An Archaeological Investigation

Adjacent to the Refectory Undercroft, Glastonbury Abbey

GA 07B

Phase 2 works

Glastonbury Abbey Accession Number: GLSGA:07/9/..

Carried out for the Trustees of Glastonbury Abbey

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Report Number 401

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Table of Contents

section	contents	page
	Summary	1
1.0	Introduction	2
2.0	Topography and Geology	4
3.0	Archaeological Background	5
4.0	Methods Statement	
5.0	The Phase 2 Excavation	15
6.0	Culvert U363	17
	Stone Drain U362	22
7.0	The Mortar bedding Deposits	26
	Sondage B	
	Sondage C	
8.0	The N-S oriented Trench	
8.11	Gully 350	
9.0	The clay pipe drain	
9.6	The Doulting Stone blocks	
10.0	Phasing of the recorded contexts	
10.3	Phase 1 Contexts and Finds	
11.0	Discussion	
11.7	Unresolved Problems	
	Acknowledgements	
	Bibliography	
	<i>3</i> 1 <i>3</i>	
Figures.		
Figures		
number	contents	
1	Excavation area	
2	Location plan	
3	F. Bligh Bond's excavation plan	
4	Refectory Undercroft plan, Bligh Bond	
5	1986 Parchmark survey	
6	Initial cleaning plan	
7	Matrix of U363 contexts	
8	Plan of culvert U363	
9	Section of U362 in the N baulk	
10	Matrix of U362 contexts	
11	Layers and floors within Sondages B and C	
12	Plan of charcoal-rich layer 351	
13	Plan of 360 and 361	
14	Matrix, Sondage B and C	
15	Features recorded in the N-S trench	35

number	contents	. page
16	N facing (Composite) section of cuts [323] and [345]	35
17	Gully 350	.38
18	West section of N-S area and photographs	
19	Wall [355]	.44
20	Matrix of recorded contexts	.46
21	Suggested medieval features	.49
22	Final phase of excavation with FBB's trenches	51
Photograp	ahs	
number	contents	nage
1	The permanently saturated boggy patch	
2	The centre lines of the trench	
3	Cleaned trench from the North	
4	Cleaned trench from the South-East.	
5	Cleaned trench from the East	
6	Cleaned trench from the West	
7		
	Culvert U363	
8	Capstones 309	. 19
9	Robbing of culvert U363	
10	Culvert U363 looking E	
11	Culvert U363 and stone drain U362	
12	Culvert U363 and stone drain U362	
13	Organic deposit 316 exposed	
14	U362 under excavation	
15	Deposits within U362	
16	Base of U362	
17	U362 and disturbed part of U363	
18	Close view of S end of U362	
19	The areas of floor bedding and the two stone drains	
20	General view of mortar bedding 307 and the stone drains.	
21	Base of mortar bedding 348	
22	Charcoal-rich layer 351	
23	Scorched surface 360, below 351, and stones 361	
24	Detail of mortar bedding 307A	
25	North. section of FBB trench 323	
26	Section	
27	Ash and charcoal layer 358 with nails.	
28	Scorched surface 359 with nails	
29	Section	
30	336 and its relationship to stone drain U362	
31	Wall 313 and cut 319	
32	Wall 313 and cut 319	.41
33	section through wall 313	.41
34	Clay pipe drain	. 43
35	Clay pipe drain trench, pipes removed	43

number	contents	page
36	Wall 355	
37	View of final phase of excavation	51
38	Final phase of excavation	
39	Working shot	55
40	The new plastic pipe installed	
Tables		
number	contents	
1	Contexts associated with U363	
2	Contexts associated with U362	24
3	Finds from U362.	25
4	Trench 338 contexts	25
5	Finds from trench 338 / 316.	26
6	Contexts associated with the first cloister floor	32
7	Descriptions of burnt deposits, Sondages B and C	33
8	Finds associated with burnt layers	
9	Contexts, post-fire Cloister floor bedding	
10	Finds associated with the post-fire Cloister floors	34
11	Contexts associated with gully 350 .	
12	Finds from gully 350	
13	Contexts associated with the clay drain pipe	
14	Finds from the clay pipe trench.	
15	Description of Dormitory wall	
16	Phase 1 Mixed clay or silty-clay context descriptions	
17	Phase 1 finds	

An Archaeological Investigation adjacent to the Refectory Undercroft, Glastonbury Abbey Phase 2 works

Summary

The Phase 2 archaeological works in Glastonbury Abbey, undertaken in order to both investigate and to remedy a large boggy patch immediately E of the SE corner of the East Cloister, involved the excavation of a 'T' shaped trench immediately W of the small area investigated in June 2007 (the Phase 1 works).

The boggy ground was seen to have been caused by a series of breaks along a 20th century, ceramic drain. Various sections of clay pipe had been either crushed, cracked or separated over a length of around 11 metres. In addition, part of the clay pipe line had been placed above some large blocks of Doulting stone, part of an unrecorded, W-E wall.

Excavations within the East Cloister Walk, designed to locate an area of minimal archaeology through which a new drain could be inserted, recorded a series of 20th century disturbances, probably connected with the excavations of Bligh Bond between 1910 and 1912, and a broken, disused, stone culvert.

Two deposits of medieval, mortar bedding within the Cloister Walk still survive. When these were trenched in 1910-1911 the section through the mortar bedding exposed two or three separate mortar layers and a discrete, but obvious, layer of charcoal, probably a result of the disastrous fire of 1184.

The mortar bedding at the extreme S end of East Closter Walk had been removed, and the surface there had been graded down to form a slope leading from, or towards, the Refectory Undercroft. This may have been a barrow-run, probably constructed during Bond's investigations of the Undercroft in 1912.

There were no traces of any of the walls that must once have defined the SE corner of the Cloister Walk

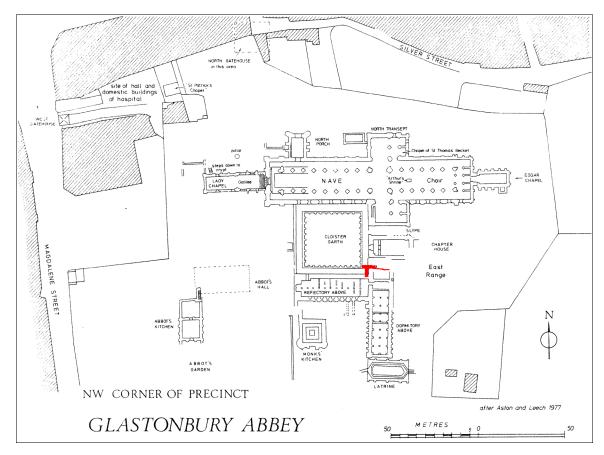


Figure 1. 2007 Excavation area marked in red (plan from Rahtz, fig.42).

1.0 Introduction

1.1 A more-or-less permanent boggy patch (actually, two separate but adjacent boggy patches), situated immediately NE of the Refectory Undercroft, immediately E of the SE corner of the East Cloister Walk and to the SW of the site of the Chapter House, was first investigated through a small archaeological trench in 2000 (Hollinrake, 2000) when it was noted that a 19th or 20th century land drain, running downslope from the east, terminated at that location without any obvious conduit for any water that issued from the open-ended pipe.

A second boggy patch subsequently appeared ca.6m to the east of the boggy patch investigated in 2000 (see Photograph 1). This second patch was not apparent in 2000.

1.2 The problem - permanently waterlogged ground within an area frequented by tourists and visitors - did not improve over the intervening years and the boggy area was

roped-off to protect the public. The Trustees of Glastonbury Abbey, the Architectural Consultant to the abbey, Mr. Alan Thomas, and the Archaeological Consultant for the abbey, Mr. John Allen, decided to apply for Scheduled Monument Consent for a small, exploratory excavation, in two phases, so that a practical solution to the problem could be found.

1.3 Previous plans of the affected area, by Messrs. Bligh Bond and Bill Wedlake, in 1910 and 1935, respectively, depicted a small, stone-lined chamber immediately north of the 2000 investigation trench This feature was described by Bond as a well and by Wedlake as a water tank.

The brief for the Phase 1 archaeological investigation was to re-locate this feature, through the excavation of a 2m square trench and, if practicable, the upper 0.60m of fill of the feature would then be removed archaeologically, so that a made-to-measure plastic tank could be inserted inside the structure in order to capture and contain both rising ground water and run-off from the land drain, and to monitor the amount and frequency of any water flows.

- 1.5 The Phase 2 brief consisted of a more substantial 'T-shaped' excavation/investigation trench that was situated immediately west of the Phase 1 square. The Phase 2 trench was designed to accommodate a new, permanent drain, leading from the boggy patch into the NE corner of the Undercroft, if required.
- 1.6 Mr. John Allen, for the Trustees of Glastonbury Abbey, commissioned C. and N. Hollinrake Ltd. to carry out the archaeological works. The Phase 1 investigation was undertaken between Weds 6th June and Fri 8th June 2007 and the **Phase 2 works** were undertaken between 16th August and 10th September 2007 by Faith Cairns, Arthur Hollinrake, Keith Faxon, Owen Watts, Nancy Hollinrake and Charles Hollinrake. The weather was generally warm and dry with some showers.

2.0 Topography and Geology

2.1 Two separate, but adjacent, boggy patches were situated within the area bounded by the site of the Chapter House/s to the NE, the Refectory Undercroft to the SW and the NE corner of the East Cloister Walk to the W at grid reference ST 501 388.

The surface of the ground is relatively level with a very gentle incline down to the Cloister Garth. East of the boggy area, however, the ground rises more steeply towards a sharp, N-S oriented, scarp and terrace.

The whole of the abbey enclosure has a gradual, E-W fall, sloping down from Chalice Hill and Chilkwell Street towards Magdalene Street. Chilkwell Street stands at approximately 33m - 34m above Ordnance Datum, and marks the eastern boundary of the precinct and Magdalene Street, standing at approximately 15m - 17m a.O.D., follows the western precinct boundary.

The archaeological investigation area stands at approximately 20m a.O.D.

Geologically, the whole of the abbey enclosure lies above Lower Lias Clay with Limestone of the Jurassic period (British Geology Survey).

3.0 Archaeological Background - East Cloister Walk / Chapter House area.

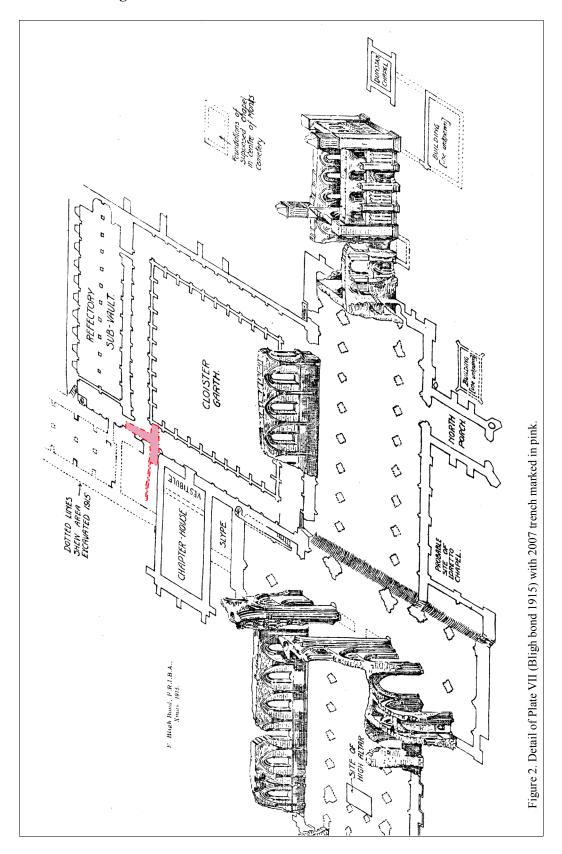
This section is copied, with additions, from the 2000 report.

