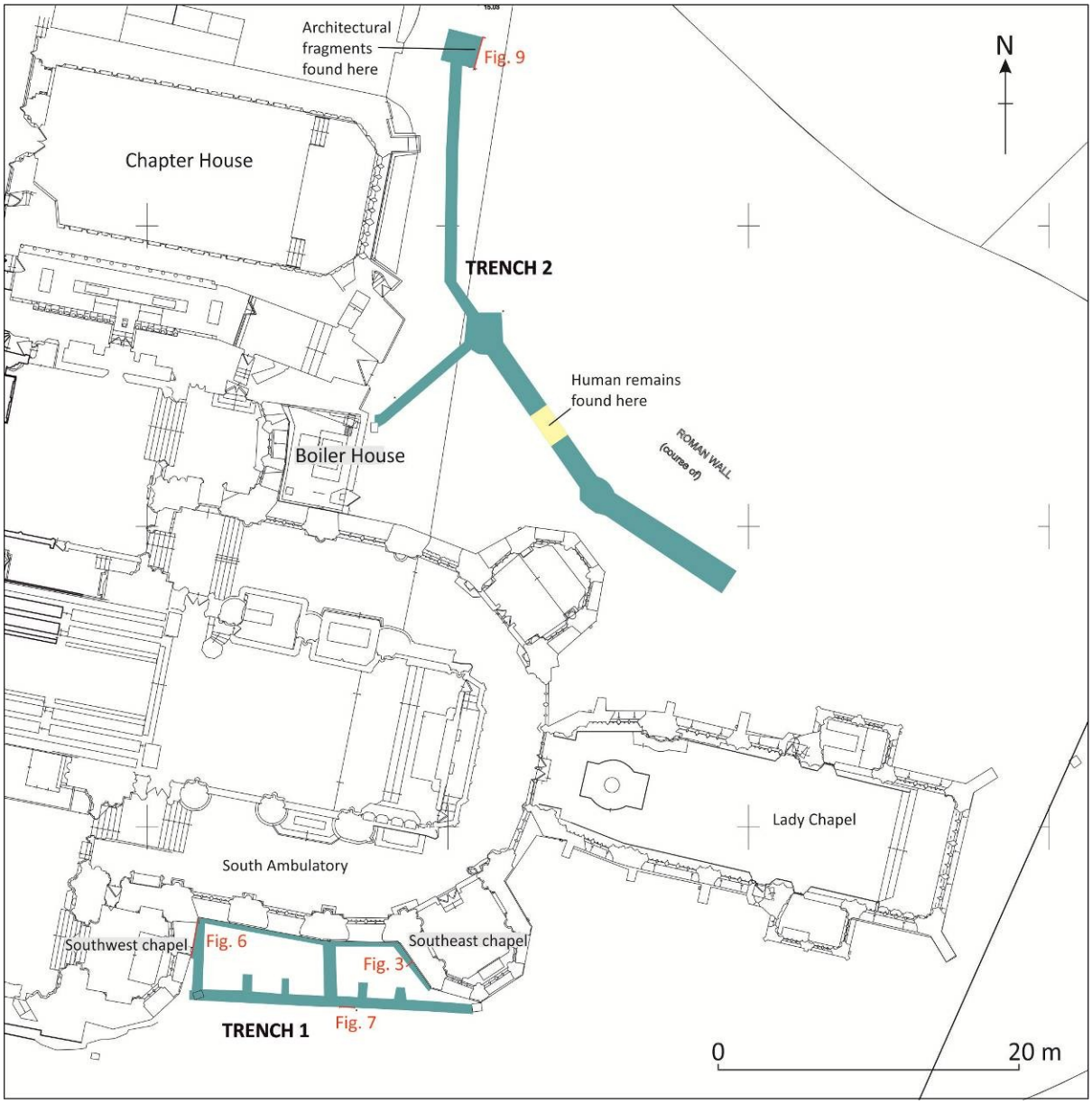


Fig. 2 Trench plan

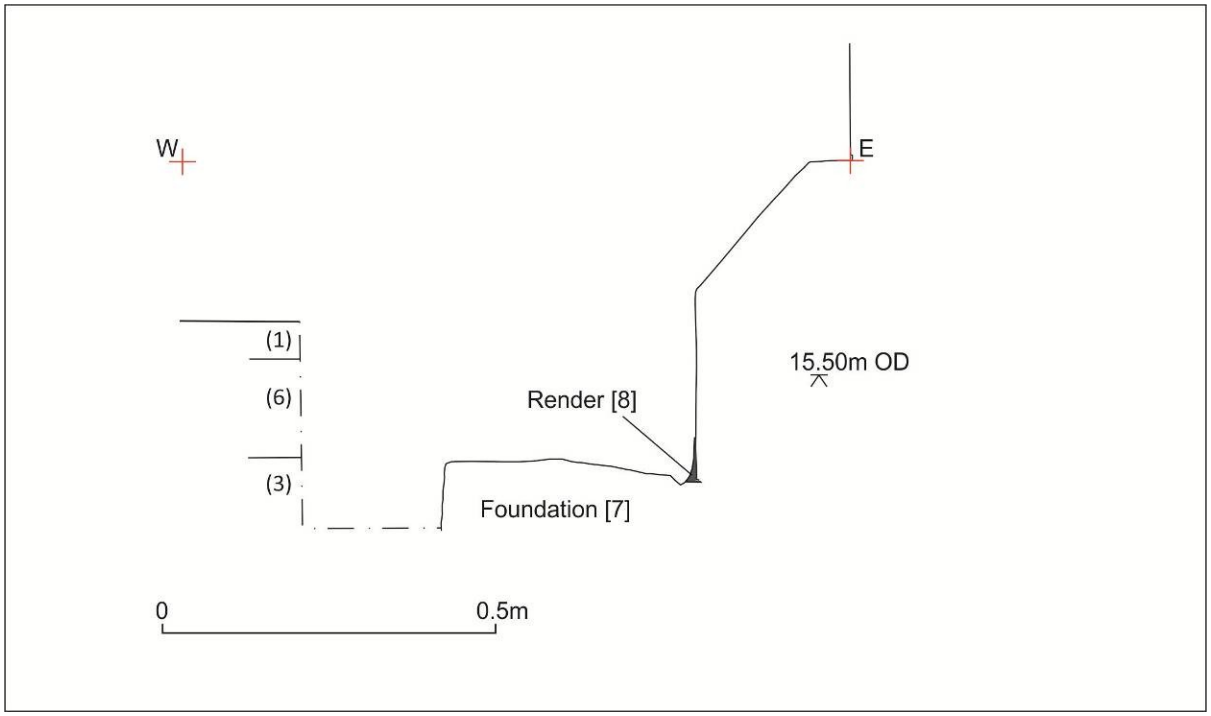


Fig. 3 South facing section across Trench 1 showing profile of foundations [4] and [7]

Fig. 4 View looking east showing the southeast Ambulatory chapel foundation [7]; 0.5m scale

Fig. 5 View looking east along south wall of South ambulatory showing curve of foundation [4] compared to straight line of superstructure; 0.5m scale

