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## **Summary**

*Archenfield Archaeology, in association with the Hereford Cathedral Archaeologist, Ron Shoesmith, was commissioned to undertake the monitoring of groundwork in the courtyard of the Bishop's Palace. The purpose was to increase the car parking capacity by reducing the lawn size and inserting new drainage, tarmac and kerbstones. As the area is of historical importance, it was considered that archaeological deposits could be present even at a shallow depth. The groundwork began on the 17<sup>th</sup> October 2005 and followed the specifications laid out in the plan by the architects, Hook Mason.*

*Work was interrupted by the discovery of a subterranean chamber made of stone and brick and a series of stone culverts. The exact purpose of the chamber is uncertain, it could be an 18<sup>th</sup> or 19<sup>th</sup> century ice house or simply an underground structure associated with drainage.*

## 1.0 Introduction

NGR: SO 351 240

SMR Event number: 43273

Planning authority: Herefordshire Council

The Bishop's Palace is located to the south-west of Hereford Cathedral on the left bank of the River Wye. Groundworks associated with the extension of the car park in the courtyard were carried out during October 2005. Even though it was planned only to disturb the topsoil, monitoring was required due to the area being archaeologically sensitive. Archenfield Archaeology undertook this in association with the Cathedral Archaeologist, Ron Shoesmith. The project architects were Hook Mason and the building contractors were I J Preece and Son.

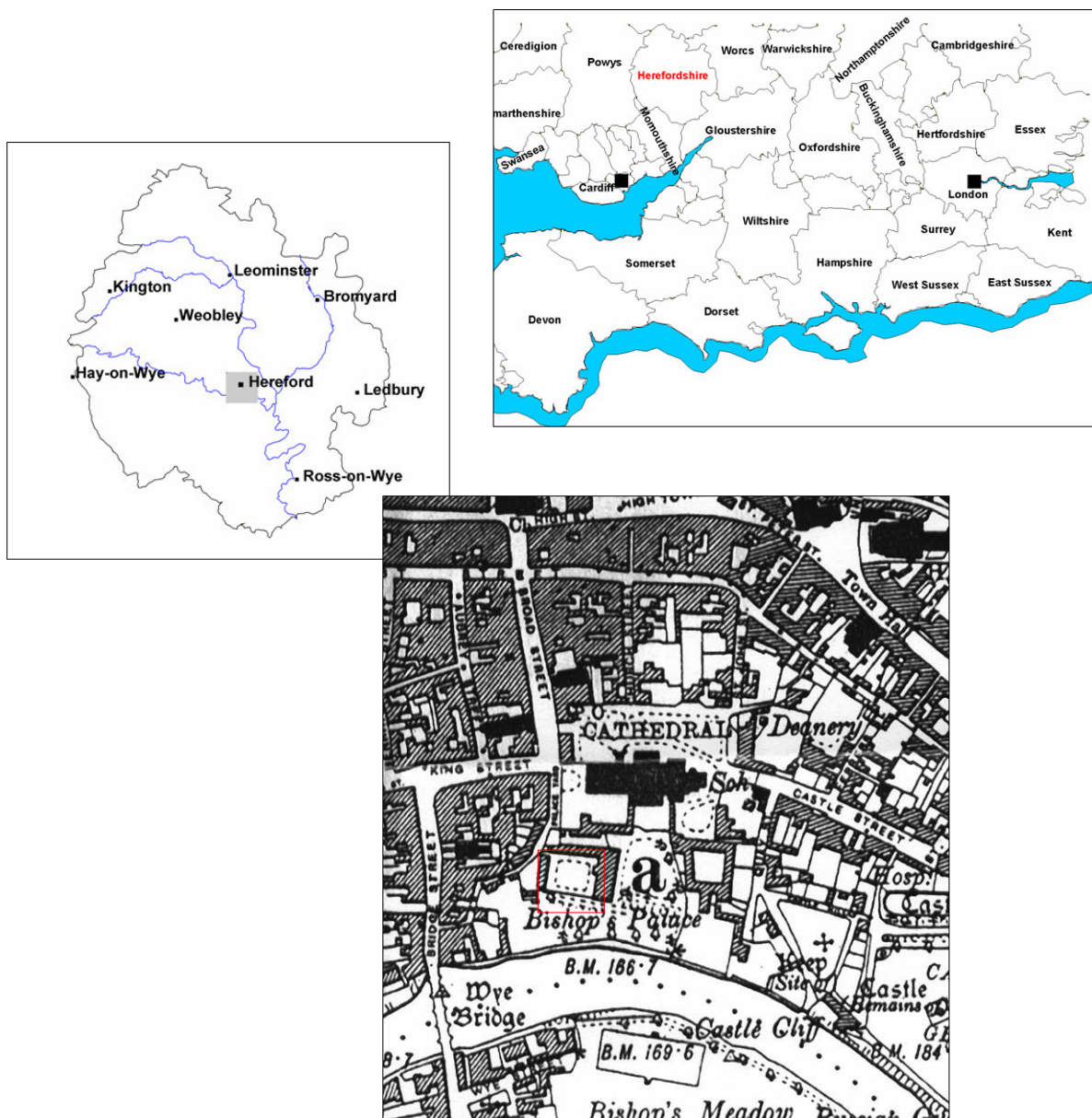


Figure 1: Location of the Bishop's Palace on the 1923 OS map

## **2.0 Geological, historical and archaeological background**

### **2.1 Geological background**

Hereford stands on a fluvioglacial gravel terrace on the left bank of the River Wye. These gravels represent a glacial outwash fan and are present below the whole of the old city. Directly beneath the gravel is the Raglan Mudstone Formation of the Old Red Sandstone (Brandon and Hains, 1981).