3.1 Two separate archaeological projects and an earlier, compilation plan of the abbey provided information that was relevant to the problem of the boggy patch [in 2000]. The first was a ground survey undertaken by C. and N. Hollinrake during a drought in 1986 that shows various parchmarks in this location, many of which appeared to be drains or culverts. This group of parchmarks was identified in 1986 as Group H, described then as "a series of clear drains and/or water channels; these are shown by Bond in 1910". One of these features appeared to be within the boggy area.

These parchmarks are shown on **figure 5**.

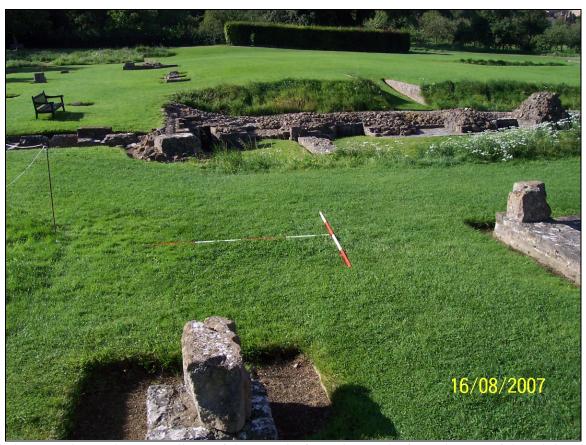
- 3.2 The second project was the report by Bligh Bond on his work in 1910. Included in that report was a plan which showed a culvert running through the affected area (see **figure 3**). Although Bond's text does not specifically mention the culvert, it is described on the plan as a "conduit of squared freestone and indications of wall over same." This feature appeared to be identical to the parchmarks in group H, recorded in 1986, and in 2000 it was therefore assumed that the problem arose from a broken medieval culvert. Bond's plan also showed a small, square, stone well adjacent to the culvert.
- 3.3 The third reference is a composite plan of the abbey showing, amongst other features, a series of water drains, conduits or culverts. This plan was produced in 1935 by Mr. Bill Wedlake, who acted as supervisor for many of the abbey excavations in the 1920s and 1930s, and later through the 1950s and 1960s. On his plan he shows the same culvert as that drawn by Bond, although Wedlake described it as a 'watercourse'. Mr. Wedlake appears not to have investigated the area within which the boggy patch is situated but he did excavate the east end of the Chapter House where he recorded a series of drains or culverts. His plan shows the drain splitting in two directions to the east of the culvert shown on Bond's plan, with the major line running to the east, up the slope, with a secondary spur running into it from the NE (This is shown on the 1986 parchmark survey as group G3). Mr. Wedlake also described the well shown by Bond as a water tank; another, similar feature appears on his plan situated south of the SE corner of the Chapter House. Mr. Wedlake's plan is stored in the abbey museum.

Phase 2 Archaeological Works - Trench Location





Photograph 1. Water from a broken pipe had killed the grass in a permanently saturated boggy patch. Ranging rods mark the centre lines of the excavatiuon trench. View from the east.



Photograph 2. The centre lines of the trench, from the north, from the top of the Cloister wall looking towards the Refectory Undercroft (tbm stone in foreground).

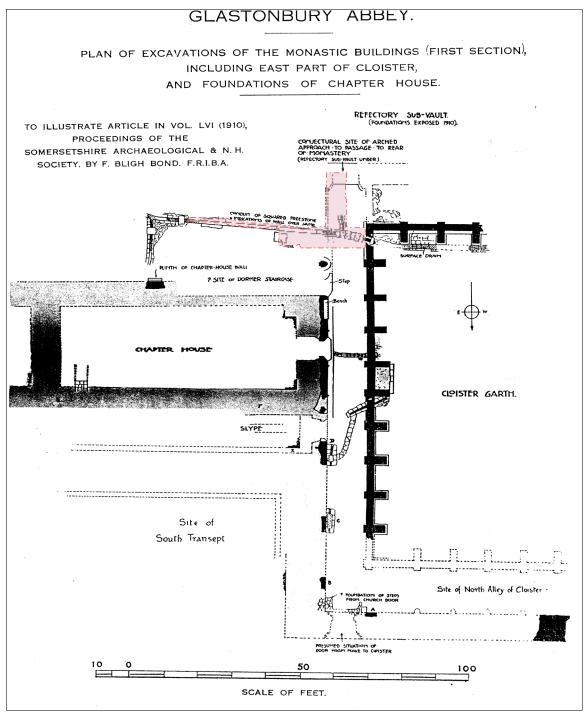


Figure 3. Location of the 2007 trench (marked in pink) in relation to F. Bligh Bond's excavation plan.

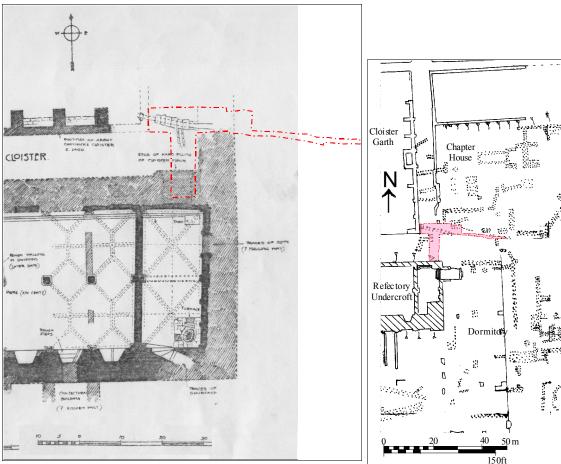


Figure 4. Detail of plan of the Refectory Undercroft produced by Bligh Bond (1911, Plate II) with the 2007 trench outlined in red.

Figure 5. 1986 Parchmark survey (Rahtz) with location of 2007 trench marked in red.

3.4 The 2000 investigation identified an open-ended land drain, terminating in the affected area. Water seeping through the drain had, over some years, soaked the surrounding area to the extent that it was completely waterlogged. A number of recommendations and suggestions were attached to the 2000 report, one of which was to fix a flexible pipe to the land drain and direct the water into the Refectory Undercroft or Vault, where it would eventually drain away along existing channels at the base of that structure.

The 2000 investigation also recorded a section of rough walling which was assumed to be the south wall of the well, or water tank mentioned above. A small amount of rubble-fill was removed from inside this structure, apparently confirming that it was the well/water tank feature depicted on the 1910 and 1935 plans.

The 2007, Phase 1 archaeological works located and exposed the water tank and removed ca.0.60m of fill. The fill, essentially rubble stone and re-deposited, natural, yellow, Lias clay, was dumped, either during the 19th or, more probably, during the 20th century, and might have derived from any of the archaeological investigations by either F. Bligh Bond or C. A. Raleigh Radford, or by landscaping works, that were carried out in this general area during the early to mid-20th century.

4.0 The 2007, Phase 2, Archaeological Investigation Trench - Methods

- 4.1 The archaeological specifications stipulated that a 'T' shaped trench was to be opened in the area bounded on the East by the 2007, Phase 1 excavation square and by the modern, stub wall marking the line of the medieval W wall of the East Cloister Walk on the W. This resulted in an excavation area measuring ca.6m E-W x 2m N-S. Contiguous with this area, a second trench ran to the south as far as the N wall of the Refectory Undercroft. This N-S area, also, measured approximately 6m x 2m.
- 4.2 The brief was not to fully excavate this area but to attempt to identify any 20th century or modern deposits and, if possible, either to remove or to excavate enough of those modern deposits so that a new ,pipe could be inserted, after attachment to the W end of the open, ceramic pipe identified in 2000, and then run it to the W and then to the S so that it would empty into the Undercroft where any water could be directed into the drains that run through that structure.

It was not known whether any medieval walls, or any other obstructions to the insertion of a new pipeline, were present within the Phase 2 trench as the only plans of the general area were those arising out of F. Bligh Bond's work on the Cloisters and the Undercroft between 1910 and 1912.

- **4.3** The turf was to be removed by hand and the turves stacked on-site after which the archaeological deposits were to be hand-excavated and fully recorded with full finds retrieval, including metal detecting.
- 4.4 The excavation was planned at a scale of 1:20 and sections and profiles were drawn at a scale of 1:10 or 1:20, as appropriate. Single context recording was employed with all archaeological context descriptions entered onto *pro-forma* record sheets. Context numbers started with [300] for the turf and topsoil and extended to [368]. The 2007, Phase 1 archaeological works used [200] context numbers whilst the 2000 archaeological works in the same area used context numbers up to [100]. All Phase 2 context descriptions are shown on the attached **Context List**. All drawn plans, sections and profiles were entered onto *pro-forma* graphics sheets.

4.7 Levels above mean Ordnance Datum (a.O.D.) were taken throughout the excavation. A temporary bench mark (tbm) on the surface of a large stone block, situated immediately N of the Phase 2 trench, was used (stone shown on **Photograph 2**). This same tbm was employed for both the Phase 1 works and the 2000 investigation.

The value of the top of the **tbm** stone is: **20.38metres** a.O.D.

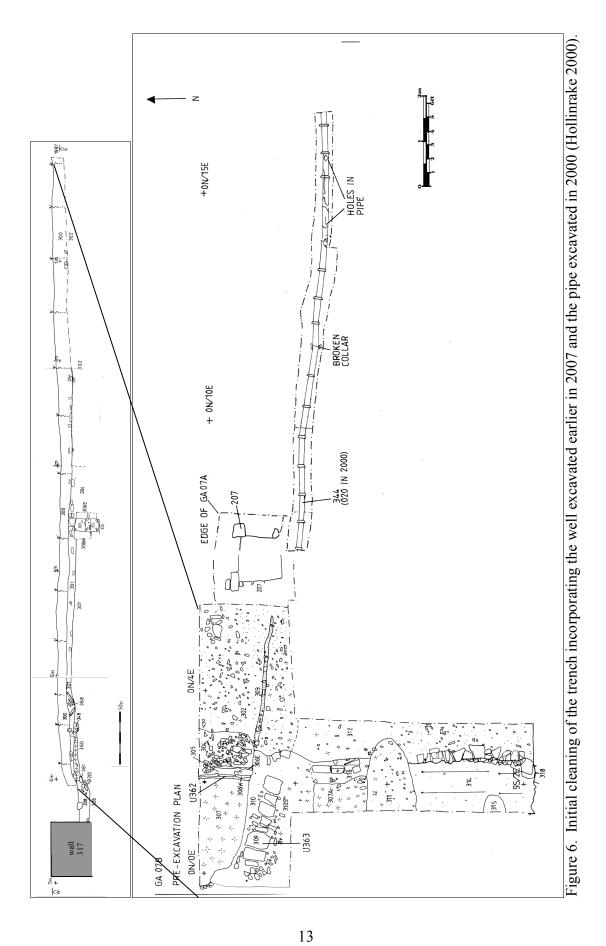
All levels were entered onto *pro-forma* levels sheets.

