FABC11 - 004

FURNESS ABBEY, CUMBRIA
ARCHAEOLOGICAL ENABLING WORK FOR MASONRY UNDERPINNING TO THE PRESBYTERY

PHASES 5 & 6

Commissioned by English Heritage

March 2014

HEADLAND ARCHAEOLOGY

Summary

Excavations were carried out at Furness Abbey between April and October 2013 on behalf of English Heritage as part of an ongoing scheme of works relating to the essential repairs necessary to secure the conservation of the Presbytery walls, which have become structurally unsound. The current programme of work follows previous excavations since 2009 by both Oxford Archaeology North and Headland Archaeology. The 2013 works by Headland Archaeology comprised the removal of previously excavated backfilled ground around the south and east walls of the Presbytery together with excavation of areas which had not yet been excavated to the required depths and profiles. These works were undertaken to allow the underpinning of the masonry walls to take place.

The majority of the excavation reiterated what was recorded and interpreted in previous phases of works. The plan of the Savigniac church was known from previous investigations to comprise an apsidal Presbytery. Stone foundations recorded below the timber foundation raft during the 2013 phase have built on these findings, suggesting a more substantial foundation existed for the eastern end apse of the Savigniac Presbytery than previously recorded. Two burials were also recovered in the course of the excavation and were in keeping with previous interpretations of the monks' burial ground to the east of the church.

PROJECT SUMMARY SHEET (FABC11-004)

Client	English Heritage
National Grid Reference	SD 2182 7179
Address	Furness Abbey, Barrow-in-Furness, Cumbria
Council	Barrow Borough
Project Manager	Sorina Spanou
Text	Nuala Woodley
Illustrations	Anna Sztromwasser, Jürgen van Wessel
Fieldwork	Matthew Ginnever, Richard Tuffin, Jürgen van Wessel, Nuala Woodley

Specialists

Finds	Julie Lochrie
Human Bone	Dave Henderson
Architectural Stonework	Stuart Harrison
Palaeoenvironmental	Laura Bailey

Schedule

Fieldwork	April – October 2013
Post Excavation Assessment Report	March 2013

1 INTRODUCTION

1.1 Circumstances of the project

Headland Archaeology (UK) Ltd carried out a programme of archaeological excavation and watching brief at Furness Abbey, near Barrow-in Furness, Cumbria (NGR SD 2182 7179) between 29 April and 8 October 2013 on behalf of English Heritage. The investigation formed part of an ongoing scheme of works relating to the essential repairs necessary to secure the conservations of the Presbytery walls. Archaeological excavations were required prior to the consolidation and underpinning of the Presbytery walls, both to inform the development of the structural engineering solution and as mitigation for the effects of excavation works.

Previous stages of archaeological excavation were carried out by Oxford Archaeology North, beginning with the excavation of an evaluation trench against the east wall of the Presbytery (OA North, 2009). During 2009-2010, excavations were carried out within and to the north of the Presbytery, in advance of the installation of anchor blocks for a steel support framework, which currently remains in place (OA North, 2011). The first stage of enabling works for underpinning the Presbytery wall took place during the autumn and winter of 2010-11, and comprised complete excavation of deposits on either side of the north wall of the Presbytery (OA North, 2011). During late 2011 and early 2012, Headland Archaeology, carried out further investigations which comprised complete excavation on either side of the south wall of the Presbytery and around the outer face of the east wall of the Presbytery.

Headland Archaeology was commissioned to carry out further enabling works, comprising Project Phases 5 and 6. Phase 5 comprised the removal of previously excavated backfilled ground around the north, south and east walls of the Presbytery together with excavation of areas which had not yet been excavated to the required levels and profiles. This was to allow the underpinning contractor (Historic Properties Restoration) to carry out the underpinning of the masonry walls. The underpinning works were monitored by an archaeologist with any remains not previously investigated being excavated and recorded (Phase 6). The work follows a Specification and Schedule of Works issued by English Heritage (English Heritage 2013) and a Project Design prepared by Headland Archaeology (Headland Archaeology 2013). The site of Furness Abbey is a Scheduled Monument (National Monument Number 13572) and Scheduled Monument Consent was granted for the works by English Heritage (SMCC00059218).

1.2 Site location

Furness Abbey is located just to the north of Barrow-in-Furness, in a narrow, steep-sided, wooded valley, the Vale of Nightshade (Illus. 1). The central complex of the Abbey, including most of the upstanding ruins, has been managed and maintained by English Heritage under guardianship arrangements since 1923, and is open to the public via a modern visitor centre on the north side of the site. The site is bounded to the south and west by a minor road (Manor Road) and to the east by the Barrow-Lancaster railway line which runs through a cutting at the edge of the valley. Outlying parts of the Abbey precincts, including the gates and precinct walls, lie beyond this area.

1.3 Description of the assets affected

Furness Abbey is a Grade 1 Listed Building, a Scheduled Ancient Monument and in State care. The abbey as a whole is therefore of the highest national importance. Furness Abbey had close connections via daughter houses with Ireland, Scotland and the Isle of Man and

is representative of the buildings raised by the Savigniac and Cistercian Orders across Europe, which is also of international importance. The abbey was founded in 1127 by monks of the Benedictine Order of Savigny, which was merged with the Cistercian Order about 1150. The abbey follows the Cistercian plan, with the cloister to the south of the church and the refectory at right angles to the cloister, although the overall precinct layout was adjusted to fit the local topography. At the time of the Dissolution, Furness Abbey was one of the richest abbeys in the country, and its importance and wealth can still be seen in the quality of the upstanding remains that survive today.

The Presbytery is at the east end of the church where the high alter is located and other significant features related to the celebration of the mass such as the sedilia, the piscina and an aumbry for storage of plates and vessels. This end of the church has some of the highest upstanding masonry in the abbey complex. The church is known from previous investigations to have been rebuilt by the Cistercians, replacing a more highly decorated Romanesque Savigniac church, traces of which can still be seen. Later remodelling in the 15th century provided the Presbytery with larger windows. The Presbytery was also a place for important burials of abbots and lay benefactors who has earned the right to be buried within the church.

1.4 Previous archaeological work

An exhaustive history of investigations at the abbey is beyond the scope of this document, but relevant issues for the investigations of the Presbytery are briefly highlighted. The following documents have been consulted:

- Archaeological Post-excavation Assessment (Project Stage 4 of 6) by Oxford Archaeology North (referenced as OAN 2011)
- Archaeological Post-Excavation Assessment by Headland Archaeology (referenced as HA 2012)

Abbey remains proved irresistible to early antiquaries and Furness was no exception with reduction of levels and clearance of 'rubbish' carried out in the church in the 1840s by Thomas Beck (Harrison *et al* 1998, 34). Further 'clearance' was carried out in the early 1880s, and towards the turn of the century the experienced abbey-digger Sir William St John Hope was active at Furness. He carried out excavations in other parts of the abbey but also exposed the lower parts of the walls within the presbytery (OAN 2011, 1.4.1).

After the abbey was taken into Guardianship in 1923, a major programme of restoration and work on the presentation of the buildings began. Major stabilisation works on the north transept involving underpinning with concrete were carried out (Harrison *et al* 1998, 5), which must have necessitated excavation in and around the east end of the church, but no detailed records of this work survive (OAN 2011, 1.4.2). It was discovered at this time that timber piles and rafts had been used in the foundations. It is the decay of these timbers that seems to be causing localised failure of the foundations and destabilisation of the abbey walls.

Archaeological monitoring of works at the abbey became more systematic from the mid-1980s onwards. In 1992, an evaluation in advance of remedial work in the angle of the north transept and Presbytery indicated archaeological deposits at depths as little as 200mm below the turf and burial cists 400mm below the surface (OAN 2011, 1.4.6).

The current programme of works associated with the investigation and stabilisation of the Presbytery began in 2009 and continued on and off until spring 2011 (OAN 2011, 7-8). The first investigation in 2009 was an evaluation against the outside of the Presbytery

east wall, followed by testpitting in various locations in and around the Presbytery prior to the installation of concrete supporting blocks as anchors for a steel support system. Also in late 2009 was the excavation of two pits for anchor blocks to the north of the Presbytery. More extensive excavations were carried out in two phases; between August 2010 and January 2011 (Oxford Archaeology) and between September 2011 and February 2012 (Headland Archaeology).

1.4.1 Archaeological Investigations: 2009-11 (Oxford Archaeology)

The findings of the 2009-11 Oxford Archaeology investigations can be summarised as follows:

Excavation took place on either side of the north wall of the Presbytery in order to record deposits affected by proposed underpinning works. Archaeological deposits were found to depths of 2-2.5m. Three phases of medieval structural activity could be identified, which reflected the primary Savigniac construction and two phases of subsequent Cistercian remodelling.

Sufficient, relatively well-preserved, remains of the primary Savigniac church were found to show that the east end of this structure had been apsidal, and some internal decorative structural features were identified. The foundations of the original Cistercian square-ended Presbytery were found to overlie the remains of the Savigniac apsidal structure.

The bulk of the archaeological features related to the 15th century Cistercian remodelling, which introduced a different method for constructing foundations, using horizontal oak beams within stone-built cells. It was this method which ultimately caused structural instability as the timbers decayed over time. Other significant finds included 14th century structural stonework, which had been incorporated into the foundations; these cannot be matched with any existing structure within the abbey so perhaps relate to a lost structure or one for which the stones were cut but never assembled. Internal features of this phase included altar bases and a flagged surface.

Burials were also recovered, amounting to 18 complete skeletons in stone cists and sarcophagi as well as wooden coffins (represented only by their iron fittings), and a quantity of disarticulated charnel. One particularly significant burial, close to the centre of the Presbytery, was that of an abbot, buried with his crozier and finger-ring.

1.4.2 Archaeological Investigations: 2011-12 (Headland Archaeology)

The 2011/12 works by Headland Archaeology comprised three main excavation areas: on either side of the south wall of the Presbytery and around the outer face of the east wall of the Presbytery. The earliest phase of construction on site relates to the church built by the Savigniac order following the foundation of Furness Abbey in 1127. A layer of made ground overlying natural alluvial silts to the east of the church is thought to relate to levelling of the site in advance of construction. Elements of the Savigniac church survived at the west end of the Presbytery, where an arch led through to the chapels. The Savigniac floor levels north and south of the arch were represented by spreads of mortar, which abutted a step immediately east of the arch in the Presbytery. The east end of the Savigniac Presbytery had been completely demolished, leaving only the rubble foundation course for the apse. However, the east end of the chapel to the south survived to a greater height, with two courses of ashlar masonry overlying rubble foundations. A large stone box culvert, extending east from the base of the foundations, was evidently intended as a measure against flooding.

During the 12th or 13th century, following the absorption of the Savigniac order by the Cistercians, the east end of the church was rebuilt with a square-ended Presbytery and

three square-ended chapels opening off the north and south transepts. A fragment of the outer face of the early Cistercian south Presbytery wall was seen in the Sacristy, abutting the east wall of the early Cistercian chapel, indicating that the transepts were rebuilt before the Presbytery. The early Cistercian foundations in the Presbytery were of two distinct builds: to the west, the existing Savigniac foundations appear to have been partially removed and re-faced, while the east end rested on entirely new foundations. The floor surfaces in the Presbytery and chapels were raised, with a paved surface consisting of closely-fitted dressed stone blocks laid in the Presbytery.

To the east of the church, the ground levels appear to have been raised at the time of the early Cistercian rebuilding, and the made ground to the south and east of the Presbytery used as a burial ground. Some burials were in long cists, others in simple grave cuts, with some of them intercutting. Eleven complete or partial skeletons were recovered, but there was evidence for at least another six burials in this area, including cists from which the burials had been exhumed, or which were partially exposed but left unexcavated.

The 15th century Presbytery was rebuilt on a foundation raft consisting of timbers laid along the lines of the walls, which in the case of the east wall rested on a lower stone foundation course set in a deep trench. The early Cistercian foundations were not completely demolished, but in places were hacked back or hollowed out and the new foundations inserted behind them; this technique was observed along the east and south walls within the Presbytery, and along part of the outer (south) face of the south Presbytery wall, and a small fragment of the early foundations was also retained and built into the outer face of the east wall, for reasons that remain unclear.

Elsewhere, the timber raft was laid in a foundation cut carefully packed with stones and sealed with clay. The south-east buttress, however, was built on a foundation of vertically driven piles and large cobbles, also packed with clay. The late Cistercian rebuilding also saw the east wall of the chapel adjacent to the south side of the Presbytery demolished, and the chapel extended to the east to form the present-day Sacristy. The walls of the extended chapel are supported below ground level on three relieving arches which rest on two large pier bases and on the existing Presbytery and transept walls. This rebuilding covered part of the burial ground, and resulted in considerable disturbance to the burials, some of which were exhumed and probably reburied in a charnel pit dug into the deposits below the chapel floor. The floor levels were raised by around 0.7m in the Presbytery and the Sacristy at the time of the 15th century rebuilding, although the only evidence for the floor surfaces themselves consisted of quantities of glazed floor tile fragments from a thin layer immediately below the turf. A single burial in the Presbytery is thought to relate to the late Cistercian phase.

2 AIMS AND METHODS

2.1 Research Aims

There is no overarching national research framework for the medieval period, but in the absence of such documents some general issues of national and international importance can still be identified which are relevant to this particular project. Remains of Savigniac buildings in Britain are rare and the investigation of the Savigniac structural remains at Furness and comparison of them with known sites in Britain and on the Continent, has the potential to add significantly to this small body of evidence. Further burials were encountered, and these have the potential to increase our understanding of the variations in Christian burial practice associated with large religious institutions.

There is a regional research framework for North West England with a specific medieval period framework and agenda (Newman 2006; Newman & Newman 2007). The particular investigations in and around the Presbytery have little potential to contribute directly to wider landscape studies apart from the sourcing of timber, presumably from the abbey's own managed forests or those of benefactors, for use in the foundations.