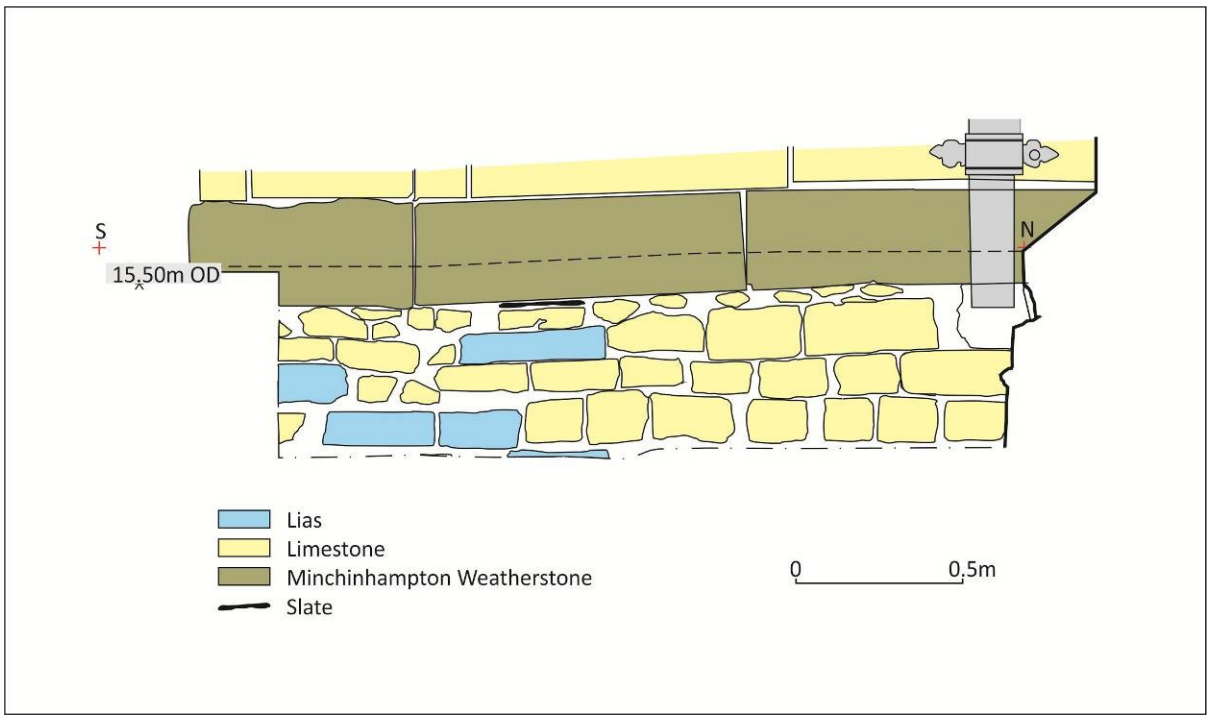


Fig. 6 East facing elevation of the foundation of the southwest Ambulatory chapel in Trench 1

