

Gloucester Cathedral  
North Transept  
Phase 2  
2007



GLOUCESTER CATHEDRAL NORTH TRANSEPT,

PHASE 2 , NORTH GABLE

ARCHAEOLOGICAL REPORT 2007

*Archaeology reference number* GCAR 2007/A

*Architects reference number* 1900-5095/2

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Cover photograph by Rita Dawe

# GLoucester Cathedral North Transept,

## Phase 2 , North Gable

### Archaeological Report 2007

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#### SUMMARY

*Repairs to the north gable of the north transept of Gloucester Cathedral were carried out in 2006, using modified scaffolding from the previous project for the north-east turret. There was plentiful evidence for the Romanesque building in the form of reused architectural detail; and the gable is formed of a Romanesque blind arcading of unusual type. Graffiti, masons marks (banker marks) and evidence of past repairs were all noted.*

#### INTRODUCTION

Repairs to the north gable and parapets of the north transept were specified by the Cathedral Architect Ian Stainburn and agreed by the Fabric Advisory Committee in March 2007 (application no 112). The application included a scheme for archaeological recording (Heighway 2007b). The project extended work already carried out the previous year on the adjacent north-east turret, after which an archaeological report was prepared (Heighway 2007a).

The plan and turrets of the north transept (Figs 1 and 2) belong to the first phase of construction of the Romanesque church begun in 1089. The top two stages of the turrets were completed in the 12th century. These upper stages originally had string-courses of contrasting green sandstone (Bagshaw 2002, 6; Heighway 2007a, 2).

In the 14th century the north transept was radically altered, as the last part of a major refurbishment of the eastern arm of the church. The walls between the turrets were thinned down and portions of the full thickness retained as buttresses: the walls were raised; large windows were inserted. Parapets were added, and spires added to the turrets. The gable was taken down and rebuilt, on a line further back to the south, making room for a gutter behind a parapet. The new design used a very great deal of Romanesque architectural detail, both as building stone and re-used as architectural detail.

This report makes full use of the record made by the cathedral's Master Mason, Pascal Mychalysin (reproduced below as Appendix 1).

#### REPAIR HISTORY

A survey of the repair history has been done in preparation for phase 1 of this project (Heighway 2007a, p 2-3). The 1855 report of the architects F S Waller and Thomas Fulljames (Heighway 2007c, 212) described the north transept as in poor condition as to parapets buttresses and copings. Waller's report to the Dean and Chapter in 1875 (Cathedral library, MS 54, p 60-62) observes:

I find on carefully examining this window and the Turrets which for part of the North Facade of this Transept that a considerable settlement has taken place and the iron bar which passes through at the springing of the Arch has been torn in two. that several of the stones and mullions of the window have crushed and that the centre mullion has been screwed up with iron bolts. the settlement I think must have taken place soon after the window was erected and I am not apprehensive of any further mischief if proper care be taken in reinstating the work, but feeling as I do the necessity of the greatest caution in dealing with the great national monument I think I shall best be doing my duty towards you by asking to be allowed to consult with Sir G. G. Scott on the subject.

Gilbert Scott was consulted and a subsequent Waller report to the Chapter added:

Sir Gilbert Scott called and inspected the work, and having agreed with me in the course I proposed adopting for the restoration of the window, immediately steps were taken to proceed with the work - a centring was made for the inside and outside of the window, the defective stonework was then removed all the joints were well wedged up with slate and well bedded with mortar, and concrete was run into all the open portions of the work which had been washed out for years past by constant rains. - after all the outer framework of the window was thus made sound the removal of the tracery commenced and this has been effected without any accident or damage though the stones are generally very badly crushed. I am of opinion that not more than one fourth of the stone mullions and tracery can be used again.

Considerable progress has been made with the other portions of the North front of the Transept. The whole of the Gable above the parapets and the parapets themselves are finished, such new stonework as was absolutely indispensable has been provided and all the joints have been most carefully pointed. The outer Arch and the jamb of the window are finished and as much of the Turrets also as can be reached from the scaffolding erected for the window. (MS 54, p 64-6)

In 1877 Waller reported to the Dean and Chapter the rather alarming news that the north-west turret of the north transept had settled since the window had been restored: 'cracks have shown themselves in several places'. Waller stopped up the cracks and noted:

the turrets have been tied together with iron ties placed over the window, since which no further settlement has been observed (Cathedral Library MS 54, p 79).