The principal research themes relevant to this particular investigation of the Presbytery, the Sacristy, and the Monks' Cemetery can be summarised as follows:

- Elucidation of structural sequences combining existing historic building records with evidence (stratigraphy, architectural stone fragments, timber) recovered from the archaeological excavation
- Use of space within the Presbytery and Sacristy and evolution of the use of these areas over time
- Evidence recovered from the burials and grave slabs, including rites and ceremonial, the status, origins and possibly the identity of individuals buried, and evidence of pathology and diet which can indicate social differences.

It is envisaged that this most recent phase of excavation, along with the next phase (final phase, due in summer 2014) will provide further details on the stratigraphic sequence recorded during previous investigations. An important task upon completion of all excavation work will be to tie the various phases of work together into a single stratigraphic and chronological sequence. This will allow the compilation of a narrative detailing the chronological development of the Abbey based on the archaeological evidence.

2.2 Project design and methodology

2.2.1 Location and extent of excavations

The position and sequence of the excavations followed the *Specification* and *Schedule of Works* issued by English Heritage (2013), except where variations were instructed by the EH Project Manager. Initially the *Specification* stated that all areas of previously excavated material around the north, east and south wall of the Presbytery were to be removed (Areas A to E), but a change in methodology directed by EH resulted in three main excavation areas being opened up:

- on either side of the south wall of the Presbytery;
- within the Presbytery (referred to as Area A in *Specification*) and the Sacristy (referred to as Area B in the *Specification*); and
- around the east wall of the Presbytery and the south-east buttress (referred to as Area C in the *Specification*) (Illus . 2).

The area to the south of the north wall of the Presbytery (referred to as Area D in the *Specification*) was also opened up, but no further excavation took place during this phase and it was backfilled. The remaining areas of excavation will be addressed in the next phase of work.

Previously excavated material was excavated down to a level covered in terram which indicated the limit of excavation reached in previous phases of work. The material was removed using a 5 ton mini digger under the direct supervision of an archaeologist. Excavation by mini-digger was replaced by hand digging within 300mm of the abbey walls. Below the terram level, excavation was continued by hand in stages during both Phase 5 and Phase 6 of the works, to the depth required by the main contractor. Generally

this was to a depth 250mm below the base of the timber raft at between 13.10m OD and 13.30m OD. Excavation within the Presbytery and the external area included the partial dismantling of the early Cistercian Wall foundation. This was undertaken by hand with stonework of architectural interest being retained for inspection.

The excavation area within the Presbytery extended 11m from the east end along the south wall. For 2.75m from the east end of the Presbytery, the excavation adjoined the concrete plinth for the support frame, installed following an earlier phase of excavation in 2009. The western end of the area was excavated to form a battered face and was also stepped at a depth of 1m below current ground level on the north side of the excavation, south of the concrete plinth (Illus. 2).

The excavation within the Sacristy comprised a 3m x 7.5m trench (stepped in to 2m x 7.5m below 1.2m depth) from the east end along the south wall of the Presbytery. The western half of the trench was later extended to 3.5m in width (stepped in to 2.5m below 1.2m depth) to allow for excavation of a cist.

The external trench around the east wall of the Presbytery and the south-east buttress comprised a 3m wide trench around the external face of the buttress and Presbytery wall. The trench along the east Presbytery wall extended 3.25m north from the buttress. The north end of the area was excavated to form a battered face with the rest of the trench edges being stepped in to 2m below 1m depth. Where burials were found to extend beyond the limit of excavation, advice was taken from
English Heritage on a case-by-case basis on whether to extend the excavation area to retrieve the whole skeleton. This was necessary in the external area in one case where burials extended into the stepped area (Illus. 2).

2.2.2 Recording

All deposits, cuts, structural features and other stratigraphic elements were assigned individual context numbers and described on pro forma context sheets. Context numbers were assigned to architectural features and courses within the walls. Context numbers started at 14000 to facilitate integration with previous phases of work. Detailed context descriptions are included in Appendix 1.1. Multiple context numbers were used to refer to the same context where it was excavated in a number of different excavation areas: where this is the case, the first number assigned will generally be referred to, and concordance between numbers mentioned in the Appendix.

A Total Station linked to an on-site computer running AutoCAD LT and TheoLT software was used to record contexts in outline, and provided levels. The survey has been georeferenced and reduced to Ordnance Datum by tying it in to previously existing survey stations. This basic record was supplemented with hand-drawn plans, sections and elevations produced at appropriate scales (1:10 or 1:20) where necessary, with all drawings located on the survey with drawing control points and datum lines. Plans of all skeletons were drawn by hand. A list of drawings is included in Appendix 1.2.

A full photographic record was maintained, using colour slide, black and white print film and digital photography for all record shots. A complete photo catalogue is included in Appendix 1.3.

A laser scan survey was undertaken to provide a comprehensive metric record of the structures revealed by the 2013 excavations, including the apsidal Savignac foundations and those relating to the early Cistercian phases. Please refer to Appendix 4 for a summary report and results.

2.2.3 Finds and environmental samples

A number of worked stone fragments were recovered. Following a process of selection on site, and with the advice of the English Heritage Collections team, some of these were transferred to the store at Helmsley, and others stored on site in a stone clamp created to the south-east of the church. The work stone assemblage has been assessed by Stuart Harrison. No finds were recovered during the fieldwork, and only a small amount was recovered from the bulk soil samples. A finds assessment by Julie Lochrie is included in this report, with a full catalogue in Appendix 2.

Bulk soil samples, 40-60 litres volume where possible, where taken from deposits with potential for environmental analysis. All samples have been processed and a palaeoenvironmental assessment by Laura Bailey is included in this report.

3 STRATIGRAPHIC ASSESSMENT

3.1 Quantification

The stratigraphic record which forms the primary archive for the Phase 5 & 6 works comprises the following:

- registers: context register (1 sheet), drawing register (1 sheet), photo register (15 sheets), environmental sample register (1 sheet)
- context sheets: 36 in total, numbered 14000 – 14035
- drawings: 13 in total, on 8 sheets of A4 and 3 sheets of A3 format drawing film
- photographs: 3 black and white print films, 3 colour slide films, 415 digital photographs
- digital survey (AutoCAD LT)
- site diary (65 sheets bounded)

It should be noted that numbering of contexts, such as deposits and wall foundations, which were recorded in previous phases of work, have retained their original number within this report. Context numbers used in this report from previous phases of work have been included in Appendix 1.1. Individual reports for previous phases of work should be consulted for full context registers.

3.2. Phasing

The results of the main excavation within and outside the Presbytery and Sacristy are presented by area; however, references to phasing will be included. The phases remain as defined by previous work and these are:

Phase 1: the original Savigniac church, built following the foundation of the abbey in 1127
Phase 2: the early Cistercian rebuilding, dating to the 12th or 13th century
Phase 3: the late Cistercian rebuilding during the 15th century
Phase 4: post-Dissolution and modern activity

It is also worth noting that the church at Furness Abbey deviates quite significantly from the conventional east/west orientation, with the 'east' end actually facing north-east. For convenience and avoidance of confusion, a 'site' north will be used in describing directions, aligned with the layout of the church rather than with true north: for instance, reference will be made to the east and south Presbytery wall whereas these in fact face southeast and northeast in relation to true north.

3.3 Geological deposits

All excavation within the trenches was within previously observed alluvial deposits. Within the Presbytery, a layer of soft, mid greyish-brown silt [12375] was present at 13.65m OD. This alluvial deposit continued to at least the limit of excavation at 13.25m OD. Alluvial silt deposit [12163] was exposed in the east end of the Sacristy beside the arch in the east wall, at a level of 13.45m OD, and overlay a layer of gravel [12186] and pinkish-orange silt clay [14003] which continued to a level of 13.15m OD across the majority of the trench. In the external trench, the uppermost deposit [12602] of the alluvial sequence consisted of a reddish-grey sandy silt, and overlay successive layers of soft, waterlogged alluvial silt, [12631], [12632] and [12633], the lowest of which [12633], was not bottomed at 13.10m OD.

It was presumed that basal deposits recorded in areas of excavation in this phase of work were naturally occurring deposits and that they were not sealing any further archaeological features. Only foundations of the first phase of the abbey were cut into these deposits.

3.4 The Presbytery

The rubble foundation [12558] for the apsidal east end of the Savigniac church that was recorded in the previous phase of work was uncovered and further investigated (Illus. 3, Plate 1). The foundation was cut [14035] into an alluvial silt deposit [12375] and removal of one or two courses of stone (two courses where more depth was required to allow the underpinning) revealed the continuation of the foundation to a depth of at least 13.20m OD. The foundation was made up of rough courses of large, irregular quarried stone fragments, with similar material packed in between to form the core. The stones were laid in a non-uniform pattern with lenses of pinkish brown silt clay situated between the courses possibly representing a levelling material. At the east end of [12558], one course of the curving east wall [14025] of the apsidal Savigniac Presbytery was partially visible, situated below the 1st Cistercian wall [12303], at a height of 13.50m OD (Illus. 3).This was made up of shaped sandstone blocks that formed a regular face which abutted the foundation pad [12558].

There was a requirement for the 1st Cistercian wall present within the Presbytery to be dismantled to allow the underpinning works to take place (Illus. 6). The section of 1st Cistercian wall deemed the most unstable was removed along the south, [12303], and east, [12301], walls of the Presbytery to a height of around 14.25m OD. This allowed for the underpinning to take place safely but at the same time allowed for partial preservation of the wall. As the 1st Cistercian wall was removed, it became clear for the majority, it was independent from the later 15th Century foundation. In the south-east corner of the Presbytery, however, the earlier wall was more intertwined into the later foundation, but the limitations of the extent of dismantling in this area made it unclear exactly how the walls were constructed and connected (Plate 2). The foundations of the south and east 15th century walls were revealed behind the earlier foundation and were constructed of both loose random rubble and larger squared blocks, bonded with lime mortar (Illus. 7, Plate 13).

3.5 The Sacristy

The rubble foundation [14009] for the apsidal Savigniac chapel was found to continue to a depth of at least 13.16m OD (Illus. 3, Plate 3). It consisted of large irregular stone slabs ([12545] and [14009]) laid in a non-uniform pattern with lenses of dark pink and dark

brown mixed silt clay with smaller rubble stones situated between the rough courses, possibly representing a degraded organic packing material. The foundation extended 1.8m out from the end of the apse, in a cut [14010] that cut through pink sand clay alluvial deposit [14003].

Adjoining [14009], a similar stone slab foundation [14011] continued to the east below the Presbytery wall, directly below the timber raft, which continued to a depth of between 13.15m and 13.25m OD at least (Illus. 3, Plate 4). The outer edge was roughly faced to form a linear foundation running east to west. This was thought to be representative of the edge of the foundation for the Savigniac Presbytery. At the eastern end, below [14011], a curving, stone paved feature [14023] stepped out 400mm from the foundation base (Illus. 3, Plate 5). The limited extent of excavation of this feature restricted the interpretation, but it was most likely to do with the construction of the Savigniac church.

A cist [14000] with capstones was cut into foundation pad [14009] within the Sacristy at 13.40m OD (Illus. 4 & 5, Plates 6 & 7). Originally interpreted as a drain ([12567]) during the previous phase of work, in the course of removing part of the foundation pad a capstone of the cist was removed, revealing the curved end of the cist. Although no grave cut was discernible, it was established that the cist post-dated the foundation as lower courses of the foundation existed below the cist stones (Plate 3). The cist contained skeleton [14004] which had been slightly disturbed. This was evident as the top half of the skull was positioned at the pelvic area, but the remainder of the skeleton remained un-disturbed. Directly below the skeleton, a thin (0.03m) deposit of reddish brown mixed sandy clay [14006] was present which contained a high percentage of charcoal fragments. Another cist was visible in the north facing section of the sacristy trench (Illus. 10) but remained unexcavated *in-situ*.

3.6 External area

A similar stone block foundation [12445] to that recorded below the timber within the Sacristy ([14011]) was situated below the timber of the east wall of the Presbytery and continued to a depth of at least 13.25m OD (Illus. 3, Plate 8). It was formed of faced stone blocks to form a foundation running north-south. This was thought perhaps to be representative of the eastern edge of the foundation for the Savigniac Presbytery.

To the east of the Presbytery, two burials were investigated at a height of 14.10m OD (Illus 4 & 5, Plate 10 & 11). Skeleton [14028] was contained by a disturbed cist [14027]; capstones only partially covered the skeleton, and stones were present on the north-east side of the skeleton but not on the opposing side. Once the capstone was removed from over the skull, a thin sheet of oak [14031], measuring 400x250mm partly covered the skull. No wood was found elsewhere in connection to the skeleton. The stones to the north-east looked to have slumped over the skeleton, but it remained in good condition, apart from the skull which had been affected possibly by pressure and movement of the capstone (Plate 12). Skeleton [14030] was partly excavated and was situated over the sloping cist stone [14027]. The left humerus, radius, pelvis, femur and some vertebrae were exposed, recorded and subsequently left *in-situ* and reburied as there was no requirement for removal. Both burials belong to the burial ground previously recorded in prior phases of work and were thought to date to the phase between the early Cistercian rebuilding in the 12th/13th century, and the second rebuilding in the 15th century.

During the underpinning works, further ground reduction below the lowest course of the south-east buttress revealed the presence of a number of oak timber uprights below the stone. Excavation in this area confirmed the presence of the timber raft projecting to a right-angled join beneath the buttress and the foundations resting on a layer of large

rounded cobbles bonded with clay [12563]. Several vertically driven wooden posts were noted within the stone/clay matrix and during the underpinning works; the drilling process encountered further timber uprights in a staggered formation below the buttress. It was presumed that their function was piling for the buttress foundation. The same type of oak timber uprights were situated below the springer stone of archway [12345]/ [12048], south of the buttress (Plate 9). It was not clear, however, if these were only situated along the inner edge of the base of the springer or whether they were staggered below in a similar way to below the buttress.