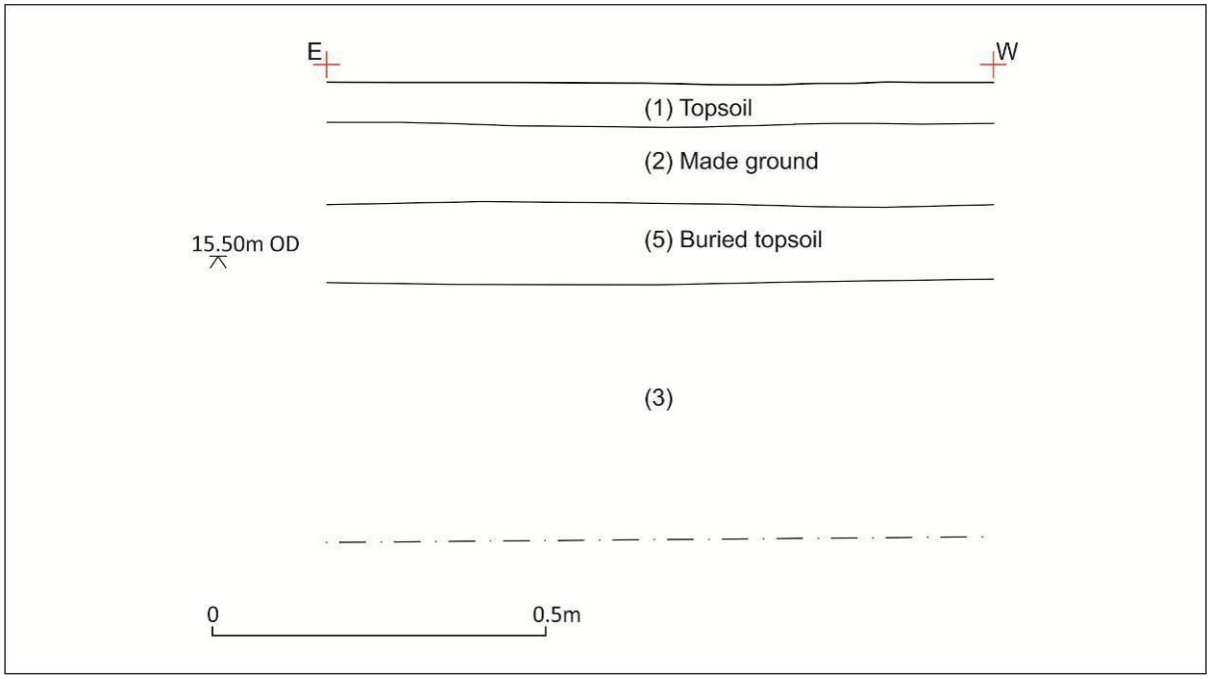


Fig. 7 North facing elevation of Trench 2 showing sequence of deposits

Fig. 8 West facing section Trench 2; 2m scale

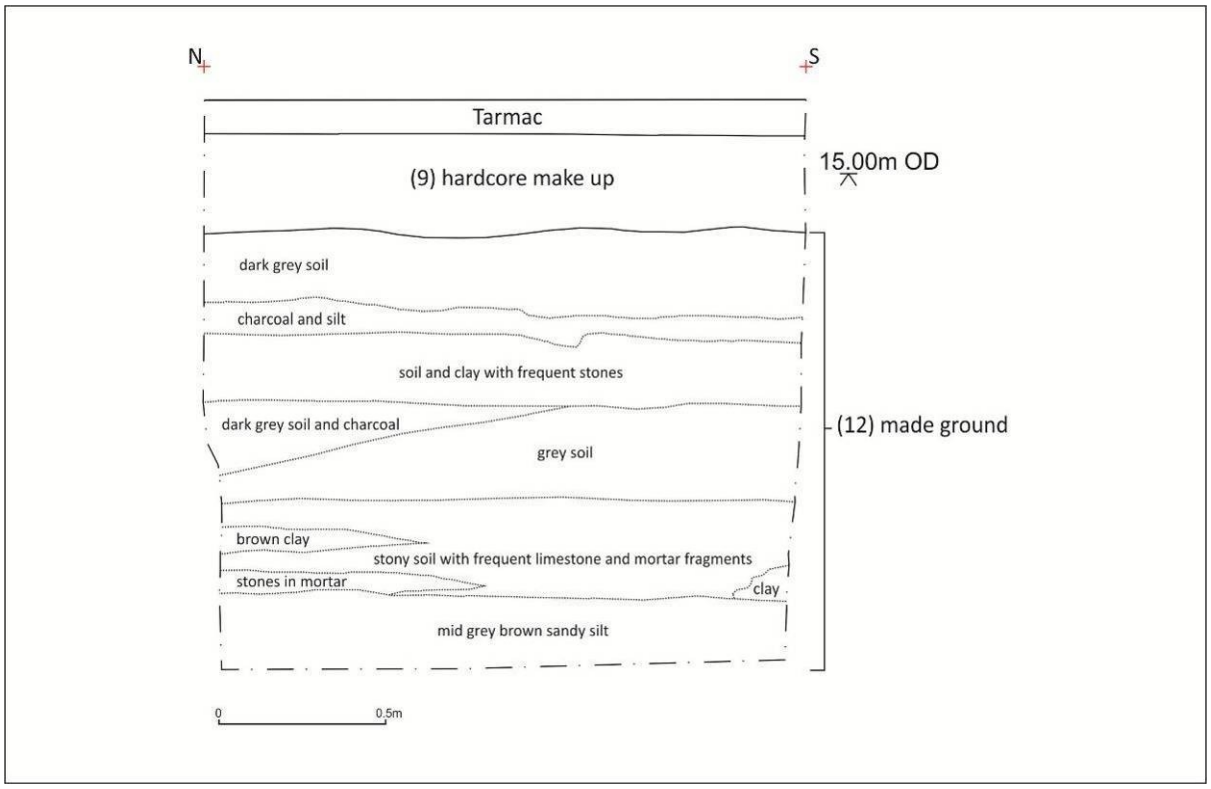