The work was also recorded photographically using colour transparency slides, colour and black and white prints and digitally.

4.8 Finds and Artefacts recovered during the excavation were bagged, either by [context] or as unstratified [U/S]. After completion of the excavation, all finds and artefacts were washed, dried, sorted and listed after which they were marked with their appropriate context number plus the **Glastonbury Abbey Museum Accession Number: GLSGA:07/09 [context].** Metal, slag and glass objects were not marked but were wrapped in protective, acid-free paper and stored in marked, sealed bags.

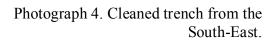
After listing, a few finds were discarded: These included clay pipe stems, modern brick and tile fragments, natural stones and etc. All discarded finds are marked, as such, on the attached **Finds List**.

- **4.9** A day book or diary was kept, providing details on the weather, site visitors, hours worked, comments on the work and etc.
- **4.10** The **Phase 2 site code** is **GA07B**. The Phase 1 site code was GA07 and the site code for the 2000 investigation was GA00B
- **4.11** The turf and the upper topsoil was removed, as turves, by hand, and stacked appropriately near to the excavation area. After removal of the turf and topsoil context [300] the remainder of the topsoil was removed by hand-trowelling ([300 base]), after which the site was photographed and planned and then levelled into Ordnance Datum
- **4.13** In the following Trench Report, Frederick Bligh Bond will generally be referred to as FBB.





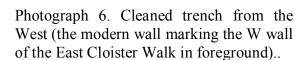
Photograph 3. Cleaned trench from the North (tbm stone in foreground).







Photograph 5. Cleaned trench from the East (manhole cover within the Phase1 works, stone tank, in foreground).





5.0 The Phase 2 Excavation

5.1 Examination of the turves produced by the removal of the turf and topsoil – context [300] - produced occasional fragments of pottery, mostly post-medieval to modern but including one medieval sherd. Fragments of medieval, encaustic floor tiles were also recovered from the topsoil. After removal of the topsoil, the base of the opened trench – covered by the base of the topsoil – context [300 Base] - was then hand-cleaned down to the top of the underlying, archaeological deposits.

The first over-all plan was drawn at this point.

5.2 Pottery sherds recovered from within [300 Base] ranged in date from the late-medieval period through to the 20th century. Removal of [300 Base] and [301] / [301C] which also contained post-medieval and modern finds, exposed diverse features and deposits including mixed clay layers containing small stones and rubble. Due to variations in the colour and the consistency of the mixed clays, several context numbers were used; primarily contexts [301] and [302] in the W-E trench and contexts [311] and [312] in the N-S trench. In addition, a line of large, flat, stones, assumed to be the capstones of a culvert, were exposed at the western end of the trench – [309], a spread of relatively dense, stony rubble was recorded adjacent to the north edge – [304], a N-S alignment of stones running to the south end of the trench was visible – [313], and two separate deposits of gritty, yellow mortar were evident – [307] and [307A]. Running through context [302] was a thin band containing small slag and cinder fragments – [303]. The southern half of [302], south of [303], was later re-numbered as context [339].

The cleaning plan is depicted in Figure 6 and also shown in Photographs 4-6.

5.3 As a route needed to be found for a new drainpipe, it was decided that the southern half of [302] = [339] - in the W-E trench - would be removed, together with the thin, black band – [303], plus context [312] in the N-S trench. Both [339] and [312] were similar contexts – mixed, gritty clays with small stones.

- 5.4 The thin, dark band, [303] was removed. It consisted of dark, gritty, mixed clays with charcoal and grey slag/cinder fragments, possibly waste from the local gas works. The deposit was only 2cms-4cms thick and it was clear that it marked the edge of a feature below. The function of [303] is not known, but it might have been a bedding deposit for the clay pipe line that survived to the east. Finds within the deposit included modern roof tile fragment and lumps of grey cement.
- 5.5 Deposit [339], filling the southern part of the W-E trench was also removed. [339] consisted of mixed clays, with rubble Lias and fragments of Doulting Stone. Finds included numerous 19th and 20th century pot sherds, clay pipe stems and coal, all indicating a modern deposit. In addition, a fragment of a ceramic drain pipe, similar to those surviving to the east, was also recovered.
- 5.6 [339] was contained within a straight cut context [340] and was around 0.30m deep. At the base of the deposit, and of the cut, were large lumps of grey, limemortar/cement, similar to, or the same as, the cement noted on the outer face of the stone tank to the east (and later noted on the north side of Refectory wall [318]).
- 5.7 The northern edge of cut [340] exposed a spread of Lias stone blocks, more or less coursed, which were on the same line and alignment as the culvert to the west. These probably represent the original culvert wall but seem to have been disturbed, and then re-arranged, although the yellow, lime mortar bedding below the stones was clear.

Cut [340] / fill [339] probably represents one of FBB's excavation trenches. It extended to the west where it merged with cut [335]. The trench cut was slightly over 1.0m wide, N-S.

5.8 Cut [335], extending west from cut [340], was filled by [310]. Fill [310] was slightly lighter in colour than [339], to the east, and contained Lias stone and Tor Burr rubble, modern pottery and other debris including coal, and also some medieval floor tile fragments as well as lumps of the same, grey cement recovered from [339].

Cut [335] enclosed the remnants of a stone culvert, the various components of which were grouped together as context [**U363**].

At its western end, trench [335] was cut by [320]; the foundation trench for the modern stone wall – [317] - that marks the line of the W wall of the East Cloister Walk.

- 6.0 Culvert U363, consists of the following elements: Lias stone capstones [309]; north wall [327]; south wall [328]; base stones [329]. There was no sign of mortar bonding for any of these components. The surviving portion of the culvert might have been disturbed, especially to the west, as it is shown on Bond's plans and he obviously saw it but there are indications that it may have been disturbed, either by him or by others at a later date, as the western capstones appeared to lie above mixed clays context [324] with the original fill lying within the remainder of the culvert, to the east, only ca.0.10m thick. [324] filled all of the culvert void below the capstones. The missing part of the culvert, east of the surviving portion, must have been robbed and removed prior to Bond's investigations.
- **6.1** Two of the capstones are re-used, worked, masonry blocks of Lias stone. Both appear to be dateable, broadly, to the 12th century. It is possible (but not certain) that these are *in-situ*.

The side walls of the culvert consisted of three courses of rubble Lias supporting the capstones whilst the base stones consisted of large, flat, Lias slabs.

The culvert had been removed further to the east, within cut [340], whether by FBB or others, and replaced by the ceramic land drain, probably during the early or mid-20th century. If the land drain had ever been present within the 2007 excavation area, it must have been removed at a later date.

6.2 Culvert U363

309 capstones
324 fill
327 stones
329 base stones
U363 culvert

Figure 7. Matrix of **U363** contexts.

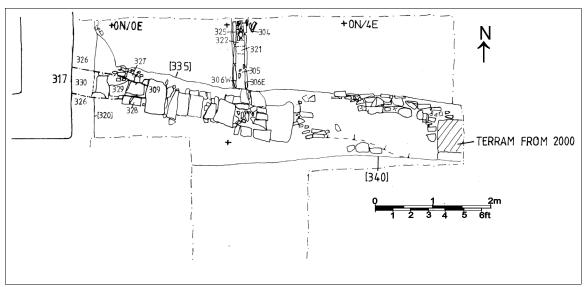


Figure 8. Plan of culvert U363.

Context No.	Type	Description of Context	Interpretation
U 363	Unifying Number for E-W culvert	Culvert. Aligned c.W-E with an inclination of axis towards the WNW-ESE. Fill = 324 . Cap stones = 309 . N Side stones = 327 . S Side stones = 328 . Stone base of culvert = 329 . ?Clay bonded.	Culvert in Area 3N(W). Exposed & planned by FBB.
329	Masonry	Rough Lias limestone slabs (up to 320 x 350 x 40mm). Laid flat, flush to one another. 1 x course thick. No mortar, bedded into the underlying clay. Unexcavated - left in situ.	Stone slabs forming the base of culvert U363
327	Masonry	Small, rough, Doulting blocks (upper course) - up to c.120 x 100 x 600mm & Lias blocks faced on the S face (lower courses) up to c.200 x 200 x 200mm. Randomly coursed - up to 3 x courses high x 1 x course thick. No mortar recorded - clay bonded. c.22cm high x up to c.20cm wide N-S x c.70cm exposed E-W.	The Northern wall stones for culvert U363. in situ & contemporary with 328
328	Masonry	Lias limestone blocks (up to 220 x 190 x 16mm). Roughly faced on the N side. Randomly coursed - up to 3 x courses high x 1 x course thick. No mortar recorded - clay bonded. c.22cm high x up to c.16cm wide N-S x c50cm exposed E-W.	The Southern wall stones for culvert U363. in situ & contemporary with 328
324	Fill	Fairly loose, mid brown silty clay; small angular stones, snail shells. c.22cm thick x 29cm wide x 88cm E-W.	Backfill of the W portion of culvert U363.
309	Masonry	Lias slabs & re-used, worked, ashlar blocks; up to 520 x 33 x 6mm. 1 or 2 x courses thick. Flat cover slabs. No mortar seen	Cover stones for culvert U363.

Table 1. Contexts associated with U363.

6.2.1 The relationship of the culvert to the mortar bedding deposits to the north and south cannot be known as the FBB trench, cuts [335] and [340], has removed any links between them.

6.2.3 The date of the culvert is also uncertain although it is assumed to be medieval. Whether it belongs with the 13th century Cloister or the late-14th century rebuild cannot be known.



Photograph 7. Montage showing U363 looking North (capstones removed at the west end).



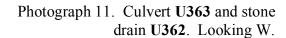
Photograph 8. Capstones 309 resting on clay.



Photograph 9. Culvert U363 showing robbing to the East. Looking E.



Photograph 10. Culvert **U363** looking E. Fill removed at west end. Mortar [307] N (left) of culvert.





- 6.3 Cutting through trench [335] was cut [320], the foundation trench for the modern Cloister wall [317]. This was very shallow and filled by mid-brown, silty clay [308] containing a post-medieval pot sherd and a lump of the same grey mortar found in trench cuts [335] and [340]. [317] is a modern wall of Lias stone bonded with Portland cement, that marks the line of the west wall of the East Cloister.
- 6.4 Three features were exposed on the N side of the W-E trench. To the west, cut by wall trench [320], was a spread of yellow, gritty mortar context [307]. This had a relatively flat surface but was disturbed to the west, possibly during construction of wall [317]. Mortar [307] extended as far as a small, open, drain [U362]. To the east of [U362] was a N-S spread of mixed clay with densely packed small blocks of rubble stone context [304].
- 6.5 Context [304] was not disturbed. At first thought to mark the line of the east wall of the East Cloister Walk, of which there was no sign within the excavation area, it is now thought possible that it might mark the site of a buttress at the SE corner of the medieval Chapter House.
- 6.6 The stone drain [U362] appeared to be undisturbed within the north part of the excavation area and a small section was visible c.0.60m north of the excavation area, at the base of a large, worked stone block (the tbm stone). South of the excavation area it has been destroyed but its route is marked by deposit [316]. The drain must formerly have run N-S along the inner edge of the east wall of the East Cloister.