### **2.2 Historical background - Ron Shoesmith FSA MIFA**

The Bishop's Palace and grounds stand between the cathedral and the River Wye, the palace and upper gardens being on a gravel terrace whilst the remainder of the garden is at a lower level sloping down to the river and regularly floods. The area under consideration is the garden to the west and in front of the Bishop's Palace. The eastern and southern parts of the garden, from the main palace west and down to the river; the stable block; and the south-western parts of the garden (bounded on the north-west by Gwynne Street and now occupied by tennis courts), are not included in this study.

Various ideas have been put forward about the possibility of a Roman settlement or fort at Hereford, but there is little archaeological evidence. However, traces of Roman material found in trench excavations in Broad Street and in the excavations in advance of the new building to house the Cathedral Library may indicate the presence of buildings associated with a ford across the Wye. However, no firm structural remains have been found (Stone and Appleton-Fox, 1996).

The origins of the Diocese of Hereford are shrouded in history, but the foundation date is usually accepted as being 676AD. Whether the earliest bishops were based at Hereford or at another religious centre is uncertain, but by the early eighth century:

*Hereford was established as the ecclesiastical centre of the Magonsaete, a people who were predominantly Welsh in blood and speech ... [with] their incorporation into Mercia ... the bishopric of Hereford acquired an important role in border politics which endured well into the middle ages.*

(Fenn and Sinclair, 1990)

Although the position of the Anglo-Celtic Bishop's Palace and its pre-Norman successor is unknown, the boundaries and grid pattern of streets of the Saxon burgh have been established by excavation (Shoesmith, 1982) and this provides quite stringent limits on the area that could have been occupied by the ecclesiastical centre. Obviously the river formed the southern boundary, whilst on the west a marshy area and probably a road (the continuation south of the present Broad Street) leading down to a ford across the Wye, would have provided a boundary on that side (Watkins, 1920; Stone and Appleton-Fox, 1996). To the east was the collegiate settlement, later dedicated to St Guthlac, which, together with its burial ground, occupied an area that later became the site for Hereford Castle. The boundary of the precinct to the north is more uncertain, but may well have been the limit set by the postulated west-east road of the Saxon city joining King Street to Castle Street. However, it is possible that it continued to the north of this line to include the reasonably extensive grounds of the properties that stand on the north side of the present Cathedral Close.

The sites of the several pre-Conquest cathedrals are unknown, but are assumed to be underneath, or to the south, of the present building. Referring to the Saxon cathedral, John Duncumb wrote:



*Its position is uncertain, but about 1650 Silas Taylor found, 'beyond the lines of the present building, and particularly towards the east, near the cloisters of the College, such stupendous foundations, such capitals and pedestals, such well-wrought bases for arches, and such rare engravings, and mouldings of friezes' as left little doubt in his mind that they were the foundations of the Cathedral destroyed by Algar and Griffin.*

The position as described could well apply to the eastern side of the chapter house yard (Duncumb, 1804).

Athelstan, who became bishop in 1012 is accredited with totally rebuilding the cathedral. It was then apparently stripped of its relics and burnt by the Welsh in 1055 but, confusingly, when Athelstan died the following year he was 'buried in the church which he rebuilt from the foundations'.

Shortly after the Conquest, William FitzOsbern, Earl of Hereford, had laid out a vast new market place for his French settlers to the north of the defensive line of the Saxon city (Shoesmith, 1992). Once the Normans had established themselves in Hereford they made a start on a completely new cathedral. Although plans may have been made earlier the evidence suggests that it was laid out during the time of Bishop Reynhelm (1107-15) and that work continued throughout the first half of the twelfth century. There have been many alterations and additions – more recently, the west tower fell in 1796 and the present west face was rebuilt half-a-bay to the east of the original.

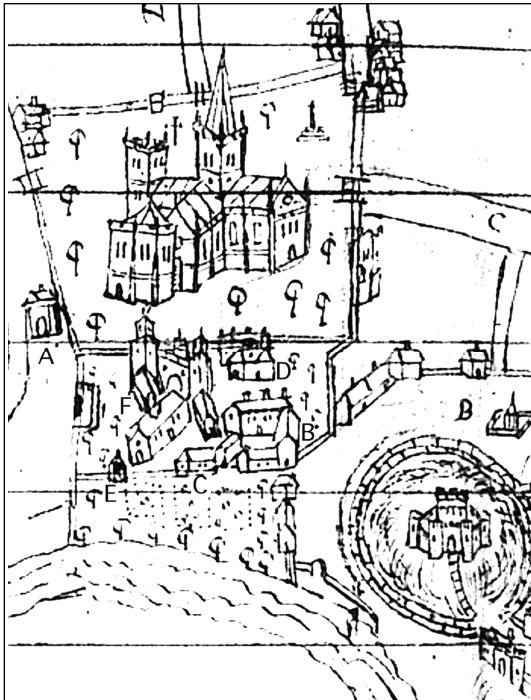
However, Robert Losinga, who hailed from Lorraine, was bishop from 1079 to 1095 and he was responsible for building a handsome two-storied double chapel based on the design of Charlemagne's building at Aachen. This building, apart from its north wall which is incorporated into the south wall of the south range of the Bishop's Cloister, was demolished in 1737 by Bishop Edgerton.

The position of the pre-Conquest Bishop's Palace is not known, but there is no reason to suppose that it was anywhere else except within the grounds of the present palace. Hereford was never a monastic foundation, so did not have cloistral ranges attached to the cathedral proper. Instead there were a series of canonical houses, each with their own grounds, surrounding the cathedral. Such an arrangement would have limited the extent of the grounds of the Bishop's Palace, especially as it is known that the present quadrangular College of the Vicars' Choral occupied the site of two of the canonical houses (Shoesmith, 2000, 293-310).