3.7 Underpinning works

During the underpinning works, the presence of the oak timber raft below the 15th century Cistercian re-build was confirmed. It consisted of three beams running the length of the south wall of the Presbytery; two beams located side-by-side on the external edge, measuring 220x340mm at most in section, and one beam on the inner edge, measuring 250x350mm. This was a similar case along the east wall of the Presbytery, but here two beams were located side-by-side on the inner edge, and one beam on the outer edge. The condition of the timber varied, with preservation of beams along the south wall being moderate to good (Plate 14), to preservation of beams along the east wall being moderate to very degraded. Material extracted, along with the timber beams, from under the abbey walls, included a grey clay deposit [14036] interpreted as packing material around the timber beams, and stone fragments which were presumably the result of either the construction process or fragments of degrading stone.

4 FINDS ASSESSMENT

By Julie Lochrie

4.1 Building Material

4.1.1 Quantification and Provenance

Building material weighing 59g was retrieved from three contexts: stone wall [14001], basal fill (14006) of cist [14000] and deposit (14029) which covers inhumation [14028]. It is almost certain the building material relates to the construction of nearby walls.

4.1.2 Range, Variety & Condition

The building material includes small fragments and larger abraded pieces of mortar in abraded and fragmentary condition.

4.1.3 Statement of Potential

The mortar is unlikely to hold any potential for further publication. However should anyone wish to characterise the mortar composition in the future this will be possible as the mortar from wall [14001] is likely related to its construction.

4.2 Industrial Waste

4.2.1 Quantification and Provenance

The Industrial Waste weighs 12g and was retrieved from two contexts: basal fill (14006) of cist [14000] and fill (14029) which covers inhumation [14028].

4.2.2 Range, Variety &Condition

The building material includes 1g of magnetic residues and a small vitrified lump of slag. The magnetic residues may be hammerscale from smithing but the very small quantities could be residual or intrusive.

4.2.3 Statement of Potential
Analysis of the small quantities of magnetic residues and slag would provide limited information.

4.3 Lithics

4.3.1 Quantification and Provenance
Two pieces of chipped flint were retrieved from two contexts: fill (14029) which covered inhumation [14028] and fill of cist [14000].

4.3.2 Range, Variety &Condition
The lithics are prehistoric but are clearly residual. Prehistoric activity may have occurred in the vicinity or they may have been transferred to the site if soils were brought into the area during the abbey construction.

4.3.3 Statement of Potential
As the lithics are residual and few in number they provide no further scope for analysis.

5 ARCHITECTURAL STONE
By Stuart Harrison

The excavations of 2013 at Furness were designed to empty previously backfilled trenches and where necessary deepen them to accommodate drilling rigs for cutting out and removal of small sectional blocks of the foundation. This was in order to replace degraded timber beams within the foundation cores with cast concrete pads. This was a rolling process gradually moving along the foundation, cutting and replacing sections until the whole foundation had been underpinned. The deeper than expected extent of the timber beams meant that additional excavation had to be employed in certain areas to ensure removal of all the timber within each sectional block. Each of these sectional blocks was designated as a slot and given a number. This was charted by the contractors on plan and elevation drawings with a keyed number system.

The nature of the foundation of the south presbytery wall was considerably different in appearance on its south face than that of the north presbytery external wall face. On the north foundation wall there are a considerable number of architectural fragments visible within the external face of the foundation. In contrast there were very few visible reused architectural fragments in the south wall south face. Before the commencement of work I had advised that this contrast was possibly illusory because fragments might exist turned face into the foundation wall core. This analysis was proved to be correct when, very early in the works of underpinning, a large facing stone from slot A25 was removed to reveal that it was from part of a moulded pier of late thirteenth-century date. Inspection of the cavity from which it had been removed showed that adjacent stones were similarly moulded.

This important discovery prompted a review of the methodology being employed in cutting the slots. If, as seemed likely, there was a large number of such stones concealed in the foundation it would prove extremely costly and damaging archeologically to remove them. A slice taken off the base of a stone in slot A1 showed a good profile of a pier moulding that had been turned face inwards. After consultations it was agreed that the cutting height be raised in order to trim 100mmm from the bottom of each block which would enable a section to be recovered from the foundation that would show the profile yet leave the bulk of each stone in situ. This method meant that we could

archaeologically assess the significance of each stone but leave them relatively undisturbed.

The revised cutting process proved a successful way of dealing with this problem and a series of sliced profiles were obtained. These were laid out in slot order and marked with the slot number indicating their source in the foundation. These sliced profiles have been retained for reference at Helmsley Archaeology Store. A simple review of the recovered profiles shows that the bulk of the stones in this masonry course have the same basic late thirteenth-century moulded profile, each forming part of a larger pier shaft.

This pier shaft profile had first been observed within the north presbytery wall foundation and also beneath the east wall foundation where examples with the moulding facing outwards had been observed. Check profiles were taken with a profile gauge and matched with the profiles that had been recorded in earlier works.

The material cut out of the core below this course of masonry did not produce any moulded material and was composed largely of rubble stone blocks.

I had also signalled up the presence of numerous large rectangular blocks, within the foundations that were 77cm wide. To date it had proved impossible to discover the full nature of these blocks and it was advised that if possible it would be opportune to remove one to establish its form. Initially it was thought that one in the southern foundation might be removed but ultimately the nature of the voids and timbers within the east wall foundation meant that it was necessary and safer to remove one from that area to facilitate the cutting operations. This block was very large and heavy but was successfully removed and was discovered to be another of the late thirteenth-century pier mouldings. This stone is notable because on one end a roll moulding has been cut away for either a patch piece to be inserted or for a socket for a screen. The other end had been extensively damaged, possibly to locate it in position in the foundation. Further detailed examination may reveal more information.

Within the cavity, created by removal of this large stone, it could be observed that there were other stones exposed with the same mouldings. At the side of this cavity was another moulded stone which was also very large. It had dropped down from the course above and was loose. This was also removed because it formed an obstacle as a loose piece of large masonry to the drilling and cutting process. This stone proved to be part of a moulded window jamb or sill with a well-defined glazing groove. It is a moulding which had not previously been encountered and adds new information to the archaeological record.

Another stone that was recovered, presumably loose in excavation, rather than from the foundation walls that were being underpinned, appears to have been part of a circular-planned chimney. It had not been drilled or cut in any way. Unfortunately I only saw this stone after it had been recovered and do not have details of its precise origin. This is a curious stone to find in such a context and may raise issues of the sourcing of such stone for recycling because it cannot have formed part of the church at any period and must have originated in the claustral ranges.

These three loose stones were removed to secure storage at Helmsley.

What has emerged from this period of underpinning the south and part of the east wall is that the extent of reused stone within the foundations is far greater than is apparent from the visual evidence. I had suspected and predicted that this was likely to be the case. In particular there are far more of the late thirteenth-century pier sections than was

obviously the case. In this respect our earlier recording of these stones has shown that there are two distinctly different types which differ in profile and overall size. The majority of material observed to date indicates that the bulk of the pier sections are from the smaller of these types. What has proved impossible to establish yet is whether both types are from half-pier responds of full freestanding piers. The larger type has so far only produced what seem to be responds that were observed at the western end of the north presbytery wall foundation in the external face, particularly around the area of the intermediate buttress. One of the smaller shaft sections, observed just east of the intermediate buttress, may have been greater in extent than a half respond. Unfortunately it was still partly buried and was not further exposed before concrete was introduced to temporarily support voids in the foundation wall. It is therefore important that this stone be revisited during the next phase of underpinning and to be recovered if possible. As it was not part of the main foundation wall, but lay alongside it, it may still prove possible to recover it.

This is a vital point in trying to understand the function and possible source of these piers shafts. We must try and establish if there are sections of full piers present as well as responds. There is no obvious source within the church and claustral buildings for these pier sections, obviously they formed part of a major structure. Yet it is possible to postulate a solution to this problem. The great infirmary hall is very wide and until now it has always been thought that it was without internal arcades because the surviving east wall and what remains of the aisle walls are devoid of articulation for them. There has been no recorded detailed excavation of the internal area of the hall. Yet a comparison with the plan of the similar but earlier hall at Fountains is perhaps telling. That hall had internal arcades with two different pier sizes and in which the aisles were carried around the end gable walls as well as the side aisle walls. This meant that there was no articulation for the arcades on any of the side or end walls. If the same design were applied to Furness then a stone internal arcade was perfectly possible. Notably the pier sections we have recovered and observed have profiles that indicate they could be contemporary in date with the infirmary hall.

Moreover the presence of these piers sections in the new presbytery foundation might indicate demolition of part or the entire infirmary arcade in the medieval period. Certainly the building to which they belonged had been demolished or radically remodelled in some way. Removal of the stone arcade might suggest a replacement single-span hammer beam roof over the infirmary hall or perhaps more likely, the conversion by subdivision of the hall by inserted stone and timber partition walls into apartments. That is what happened at Fountains and Kirkstall and many other monastic infirmaries. Such a process may well have involved the part demolition of the arcades of the hall. Though this, for the moment, remains a theory for the source of the pier shafts it is also an attractive idea. What it does highlight is the lack of knowledge about the infirmary hall and also raises issues to be addressed in future research strategies for the site as a whole.

The Nature of the Foundations

The possible overall extent and nature of the Savigniac footings have been clarified to some extent by the additional excavations undertaken during this phase of underpinning. This is an important point in understanding the Savigniac methods of foundation construction most notably because they seem to have been superior in durability and load-bearing capacity than the later Cistercian foundation phases. Previous problems with the Cistercian first phase foundations, in the north transept, were encountered in the 1920s and remedied by underpinning. These works included the removal of timbers including piles. The current works have also shown that the second phase of Cistercian foundations was reinforced with timbers that have also ultimately failed.

These failures raise certain questions regarding the types of foundations employed but also why was the first Cistercian presbytery completely replaced with a new structure, built on new foundation, which was almost the same size? Was this motivated by a failure of the foundations of this first Cistercian presbytery? Certainly there was no gain in space and the existing structure, if sound, could have simply been updated with new windows etc.

The Changes in Floor Levels

We are also gaining new insights into the changes in relative floor levels of the church between the three main phases of building and alteration. This must have had a significant effect on the appearance of the church and its fixtures and fittings. Again motivation for such changes must be sought and questioned. Was the church suffering from a high water table and therefore rising damp, countered by raising the floor levels, as is known to have happened at Bordesley Abbey? If so how did this also affect the claustral ranges? A short published note regarding the discovery of buried octagonal pier bases in the chapter house also suggests a general raising of the floor levels in the post Savigniac period. Presumably such bases relate to the first Savigniac chapter house that had an apsidal plan.

6 ENVIRONMENTAL ASSESSMENT

By Laura Bailey

6.1 Quantification

Four samples ranging in volume from 20 to 70 litres were processed for environmental assessment, together with hand collected charcoal. The samples were taken from features including grave fills and wall foundations (see Tables 1 and 2). One hundred percent of each sample was processed for the recovery of environmental remains. Five pieces of uncharred, waterlogged, timber were also examined and their species identified. The results are presented in Table 1 (Retent sample results) 2 (Flot sample results) and 3 (Identified Timber). The survival of the charcoal together with the waterlogged wood and plant remains indicates that conditions on site were suitable for the preservation of both charred and uncharred environmental remains.

6.2 Processing methods

The samples were subject to flotation and wet sieving in a Siraf-style flotation machine. The floating debris (the flot) was collected in a 250 µm sieve and, once dry, scanned using a binocular microscope. Any material remaining in the flotation tank (retent) was wet-sieved through a 1mm mesh and air-dried. This was then sorted and any material of archaeological significance removed. All plant macrofossil samples were analysed using a stereomicroscope at magnifications of x10 and up to x100 where necessary to aid identification. Identifications, where provided, were confirmed using modern reference material and seed atlases including Cappers *et al.* (2006). Charcoal was identified as oak/ non-oak wherever possible.

Timbers were collected for species identification. Timber fragments were sliced along radial, tangential and transverse sections using a razor blade and then bleached before being mounted on a slide in glycerol and examined under a microscope at x100 and x400. Wood sections were identified to species level using features described by Schweingruber (1978, 1990) and IAWA (1989).

6.3 Assessment of plant remains

Two of the four samples, taken from grave fill (14209) and the upper cist fill (14005), contained uncharred seeds, likely to have been preserved by water logging (see Table 2),

these included small quantities of elder (*Sambucus nigra*), brambles (*Rubus* sp.), buttercup-type (*Ranunculus* sp.) and sedges (*Carex* sp.). The majority of these species are associated with waste ground or scrub. The sedge may be indicative of damp ground.

6.3.1 Wood Charcoal

Charcoal fragments were present in all the samples in varying quantities. Charcoal was abundant in contexts (14006) and (14005) and ranged in size from less than 1mm to 3.5 cm, the majority of fragments, particularly from context (14006), were in the large size range (> 3cm) suggesting that they were probably closer to the point of burning. Both oak and non-oak charcoal was identified in all of the samples, with the exception of hand collected charcoal from context (14004) which exclusively contained oak charcoal.

6.3.2 Hazel nutshell

A single nutshell fragment, probably preserved by waterlogging was found in context (14005).

6.3.3 Human Bone

Bone fragments were recovered from contexts (14006), (14029) and (14005) and will be discussed as the subject of a separate report.

6.3.4 Timber

Three squared sections of a timber raft foundation, one timber upright post and a thin wooden sheet were recovered for species identification, all were found to be oak (*Quercus* sp.) (Table 3)

Sample	Context	Interpretation	Material	Condition
	14024	Timber upright	*Quercus* sp.	Reasonable
	14031	Wooden sheet situated over skull of inhumation [14028]	*Quercus* sp.	Very poor condition
Timber A		Section of timber raft foundation	*Quercus* sp.	Reasonable
Timber B		Section of timber raft foundation	*Quercus* sp.	Reasonable
Timber C		Section of timber raft foundation	*Quercus* sp.	Very poor condition

Table 3- Identified Timber

Suitable material for radiocarbon dating such as bone and charcoal was recovered from three of the four samples (see Tables 1 and 2).