Fig. 9 West facing section Trench 2 showing made ground

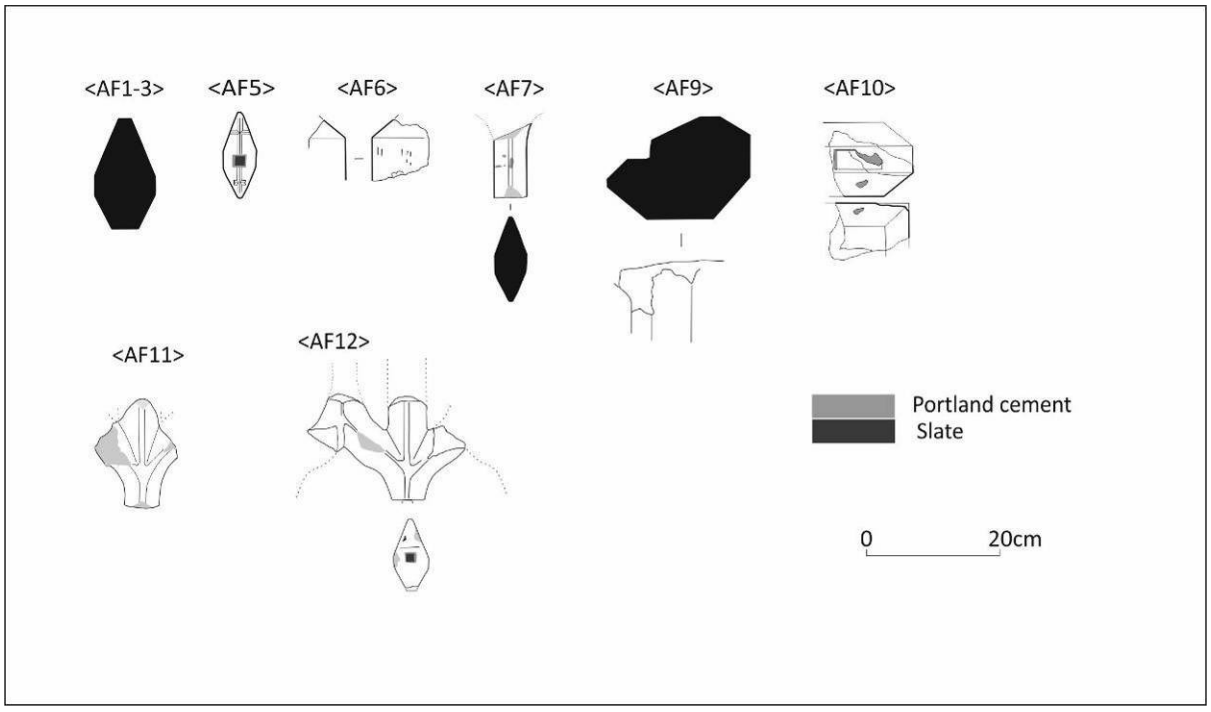


Fig. 10 Architectural fragments

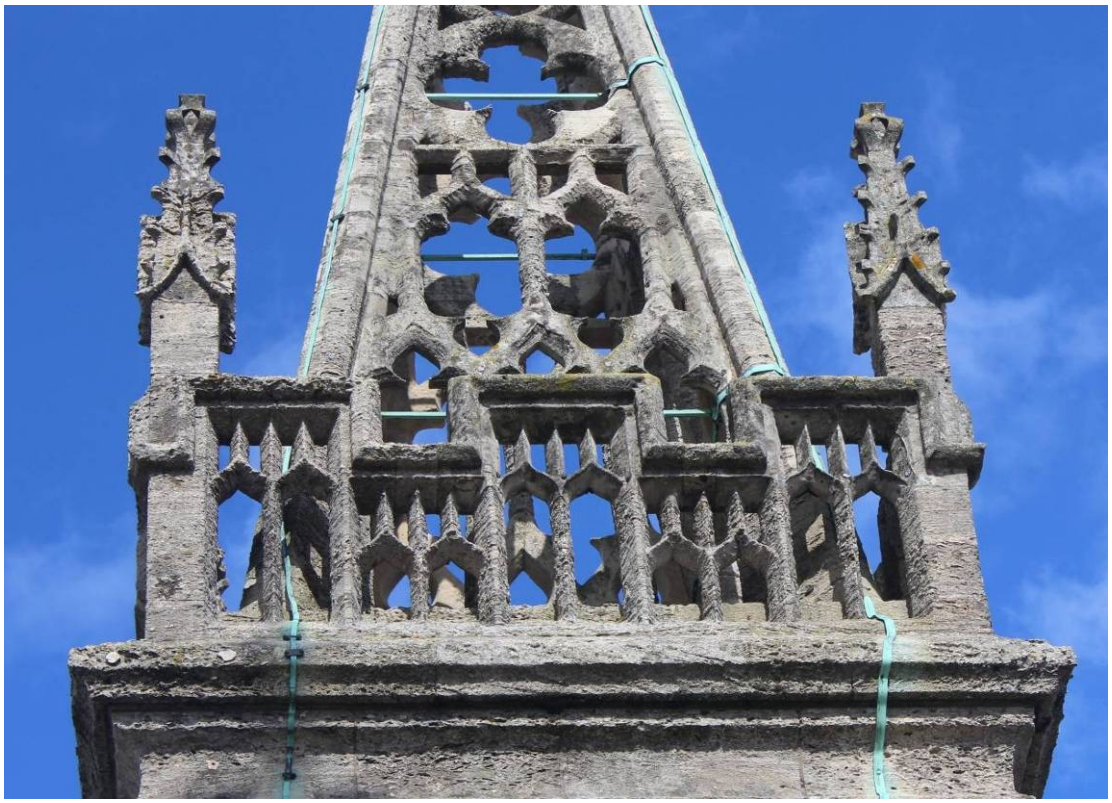