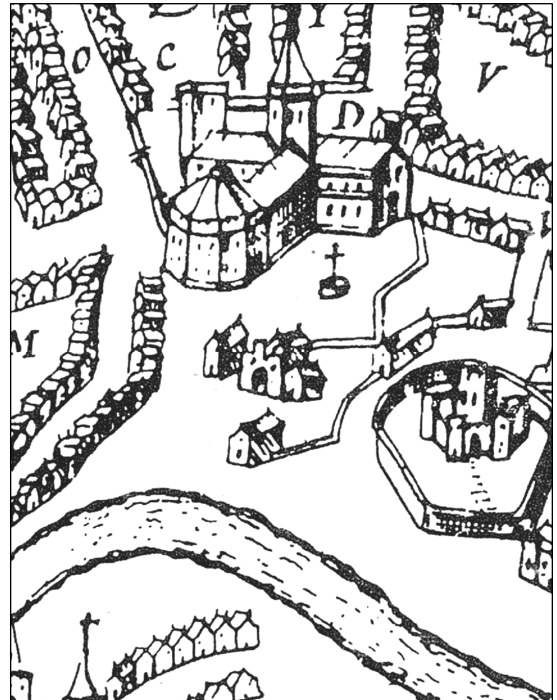
The present Bishop's Palace was probably built by Bishop William de Vere (1186-98) as a large timber hall, complete with a clerestorey, of which three bays of the arcades survive in a fragmentary state. The original building was of four bays with side aisles with a three-storey chamber block at its southern end; it was about 110 ft long and 55 ft wide. Without much doubt, it was deliberately built as a timber version that followed the design of contemporary stone-built halls. It was Bishop Bisse (1713-21) who reconstructed the palace, inserting a new, smaller cross-hall in one bay of the medieval building with services to the north and living rooms to the south. The exterior of this new building was clad in brick and stone. A recent writer commented that 'Philip Bisse left the bishops who succeeded him a palace the elegance of which was only equalled by its inconvenience', the first floors being in two distinct sections totally separated by the new great hall (Fenn and Sinclair, 1990). It was Bishop Thomas Musgrave (1837-47) who gave the palace its predominantly Victorian appearance, employing as architect Philip Hardwick. The work included the replacement of the northern bay with the present north wing; the replacement of the Romanesque porch with the present one; restyling the east elevation and, in the western part of the grounds, building the stable block. Later alterations have been mainly internal, with little change to the general aspect of the

building (Blair, 1987). The range of buildings that joins the Bishop's Palace to the entrance gateway are of 16<sup>th</sup> century date as is the gateway itself.

There has been little archaeological work in the area of the bishop's front garden and the main available sources for the previous use of the site are early maps. The earliest printed map of Hereford is the well-known one by John Speed, published in 1611. It includes a rather oversize cathedral, complete with its chapter house and an odd-looking collection of smaller buildings between there and the river, which are meant to represent the Bishop's Palace and the College of the Vicars' Choral. It is difficult to make any logical interpretation of the buildings as depicted on this map.



**Figure 2: Detail of Speed's 1606 sketch of the City of Hereford**



**Figure 3: Detail of Speed's 1611 map of the City of Hereford**

The problem has been partially resolved by the recent discovery of the original survey of Hereford made by Speed himself in 1606 (Figure 2). This is better scaled and includes far more buildings and features than it was possible to include on the printed version (Figure 3). The following notes should be seen as a very preliminary view.

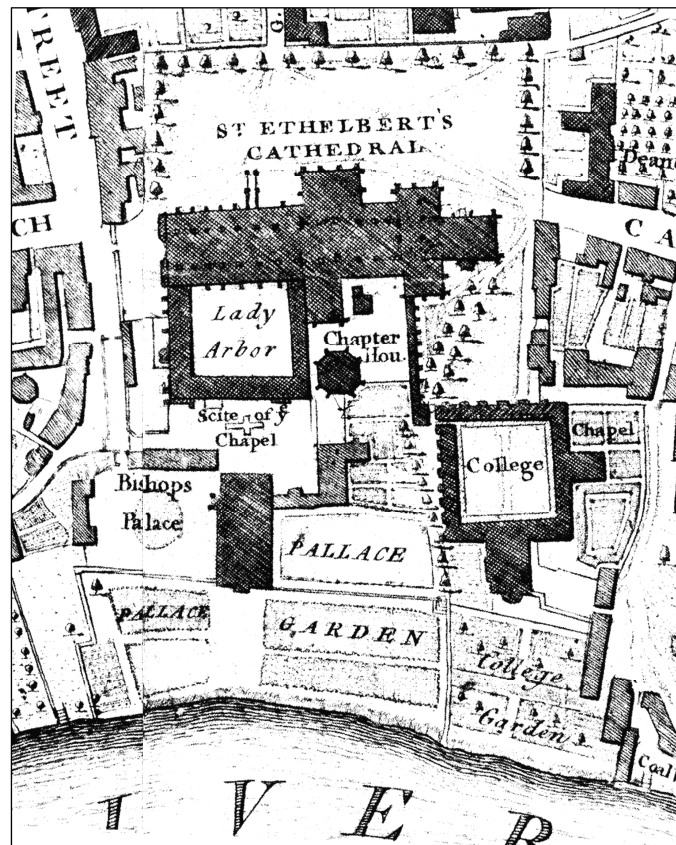
It is suggested that the various blocks of buildings were drawn in isolation with little or no attempt being made to relate one block to another. This is well shown by the cathedral and chapter house, which appear to have been drawn as a single block surrounded by walls, viewed from the south-east, with little or no consideration of their relationship to any other buildings. The initial impression is that a square, representing the cathedral precinct walls, was first drawn and a representation of the cathedral complex was then placed centrally within that space.