6.4 Discussion

A large amount of charcoal was recovered from two samples. One concentration, from the basal fill (14006) of Cist [14000], is of particular interest and formed a distinct layer beneath the inhumation. It seems likely that the body was deliberately placed upon the deposit as part of the burial practice. Similar graves have been recorded on other sites dating from the later Anglo-Saxon period to the 12th century AD (e.g. Roffey 2007) with the body being placed on, or covered by charcoal (e.g. Thompson 2002). These 'charcoal burials' containing foreign or burnt material (e.g. Roffey 2007), are broadly diagnostic of late Anglo-Saxon burial practice and commonly found at larger churches and minster sites

such as Exeter and Winchester (Thompson *ibid*). It is possible that the charcoal was used to soak up unpleasant smells. Analysis of the charcoal from the cist burial could provide information on species used and together with comparative examples provide further information on burial practice.

The waterlogged plant remains are similar to environmental assemblages recovered from the site during previous phases of work (Oxford Archaeology North 2007; Timpany 2011) and contribute low–level data to the understanding of the surrounding environment. It is likely that in most cases the waterlogged plant remains relate to secondary deposition, for example grave backfill, and will not significantly address the current research agenda on diet, economy or agricultural activity (Newman and Newman 2007). Waterlogged plant remains are generally found in areas where the water-table has remained high enough to inhibit destruction by decay-causing micro-organisms. They can also occur in certain deposits if conditions are anoxic, i.e. waterlogged, and highly organic, such as in pits lined with stone, dug into heavy clay, or sealed by overlying stratigraphy (English Heritage 2011). The preservation of waterlogged plant remains suggests that the area was subject to persistent waterlogging rather than periodic flooding.

Three of the contexts provided sufficient material for radiocarbon dating and could be combined with existing data to refine the chronology of the site.

7 HUMAN BONE ASSESSMENT

By Dave Henderson

7.1 Quantification

Two further articulated skeletons were excavated from Furness Abbey, SK [14028] and SK [14004]. SK [14004] was found in a cist in the sacristy, laid on a bed of charcoal; this may account for the very dark colouration of the cranium of this individual, alternatively the stain may be the result of manganese in the surrounding matrix, as recorded on some of the previously excavated skeletons from the site.

7.2 Condition

Both skeletons were essentially complete. Some small bones of the hands and feet were missing; the ribs and vertebrae were very poorly preserved.

The integrity of the bone was mostly good, but the bone surface was eroded in many places, particularly on the joint surfaces. As stated above, much of the bone of the torso was missing, probably due to lying on the base of the grave, therefore being most subject to the effects of groundwater (surface preservation McKinley's [20004] Grade 3). Both skeletons had experienced a slight degree of fragmentation, particularly of the skull. Most breaks are uneroded and so will be repairable if necessary, although it appears that the cranium of SK [14028] may have been distorted by the weight of overlying grave-fill.

7.3 Age/Biological Sex Estimation

Both skeletons yielded data allowing assessment of their age at death, the most accurate being wear and development of the dentition and fusion of epiphyses. One individual was sub-adult or a very young adult (~18 - 25 years), the other an older juvenile or sub-adult (~15 - 21 years). These age estimates are lower than any of the 12 previously excavated skeletons.

Although young, both individuals exhibited definite male characteristics based on surviving diagnostic features.

7.4 Metrical Analysis

Although there is not a high level of fragmentation of the long bones, the erosion of the ends of the bones means that few measurements are potentially available for stature estimation in SK [14028]. Stature estimates will be possible for the other individual. Both skeletons have the potential for calculation of the cranial- and post-cranial indices, although the distortion of the skull of SK [14028] may not allow the full suite of indices to be derived.

7.5 Non-metrical analysis

Most non-metric, or discontinuous skeletal, traits will be available for recording, although small sample size and the poor potential of the previously recovered skeletons will limit the usefulness of this data.

7.6 Skeletal pathology

No skeletal pathological lesions were noted on SK [14004]. An enthesopathy was recorded on the sternal end of the left clavicle of SK [14028], indicating a possible muscle injury to the shoulder or neck. Poor preservation of joint surfaces in both skeletons precludes assessment of any potential degenerative joint conditions.

7.7 Dental Pathology

Complete dentitions were present in both skeletons. Dental enamel hypoplasia was noted on both individuals, potentially giving insight into childhood morbidity. SK [14028] had calculus on the anterior teeth.

7.8 Potential

Analysis of these two skeletons (substantially complete and younger than the previously excavated assemblage) would be a worthwhile addition to the study of the buried population from the site, as outlined in the assessment of the previous material.

8 STATEMENT OF POTENTIAL

A comprehensive discussion of the stratigraphic sequence as understood at the time, and its archaeological and historical context, is included in section 6.2 of the Oxford Archaeology North report (OA North, 2011, 80-86) and updated in section 8.1 of the Headland Archaeology report (Headland Archaeology, 2012, 28-30). The following section aims to identify were the recent excavations provide additional information to the existing account of the abbey.

The information gained from this most recent phase of work is limited in comparison to the amount gained in previous phases. However, it has provided additional, significant evidence of how the Savigniac church (Phase 1) may have been constructed. Previous excavations within the Presbytery had confirmed the apsidal plan of the Savigniac Presbytery. It was noted that as the transept chapel rested on a substantial pad of large stone rubble to provide a solid base on soft ground, it was curious that the rubble foundation of the Presbytery apse was insubstantial in comparison (Headland

Archaeology, 2012, 28). The stone foundation recorded below the timber raft foundation during this phase of work, within both the Sacristy area and in the external area, could be evidence that in fact there was a more substantial foundation pad for the Presbytery apse.

If the foundation recorded below the timber is representative of the edge of the Savigniac Presbytery foundation, the rubble foundation pad could be up 3.75m in width; notably more substantial than previously thought. The presence of one course of what was interpreted as the curving east wall of the apsidal Savigniac church abutted against the foundation pad, would change the dimensions of the apse end of the Presbytery making it larger and more substantial than prior interpretations. Consequently, the foundation pad of the Savigniac Presbytery would be more in keeping with that of the transept chapel.

The foundation below the timber on the east wall of the presbytery was previously interpreted as part of the later 15th century re-build (Phase 3); as an additional support for the timber raft to rest on. This is still a plausible interpretation, particularly as it is constructed of more uniform, coursed, cut stone blocks than the foundation below the timber on the south wall. The next phase of works should confirm what phase this foundation belongs to and subsequently confirm whether it was part of the Savigniac apsidal foundation pad or in fact a later support for the timber raft.

The two burials excavated in the current phase of work were located outside the church, as it existed before the extension of the Sacristy (Phase 3), and most likely represent part of the monk' burial ground (Phase 2). The condition of the burials were quite different and with the external area of the abbey being more prone to flooding, it is not surprising that the grave condition of the skeleton in this area is less well preserved than that of the cist within the Sacristy area. It is likely the external area has suffered from frequent fluctuations in the water table. When considered together with burials excavated in previous phases, the burials recorded during this phase have potential to add to the study of changing burial practices.

The potential of the results from the current phase of investigations carried out by Headland Archaeology is limited in being assessed in relation to the majority of *updated research questions* set out in previous reports by Oxford Archaeology North (OA North, 2011, 6.4.2) and Headland Archaeology (Headland Archaeology, 2012, 8.2).

Additional information relating to the layout of the Savigniac Presbytery is particularly significant in establishing the layout and chronology of the abbey. Future investigation in the next phase of work could potentially confirm the above interpretations, allowing for the accurate reconstruction of the phasing, plan and dimensions of the east end of the Presbytery.

Assessment of the human bone assemblage indicated that the age and sex of the skeletons can be determined. Along with the skeletons recovered during previous phases of work, and any further human remains that may be found in the next phase of work, further analysis would allow information to be gained about the demography of the population buried within and around the abbey.

Once the next and final phase of the site works are carried out, the dissemination of the results of the investigation would be most effectively achieved by publication of a synthesis of all the work carried out at Furness in recent years in a single volume. There is also potential for more popular forms of publication, such as an updated guidebook and enhanced displays for the visitor centre.

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APPENDICES

APPENDIX 1 – SITE REGISTERS

Appendix 1.1 Context Register

Context	Area	Description	Interpretation
12048	Sacristy	Stone arch located in Sacristy's eastern wall formed from variously-sized pieces of stone, bonded by mortar	Relieving arch supporting east wall of Sacristy
12163	Sacristy	Deposit revealed in sondage adjacent to east wall of Sacristy, 100mm thick: brownish dark grey plastic sandy silt with charcoal inclusions. Situated below (12162) and overlies (12186)	Natural alluvial deposit
12186	Sacristy	Brown grey compact sand and gravel at least 60mm thick, exposed in sondage adjacent to east wall of Sacristy, beneath (12163)	Natural alluvial deposit
12274	External	Fragment of irregular coursed mortared stone wall projecting 0.29m from east face of external Presbytery wall, 0.42m high, extending for 1.4m	Remnant of early Cistercian foundation built into external face of east wall of Presbytery
12301	Presbytery	Wall foundation 2.1m in length and 400mm deep. Composed of variable and irregular roughly squared sandstone blocks 200mm to 400mm wide by 100mm to 250mm high laid in irregular courses bonded with lime mortar. Overlies [12295], underlies [12183].	Foundation of early Cistercian east Presbytery wall
12303	Presbytery	Wall foundation 500mm wide and 1.10m deep. Composed of variably sized roughly squared sandstone blocks 200mm to 400mm wide and 100 to 250mm high laid in irregular courses and bonded with lime mortar.	Foundation of early Cistercian south Presbytery wall
12345	External	Arch within foundation of Sacristy east wall. Composed of sandstone blocks of varying sizes laid in two courses to form an arch and bonded with lime mortar.	Relieving arch in east face of Sacristy east wall
12375	Presbytery	Pinkish red clayey sand with rounded stone.	Natural alluvial deposit
12445	External (HH)	Wall underlying timber beam [12490] 420mm deep. Composed of sandstone blocks of average size 270mm by 240mm laid in two irregular courses with no visible bonding material.	Wall foundation below timber raft (same as [12433]

Context	Area	Description	Interpretation
12545	Sacristy	Layer of poorly sorted angular stone with occasional gravel deposits with the larger stone found towards the base of the deposit.	Foundation pad for apsidal east end of Savigniac chapel - same as 14009
12558	Presbytery	Foundation course of apsidal end of presbytery. Composed of roughly shaped sandstone 130mm to 120mm to 480mm by 300mm in size, three stones on the inner face of the wall appear to be faced while the rest are roughly finished.	Foundation pad for apsidal east end of Savigniac Presbytery
12563	External	Structure supporting buttress foundations1.60m in length. Composed of timber piles driven into the natural with round pebbles and clay in between the individual piles.	Foundation pad for SE buttress of Presbytery
12567	Sacristy	Stone drain over 2.00m in length by 750mm wide. Composed of vertically set sandstone slabs and partially collapsed capstones. Adjoins foundation pad [12545] within cut [12568], oriented E/W	Drain extending east from foundations of Savigniac chapel - actually cist 14000
12602	External	Deposit 190mm thick of reddish grey sandy silt.	Natural alluvial deposit
12632	External (J)	Deposit 210mm thick of greyish red silty sand, overlying (12633), beneath (12631)	Natural alluvial deposit
12633	External (J)	Deposit 110mm thick of dark grey silt below (12632)	Natural alluvial deposit
12634	External (HH/JJ)	Deposit 310mm thick of reddish brown silty sand with frequent angular stone, beneath (12415), overlying (12635)	Medieval made ground deposit, equivalent to (12586)
14000	Sacristy (Area B)	Stone lined burial cist {E-w} (12567)	Burial cist - previously 12567
14001	Sacristy (Area B)	Possible stone Wall course	Foundation pad for apsidal east end of Savigniac Chapel - same as 14009, 14002, 14012
14002	Sacristy (Area B)	Deposit north of [14000] below rubble of [14001]	Foundation pad for apsidal east end of Savigniac Chapel - same as 14009, 14001, 14012
14003	Sacristy (Area B)	Pink sand clay deposit	Natural alluvial deposit
14004	Sacristy (Area B)	Skeleton within [14000]	Burial

Context	Area	Description	Interpretation
14005	Sacristy (Area B)	Deposit containing skeleton (14004) in [14000]	Backfill of cist burial
14006	Sacristy (Area B)	Black deposit on base of cist [14000]	Deposit of organic material on which skeleton 14004 was laid
14007	Sacristy (Area B)	Cut for cist [14000]	Cut for burial cist
14008	Sacristy (Area B)	Fill in [14007]	Backfill of cist cut 14007
14009	Sacristy (Area B)	Flat stones laid below (14002)	Foundation pad for apsidal east end of Savigniac Chapel - same as 12545
14010	Sacristy (Area B)	Cut for [14009]	Cut for foundation pad for apsidal east end of Savigniac Chapel
14011	Sacristy (Area B)	Stone footing below timbers	Foundation pad for apsidal east end of Savigniac Presbytery
14012	Sacristy (Area B)	Pink crushed sandstone above (14002)	Foundation pad for apsidal east end of Savigniac Chapel - same as 14009, 14001, 14002
14013	Sacristy (Area B)	Deposit of sandstone rubble above [14001]	Foundation pad for apsidal east end of Savigniac Presbytery
14014	Sacristy (Area B)	Cut for [14011]	Cut for foundation pad for apsidal east end of Savigniac Chapel
14015	Sacristy (Area B)	Fill in [14014]	Backfill of cut for foundation pad for apsidal east end of Savigniac Chapel
14016	Sacristy (Area B)	Reddy brown clay silt below backfill	Medieval made ground deposit
14017	Sacristy (Area B)	Gravelly clay silt above (14016)	Medieval made ground deposit
14018	Sacristy (Area B)	Mid brown clay silt above (14013)	Medieval made ground deposit
14019	Sacristy (Area B)	Mid brown clay silt cut by [14010]	Medieval made ground deposit
14020	Sacristy (Area B)	Grey brown clay silt cut by [14014]	Medieval made ground deposit
14021	Sacristy (Area B)	Gravelly clay silt cut by [14010]	Natural alluvial deposit
14022	Sacristy (Area B)	Gravelly clay silt cut by [14010]	Natural alluvial deposit