Drain [U362] has been cut through by FBB trench cut [335].

- **6.6.1 [U362]** contains the following components: side walls of small, Lias slabs [306]; top fill of drain [305]; middle fill of drain [321]; lower fill [322]; base stones small, flat Lias slabs, [326].
- **6.6.2** The fill of [U362] was partly excavated against the N section. The following photographs, plans and tables describe the results.

Stone Drain U362

See Figure 6



Photograph 12. **U362** at top of picture, U363 capstones on the left. The ranging rods mark the edges of an FBB trench. Small slabs to the bottom right cover **316**. Looking NW.



Photograph 13. Organic deposit **316** exposed. Looking NE.



Photograph 14. **U362** under excavation. Rubble stone [304] to right. Looking N.



Photograph 15. Deposits within U362.





Photograph 18. Close view of S end of U362. Mortar 307 has flowed over the end stone (left edge of photograph).



Photograph 17 U362 and disturbed part of **U363**. Looking N.

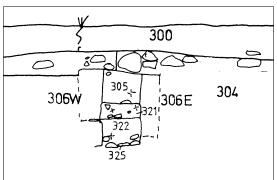


Figure 9. Section of U362 in the N baulk.

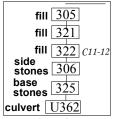


Figure 10. Matrix of U362 contexts.

Context No.	Type	Description of Context	Interpretation
325	Deposit	Moderately compacted - horizontally laid, medium sized unworked angular Lias stones (up to 9 x 4cm) - also included 1 x rough Tor Burr stone (c.4 x 2cm). 1 or 2 courses laid roughly flush to one another, firmly pressed into the underlying layer. Unexcavated	Stone base of drain U362.
306 E & W	Masonry	Unworked vertical Lias slabs (up to 580 x 40 x 200mm). Linear (N-S). parallel @ c.15cm apart. 1 x course thick. No mortar, bedded into clay - slabs = nearly flush. Dimensions of exposed masonry = c.20cm deep. c.25cm E-W. c.1.15m N-S.	Side wall stones for drain U362.
322	Fill	Friable, dark brown silt with frequent green - blue mottles; occasional pottery, bone, small mortar frags (<1cm), rare ?fired clay, small angular Lias chips (<1cm). 10cm thick.	Lowest layer of fill in drain U362.
321	Fill	Moderately compact, mixed dark grey - brown silt with light brown greasy clay (c.30%); frequent, fine yellow mortar inclusions (c.20%) & occasional small lumps (up to 3cm), occasional small angular Lias stones, rare bone, rare slag. c.7cm thick.	Middle layer of fill in drain U362.
305	Fill	Soft, dark brown silt mixed with some clay (c.20%). Top of fill contained occasional small angular Lias stones, small lime mortar lumps, 1 x Medieval ceramic tile frag. occasional small mortar / plaster lumps, roof slate frags, rare bone, no charcoal. c.12cm thick.	Upper fill of drain U362. Same as ?336

Table 2. Contexts associated with **U362**.

- **6.6.3** The material composition of [321] might suggest that the increase in clay & mortar inclusions could be the result of an episode of construction or repair of the mortar floor layers immediately to the W (?during the 15th century rebuild).
- **6.6.4** Artefacts recovered from upper fill [305] might relate to post-Dissolution, destructive activity. [305] contained less clay than [321] immediately below.
- **6.6.4** Pottery sherds from the bottom fill [322] are broadly dateable to the $11^{th}/12^{th}$ century. This might indicate that the fill, and therefore the drain, could belong to the first phase of the medieval Cloisters, built during the abbacy of Henry de Blois in the early 12^{th} century.
- 6.6.6 Stone drain [U362] is depicted by FBB on **figures 3** and **4**, where it is shown to the south of Culvert [U363] (in the 2007 excavation trench). He did not show the drain north of the culvert as he cannot have seen it. As cuts [335] and [340] probably define one of FBB's excavation trenches, the survival of that portion of the drain recorded in 2007 (north of FBB's trench) and the absence of a drain south of cuts [335] and [340] (where Bond drew the feature) probably implies that its destruction in that area was a direct result of FBB's investigations

context	pottery			buildi	ng materials	misc	
	qty	fabric & weight	surface	date	qty	type	
322	1	coarseware, reduced, limestone temper. 7g	oxidised surfaces, small voids	10-12th			1 x bone. 8g
	1	coarseware, reduced, grit temper. 6g	pale oxidised surfaces, gritty	11-12th			14 x small bone frags. 8g
322 B Base	1	small coarseware sherd, reduced. <1g	oxidised surface	11-12th			3 x animal teeth = 2g, 2 x bone = 5g, 1g. Total weight = 8g 1 x small oyster shell frag. <1g 1 x snail shell. 2g
					2	mortar frags, white. 5g, 2g	1 x dark grey glassy slag. 3g
321					3	small Doulting stone frags. 17g, 6g, 6g	
					8	lime mortar frags, white. 21g	2 x small bone frags. 1g
305					1	wall plaster frag, off - white. 4g	3 x oyster shell frags. 10g, 3g, <1g
					3	small roof slate frags. 5g, 1g, 1g	

Table3. Finds from **U362**.

6.6.7 FBB depicted stone drain [U362] south of Culvert [U363], running towards the south (see **figure 3**). However, it was not present within the 2007 excavation trench in that area and its line is marked by a relatively narrow, linear spread, of dark grey, loamy/organic, silty clay – context [316]. Within the surface of [316] were a number of Lias blocks, some upright, others at various angles, almost certainly representing the side-wall stones of Culvert [U362]. [316], which contained a modern pot sherd, was contained within a cut – [338] – ca.0.75m wide W-E and slightly over 1.2m long, where it merged with, or was cut by, other trenches, (335] to the N and [323] to the S; probably all dug by FBB.

Contex	xt No.	Type	Description of Context	Interpretation	
33	88	Cut	Rectangular in plan. Up to 75cm E-W. 1.2m N-S. Only the	FBB trench cut - backfilled by 316. The	
			Western slope survived. Rounded break of slope - top.	base of the cut exposed disturbed gully 336 .	
			Rounded break of slope - base. Flat base.		
31	6	Deposit	Fairly loose, dark grey brown loamy clay. Contained c.6 x	Backfill. Disturbed area may be FBB	
			Lias slabs (average size = $160 \times 60 \times 440 \text{mm}$), moderate	excavation - where one would expect to see	
			amounts of small to medium sized angular Lias & Tor	the continuation of drain U362. The Lias	
			Burr stones, occasional small charcoal lumps, mortar	slabs within 316 are almost certainly re-	
			lumps, bone frags. Up to 15cm thick. Up to 75cm E-W.	deposited, drain side wall stones.	

Table 4. Trench 338 contexts.

context	pottery			building materials		misc	
	qty	fabric & weight	surface	date	qty	type	
	1	small sherd, orange. 1g	traces of light brown glaze	18-19th	1	encaustic tile frag, oxidised fabric, clear glaze with	4 x bone. 4g
316					7	white piping. 46g mortar frags. 74g	2 x oysters. 59g, 38g 3 x Fe nail frags. 5g, 5g, 3g
							1 x grey slag frag. 2g 1 x small frag, vessel glass sherd, <1g, probably C18-20th

Table 5. Finds from trench 338 / 316.

6.6.8 The line of [338] / [316], to the south, was disturbed by trench cut [323] and by the cut-away slope, [314]. Because of these various, modern trench disturbances, it is not certain that the relationship between the drain represented by [338] / [316] and the mortar bedding deposit [307A], immediately to the west, is the same as that between drain [U362] and mortar deposit [307] in the W-E trench, although it is assumed that this is so.

7.0 The Mortar bedding Deposits – contexts [307] and [307A]

- 7.1 These two deposits represent the surviving elements, along with drain [U362], of the interior, and the floor, of the East Cloister Walk. They have been disconnected by FBB trench [335] and detached from the East Cloister Walk structure by the lack of either standing or foundation walls to the W and the E, both presumably robbed after the Dissolution and the resulting destruction of the Cloisters.
- 7.2 The structure, stratigraphy and floor layers within the two bedding deposits was investigated in two sondages: Sondage B at the western end of deposit [307] in the W-E excavation area and Sondage C through deposit [307A] in the N-S excavation area.
- 7.3 The two sondages were excavated due to the exposure of the stratigraphy contained below surface [307A], revealed most clearly in the (south-facing), north section of FBB trench cut [323], where several discrete floor layers, separated by a band of charcoal, were exposed. The stratigraphy was also seen in the north-facing section, but with more disturbance. Samples of these layers, including the charcoal deposit, were requested, the latter for possible radiocarbon14 assessment. Deposit [307] was also examined in a patch that might have been previously disturbed in order to investigate whether the same layers, and the same stratigraphic sequence, were present in that area.



Photograph 19. The two surviving areas of floor bedding and the two stone drains. 307 top right, 307A on left. Looking W.



Photograph 20. General view of mortar bedding 307 and the stone drains. The mortar spread extends to the edge of drain U362 at the bottom of the photograph and flows into the cut for culvert U363 on the left, which can be seen passing below modern Cloister wall 317 at the top of the photograph. Looking West.

- 7.4 Sondage B was located at the western edge of deposit [307], adjacent to foundation trench cut [320]. The area was sloping slightly to the west and might have been disturbed during construction of the modern wall. Minimal excavation was specified for both sondages and Sondage B was approximately 0.25m wide, W-E.
- 7.5 Sondage C was located at the south edge of deposit [307A], adjacent to and immediately north of FBB trench cut [323] which had cut through the mortar bedding layers, thereby clearly exposing the stratigraphic sequence, especially in the north section of the trench and less clearly, due to disturbance, in the south section of [323].. Sondage C was approximately 0.25m wide, N-S.
- 7.6 It is best to describe the different layers in both sondages together, in order to provide easy comparisons. The upper deposits—[307] and [307A] were 5cms to 10cms thick and relatively level, but with some obvious surface disturbance. They both consisted of a compact, yellowish-orange lime mortar with occasional surface fragments of small, Lias stones, small pockets of topsoil and areas and patches of root disturbance. Both [307] and [307A] lay directly below layer [301], a modern deposit of mixed clay and small rubble fragments at the base of the topsoil.

[307] had a thin layer of creamy mortar on its surface, probably bedding for the Cloister floor.

- 7.7 [307] and [307A] are presumed to represent the latest bedding deposit/s for the floor of the East Cloister Walk, probably of the 15th century. Below these surface deposits were other mortar layers, presumably for earlier floor phases, and shown most clearly in Sondage C, with an intervening layer consisting of a charcoal deposit.
- **7.8** In Sondage C, [307A] was described as [307A (S)]. [307A(S)] lay above [356], probably the same deposit but with [307A] defining a thinner surface skim, probably to take floor slabs or tiles. [307A] lay above mortar floor/deposit [357] which can be equated with mortar floor/deposit [348] in Sondage B.