To the south of this rectangle is a second block, also more or less surrounded by walls, which appears to include both the Bishop's Palace complex and the College of the Vicars' Choral within its boundary. This brings into question the position of the wall separating the cathedral grounds from the palace/college complex. If this wall was drawn as an

initial part of the survey and before the buildings to the south and east were inserted, then it would be surprising if it bore any strict relationship to the buildings on each side.

It is not the purpose of this document to go into a detailed analysis of this map or to compare it with the later maps of Taylor and Curley. It is suggested that the long building could be the present Bishop's Palace and that the building with the large arched entry could be the Losinga Chapel. The remainder could reflect the buildings that presently stand between the palace and the gatehouse.

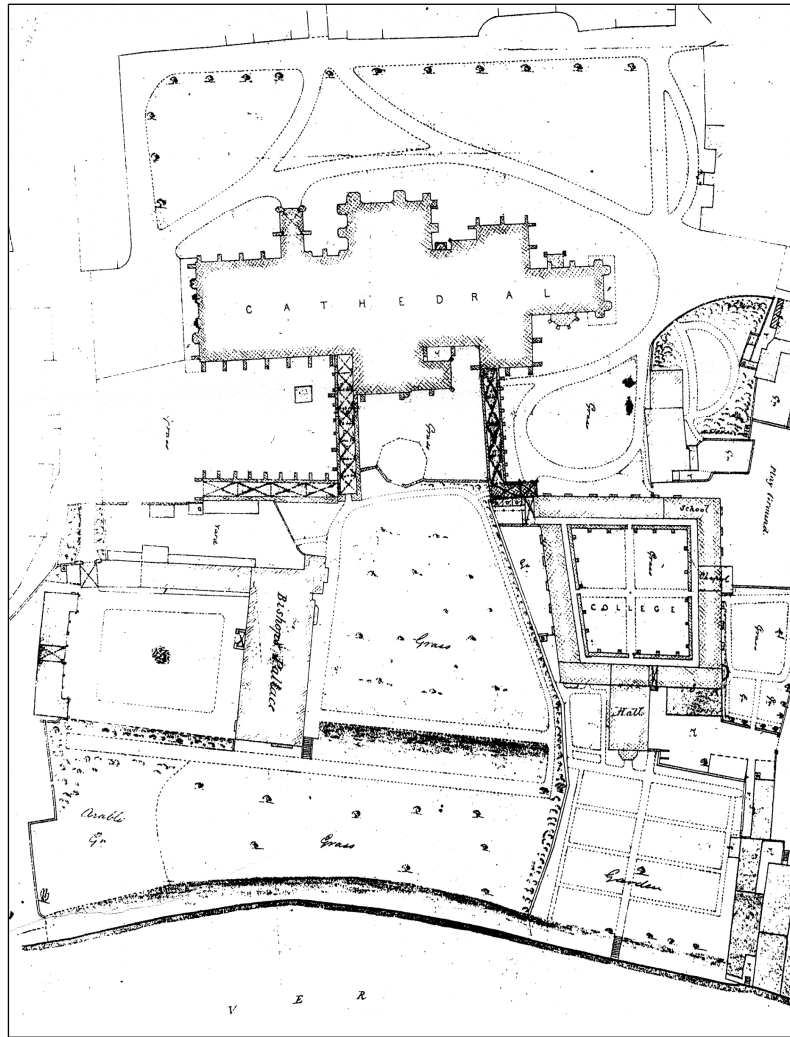
The fine map produced by Isaac Taylor in 1757 (Figure 4) shows a wealth of detail throughout the area of the cathedral and Bishop's Palace. It is in full plan form and is a useful base from which to try to interpret Speed's hand-drawn map.



**Figure 4: The Cathedral and Bishop's Palace on Isaac Taylor's 1757 map of Hereford**

The cathedral is shown before the collapse of the west face in 1786 and the Bishop's Cloister, here shown with its alternative name 'Lady Arbour', is complete on three sides (the western range was demolished later in the eighteenth century).

From Broad Street, Gwynne Street leads down towards the gatehouse leading into the Bishop's Palace grounds, but there appears to be an outer gate and passage continuing half-way up what is now Palace Yard, the northern end of Gwynne Street. This is much longer than the present outer passageway. The front garden area looks very much as it is today with a stable block to the west (originally the position of the bishop's prison) a circular area in the centre, and a row of buildings to the north. The main palace building is shown in outline, as it had been altered by Bishop Bisse, but the alterations by Bishop Musgrave aided by his architect Philip Hardwick, which joined the two ranges together, were still well in the future.