Context	Area	Description	Interpretation
14023	Sacristy (Area B)	Stone foundation (E end of trench) below [14011]	Feature of Savigniac Presbytery
14024	Sacristy (Area B)	Timber uprights (E end of Sacristy)	Timber revetting/retaining
14025	Presbytery (Area A)	Lower footing of wall (east end)	Apsidal east end wall of Savigniac Presbytery
14026	Presbytery (Area A)	Rubble fill deposit between [14025] and [12558]	Foundation pad for apsidal east end of Savigniac Presbytery - same as 12558
14027	Area C	Capstones covering skeleton [14028]	Burial cist
14028	Area C	Skeleton NE of SE buttress	Burial
14029	Area C	Deposit covering [14028]	Backfill of burial
14030	Area C	Skeleton partially exposed N of [14028]	Burial
14031	Area C	Wooden sheet covering skull of [14028]	Wooden sheet covering skull under capstone
14032	Area C	Stones separating skeletons [14028] and [14030]	Cist stones
14033	Area C/B	Grey brown silt clay below arch [12345]	Medieval made ground deposit
14034	Area C/B	Re-deposited natural below (14033)	Medieval made ground deposit
14035	Presbytery (Area A)	Cut of foundation of apse [12558]	Cut for foundation pad for apsidal east end of Savigniac Presbytery
14036	Below walls	Grey clay deposit (Packing around timber beams)	Clay deposit used as a support around timber beams of foundation raft

Appendix 1.2 Drawing Register

Drawing no.	Plan	Section	Description
001	-	1:10	Area A - Presbytery east wall elevation
002	1:10	-	Area A - Plan of Savignac foundation for trial underpin
003	-	-	VOID
004	1:20	-	Plan of W end of Area B (sacristy) showing cist [14000] and wall [14001]
005	1:10	-	Plan of skeleton [14004] in cist [14000]
006	1:20	-	Founds [14009]
007	-	1:10	Area B - SFS of Presbytery wall [W of trial hole]
008	-	1:10	Area B - North-facing section (x2 sheets)
009	-	1:20	Elevation of SFS of Presbytery wall (E of trial hole)
010	1:10	-	Plan of skeleton [14028] with capstone [14027]
011	1:10	-	Plan of skeleton [14028] with [14030] partially exposed
012	-	1:10	Elevation of [12400] after [12549] taken down
013	-	1:20	EFS through arch [12345]/[12048]

Appendix 1.3 Photographic Register

Frame no.	Direction	Description
001	E	Pre-condition survey
002	SE	Pre-condition survey
003	E	Pre-condition survey
004	SW	Pre-condition survey
005	W	Pre-condition survey
006	S	Pre-condition survey
007	SE	Pre-condition survey
008	N	Pre-condition survey
009	NW	Pre-condition survey
010	W	Pre-condition survey
011	NE	Pre-condition survey
012	S	Pre-condition survey
013	W	Pre-condition survey
014	S	Pre-condition survey
015	SW	Pre-condition survey
016	N	Pre-condition survey
017	SS	Pre-condition survey
018	SW	Pre-condition survey
019	SW	Pre-condition survey
020	SW	Pre-condition survey
021	SW	Pre-condition survey
022	SW	Pre-condition survey
023	SW	Pre-condition survey
024	S	Pre-condition survey
025	SE	Pre-condition survey
026	SW	Moving machines
027	SW	Moving machines
028	SW	Moving machines
029	SW	Moving machines
030	NE	Moving machines
031	NE	Fenced compound
032	S	Fenced compound
033	N	Pre-condition survey
034	NW	Pre-condition survey
035	E	Pre-condition survey
036	S	Pre-condition survey
037	S	Pre-condition survey
038	SW	Pre-condition survey
039	E	Area A pre-excavation
040	E	Area B pre-excavation
041	W	Pre-condition survey
042	E	Area D pre-excavation

Frame no.	Direction	Description
043	NE	Pre-condition survey (Presbytery)
044	SE	Machine in Presbytery
045	SW	Pre-condition survey
046	S	Pre-condition survey
047	SE	Pre-condition survey
048	E	Pre-condition survey
049	SE	Pre-condition survey
050	SE	Pre-condition survey
051	SW	Pre-condition survey
052	E	Pre-condition survey
053	NE	Pre-condition survey
054	N	Pre-condition survey (steps)
055	SE	Pre-condition survey (steps)
056	SE	Pre-condition survey (steps)
057	SW	Pre-condition survey (steps)
058	S	Pre-condition survey (steps)
059	N	Pre-condition survey (steps)
060	NE	Pre-condition survey (steps)
061	NW	Pre-condition survey (steps)
062	N	Building the ramp
063	NE	Building the ramp
064	SE	Building the ramp
065	SE	Building the ramp
066	SE	Building the ramp
067	SW	Building the ramp
068	SE	Building the ramp
069	SE	Area A working shot
070	E	Area A working shot
071	E	Area A working shot
072	E	Area A working shot
073	SW	Area A working shot
074	W	Working shot
075	E	Working shot
076	E	Fencing after move
077	E	Fencing after move
078	E	Using the ramp
079	E	Using the ramp
080	SE	Using the ramp
081	NW	Spoil heap
082	SW	Ramp
083	SW	Site
084	NW	Site
085	W	Site

Frame no.	Direction	Description
086	NW	Site
087	S	Broken fence after weekend
088	E	Area A post-excavation
089	E	Area A post-excavation
090	SE	Area A post-excavation
091	E	Area A post-excavation
092	SW	Area A post-excavation
093	S	Area A post-excavation
094	E	Area A post-excavation
095	E	Area B preparation
096	E	Area B preparation
097	E	Area B preparation
098	-	Notes on Area A
099	S	Muddy boards after rain
100	SE	Muddy boards after rain
101	S	Muddy boards after rain
102	N	Muddy boards after rain
103	N	Muddy boards after rain
104	NE	Working shot Area B
105	N	Working shot Area B
106	NW	Working shot Area B
107	E	Working shot Area B
108	E	Working shot Area B
109	N	Inside Abbey after Area A & B complete
110	N	Inside Abbey after Area A & B complete
111	NW	Timber, Area B
112	SE	Plywood track and spoil heap
113	S	Plywood track and spoil heap
114	S	Plywood track and spoil heap
115	S	Working shots
116	S	Working shots
117	SW	Working shots
118	E	Working shots
119	NE	Working shots
120	NE	Working shots (Area D)
121	E	Working shots
122	E	Working shots
123	NW	Working shots
124	NW	Working shots
125	NW	Working shots
126	NW	Working shot (Area D)
127	W	Working shot (Area D)
128	NE	Area D

Frame no.	Direction	Description
129	NE	Area D
130	W	Area A. Spoil removal system
131	SE	Taking down Area A wall on east
132	W	Taking down Area A wall on east
133	SE	Taking down Area A wall on east
134	E	Taking down Area A wall on east
135	N	Area F terram level
136	NW	Area F terram level
137	S	Area C
138	SW	Area C
139	W	Area C
140	S	Area C (cist)
141	S	Area C (cist)
142	S	Area C (cist)
143	NW	Area C
144	N	Area C
145	N	Area C
146A	-	ID shot
146	E	Area A. Eastern wall post-demolition
147	SE	Area A. Eastern wall post-demolition
148	SE	Area A. Eastern wall post-demolition
149	NE	Area A. Eastern wall post-demolition
150	W	Area A. Eastern wall post-demolition, top down shot
151	W	Area D. Spoil removal system
152	E	Area B. General shot, post-excavation
153	NE	Area B. General shot, post-excavation
154	NW	Area B. General shot, post-excavation
155	E	Area A
156	E	Area D
157	E	Area D
158	SW	Stone stockpile, Presbytery
159	SE	Stone stockpile and steps to Presbytery
160	E	Area B
161	W	Area B
162	E	Area B
163	N	Sacristy steps
164	-	Post-condition survey
165	-	Post-condition survey
166	-	Post-condition survey
167	-	Post-condition survey
168	-	Post-condition survey
169	-	Post-condition survey
170	-	Post-condition survey

Frame no.	Direction	Description
171	-	Post-condition survey
172	-	Post-condition survey
173	-	Post-condition survey
174	-	Post-condition survey
175	-	Post-condition survey
176	-	Post-condition survey
177	-	Post-condition survey
178	-	Post-condition survey
179	-	Post-condition survey
180	-	Post-condition survey
181	-	Post-condition survey
182	-	Post-condition survey
183	-	Post-condition survey
184	-	Post-condition survey
185	-	Post-condition survey
186	-	Post-condition survey
187	-	Post-condition survey
188	-	Post-condition survey
189	-	Post-condition survey
190	-	Post-condition survey
191	-	Post-condition survey
192	-	Post-condition survey
193	-	Post-condition survey
194	-	Post-condition survey
195	-	Post-condition survey
196	W	Broken fence
197	W	Fence fixed
198	W	Stones [12545] prior to removal
199	W	Stones [12545] prior to removal
200	NW	Exposed grave - previously recorded as 12567 Drain
201	W	Exposed grave - previously recorded as 12567 Drain
202	W	Exposed grave - previously recorded as 12567 Drain
203	E	Exposed grave - covered back over
204	NE	Starting drilling Area B
205	NE	Drilling
206	NE	Drilling
207	N	Damage after flood from burst pipe
208	N	Damage after flood from burst pipe
209	S	Damage after flood from burst pipe
210	NW	East wall in Area C taken to base of Timber + 200mm
211	NW	East wall in Area C taken to base of Timber + 200mm
212	N	Cap stone of probably burial cist in Area C
213	N	Cap stone of probably burial cist in Area C

Frame no.	Direction	Description
214	W	Wall 12274 to base of timber (Area C)
215	SW	Temporary backfill of timber at SE Buttress
216	NW	Temporary backfill of timber at SE Buttress (beside sacristy wall)
217	-	Photos for Tim B (Underpinning)
218	-	Photos for Tim B (Underpinning)
219	-	Photos for Tim B (Underpinning)
220	-	Photos for Tim B (Underpinning)
221	-	Photos for Tim B (Underpinning)
222	-	Photos for Tim B (Underpinning)
223	-	Photos for Tim B (Underpinning)
224	-	Photos for Tim B (Underpinning)
225	-	Photos for Tim B (Underpinning)
226	-	Photos for Tim B (Underpinning)
227	S	[12651] on base of slot before removal [Area A]
228	S	[12651] on base of slot before removal [Area A]
229	SW	[12651] on base of slot before removal [Area A]
230	E	Underpinning trial slot extended in depth
231	E	Underpinning trial slot extended in depth
232	W	Grave beside trial slot
233	W	Grave beside trial slot
234	S	Trial area to be excavated in Area A
235	SE	Trial area to be excavated in Area A
236	S	Working shot as Apsidal Wall removed
237	S	Working shot as Apsidal Wall removed
238	S	Section through early Cistercian Wall [12303] (trial)
239	S	Trial slot Area A showing lower course of [12558]
240	S	Lower course removed - section through [12303]
241	S	Lower course removed - cut for [12558]
242	E	Trial slot (west facing section)
243	E	Trial slot (west facing section)
244	E	Trial slot (west facing section)
245	SE	Trial slot (west facing section)
246	E	Working shot of sawing [Area A]
247	E	Working shot of sawing [Area A]
248	E	Working shot of sawing [Area A]
249	E	Working shot of sawing [Area A]
250	NE	Timber extracted [Area B] Trial timber A & B
251	-	Trial Timber A
252	-	Trial Timber A & B
253	-	Trial Timber C
254	S	Attempt at photo in hole
255	S	Attempt at photo in hole
256	S	Attempt at photo in hole

Frame no.	Direction	Description
257	N	HoleMaster damage to grass
258	N	HoleMaster damage to grass
259	NE	HoleMaster damage to grass
260	E	Backfilled timbers
261	-	Cleared out cabin
262	-	Cleared out cabin
263	-	Cleared out cabin
264	E	Working shots - Savignac Wall cleaning
265	-	Working shots - Savignac Wall cleaning
266	E	Working shots - Savignac Wall cleaning
267	W	Working shots - Savignac Wall cleaning
268	E	Working shots - Savignac Wall cleaning
269	E	Pre scanning shots of Savignac Wall
270	E	Pre scanning shots of Savignac Wall
271	S	Pre scanning shots of Savignac Wall
272	S	Pre scanning shots of Savignac Wall
273	S	Pre scanning shots of Savignac Wall
274	S	Rubble stone (14013) exposed above [14001]
275	W	Rubble stone (14013) exposed above [14001] with cist burial
276	WSW	Pre-ex of cist [14000] beside wall found [14001]
277	ENE	Pre-ex of cist [14000] beside wall found [14001]
278	W	Pre-ex of cist [14000] beside wall found [14001]
279	E	Working shots - Richard drawing
280	N	Working shots - Richard drawing
281	NE	Working shots - Richard drawing
282	W	Cist [14000] excavated skeleton [14004] and deposit (14006)
283	W	Cist [14000] excavated skeleton [14004] and deposit (14006)
284	W	Cist [14000] excavated skeleton [14004] and deposit (14006)
285	N	Cist [14000] excavated skeleton [14004] and deposit (14006)
286	E	Cist [14000] excavated skeleton [14004] and deposit (14006)
287	W	Cist [14000] excavated skeleton [14004] and deposit (14006) - no scale
288	W	Cist [14000] excavated skeleton {14004] and deposit (14006) - no scale
289	S	Cist [14000] drawing ref. shot 1
290	S	Cist [14000] drawing ref. shot 2
291	S	Cist [14000] drawing ref. shot 3
292	S	Cist [14000] drawing ref. shot 4
293	E	Cist [14000] looking along cist
294	W	Cist [14000] looking along cist