This is presumably the iron tie whose bracing-plate can be seen at parapet level on the west face of the north-west turret and is also visible inside the roof space. It was replaced with steel in 1995 (GCAR 95/D; cathedral architect's number 6205).

Also in 1995 some stone replacement of details on the north-west turret was done in Lépine stone (drawings showing replaced stone are filed with the present project GCAR 2007/A).

## PETROLOGY

A preliminary survey of petrology and historic detail was carried out by master mason Pascal Mychalysin (Fig 3; Figs 6-7 and Appendix 1 below). Stone types used at Gloucester cathedral are described elsewhere (Bagshaw Heighway and Price 2006). Though Victorian repairs generally tended to be in Bath stone, on the north transept gable, parapet, and north window, the area concerned here, no Bath stone was used, and cathedral architect F S Waller was presumably by this time (the 1870s) using 'Painswick' stone and Minchinhampton weatherstone from Plantation or Catsbrain quarries (GCAR 06/F; Heighway 2007a, 2-3).

The 'pea-grit' stone may be re-used Roman; the stone was used for the Roman city wall a length of which passed under the abbey (Bagshaw et al 2004, 104).

## THE GABLE

The gable was rebuilt of Romanesque materials in the 14th century: Pascal Mychalysin analyses this in detail (Fig 3 and Appendix 1). Three different types of coping were used, some recycled from the previous structure and others towards the apex being made to a different, 14th-century design; the 14th-century masons also added massive 'kneeler' stones with integral coping to tie the whole structure together. Apart from the evidence of reused Romanesque stone, the gable also shows several examples of quarry marks: the wedge marks (Fig 4) where the stone was split in the quarry. In the 19th century this was done with both wedges and 'scales' (Price 2007, 143); medieval quarrymen probably used wedges only. These may have been metal (according to Salzman metal wedges were in use by the 13th century; Salzman 1992).

## THE GREAT NORTH WINDOW

This shows extensive Victorian repair (Figs 6 and 7), and judging by Waller's description of the works done in 1875 (above) it is surprising that there is any medieval stone of the tracery surviving at all.

At the base of the window on one of the Victorian mullions are some charming graffiti (Fig 8).

In the well of the window (the space between the window and the library wall) can be seen the stubs of the parapet in front of the window which was chopped out when the library was built (Figs 9 and 10).

## IRON TIES

The medieval builders seem to have made full use of iron to strengthen their new windows. Originally there was an iron tie across the north window through the stone at the springing level of the window, though this had broken early in its history (see Waller's report, under 'Repair History' above). A new iron tie was put through the roof space at parapet level in 1995. There was also an iron tie bar near the base of the window, which Waller does not mention and which is of unknown date; this has been replaced in bronze probably also in 1995 (Fig 7).

## REUSE OF ROMANESQUE ARCHITECTURAL DETAIL

The gable is decorated with blind arcading carrying an unusual decoration for which we have been unable to find parallels; the masons call it 'T-moulding' (Figs 5, 11-14). This is undoubtedly Romanesque, but was reset in the 14th century (the gable rests on the inside face of the north wall rather than on the outside face). The gable was rebuilt using the former decorative detail, but the fact that some of the voussoirs of the blind arches do not quite fit makes it clear that the 14th-century builders had stored the stone imprecisely, perhaps by type of moulding (jamb voussoirs etc) and had some difficulty, as they worked up the stonework, fitting the stones together properly because they were in different positions. Some stones had to be re-carved, copying the old mouldings: this is clear from the fact that at least one T-moulding (WKS 340, Figs 11-13) was created from a Romanesque roll moulding.