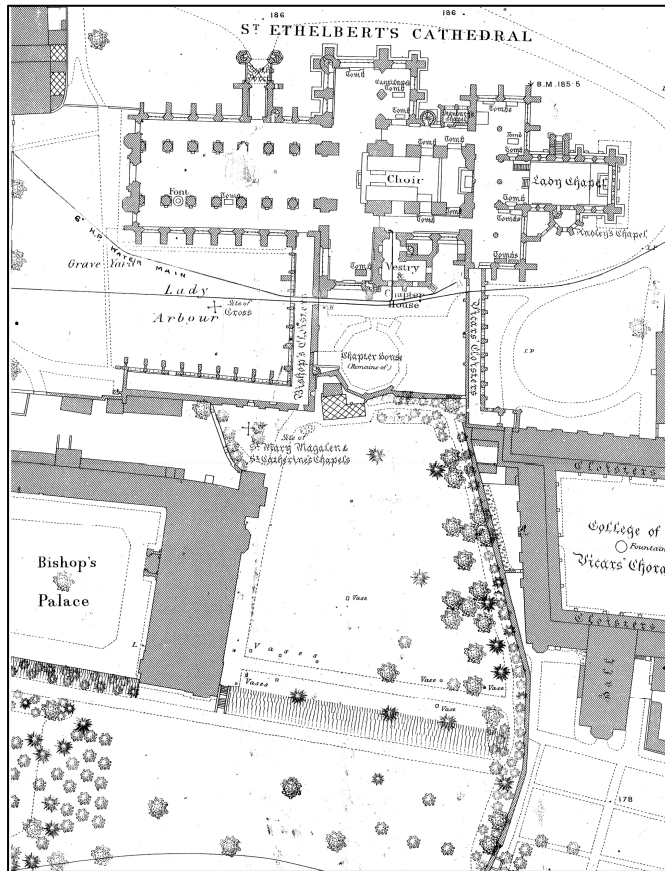


**Figure 5: The cathedral and Bishop's Palace on the draft of Thomas Curley's 1858 map of Hereford**

Thomas Curley produced a large-scale plan of Hereford to aid the installation of a sewerage system throughout the city (Figure 5). The central part of the plan is displayed in the rear passage of the Town Hall. The section including the cathedral and Bishop's Palace shows the many changes that had taken place in the 100 years since Taylor produced his map. The cathedral had lost its west tower and the new west face was set back from the original. Gone also were the western range of the Bishop's Cloister and the relatively short-lived music room that replaced it – erected in 1760 and demolished in 1835. Musgrave's alterations had been carried out to the Great Hall, which is shown contiguous with the north range.

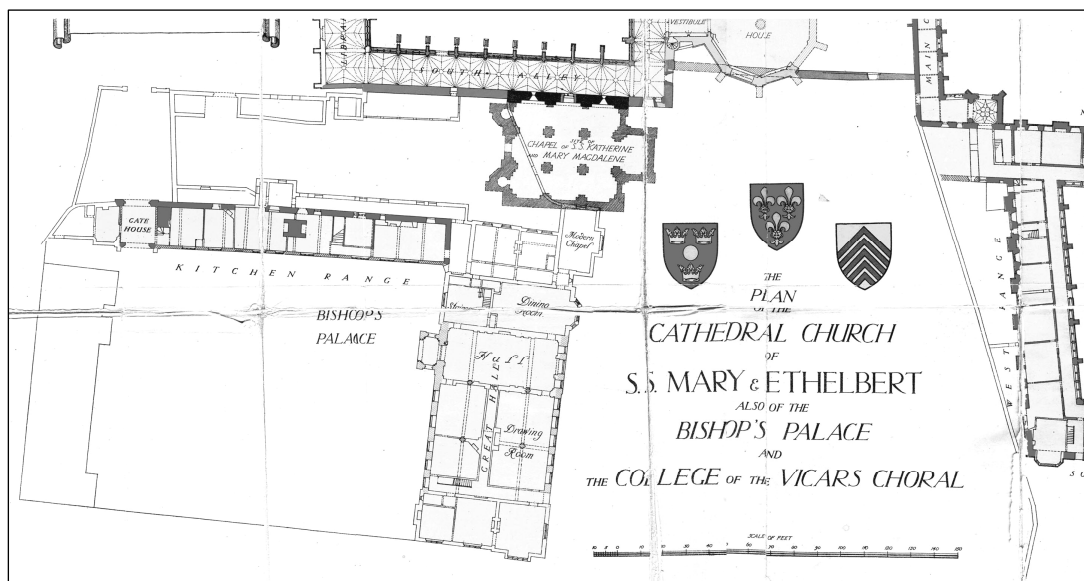
The multi-sheet set of plans of the whole of the city at this large scale produced by the Ordnance Survey in the 1880s provide a wealth of detail of individual plots, buildings, trees and even small features such as vases within the palace gardens (Figure 6). It confirms the features shown on Curley's plan with additional smaller points of detail. Basically it shows the gardens and their surrounding buildings much as they are today.

As a result later Ordnance Survey plans have not been consulted for the purposes of this report.



**Figure 6: The 1888 OS plan of Hereford Cathedral and the Bishop's Palace**

The Royal Commission plan in the rear pocket of its first Herefordshire volume (RCHM, 1931), is included because it shows the relationship and alignments of the various buildings in the Palace complex (Figure 7).



**Figure 7: The 1931 plan by the Royal Commission on Historic Monuments**

### **2.3 Archaeological background - Ron Shoesmith FSA MIFA**

Excavations took place in 1987 in advance of new housing on the western side of Palace Yard. The most notable feature was the total absence of Saxon levels and near absence of medieval deposits. Later buildings were terraced into the sloping ground and it must be accepted that all earlier levels were totally stripped from the site during these works. It follows that the ground level in this area during the Saxon and medieval periods must have been much higher than it is at present (Thomas and Boucher, 2002, 22-3).

In 1985 a new services trench was excavated from Palace Yard through the gatehouse, along the west and south sides of the western garden area to the southern end of the palace. As with the Palace Yard excavation, natural gravel was found in the area outside the gatehouse at 2ft 4ins, once again indicating a systematic lowering of the ground level in this area. The southern trench exposed demolition rubble, possibly associated with the wall shown on the Speed and Taylor maps. A layer of tufa blocks, found close to the palace, may have come from the Losinga Chapel (HAS 3, 1986).

Further trenches dug for services in the western garden area in 2004 did not expose any significant archaeological layers.

Within the palace grounds there may be features associated with much earlier periods in the history and pre-history of Hereford. Such considerations, and the proximity of the area to buildings of great historical importance put the whole site within the category of national archaeological importance.