- 7.9 In Sondage B, a small posthole [347] was cut into [348] and [348] also sealed another posthole [372] which had cut into the charcoal layer below.
- **7.10** Mortar deposits [357] and [348] lay above, and sealed, charcoal layers. In Sondage B, charcoal layer [351], a thin layer less than 1cm thick, contained moderate charcoal flecks and lumps. In Sondage C, floor [357] lay above [358] a layer of charcoal lumps and flecks up to 2cms deep (in the south section, [358] equals [333]. A few iron nails were contained above and within the charcoal.

All of [358] was retained for possible radiocarbon14 dating.

7.11 In Sondage C, the charcoal deposit lay above the hard surface of a mortar deposit – context [359] - that had been subjected to intense burning. The surface was burnt red and reddish-brown. Some iron nails were lying on this surface

In Sondage B, charcoal layer [351] lay above a burnt surface – [360] of a mortar deposit. The surface was burnt dark-grey, orange and red. The most severe burning was around a group of small, unworked stones – [361] - which had been burnt to a soft, grey colour with a heat-induced, crumbly texture.

- 7.12 The lowest mortar deposit in Sondage C [366] / [334] can be equated with the mortar deposit with the burnt surface in Sondage <math>B [360]. In Sondage C, [366] lay above dark, greyish-brown silty clay context [367] which predates the Cloisters.
- **7.13** If the lowest mortar deposits represent the first, post Norman Conquest, Cloister floor of the early 13th century, then the charcoal deposits can probably be associated with the great fire of 1184 that destroyed the 12th century monastery.

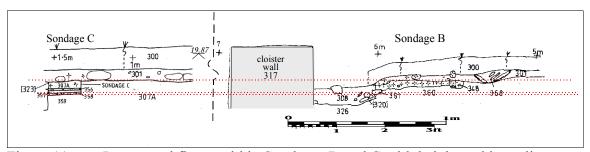


Figure 11 Layers and floors within Sondages B and C with height and layer lines

Sondage B



Photograph 21. Base of mortar bedding **348**.



Photograph 22. Charcoal-rich layer **351**. Looking N.



Photograph 23. Scorched surface **360**, below **351**, and stones **361**. Looking N.

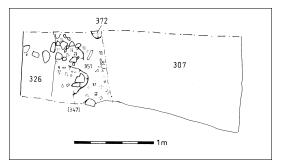


Figure 12. Plan of charcoal-rich layer **351**.

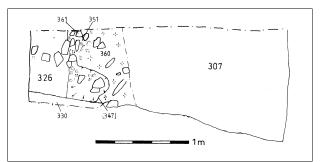


Figure 13. Plan of **360** and **361**.

Sondage C



Photograph 24. Initial Cleaning: Detail of mortar bedding **307A** in the N-S spur. Looking East. Sondage C was on the S edge of the deposit, right of photograph



Photograph 25. North. section of FBB Photograph 26. trench 323. Looking N. Photograph 16 w



Photograph 26. Section shown in Photograph 16 with **357** removed to show charcoal layer [**358**]



Photograph 27. Ash and charcoal layer **358** with nails.



Photograph 28. Bird's-eye view of scorched surface **359** with nails on surface (below section).

7.2 Tables and Matrices associated with Sondages B and C

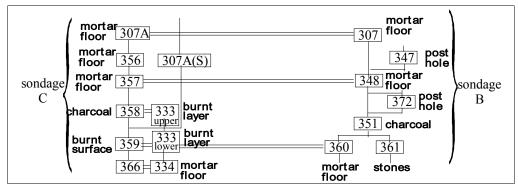


Figure 14. Matrix of relationships between the floor beddings for the East Cloister Walk in Sondages B and C.

Floor Probably 1st half of C12th

Context No.	Type	Description of Context	Interpretation
366 Sondage C	Deposit	Compact, mixed light brown silty clay (c.60%) & yellow mortar (c.40%). Unexcavated - only seen in the S face of cut 323 . c.2cm thick.	Mortar floor layer. Only seen in the S facing section cut 323 Same as 334
334 Sondage C	Deposit	Compact, mixed light brown silty clay (c.60%) & yellow mortar (c.40%). Unexcavated - only seen in the N face of cut 323. From 2cm to 5cm thick.	Mortar floor layer(s). Same as 366 .
360 Sondage B	Deposit	Hard, light - buff, sandy mortar, burnt orange - red or grey black - especially around stones 361. Uneven - disturbed surface with frequent small pockets containing dark grey ashy loam. Contained occasional small Lias chips (<1cm). Unexcavated - depth unknown.	Burnt surfaced of a mortar floor - same as 333 lower & 359. Unexcavated.
361 Sondage B	Deposit	Group of unworked stones in extreme NW corner Area 3N. c.20 x burnt limestones (in plan) (up to c.10cm diam.) Scorched grey, crumbly stone with many fractures. ?Appears to potentially have 1 x straight edge - aligned c.ENE-WSW. Unexcavated - left in situ. c.10cm depth exposed in the S facing section.	A group of burnt stones. underlying burnt deposits. Possibly structural remains 361 also appeared to slope down towards the W - ?archaeological or ?disturbance

Table 6. Contexts associated with the first cloister floor.

GA 07B

Context No.	Type	Description of Context	Interpretation
359 Sondage C	Deposit	Very firm, orange - red, burnt clay & mortar. From <1cm up to 1cm thick. Fe nails on surface. Unexcavated	Intense burning on the surface of mortar floor 366 due to the same burning event that created charcoal deposit 359 immediately above. Same as 333 lower, 360.
333 Sondage C	Deposit	Sub-divided into 333 upper & 333 lower . Firmly compact layer. Unexcavated - only seen in the N face of cut 323. Up to 4cm thick.	Layer of intense burning as seen in the N face of FBB trench cut 323 .
333 Lower	Deposit	Very firm, orange - red, burnt clay & mortar. From <1cm up to 1cm thick.	Intense burning on the surface of 334 . Same as 359 , 360
360 Sondage B	Deposit	Hard, light - buff, sandy mortar, burnt orange - red or grey black - especialy around stones 361 . Uneven - disturbed surface with frequent small pockets containing dark grey ashy loam. Contained occasional small Lias chips (<1cm). Unexcavated - depth unknown.	Burnt surfaced of a mortar floor - same as 333 lower & 359.
361 Sondage B	Deposit	Group of unworked stones in extreme NW corner Area 3N. c.20 x burnt limestones (in plan) (up to c.10cm diam.) Scorched grey, crumbly stone with many fractures. ?Appears to potentially have 1 x straight edge - aligned c.ENE-WSW. Unexcavated - left in situ. c.10cm depth exposed in the S facing section.	A group of burnt stones. underlying burnt deposits. Possibly structural remains 361 also appeared to slope down towards the W - ?archaeological or ?disturbance
358 Sondage C	Deposit	Firmly compacted, black charcoal & ash - mostly fine with occasional lumps up to c.1cm. Contained occasional small angular burnt stones / pebbles, 2 x small Fe nails from the surface. From <1cm up to 2cm thick.	A thick, compact layer of charcoal and ash. Appears to be the same layer as 333 upper . ?The great fire of c.1184AD Same as 333 upper , 351
333 Upper Sondage C	Deposit	Firmly compacted, black charcoal & ash - mostly fine with occasional lumps up to c.1cm. Contained occasional small angular burnt stone. From <1cm up to 3cm thick.	A thick, compact layer of charcoal and ash. Presumed to be the wooden structure associated with mortar floor 334. ?The great fire of c.1184AD Same as 358.

Table 7. Descriptions of burnt deposits, Sondages B and C.

context		pot	tery	building materials		misc	
	qty	fabric & weight	surface	date	qty	type	
							8 x Fe nail frags. 7g,
358 Surface							6g, 5g, 5g, 4g, 3g, 2g,
Sondage C							5 x small burnt stone
							frags. 19g

Table 8. Finds associated with burnt layers.

Context No.	Type	Description of Context	Interpretation
357 Sondage C	Deposit	Moderately compact dark clay with some pockets of mortar, 1 x broken plaster / render frag (c.10cm diam.). Only seen in section. From 1cm up to 3cm thick at the E end.	Thin clay layer between burnt layer 338 & mortar floor 356. Disturbed. Not seen in the N facing section 323. Same as 351
351 Sondage B	Layer	Firm, mixed brown clay; moderate amounts of charcoal. Extremely thin layer <1cm thick, extremely uneven upper surface.	Thin clay layer between burnt layer 360 & mortar floor 348 . Disturbed, did not show up in the section.
348 Sondage B	Layer	Firm, mixed, yellow / orange lime mortar with brown clay; frequent small rounded pebbles; root disturbance. Up to 6cm thick. Close to the surface - especially where truncated by 320 ; brown clay may be intrusive.	Mortar floor bedding.
356 Sondage C	Deposit	Orange lime mortar with lumps & streaks & lenses of cream mortar. Contained occasional loamy streaks & pockets, small Lias chips (c.2-4cm), 1 x horizontal slate on the surface. Only seen in section. From 1cm to 6cm thick.	Mortar floor bedding. Seen in section.
307A (S) Sondage C	Deposit	Firm, yellow-orange compacted mortar with patchy lenses of brown loam; occasional small angular stones. From <1cm (E) up to 5cm (W) thick.	Mortar floor bedding. Same as 307A , but to the S of Cut 323 . Only as small portion remains due to truncation by cut 319 Same as 307 , 307A .
347 Sondage B	Cut & Fill	Fill = Firm, mid - brown loamy soil; 2 x pitched unworked Lias blocks up to c.15cm. Cut = oval (truncated by 320). 1 x rounded corner @ the E. Flat base.	post hole.
307 Sondge B	Deposit	Firm, yellow, well compacted lime mortar with a patchy layer of cream - coloured mortar on top. Contained occasional small angular stones & rare Medieval ceramic tile frags pressed in from above. Damaged by exposure & root action	Surviving area of mortar bedding deposit for E Cloister Walk - in situ. The patchy cream mortar probably represents the last phase of flooring Same as 307A, 307A(S).

Table 9. Contexts associated with the post-fire Cloister floor bedding.

context	pottery				buildi	ng materials	misc
	qty	fabric & weight	surface	date	qty	type	
351 Top Sondage B							1 x Curving Fe object o top of ?Plaster. 23g. SF - 5
351							2 x bone frags. 9g, 7g
351 Base Sondage B							1 x bag of a disintegrated Cu alloy object. 21g. SF - 6
348 Sondage B							11 x Fe Plate fragments - same object. 21g. SF - 3
348 Base Sondage B							1 x Cu Alloy fragment. <1 g. SF - 4
356 Sondage C					1	roof slate frag. 127g	
347 Sondage B					1	Doulting stone frag, 2 x worked edges. 101g	

Table 10. Finds associated with the post-fire Cloister floors.