Fig. 11 Parapet on pinnacles of tower

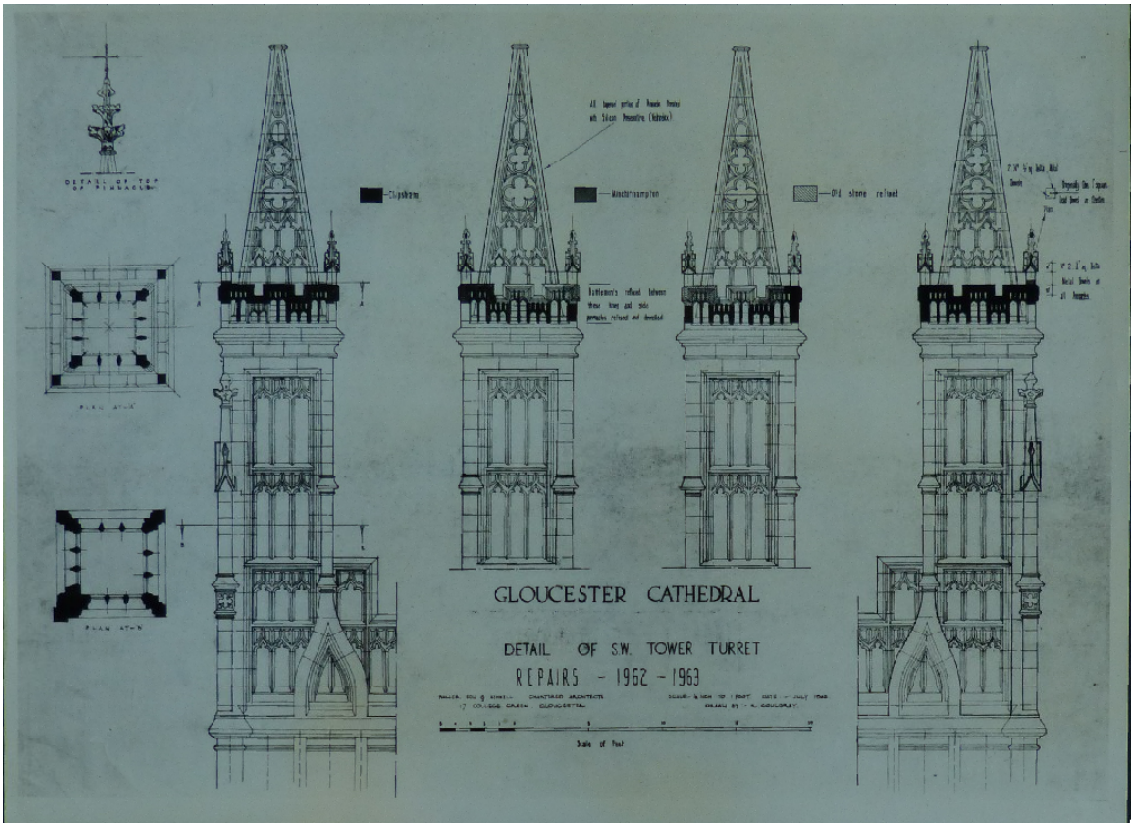


Fig. 12 Architect's drawing showing detail of work carried out in 1962–3 on the south west pinnacle (Gloucester Cathedral 1983, Fig 223)