PPG 16 (Archaeology and Planning) section 8 states that:

*Where nationally important archaeological remains, whether scheduled or not, and their settings, are affected by proposed development there should be a presumption in favour of their physical preservation.*

Buried archaeological remains are irreplaceable. They are a finite and non-renewable resource, in many cases highly fragile and vulnerable to damage and destruction. Archaeological remains, if left buried, suffer little change and is accepted as the best method of preservation. Archaeological excavation techniques, although they have greatly improved during the second half of the 20<sup>th</sup> century, are still essentially destructive and increasingly expensive. It is not just the buried buildings that have to be considered, archaeological sites contain irreplaceable information about our past and the people who lived in those historic and prehistoric periods.

### **3.0 Project aims and objectives**

The general aims of the project were: -

- to monitor all groundwork undertaken by the contractor
- to make a record of the extent and depth of the groundwork
- to record the presence of archaeological material within the trenches and in the spoil removed during excavation, and to retrieve any potential dating evidence
- to make a record of all finds and any environmental material recovered
- to ensure that if any environmental evidence was preserved, that a sufficient sample be retained to allow for further analysis
- to ensure that the location of the area excavated was accurately recorded on a suitably scaled plan
- to record negative evidence and to consider its implications

Site specific aims and objectives were:-

- to make a record of any archaeological features exposed during groundworks at the Bishop's Palace

The objectives of monitoring were:-

- to allow, within the resources available, the preservation by record of potential archaeological deposits
- to provide an opportunity for the monitoring archaeologist to observe the archaeological resource before the destruction of any deposits

## **4.0 Methodology**

### **4.1 *Field methodology***

The following methodology was employed:-

- a suitably qualified archaeologist monitored all activity that involved disturbance of the ground surface
- an assessment of the archaeological significance of finds, structures and deposits was made and appropriate action taken
- structures and stratigraphic sequences observed were recorded on scaled drawings. The position of all work disturbing the ground and any archaeological features was shown on the drawings.
- artefacts were recorded with a description of their type, quantity and original location. The spoil was scanned for significant finds.
- all descriptions of structures and deposits, photographic records and drawing numbers were recorded on the relevant data capture documents in accordance with Archenfield Archaeology's standard site recording procedures
- significant features were, where possible, photographed next to an appropriate scale rule, and a board displaying a unique context number. Each photographic exposure was recorded in the photographic log.
- staff carrying out the monitoring of the groundwork followed the guidelines laid down in the Archenfield Archaeology Health and Safety Policy
- Archenfield Archaeology conforms to the Institute of Field Archaeologists' Code of Conduct and Code of Approved Practice for the Regulation of Contractual Arrangements in Field Archaeology. All projects are, where applicable, carried out in accordance with IFA Standards and Guidance or Draft Standards and Guidance.

### **4.2 *Processing methodology***

The following processing methodology was employed:-

- all artefacts form part of the project archive
- all data was entered into a Microsoft Access relational database



## 5.0 The results

### 5.1 *The stratigraphy*



Turf and topsoil (1) overlay the excavated area. Beneath this was layer 2, a mixed deposit of variable depth that spread across the whole site containing medieval and post-medieval material. This layer was cut by several post-medieval features, the earliest being cuts 7 and 21 which contained stone culverts 8 and 22. These were revealed in the trench both to the north and south of the lawn and are probably lengths of the same culvert (Figure 2). The walls of this culvert were of stone and mortar and stone slabs formed the base and cap. It was probably used to drain rain water from the north range of the courtyard down towards the river bank. A few broken bottles were retrieved from the backfill (9) of the northern section which appear to be 18<sup>th</sup> century in date. Another culvert (14) was revealed to the west of the lawn and orientated north-east/south-west. An insufficient amount of this feature was revealed to determine if (or how) it related to the other culvert.