Frame no.	Direction	Description
295	W	Post-ex of cist [14000] - skeleton removed
296	W	Post-ex of cist [14000] - skeleton removed
297	W	Exposed foundation [14001] at west end of Area B
298	N	Exposed foundation [14001] at west end of Area B
299	W	Foundation [14001] exposed below (14013) rubble
300	W	Foundation [14001] exposed below (14013) rubble
301	N	Foundation [14001] exposed below (14013) rubble
302	S	Foundation [14001] exposed NFS below stones
303	SW	Foundation [14001] exposed NFS below stones
304	S	Foundation [14001] exposed NFS below stones
305	W	Black gravel (14002) below large stones
306	W	Black gravel (14002) below large stones
307	N	Foundation stone [14009] and cut [14010]
308	E	Foundation stone [14009] and cut [14010]
309	W	Foundation stone [14009] and cut [14010]
310	W	E facing section of baulk
311	S	N facing section of west end of Area B
312	S	N facing section of west end of Area B
313	N	Area B S facing section
314	NW	Area B stone founds [14009] and cut [14010]
315	W	Area B stone founds [14009] and cut [14010]
316	E	Area B stone founds [14009] and cut [14010]
317	E	Working shot in Sacristy
318	NW	Working shot in Sacristy
319	NE	Area B - East extent excavated
320	N	Area B - East extent excavated. Elevation showing uprights and treenail hole
321	W	Area B - East extent excavated
322	W	Area B - East extent excavated
323	NE	Area B - East extent excavated
324	E	Working shots of finished sacristy - left nice and tidy
325	NE	Working shots of finished sacristy - left nice and tidy
326	SE	Working shots of finished sacristy - left nice and tidy
327	W	Masons mark and inner wall face mark. Presbytery E wall
328	W	Masons mark and inner wall face mark. Presbytery E wall
329	W	Earlier foundation (12274) before removal
330	W	Foundation (12274) removed exposing s/stone foundations below timber on E. wall of Presbytery
331	W	Foundation (12274) removed exposing s/stone foundations below timber on E. wall of Presbytery
332	SE	One course removed of [12558] for A25

Frame no.	Direction	Description
333	E	E. end of Presbytery showing deposit (14026) between [14025] and [12558] with one course removed
334	S	E. end of Presbytery showing deposit (14026) between [14025] and [12558] with one course removed
335	S	E. end of Presbytery showing deposit (14026) between [14025] and [12558] with one course removed
336	W	Working shot
337	E	E. end of Presbytery reduced to level
338	E	E. end of Presbytery reduced to level
339	E	Presbytery Area A - Savignac foundation with one course removed
340	W	Pretty sky and Abbey
341	-	Pretty sky and Abbey
342	E	W. end of Presbytery reduced to level and complete
343	SE	W. end of Presbytery reduced to level and complete
344	E	W. end of Presbytery reduced to level and complete
345	W	Area C. NE side buttress cist and arm bone exposed
346	W	Area C. NE side buttress cist and arm bone exposed
347	W	Skeleton mid-ex being exposed (Area C)
348	W	Working shot - all cist stones exposed
349	W	Skeleton [14028] with stone [14027]
350	W	Skeleton [14028] with stone [14027]
351	W	Skeleton [14028] with stone [14027]
352	W	Cap stone removed [14028] showing wood sheet
353	W	Skeleton [14028]
354	W	Skeleton [14028]
355	W	Skeleton [14028]
356	NW	Skeleton [14028]
357	W	Skeleton [14028] and Skeleton [14030]
358	W	Skeleton [14028] and Skeleton [14030]
359	W	Skeleton [14028] prior to lifting after heavy rain
360	W	Skeleton [14030] [14028 removed] ready for backfill
361	S	Working shot of 1st Cistercian wall removed in sections (Area A)
362	SW	Working shot of 1st Cistercian wall removed in sections (Area A)
363	W	Shot of Abbey
364	NE	End of week working shot Area A
365	NE	End of week working shot Area B
366	SE	Wall [12400] after [1229/303] removed
367	S	Wall [12400] after [1229/303] removed (W. end)
368	S	Wall [12400] after [1229/303] removed (Middle)
369	S	Wall [12400] after [1229/303] removed (E. end)
370	SE	Wall [12400] after [1229/303] removed (corner still to take down)

Frame no.	Direction	Description
371	S	Wall [12400] slot already concreted
372	W	Full extent of excavation for eastern Presbytery outside wall this year
373	SE	Corner of 1st Cistercian to show engineers
374	SE	Corner of 1st Cistercian to show engineers
375	SE	Corner of 1st Cistercian to show engineers
376	SW	Backfill removed NE of SE buttress revealing organic deposit
377	SW	Reduced level in Area C NE of Buttress
378	SW	Reduced level in Area C NE of Buttress
379	NE	SW facing section re-exposed after backfill out and level reduced
380	NW	Ground reduced on both sides of SE buttress
381	NE	SFS below SE buttress (cobble foundation)
382	W	Ground reduced on SW side of SE buttress
383	SW	Timber uprights below NE side of SE buttress
384	S	Testing the buttress timbers (drilling at an angle)
385	W	Archway prior to excavation - working shot
386	W	Section under archway [12345] fills (14033)/(14034)
387	W	Section under archway [12345] fills (14033)/(14034)
388	W	Working shot - half way through archway [12345]
389	W	Mid-ex shot of excavation through arch
390	NW	Mid-ex shot of excavation through arch showing timber uprights revealed
391	NW	Mid-ex shot of excavation through arch showing timber uprights revealed
392	E	Working shot of arch excavation from Sacristy
393	E	Working shot of arch excavation from Sacristy
394	E	Working shot of arch excavation from Sacristy
395	E	Working shot of arch excavation from Sacristy
396	E	Working shot of arch excavation from Sacristy
397	SE	Post-ex of arch [12048] excavated from Area B
398	SE	Post-ex of arch [12048] excavated from Area B NFS under arch
399	SE	Post-ex of arch [12048] excavated from Area B NFS under arch
400	NE	Post-ex of arch [12048] excavated from Area B SFS and uprights
401	E	Post-ex of arch [12048] excavated from Area B SFS and uprights
402	-	Below the arch [12345/12048]
403	-	Below the arch [12345/12048]
404	-	Below the arch [12345/12048]
405	W	Post-ex of arch [12345] from Area C
406	W	Post-ex of arch [12345] from Area C

Frame no.	Direction	Description
407	NW	Post-ex of arch [12345] from Area C with timber uprights
408	E	Sondage in E. end of Area A to allow drilling (one more course of Savignac foundation removed)
409	E	Sondage in E. end of Area A to allow drilling (one more course of Savignac foundation removed)
410	S	Sondage in E. end of Area A to allow drilling (one more course of Savignac foundation removed)
411	-	Working shot
412	-	Working shot
413	-	Working shot
414	-	Working shot
415	-	Working shot

Appendix 1.4 Sample Register

Sample no.	Context no.	Description
1001	14005	Deposit above skeleton (14004) in cist [14000]
1002	14001	Black deposit below wall [14001]
1003	14006	Charcoal rich layer underlying skeleton (14004) in cist [14000]
1004	14029	Deposit containing skeleton [14028]

APPENDIX 2 – FINDS CATALOGUE

Context	Sample	Qty	Weight (g)	Material	Object	Description	Condition	Period
14001	1002	-	4	Building Material	Mortar	small fragments	abraded	-
14005	1001	1	1	Lithics	Debitage	Flint, flake fragment	fresh	PH
14006	1003	-	54	Building Material	Mortar	lumps and fragments	abraded	-
14006	1003	-	1	Industrial Waste	Mag Res	possible hammerscale	-	-
14029	1004	-	1	Building Material	Mortar	small fragment	abraded	-
14029	1004	1	11	Industrial Waste	Slag	vitrified lump	-	-
14029	1004	1	1	Lithics	Debitage	Flint, medial blade fragment with trapezoidal section	abraded and patinated	PH

APPENDIX 3 – ENVIRONMENTAL TABLES

Table 1- Retent results

Context	Sample	Sample Vol (l)	Building Materials	Stone	Glass	Industrial Waste		Unburnt bone	Uncharred Wood	Charred Nutshell	Charcoal		Material available for AMS Dating	Comments
			Mortar	Lithics	Glass waste	Fe slag	Mag res	Human			Qty	Max Size (cm)		
14001	1002	20	+++											
14005	1001	70		+		+		+++		+	+++ +	3.3	Charcoal ++++, Unburnt Bone +++, Charred Nutshell +	Charcoal oak and non-oak
14006	1003	20	++				+++	++++			+++ +	3.5	Charcoal ++++, Unburnt Bone ++++	Sample refloated to recover maximum Charcoal. Charcoal was oak and non-oak
14029	1004	40	+	+	+			++++	++		+		Unburnt Bone ++++, Unburnt Wood +	

Key: + = rare (0-5), ++ = occasional (6-15), +++ = common (15-50) and ++++ = abundant (>50)
NB charcoal over 1cm is suitable for identification and AMS dating

Table 2- Flotation sample results

Context	Sample	Total flot Vol (ml)	Plant remains	Charcoal Qty	Charcoal Max size (cm)	Material available for AMS	Comments
14001	1002	5		++	<1mm		Charcoal oak and non-oak
14005	1001	50	Uncharred *Sambucus nigra* +, *Rubus* sp +	++++	1	Charcoal +	Charcoal non-oak
14006	1003	50		++++	<1mm		Charcoal non-oak

Key: + = rare (0-5), ++ = occasional (6-15), +++ = common (15-50) and ++++ = abundant (>50)
NB charcoal over 1cm is suitable for identification and AMS dating

APPENDIX 4 – LASER SCANNING

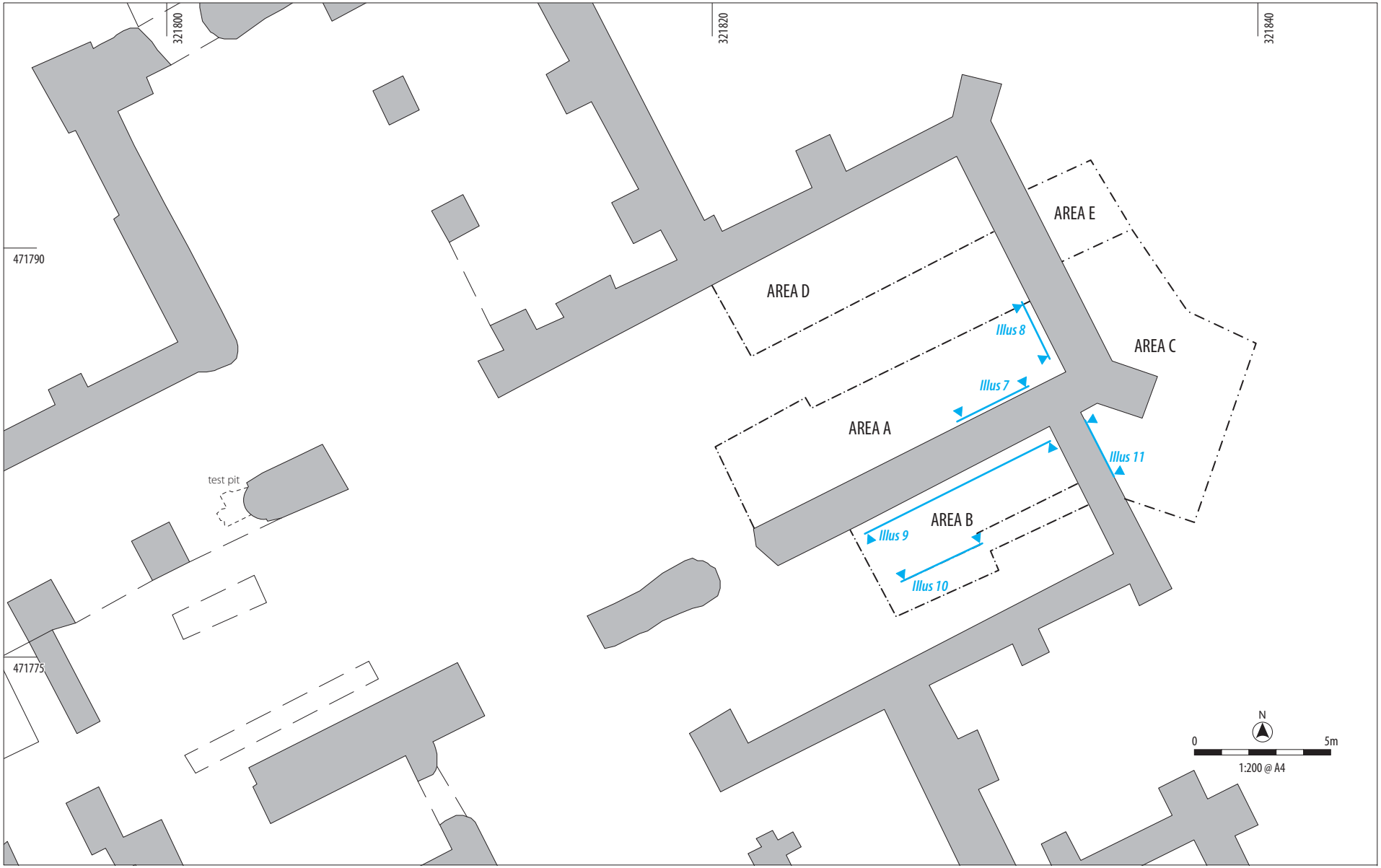
A laser scan survey was undertaken to provide a comprehensive metric record of the structures revealed by the 2013 excavations, including the apsidal Savignac foundations and those relating to the early Cistercian phases. This was intended to complement the existing drawn, photographed and written record with a highly detailed and accurate snapshot of the remains prior to the main underpinning work. The survey was undertaken on the 5th of July, 2013.