8.0 The N-S oriented Trench

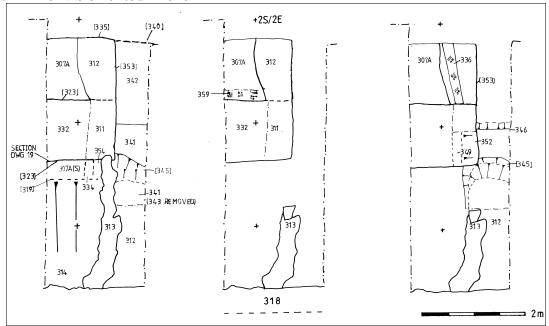


Figure 15. Features recorded in the N-S trench, the latest phase to the left ([311] & [312] part-removed).

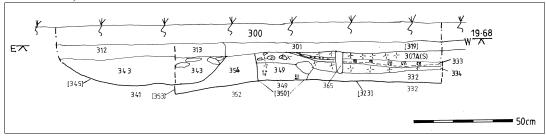


Figure 16. N facing (Composite) section of cuts [323] and [345]



Photograph29 Section shown in Figure 17, above. Looking S.

8.1 In the N-S oriented trench, mortar spread [307A] had been cut to the E and to the S by modern trenches, probably part of FBB's investigations between 1910 and 1912.

In addition, deposits in the S end of the trench had been cut away to form a slope or ramp down to the N wall of the Refectory Undercroft, - context [314] / [319] - again, probably by FBB.

Immediately east of slope [314], and defining its E edge, was a rough, drystone wall, context [313]. The narrow strip between [313] and the eastern edge of the excavation area was left *in-situ*, covered by [312]. The new pipe was to be routed to the west of wall [313], running down slope [314] / [319].

- 8.2 East of mortar spread [307A], and east of stone drain extension [316], was deposit [312]. This was similar to, or the same as, deposit [301] and lay below the turf and topsoil in a linear, N-S spread approximately 0.70m wide. [312] was a compacted or trampled layer of mixed clays and small rubble stones and contained post-medieval and medieval pottery sherds, post-medieval clay pipe stems, coal and cinder. It was a modern deposit, up to 10cms thick, and was therefore chosen for partial excavation as the route for the new pipe. The south end of [312], to the east of wall [313] was not excavated and was *left in-situ*.
- 8.3 The north part of [312] sealed a series of different deposits; from N to S they were: [342], [341] and [343]. These three deposits lay within a cut [353] probably an FBB excavation trench of which only the N edge was seen (the FBB trench extended E beyond the side of the 2007 excavation trench).

Cut [353] appears to have been cut through, to the north, by FBB trench [335] / 340]. It might also have been cut, to the south, by [323] although all of these FBB trenches are likely to be, more-or-less, contemporary.

8.4 [342] was a mixed, grey-brown clay with small, Lias rubble, roof slate fragments, coal, animal bone fragments and medieval pottery. One sherd of post-medieval, orange glazed pottery was also recovered.

[342] lay over a spread of yellowish-orange-brown, sandy, mortar containing Lias stone chips – context [341], similar to cut-away surface [314] / [319]. To the south, [341] formed a low bank, cut away to the south by cut [345]. [341] was not excavated.

- **8.5** Filling cut [345], was [**343**], mixed, grey-brown clay, similar to, or the same as [342], and containing mortar/plaster fragments, animal bone, coal and a clay pipe stem. [343] also lay above [341].
- 8.6 Cut [345] might be associated with, or be a trench for, rough walling [313], to the south. Wall [313] consisted of up to three, random courses of rubble Lias stone. It was partly bonded by clay and lay above a thin soil on the surface of cut-away [314]. One sherd of 19th or 20th century blue transfer ware pottery was found within the wall, plus a very small, medieval sherd. Other finds from within the wall and from within the thin, soil below the wall, included modern bottle glass sherds, coal and animal bone fragments. [313] ran down the slope of [314] / [319] where it butted up to Undercroft wall [318]. Where these wall joined, they had been bonded together by a grey, charcoal flecked, lime cement of late-19th or early-20th century date.
- 8.7 The slope, [319], with surface deposit [314], is obviously a late feature. It lay directly below the topsoil and extended south to the Undercroft wall. It had been cut into by a probable animal burrow, possibly a badger sett context [315] of unknown depth.

This feature is linked with wall [313] and was probably created to serve as an entrance, possibly a barrow-run, to the excavations within the Undercroft carried out by FBB. The surface, [314], and underlying deposits, consist of mixed, clay/mortar, either the remnants of the mortar bedding represented by [307A] and [307], or the same material re-deposited to form the barrow run.

- **8.8** South of mortar [307A], between [307A] and the cut slope [314], and below [301], was context [311], a similar deposit to [312], consisting of mixed clays with small stones and lenses or pockets of yellow clay. [311] appeared to lie within a cut feature.
- [311] was removed. The deposit was ca.0.15m thick and contained medieval pottery sherds and one 19th or 20th century sherd, oyster shells, animal bone, iron nails

and small rubble. It was the top fill of a straight-edged trench that cut through mortar spread [307A] and the mortar spread to the south – [314].

- 8.9 [311] lay above a lower fill [331]. This was a dark grey, clayey loam with small Lias stone fragments, roofing slate fragments, mortar and slag. It was the lowest fill of trench **cut** [323], only around ca.2cms deep and lay above an unexcavated context, [332].
- **8.10** [332] was cleaned but not excavated. It appears to be an undisturbed, medieval deposit, underlying the mortar floors exposed in the N and S sections of FBB trench cut [323]. Pottery sherds were recovered from the surface of [332]. All were coarsewares, broadly dateable to between the 10th and 13th centuries. None are likely to post-date the early 12th century.

8.11 Gully 350

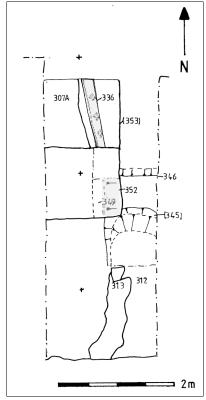


Figure 17. Gully 350 (fills shaded)



Photograph 30. N-S trench looking N showing **336** and its relationship to stone drain **U362** at top of picture. Looking N.

Context No.	Type	Description of Context	Interpretation
349	Fill	Moderate to loosely compacted, dark buff - grey silty clay (c.90%) with some rare re-deposited yellow clay; moderate amounts of small charcoal (up to 1cm), occasional small bone frags, rare pottery, slag, 1 x angular Lias stone (c.10cm) in the top (W) of the fill. Not fully excavated	Silted-up fill of gully cut 350 . Potentially the same as, or associated with 336 to the N of 323 - but uncertain. Pame as 336 .
350	Cut	Linear (N-S). Vertical or near vertical sides. Base	Cut for small gully or drain - filled by silts
		not seen.	349
?336	Fill	Fairly loose, dark brown silty clay; frequent charcoal, occasional very small mortar lumps (<1cm), snail shell frags. Unexcavated. c.20cm wide x c.1.2m.	Fill of an unexcavated drain or gully that was exposed when 316 was removed.

Table 11. Contexts associated with gully 350.

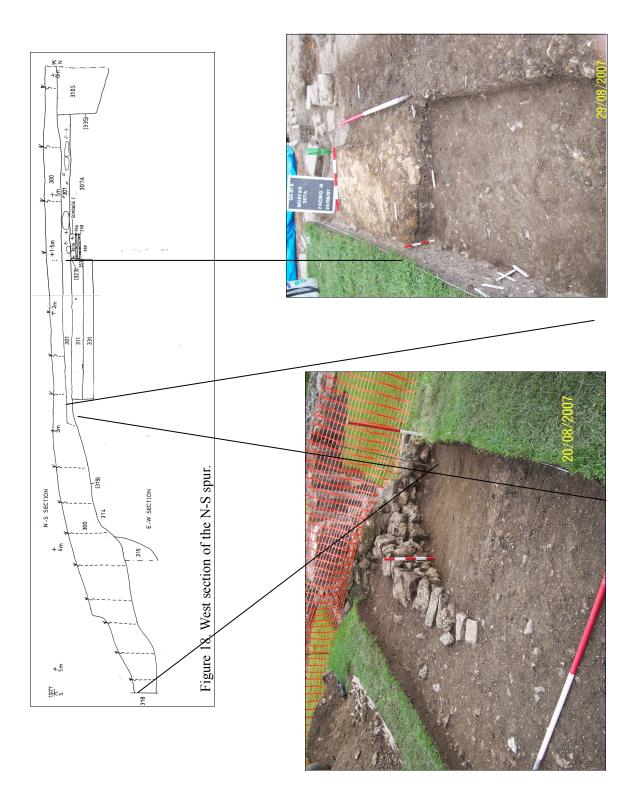
context	pottery				buildi	ng materials	misc
	qty	fabric & weight	surface	date	qty	type	
349	1	coarseware, reduced, abundant quartz temper. 3g	brown surfaces	11-13th			6 x small bone frags. 15g 1 x Fe slag. 10g
336 Top Cleaning	1	coarseware, reduced, small quartz temper. 3g	1 x oxidised surface	12-14th			

Table12. Finds from gully **350**.

8.12 Linear feature [**350**] cuts through the early, mixed, silty clay deposits [334] & [354] and is sealed by early mortar floor deposit [334]. The section of [350] is shown in figure 8. The feature was only recorded in the North-facing section of FBB trench cut [323]. Deposit [336] immediately north, may be associated.

Cut [350] was filled by [349], buff-grey, silty clay. The feature was not excavated but finds were recovered during cleaning of the surface and of the section.

Theoretically, [350] should be cut by later stone lined drain [U362] and its southern continuation [316], ca.1m to the N. [U362] appears to, generally, take a similar line to [350]. If they were associated, however, the evidence has been destroyed by FBB trench cut [323].



Cut **319** / surface **314** and Wall **313**



Photograph 31. Wall 313 and cut 319 looking S.



Photograph 32. Wall 313 and cut 319 looking SW.



Photograph 33. Detail of section through wall **313**. Looking S

9.0 The Clay pipe drain see figure 6

No further investigations were carried out in the two main excavation areas as the route for the new pipe had been examined and excavated. The original intention was to fix the new pipe to the western end of the existing ceramic pipe. The second boggy patch further to the east, however, made it imperative that the existing ceramic drain should be exposed and examined as least as far as that area. A narrow trench was then cut, using spades, along the line of the ceramic pipes, first exposing the green mesh terram, laid down at the end of the 2000 archaeological investigation, and then the remainder of the pipe line. The trench was only 0.25m to 0.35m wide.

9.1 The fill of the pipe trench was assigned context number [364] and the clay pipes were assigned context number [344].

[364] consisted of re-deposited, mixed clays with rubble Lias stone fragments. One medieval pot sherd and one $19^{th}/20^{th}$ century pot sherd were recovered from the fill.

The original trench cut for the ceramic pipe was not looked for and was not seen.