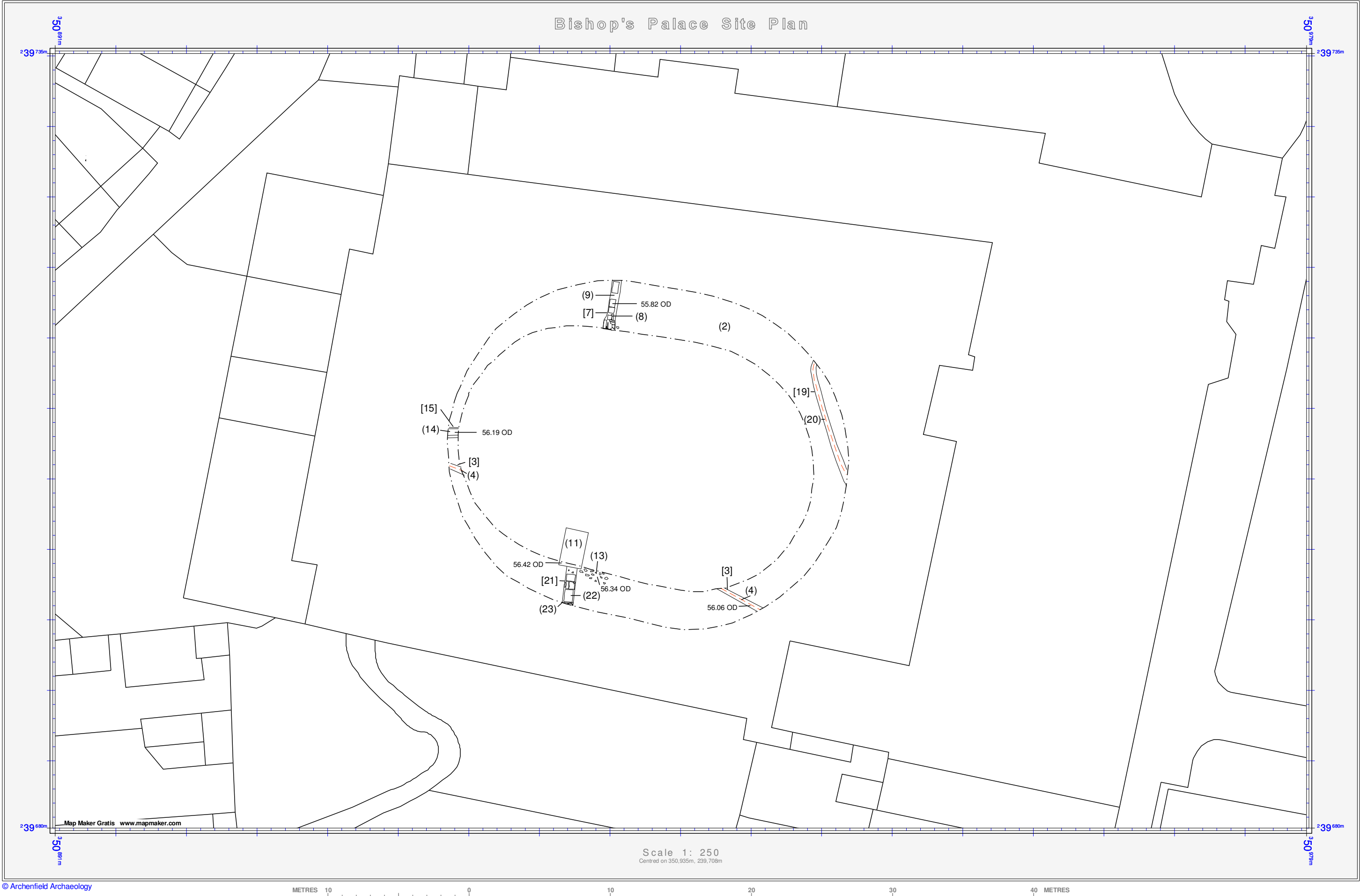
**Plate 1: (Above) Stone Culvert 8, looking west**

**Plate 2: (Right) The discovery of chamber 11**



**Plate 3: The opening of chamber 11**









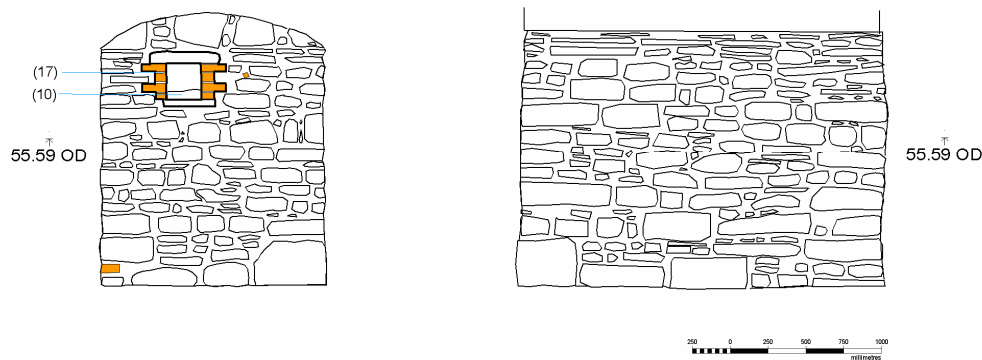
**Plate 4: The south-east corner of chamber 11**

The north-south culvert was divided by cut 12, which contained a subterranean chamber (11, see Plate 4) made of stone and brick. The walls were dry stone, and its internal measurements were 2.40 metres north-south and 1.60 metres east-west. The walls were roughly 250mm thick and 1.60 metres tall, and the stones were of varying size and shape, a few showing obvious signs of re-use. Several stones had evidence of mortar, of which a 351g sample was taken. The top courses of the walls were slabs forming a sill for an arched brick roof. The bricks did not have frogs, indicating that the construction was pre-1850. They had been laid with a stretcher bond on a north-south orientation. The roof was one course thick, ten bricks long, and twenty wide. The central north-south row was laid as headers. The bricks were cut and arranged to form a circular access hole at the centre, measuring roughly 600mm across. It had been blocked with concrete slabs at some time in the 20<sup>th</sup> century.



**Plate 5: (Above) The circular access hole in the brick roof**

**Plate 6: (Left) The east-facing wall, showing a block of tufa**



**Figure 9: The south-facing (left) and west-facing (right) walls of chamber 11. The bricks and brick fragments are indicated in orange.**



**Plate 7: The south-facing wall of chamber 11, showing culvert 17**

The north-facing wall showed no indication of culvert 22 which abutted its exterior side. The culvert protruding through the south-facing wall had been realigned to enter at a right angle with brick and mortar of the same type as that used in the arched roof. This brick and stone realigned culvert (17) was partially filled with a loose clay deposit (10).

Rubble scatter 13 was revealed on a level horizon with the top of chamber 11 and adjoined it to the east and south. It was probably associated with the construction and subsequent burial of the chamber.





Layer 2 was cut by a further three features. The earliest was cut 6, which was filled with a metallised surface (5). It was revealed only in section approximately 100mm below the present surface and with a width of roughly 4 metres. It occurred in front of the main porch of the Bishop's Palace and it seems likely that it was a path that led to the entrance, although no datable evidence was recovered from the feature. The other two features were modern. Cut 3 was filled by a redundant lead water pipe (4), and cut 19 contained a service cable.