A Faro Focus 120 scanner was set up at eight locations within the presbytery, and captured high-resolution point data of the entire excavation. Each scan location was controlled by spheres and chequerboard targets (Plate 15), which were used to create a combined point cloud using Faro SCENE 5.2 software. A total of over 300 million points were measured, including incidental coverage of much of the surrounding building fabric and temporary support structures (Plate 16). Within the excavation area, a typical point density of around 83 points per cm^2 was achieved with a maximum ranging error of 2mm. Colour data was recorded using the camera on-board the instrument, but challenging lighting conditions resulted in poor colour results. The images produced from the survey are therefore based on intensity data.

Two orthographic views of the survey are presented here. The first (Illus 12) shows a comparison of the drawn and scanned record of the north-facing elevation of the south presbytery wall. The second (Plate 17) is a plan view of the apsidal Savignac foundations at the base of the excavation area.

The scan data may be supplied in a range of formats for further interrogation, including preparation of drawn elevations and plans, 3D views and web-based dissemination tools. The data is also suitable for archiving at an appropriate repository.

Illus 1
Site location



Illus 2

Trench location plan

321820

321840

471790

471775

AREA D

AREA E

AREA C

AREA A

AREA B

step

batter

13.67

12647

12645

13.63

12445

13.59

13.54

14025

13.65

12606

12558

13.78

13.27

13.57

14023

13.59

14011

13.16

14009

13.57

14.17

14010

12449

14.20

Key

trench

truncation

feature

Savignac stone structures

later walls

removed for underpinning

12558 structure

12048 cut

12048 deposit

13.67 m OD level

N

0

5m

1:100 @ A3

Illus 3

Phase 1, the original Savigniac church

321820

321840

471790

AREA D

AREA E

AREA C

AREA A

AREA B

Illus 5b

Illus 5a

14.82

12183

13.06

12301

14.82

12322

12303

14.61

step

batter

13.79

12434

foundation courses

12549/12550/12552/12604

12349

12501

Key

- trench
- feature
- stone wall/structure
- later walls
- removed for underpinning
- **12558** structure
- **12048** cut
- 12048 deposit
- 13.67 m OD level

N

0 5m

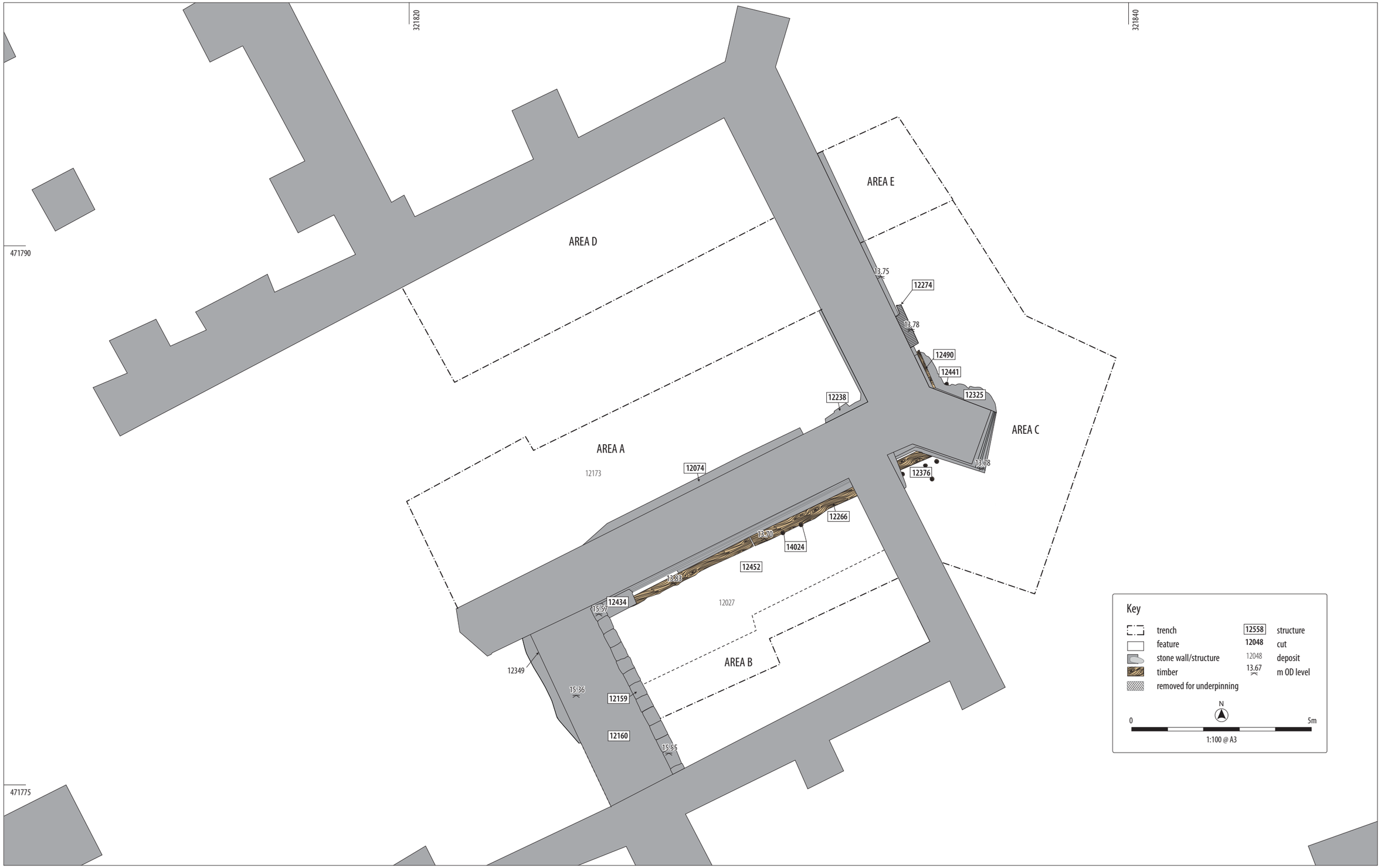
1:100 @ A3

471775

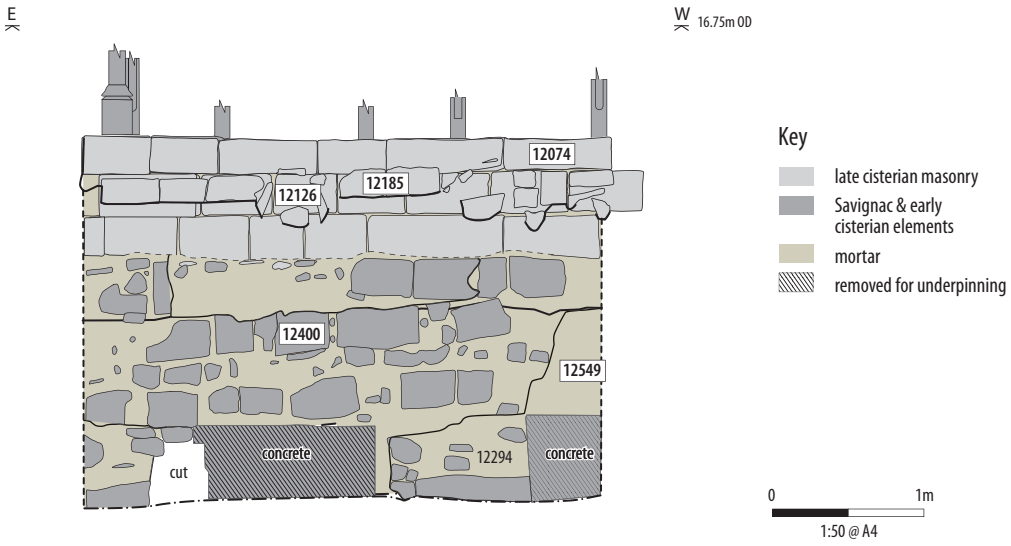
Illus 4

Phase 2, the early Cistercian rebuilding

Illus 5
Detail of inhumations

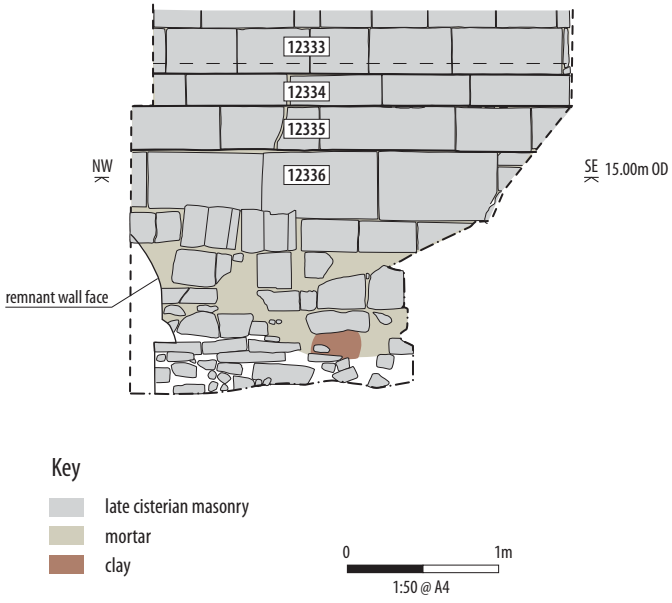


Illus 6
Phase 3

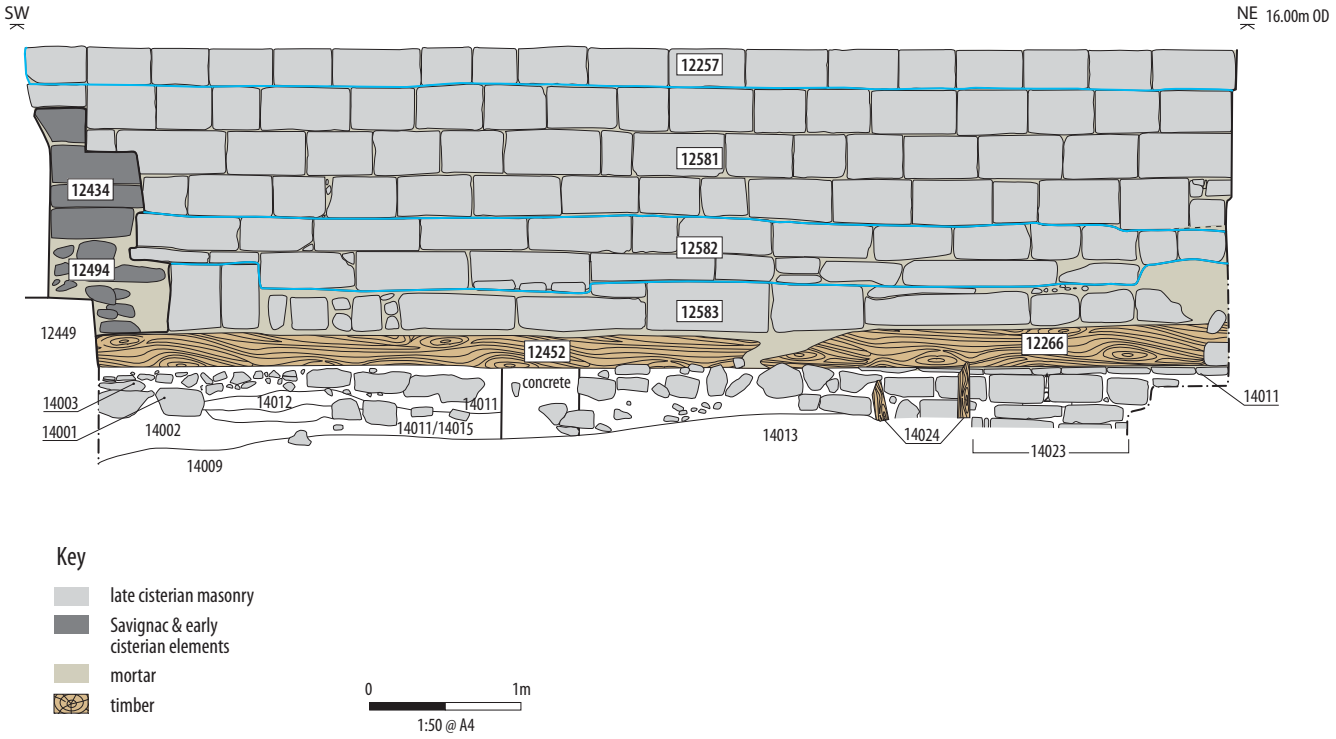


Illus 7

N facing elevation of S Presbytery wall (after de-construction of [12548])