- 9.2 The drain pipes were only around 0.25m down from the surface towards the E end of the area opened and up to 0.35m deep towards the W end. The pipes had not been bedded on either sand or gravels and lay more-or-less on the base of the trench, sometimes above fill [364]. The exception was at the eastern end of the area opened, where three or four pipes had been laid directly above three, Doulting Stone, ashlar blocks context [355] which extended to the east, beyond the end of the opened area. As a result of this uneven bedding, the pipes did not run smoothly down the slope from the east and in places it had buckled, both upwards and sideways. In one spot where this had occurred, just E of the 2000 archaeological investigation area, two pipes had become separated and this was probably the cause of the original boggy patch.
- 9.3 Further upslope, to the east, a series of pipes had been broken and crushed. Some pipes had just one hole in them, others had been almost pulverised. In the latter case, the crushing was the result of excessive weight from above; probably from a large vehicle pressing down on those pipes laid above the unyielding Doulting blocks with only ca.0.25m of soil above them. This was the cause of the second, eastern, boggy patch.

9.4 It was noted that water flowed through the drain pipes irregularly. After rainfall the flow appeared to be relatively steady but at other times there was generally little or no water and then periods of strong flow, sometimes for several hours.

The source of the water is not known.

9.5 All of the ceramic pipes were removed. There was a gap of around one day between removal of the old pipes and the installation of new pipes. A small dam had to be constructed at the W end of the pipeline to stop the water issuing out of the open pipe in the E section from flooding the excavation area.

The result can be seen in the **photographs** below.



Photograph 34. Clay pipe drain looking W. Showing breaks and holes in the pipes.



Photograph 35. Clay pipe drain trench looking E. The pipes have been removed and a small dam holds the water back from the trench.

Context No.	Description of Context	Interpretation		
344	Ceramic drain pipe aligned E-W - 16 x pipes in total =c.9.5m exposed E-W. Pipes = c.63cm (25") long x 13 cm ($5\frac{1}{2}$ ") - c.19cm ($9\frac{1}{2}$ ") wide at the collar. Interior diameter = c.10cm (4 "). Pipes had oxidised or buff fabrics with an oxidised surface or a thick orange salt glaze. 1 x C19-20th pottery from immediately below 344. Depth = from c.26cm up to 35cm below the surface. Overlies 355 In places lying at a depth of only c.26cm below the surface; as a result, at least 5 x pipes had broken	Ceramic drain pipe/land drain still carrying water, particularly after rain fall. Full length & water source unknown. At the East end 344 rested upon stone blocks /wall (355) which have contributed to the pipes cracking. The cut for 344 / 364 was not exposed.		
364	Moderately compact, mid - brown clayey loam with frequent Lias rubble, occasional Medieval & C19-20th pottery. Sondage = Up to 35cm thick (not bottomed). Up to 50cm N-S. c.7.5m E-W. Cut for 364 not exposed	Backfill around modern, ceramic drain pipes 344 . Not fully		

Table 13. Contexts associated with the clay drain pipe.

context	pottery				buildi	ng materials	misc
	qty	fabric & weight	surface	date	qty	type	
364 Pipe Trench	1	rim, fine hard pale oxidised. 2g		13-15th			2 x bone frags. 15g, 2g
	1	factory white ware.		19-20th			
344	1	factory ware. 1g	yellow glaze with white bands	19-20th			

Table 14. Finds from the clay pipe trench.

9.6 The Doulting Stone blocks – context [355]

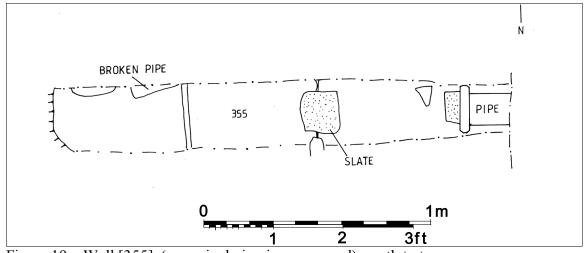


Figure 19. Wall [355] (ceramic drain pipes removed) north to top.

Context No.	Type	Description of Context	Interpretation
355	Masonry	Doulting Stone tightly fitting. ashlar blocks (>15cm thick x c.60cm long E-W. Width extends beyond width of the (2007) excavation cut for the drain pipe.) Slates cover the joins between the blocks.	Part of an unrecorded, probably medieval, wall of squared Doulting blocks; presumed E-W aligned, but not known.

Table 15. Description of Dormitory wall.

9.6.1 The ashlar blocks, context [355], appear to be structural and *in situ*. It is assumed that they are part of an unrecorded, W-E oriented, wall. The stones are well-faced and well-squared and are presumably part of a major building or structure; possibly the Dormitory, or a building situated between the Chapter House and the Dormitory.

The blocks were all ca.0.60m long and the end block, to the west, was 0.15m thick. The three blocks all extended beyond either edge (N and S) of the trench and their width is not known

Fragments of roof slate had been placed over the joints between the stones. This probably took place when the pipes were laid above the wall.



Photograph 36. A thin film of water flowing out of the open pipe, lies above the ashlar blocks of wall [355], reflecting the orange mesh, security fencing.

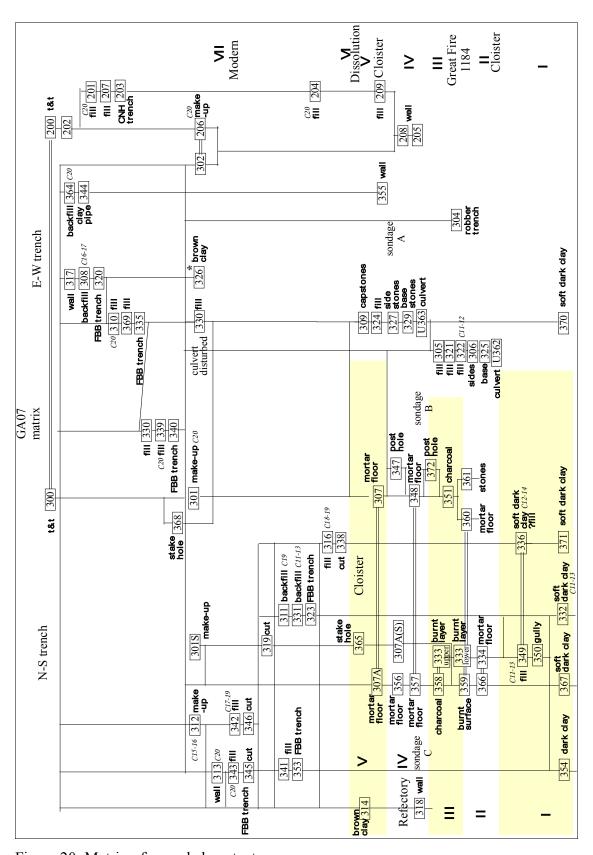


Figure 20. Matrix of recorded contexts

- 10.0 Phasing of the recorded contexts See Figure 20, above
- 10.1 Although the excavation area was relatively small, it has been possible to assign some basic phases and some conjectural, or notional dates, to the archaeological features and deposits recorded in 2007. There are caveats to this exercise in that only a small area was examined, and that area has been subjected to considerable disturbance:
- **10.1.1** during various rebuilding phases through the medieval period; destruction episodes, and removal of the fabric, during the 16th, 17th and 18th centuries.
- **10.1.2** due to a series of recorded, and probably unrecorded, archaeological excavations and investigations during the first half of the 20th century, principally by F. Bligh Bond;
- **10.1.3** and through 20th century landscaping works, involving drastic reduction of the ground surface requiring the removal of a considerable depth of overburden and rubble deposits.

10.2 Explanation of Phases and Notional Dates

- **Phase 0** No natural, undisturbed geological deposits (of Lias clay) were recorded.
- **Phase 1** pre-1126AD The earliest phase is no later than ca.1126AD; prior to the construction of the first, post-Norman Conquest, Cloister by Henry de Blois, abbot from 1126-1171. Various deposits were noted that preceded the first Cloister but these were not investigated and were left undisturbed.
- **Phase 2** ca.1126AD-1171 Construction of first Cloister by Henry de Blois.
- Phase 3 Fire of 1184 destruction of the monastery, including the Cloister
- **Phase 4** post-1184, rebuilt Cloisters; ?13th century.
- Phase 5 late C14 Cloister rebuilt by Abbot John Chinnock, (Carley, p. xxiv).
- **Phase 6** post-1539 Dissolution of the Monastery. Post-medieval destruction.
- **Phase 7** 20th century 1st half Excavations and investigations by FBB and others, followed by landscaping of the ground entailing removal of rubble and soil (see photograph 37, below).

10.3 Phase 1 Contexts and Finds

10.3.1 One important result of the 2007, Phase 2 works was the recognition of undisturbed deposits below the bases of the FBB trenches. These were not investigated by FBB who was probably more interested in the structural remains but they do demonstrate, as their finds testify, that pre-12th century deposits and features survive below the level of these early-20th century disturbances.

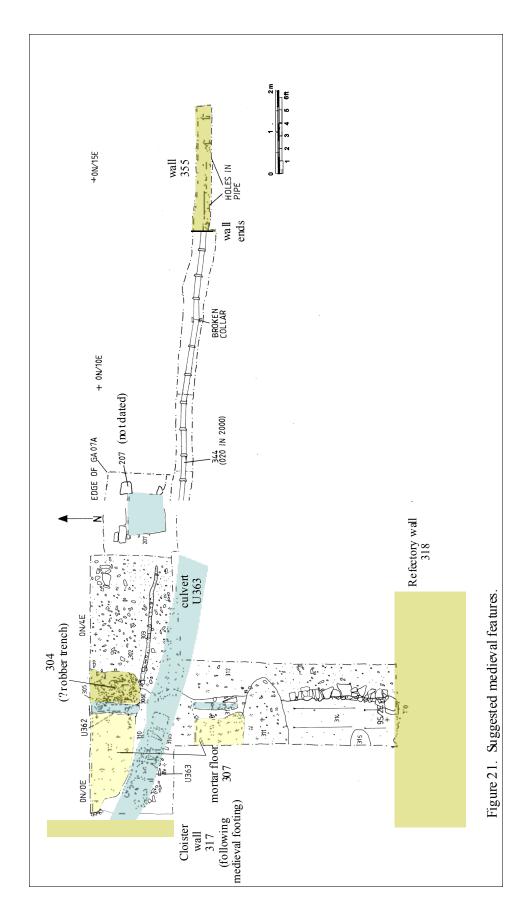
The brown clays and silty clays underlying the mortar floors, and exposed at the bases of the FBB trenches were not excavated in 2007, but they were described and a few finds were recovered from their surfaces.