**Plate 8: The possible metallised surface (the pale band beneath the middle tag), visible in front of the main entrance to the Bishop's Palace**



**Plate 9: The possible metallised surface**

## 5.2 The finds

## 5.3 The pottery

Context	Pottery type (if known)	Weight
2	8 medieval: 5 green glazed (1 rim, 1 base, 1 pitcher handle), 3 unglazed (1 rim, 1 cup handle, 1 piece of black cooking vessel). 16 post-medieval: 14 glazed (2 rims, 1 base), 2 unglazed (1 rim).	490g
9	1 post-medieval: glazed rim.	10g
10	1 post-medieval: glazed rim with blue decoration.	9g
<b>Total</b>	<b>26</b>	<b>509g</b>

**Table 1: Quantification of pottery recovered from the Bishops Palace**

The medieval pitcher handle (Plate 9) was 130mm long, with a groove that was 3mm wide and 50mm long on the convex side, and was fabric A7b. The piece of medieval cup handle was 30mm long.



**Plate 10: The A7b pitcher handle from layer 2**

## 5.4 Other finds

The total weight of bone retained was 2803g, including several pieces of animal jaw and teeth and one broken pig tusk 105mm long. However, most of the bone was fragmentary, and probably would have little informative potential. All bone was retrieved from the mixed layer (2).

The total weight of glass recovered was 1611g, and included four bottle bases and four necks from backfill 9; these may represent five or six different bottles. Two of the punts are very irregular, and suggest a date of around the 18<sup>th</sup> century.



Ten pieces of tile were recovered, all from layer 2. The total weight was 411g. Nine appear to be medieval, the largest being 105mm long and 80mm wide. Three are green-glazed and a fourth bears evidence of a murky greenish-grey glaze. A sherd with a pinkish-purple colour and a sandy surface is probably post-medieval in date.

A piece of a possible whetstone was recovered from layer 2 which measured 80mm x 40mm x 25mm. Two of its surfaces are thoroughly smoothed, but it is not possible to confirm that this might not have been caused by natural erosion.

Other finds from layer 2 included twelve fragments of clay pipe stem and a c18<sup>th</sup> century pipe bowl. Several pieces of oyster shell, five iron nails and two other iron objects were recovered from this layer, and another iron nail was retrieved from fill 10.

Several examples of re-used carved stone were present. The most ornate piece (Plates 11 and 12), which was dislodged by machining during the initial discovery, is archived with the other finds. It measures roughly 400mm in length, 250mm in height and 110mm in width. It was probably a part of an arch of an attached half column, and has the remains of a Norman style chevron design.



**Plate 11: The re-used Norman masonry. The block is roughly 400mm long.**



**Plate 12: The re-used Norman masonry, showing the chevron design**



**Plate 13:** A stone in the north-facing wall of chamber 11 with a smooth, concave, semi-cylindrical carving. It is still *in situ*.



**Plate 14:** A stone in the west-facing wall of chamber 11, with a sooty deposit. It is about 250mm long, and is still *in situ*.

Two samples of mortar were taken. The first (104g) was taken from the brick roof of chamber 11. The second (351g) was a sample of the mortar that was attached to the re-used stones of the chamber, and further study might confirm the origins of the masonry.

## 6.0 Conclusions

The archaeology encountered was predominantly post-medieval, although a small quantity of medieval pottery was recovered.

The culverts and the underground chamber appear to be 18<sup>th</sup> century in date. The re-used stones within the chamber walls, which included a single block of tufa (Plate 4), possibly originated from the chapel of St Katherine and St Mary Magdalene, which was demolished between 1737 and 1746, and/or the west end of the cathedral which collapsed in 1786. If this is the case then the structure would date from about this time.



The purpose of the chamber is difficult to determine. It intersects a pre-existing north-south culvert, but whether this was deliberate or incidental is not clear. Should it have been deliberate, it may have been designed as a cistern or a soakaway. However, although the bricks used in the realigning of the culvert were bonded with mortar, the walls of the chamber were dry stone and would not have been watertight, ruling out the possibility of the structure being a cistern. But the location in the courtyard of the Bishop's Palace also makes it an unlikely place to position a soakaway, especially given the time, effort and expense of construction when it would have performed no better and perhaps less effectively than the original culvert.

An alternative possibility is that the structure was an ice house – a subterranean chamber popular in the Victorian period for storing winter ice for use in the summer. The beguiling conundrum of the culvert draining into rather than out of the chamber could be explained by the mistake and initiative of the workmen two centuries ago. It seems that those employed to install the ice house inadvertently dug through the culvert, but rather than start again, disconnected and realigned it to enter the new chamber at a right angle. This was done so that any seepage through the roof of the now redundant culvert could drain away with the meltwater of the ice. Perhaps the drain was due for renewal anyway, because when uncovered in 2005 the culvert was no longer functional, indicating that another drain must have come into use.

## **7.0 Archive deposition**

The primary project archive, consisting of the excavated material and any original paper records, will be prepared and stored in accordance with the Institute of Field Archaeologists' guidelines for the preparation and storage of archives.

A copy of the digital archive, stored on CD and consisting of context and artefact data, together with the site plan and selected photographs, will accompany the primary archive.

The client, in consultation with the project manager, will make provision for the deposition of the primary archive with Hereford Museum. On completion of the fieldwork and the processing, collation, recording and analysis of the finds from the excavation all finds will be handed over to the museum staff, along with the project archive. Arrangements will be made with the museum for the transfer of title.

## **8.0 Publication and dissemination proposals**

Paper copies of this report will be lodged with the Archaeological Advisor to Herefordshire Council, Herefordshire Sites and Monuments Record, the National Monuments Record, the Bishop of Hereford, the Cathedral Archaeologist, Hereford City Library and Hereford Cathedral Library. A short note on the project will be prepared for publication in the Transactions of the Woolhope Naturalists' Field Club.

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## Cartographic material

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