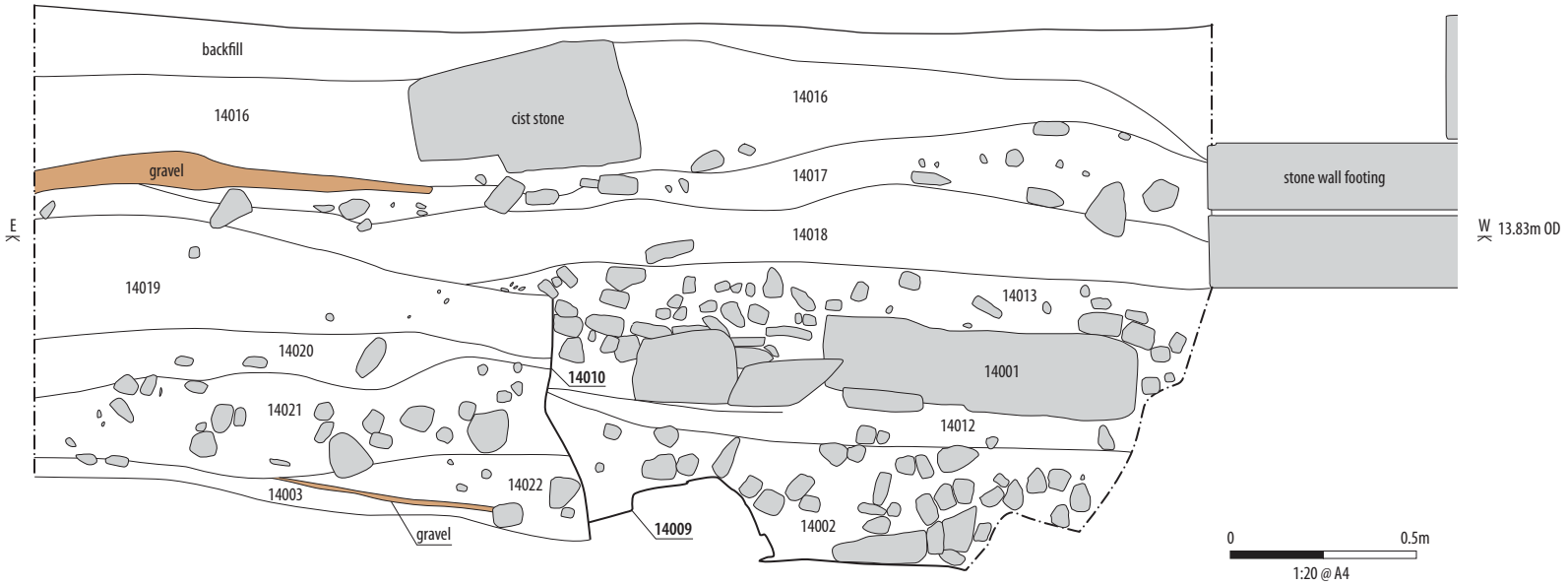


Illus 8
W facing elevation of east Presbytery wall



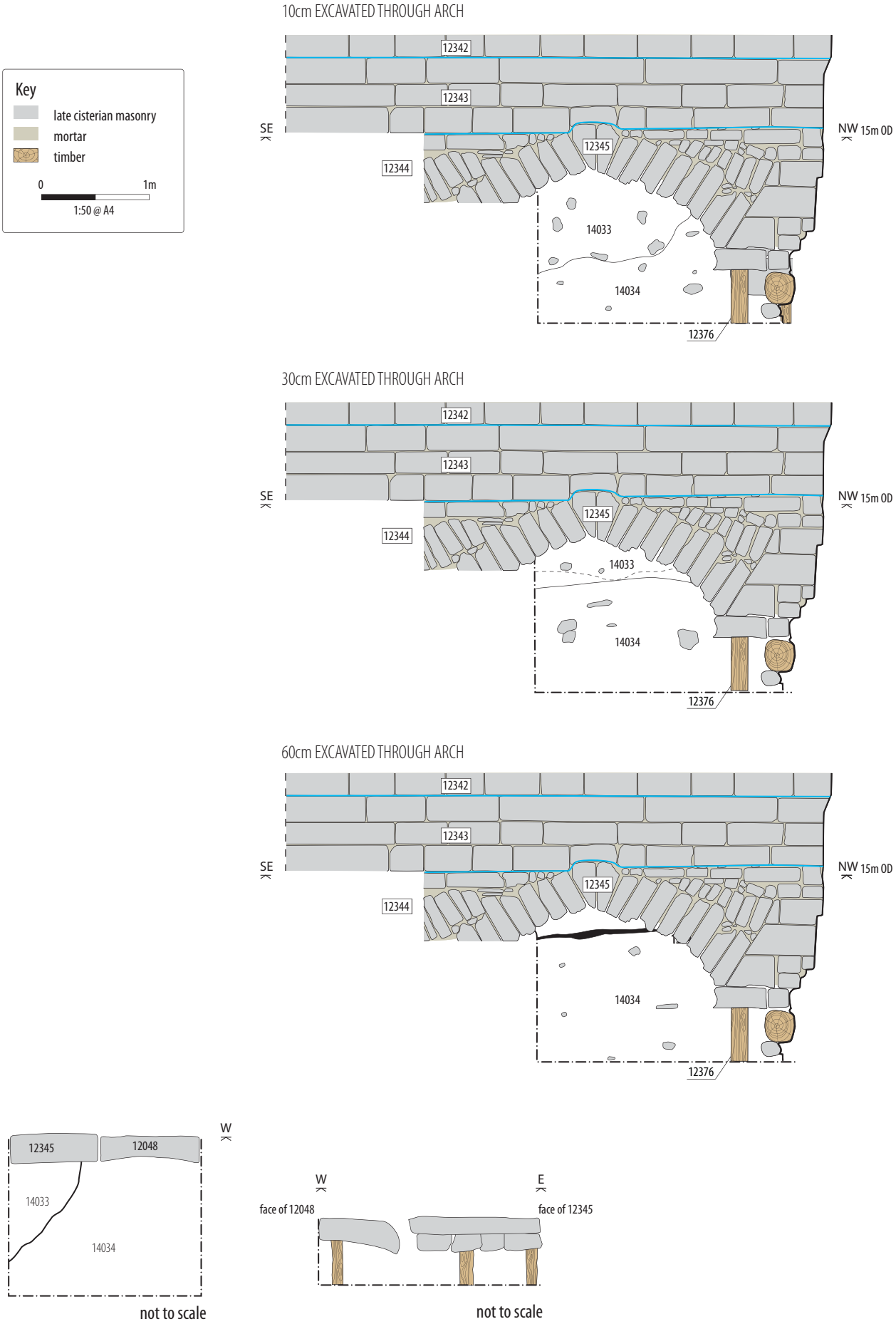
Illus 9

S facing elevation of south Presbytery wall



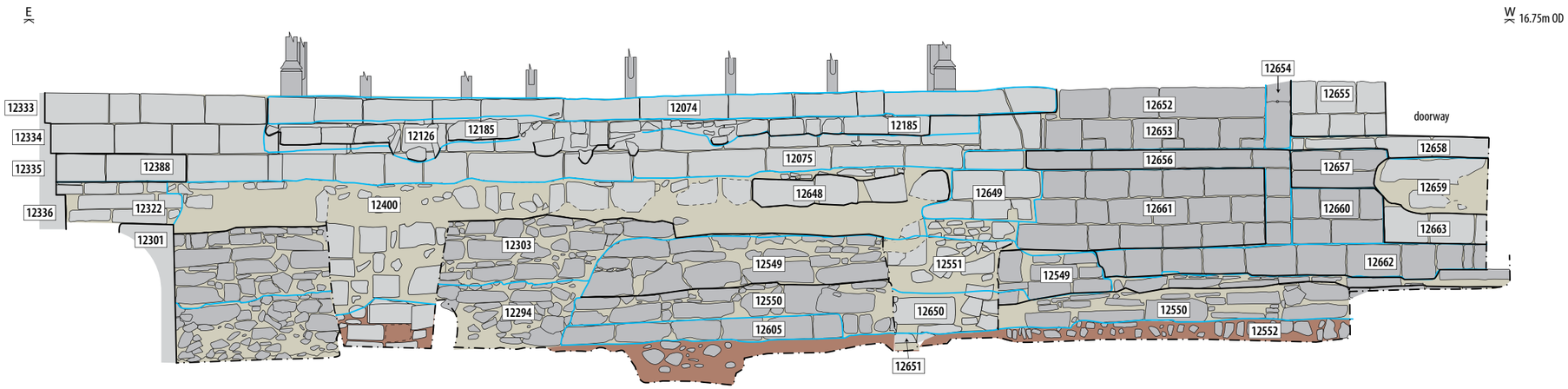
Illus 10

N facing section of Sacristy trench extended

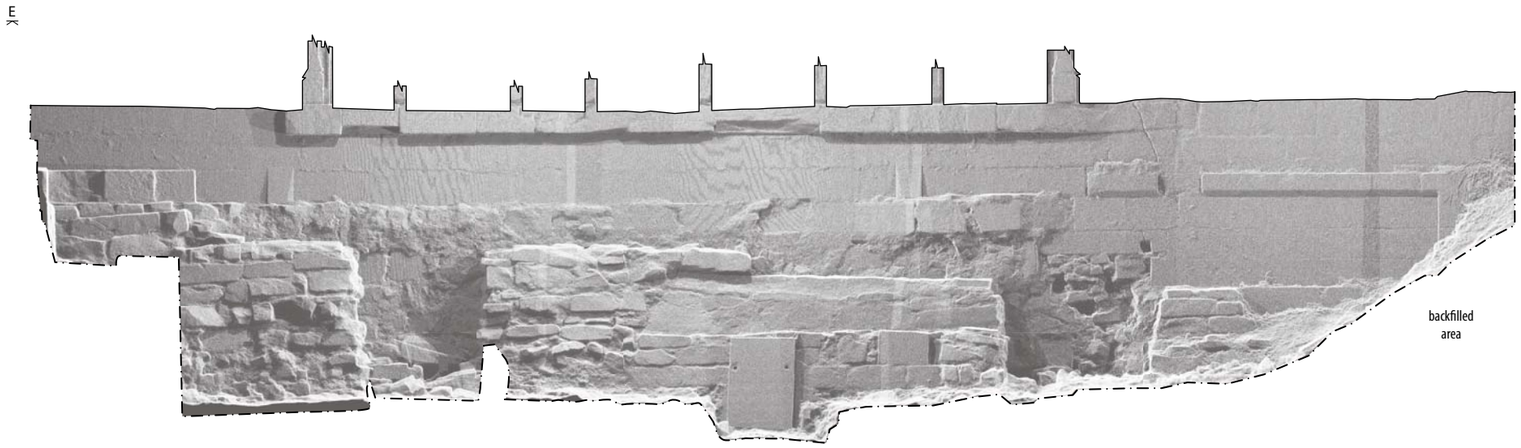


Illus 11

E facing sections of excavation below archway [12345] / [12048]



Illus 12a
N facing elevation of south Presbytery wall showing additional area exposed during enabling works



Illus 12b
N facing elevation of south Presbytery wall view of laser scan data

Plate 1 ▸
Savigniac apse foundation [12558], facing E

Plate 2 ▸
SE corner of Presbytery after early Cistercian wall has been removed

Plate 3 ▸
Foundation pad [14009], to E of Savigniac chapel wall [12449]

Plate 4 ▸
Savigniac apse foundation [14011], facing NE

Plate 5 ▸
Stone feature [14023], directly below [14011], facing N

Plate 6 ▸
Cist [14000], facing NW

Plate 7 ▸
Skeleton 14004 contained in cist [14000], facing NW

Plate 8 ▸
Potential E end of Savigniac stone foundation pad [12445] below timber, facing W

Plate 9 ▸
Timber uprights visible below archway [12345]/ [12048], facing NW

Plate 10 ▸
Skeleton [14028], partially covered by cist [14027], facing W

Plate 11 ▸
Skeleton [14028] and [14030] side-by-side, facing W

Plate 12 ▸
Skull of skeleton [14028] covered by wooden sheet [14031]

Plate 13 ▸

N facing elevation of south Presbytery wall after de-construction of [12548]

Plate 14 ▸

Two sections of timber raft beams [12456] extracted during underpinning works from outer edge of Presbytery wall (cut slot visible in background)

Plate 15 ▲

The laser scanner's view of the 2013 excavations

Plate 16 ►

A general view of the full point cloud, showing incidental coverage of much of the Presbytery and supporting structures

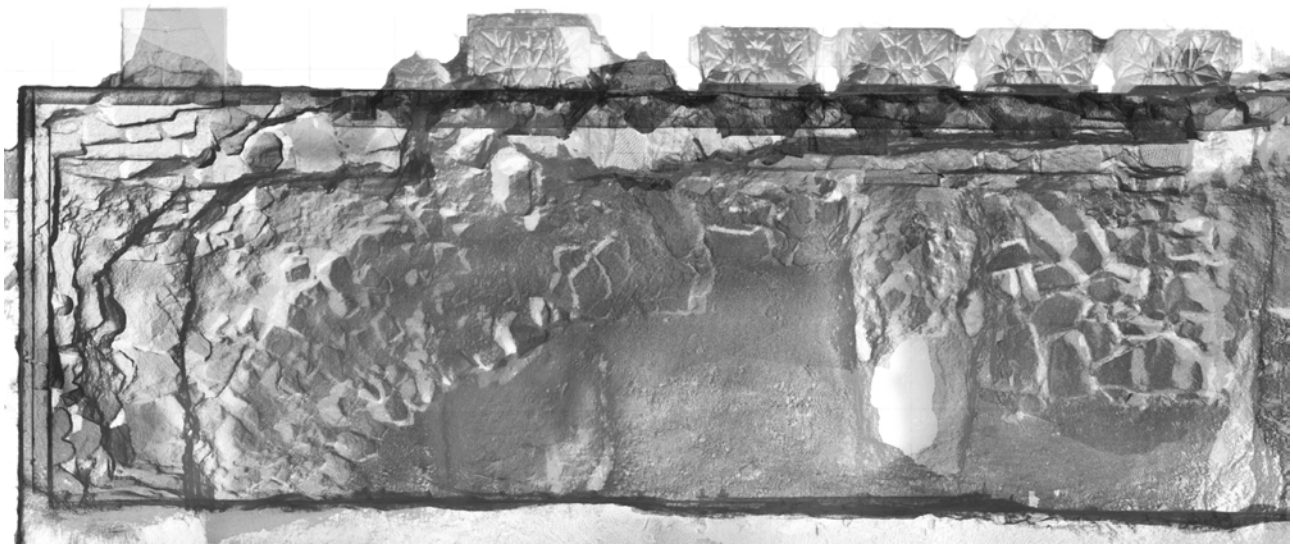


Plate 17 ▲

Plan view of the 2013 excavations, showing the apsidal Savignac foundations. The intricate vaulting in the sedilia is also visible