Context No.	Type	Description of Context	Interpretation
332	Deposit	Very soft, homogenous, dark brown silty clay. Contained small lenses of yellow stone dust, frequent small Lias chips (up to c.4cm), common charcoal flecks, occasional pottery, bone. Unexcavated - full depth unknown.	?Possibly a cultivated soil / occupation layer/soil or, less likely, ditch silts. 322 is truncated by the base of FBB trench cut 323 . Same as ? 352 / 354 , 367 .
352 and 354	Deposit	Moderately compact, mixed, mid brown & dark grey sandy clay. Contained small gravels. Unexcavated - seen in the N facing section of cut 323 and at the base of 323	?Either a cultivated soil, or ditch silts. 354 is the same as 352 - as recorded in the N facing section 323 . Relationship with 332 unclear, but it is most likely that 352 is the same deposit as 332 or contemporary. Same as ? 332 & 352 .
367	Deposit	Very soft, dark brown silty clay. Contained small lenses of yellow stone dust, frequent small Lias chips (up to c.4cm), common charcoal, small lime flecks. Unexcavated - 367 only refers to the S facing section cut 323.	?Probably either a cultivated soil or, less likely, ditch silts. 367 is sealed by the lowest layer of mortar floor 366 . Same as 332 in the N facing section cut 323 . Pre-early C12. Same as 332 , ?352 / 354
370	Deposit	Compact, yellow - brown sandy clay with moderate amounts of small angular stones. >23cm thick (as seen in the sides of Sondage A) Unexcavated.	?Made up ground - ?possibly due to building operations. Similar or same as ?314, ?326, ?330.
371	Deposit	Very soft, dark brown silty clay with occasional small Lias chips (up to c.4cm), charcoal common, and small lime flecks. Unexcavated immediately to the E & W sides of 336 depth unknown.	?Cultivated soil & / or ditch silts. ?Appears to be the same layer as 367 (?332, ?352, ?354). Unexcavated deposit Forms part of the base of cut 338 - underlying backfill 316. 371 is in a disturbed area & difficult to interpret without excavation?

Table 16. Phase 1 Mixed clay or silty-clay context descriptions.

context		pottery				ng materials	misc
	qty	fabric & weight	surface	date	qty	type	
332 Тор	1	rim, coarseware, grey, limestone & quartz temper. 5g	1 x brown surface	10-12th			
East Half	1	coarseware, black, fine limestone & quartz temper. 3g		11-13th			1 x bone frag
332	1	base; coarseware, reduced, limestone & small quartz temper. 10g	partly oxidised surfaces	10-11th			

Table 17. Phase 1 finds.



11.0 Discussion

A number of important points can be made from the results arising out of the 2007 archaeological works within the SE corner of the Cloisters:

- 11.1 Surviving archaeological features and deposits lie directly below the turf and topsoil. This fact has been noted before, especially during the archaeological watching brief on the excavation of the electric cable trenches in 2000, when, at a number of locations within the precinct, the archaeological horizon was seen to lie directly below the topsoil.
- 11.2 One reason for this, probably the main reason, is that extensive landscaping operations took place during the first half of the 20th century, when the grounds were laid out for public display and the outlines of the monastic buildings were marked on the surface by concrete setts, resulting in the removal of large quantities, and a great depth, of the surface clay and rubble deposits that extended over much of the precinct. Photograph 37, above, shows the ground level in 1911 during FBB's work in the Refectory Undercroft and Photograph 36 shows the contemporary ground levels at the same spot.
- 11.3 A number of 20th century excavation trenches were recognised during the 2007 works, most, possibly all, resulting from the investigations of Frederick Bligh Bond between about 1910 and 1912. Within the 2007 excavation area, these trenches were shallow, only up to 20cms-30cms deep below the topsoil. Their original depth, however, must have been much greater as they would have had to be cut down through the overlying rubble and clay deposits that have now been removed. FBB's trenches were approximately 1 metre or 1 yard wide and appear not to have unduly disturbed pre-12th century deposits, at least in the areas examined in 2007.

It is assumed that FBB's interest lay principally in defining the outlines of the monastic buildings and structures in this area, possibly his brief from the Abbey Trustees, and he seems not to have been interested in, or did not recognise the potential of, deposits earlier than the medieval period.

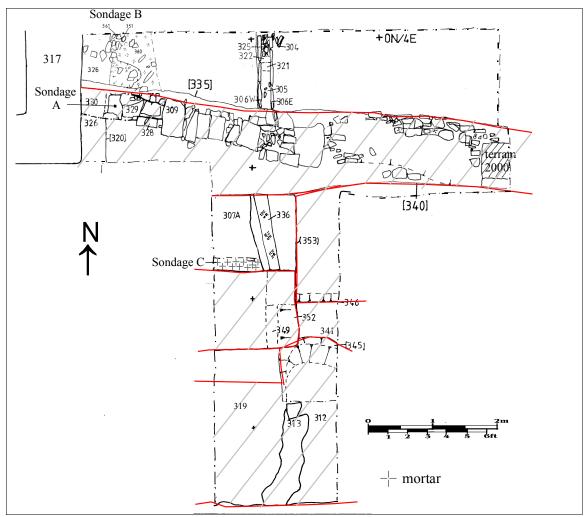


Figure 22. Final phase of excavation with FBB's trenches hached and outlined in red.



Photograph 37. View of final phase of excavation looking N.



Photograph 38. Final phase of excavation looking S.

- 11.4 The backfill of FBB's trenches contained numerous sherds of medieval, coarseware pottery. It is likely that FBB did not recognise their importance, and did not know how to date this material. No glazed, medieval pottery was recovered in 2007; possibly these more notable or more recognisable sherds were collected instead.
- 11.5 As a result of FBB's working methods, undisturbed, pre-12th century deposits exist within the 2007 investigation trenches. This general area, containing the sites of the Cloisters, Dormitory, Refectory and Chapter House, has been frequently examined and disturbed, both by FBB and others, including C. R. Radford, in the mid-20th century, and the potential for the survival of pre-medieval deposits, both in this locality and elsewhere in the precinct, must be very high.
- 11.6 The size of the 2007 excavation area is probably the absolute minimum size required to obtain any meaningful results from archaeological works. The initial investigations in 2000, at the western end of the ceramic drain pipe, was too small to allow any confidence in interpretation of features uncovered; similarly for the 1st phase of archaeological works in 2007.

Even for this larger area containing the Phase 2 works, it is still not possible to be confident of the phasing and dating of deposits, but enough stratigraphy was seen and recorded to be able to offer tentative conclusions.

Except for emergency measures, of which the 2000 archaeological works might be an example, it would be best, and more sensible, in any future archaeological projects, to avoid trench excavations and concentrate on larger, open area investigations.

11.7 Unresolved Problems

11.7.1 Culverts and water

The drainpipe inserted in 2007 connects with, and follows the line of, the earlier 20th century drainpipe. That in turn probably followed the line of the culvert – context U363 – that had been recorded by FBB – of which only the fragment seen in 2007, and recorded by FBB in 1910-11, survives.

Water still flows through this pipe. It was described by Bill Wedlake as a watercourse, and the flow noted in 2007 at times confirmed that classification.

The source of the water is not known; and it is not certain whether it lies within the precinct, as seems probable, or beyond the abbey boundaries. It might be helpful, bearing in mind that there are many other culverts within the precinct, some recorded, some probably not recorded, if the forthcoming geophysical survey can attempt to trace as many culvert lines within the abbey as is possible.

The main culvert is assumed to be medieval, possibly 13th century or later, and may have been originally built to both collect water from side drains, such as U362 in 2007, and to distribute water into the various buildings within the monastery. The south extension of U362 that was recorded by Bond, but which had been destroyed prior to the 2007 works, might have been routed into the drains at the base of the Refectory Undercroft, for instance.

11.7.2 The Cloister Walls

Within the 2007 archaeological area, and particularly during these Phase 2 works, no trace was found of either the East or the West Cloister walls. Bond's earlier plans – figures 3 and 4 in this report, and particularly figure 4 - do not appear to show them

either, and it is possible that they were robbed during the post-medieval, destruction phases (in which case the walls now marked on the ground might be somewhat speculative). Theoretically, the line of the East wall, probably a substantial foundation, should have passed through the 2007 area but it was either not present or not seen (which seems unlikely) and neither was there any rubble deriving from either stone robbing or from disturbance of foundation trenches.

11.7.3 Destruction of the higher archaeological features

Culvert U363 does not survive to the east of the portion recorded by FBB and seen during the 2007 works. Bond did describe the culvert to the east, however, as a 'stone drain with indications of a wall over'. He must have seen such a feature in the area where it was later replaced by the 20th century, ceramic pipe.

It is possible that this part of the culvert was destroyed during landscaping works post-dating FBB's investigations. Wedlake's plan of waterercourses and drains, drawn during the 1930s, seems to show the ceramic pipe, rather than a stone drain, and it can be inferred that the culvert between the Chapter House and the Dormitory might have been removed between ca.1912 and 1930, probably during the period when extensive landscaping of the grounds was taking place.

The original culvert ran down the slope from the east; and the present ground level, although still rising to the east, does not have a particularly marked slope. It is possible that the original culvert may have been too near to the required, landscaped, surface, or may even have protruded above it, and this is why it might have been removed and replaced by the ceramic pipe.

Because of the lowering of the ground surface at this period, the old ceramic drain, which might have been inserted before, or during the landscaping works when the ground was higher, was only between 0.25m and 0.35m below the turf in some places, as is the new pipe, and it is recommended that the present ground level in the 2007 excavation area should be raised with earth and clay, and then re-seeded, in order to protect the new pipe.

It should be noted that the depth of the clay pipes to the east of the 2007 works is not known, and might be even shallower, and this should also be borne in mind during any construction, landscaping or garden works in this area.

12.0 The New Pipe

The new pipe was laid after completion of the excavation and the removal of the clay pipes. Prior to laying the pipe, the excavation area was covered by plastic sheets and ca. 5cms of soil was laid above the sheets to protect the archaeological deposits and to define the base of the excavated areas.

The pipe was attached to a ceramic pipe at the east end of the pipe trench with a flexible collar and adjustable wire fixings. The pipe was routed towards wall [318] at the south end of the trench. A stone mason, Mr. Bob Sweetman, removed some stones from the wall to enable the pipe to be inserted through so that it would drain into the open drain running along the Undercroft floor. Mr. Sweetman then rebuilt the wall around the pipe.

The pipe was then covered by sand and scalpings/gravel and stone dust, before backfilling with the excavated spoil.



Photograph 39. The new plastic pipe installed. The archaeological layers are protected with plastic sheets and cushioned with sand. The new pipe is bedded on, and covered by, sand and gravel.

13.0 Metal Detecting

A metal detector was used to scan the 20^{th} century deposits in the excavation area. Very few metal objects were recovered, mostly scrap lead. The metal detector objects are shown on the attached Finds List.



Photograph 40. The mortar bedding/floor for the Cloister Walk appeared as two pale yellow patches. An FBB excavation trench -[323] - is being excavated by Arthur Hollinrake, Faith Cairns is drawing Culvert [U363] and Keith Faxon is scanning the surface of [316] / [310] with a metal detector to identify any objects. Looking NW.

14.0 Archive

The finds have been washed, sorted, listed, bagged by context and marked with the Glastonbury Abbey Museum Accession Number: GLSGA:07/9/[context number] for curation at Glastonbury Abbey. The paper archive, consisting of the day book, maps and plans, field plans and inked plans, context sheets and levels sheets, and etc, will also be deposited at the abbey museum. One copy of this report will be deposited at the Somerset Records Office, in Taunton and other copies will be deposited with the Somerset County Council Archaeology Department, and with English Heritage (SW) at Bristol. One copy will be held by Glastonbury Abbey, for the Trustees, and one copy will be held by the Consultant Archaeologist at Glastonbury Abbey, Mr. John Allen.

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