Reused material not used architecturally includes a variety of Romanesque detail. Some of the gable coping stones carry decoration of round billet (Fig 15) and cavetto mouldings; the side buttresses of the great north window are almost entirely faced with re-used stone which carried numerous masons or banker marks of Romanesque type. Also built into the buttresses is part of a Romanesque lintel with fake voussoirs of a window type familiar on the

staircases of the transept turrets (Fig 7). The north window also carries 16 Romanesque rolls reused architecturally in the hood-moulding (Fig 6, marked R), but there were clearly not enough of these to do the whole window, no doubt because by that time in the rebuilding process (the north window was finished in the 1370s: Welander 1991, 217) the stock of reusable Romanesque stone was coming to an end.

The steep pitch of the gable design suggests it imitated that of the Romanesque roof; it was presumably retained in the 14th century with the aim of re-using the Romanesque roof timbers after the wall plates had been raised. The gable has a rebate on the inside to take the principal rafters (Fig 15B) and a trefoil-headed window to ventilate the roof space. This hypothetical 14th-century roof was replaced a century or two later to a lower pitch. (The present roof is 20th-century steel but it replaced a roof of late medieval date carefully recorded before demolition: Ashwell, nd, fig 197-9 and unnumbered illustration; Heighway 1996, 77).

During restoration it was noted that the cill of the trefoil window had been raised and replaced in the past (see Appendix 1 below): the earlier cill showed signs of weathering and sooting. This raising probably took place when the roof was altered in the late medieval period.

The lion sculpture (Fig 18) at the apex of the gable is made of a pale coloured limestone; its style suggests Romanesque work rather than 14th century. It is made of a good quality, homogenous white limestone which may have withstood weathering particularly well. In fact it is difficult to judge how much a Romanesque piece should weather in 900 years, simply because so little Romanesque high-level superstructure survives.

#### PARAPETS

These, though basically of 14th century design, have been extensively renewed probably mostly in the late 19th century (see Fig 6).

#### EARLY ROOF-LINE EAST OF NORTH-EAST TURRET

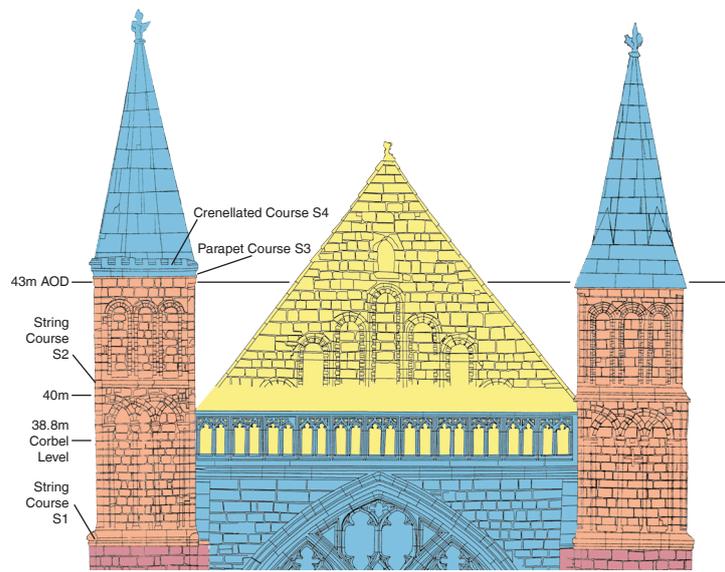
On the east face of the north-east transept turret, at library roof level, there is the line of a pitched roof sloping down both to north and to east (Fig 20). The position of this roof-scar has some significance for the building date of the library: this is discussed below in Appendix 2.

#### ACKNOWLEDGEMENTS

It will be apparent from the above text that this report owes much to the input of Pascal Mychalysin, master mason at Gloucester Cathedral: I have also relied heavily on the masons team for their observations and comments, particularly David Lamb, the foreman mason on this project. I am also grateful to Professor Malcolm Thurlby for comments, parallels, and references, and to Richard Bryant and Arthur Price for their assistance.



1  
The north transept of Gloucester Cathedral, viewed from the north, after completion of work on the north east turret (the left hand turret) and at the commencement of work on the north gable.

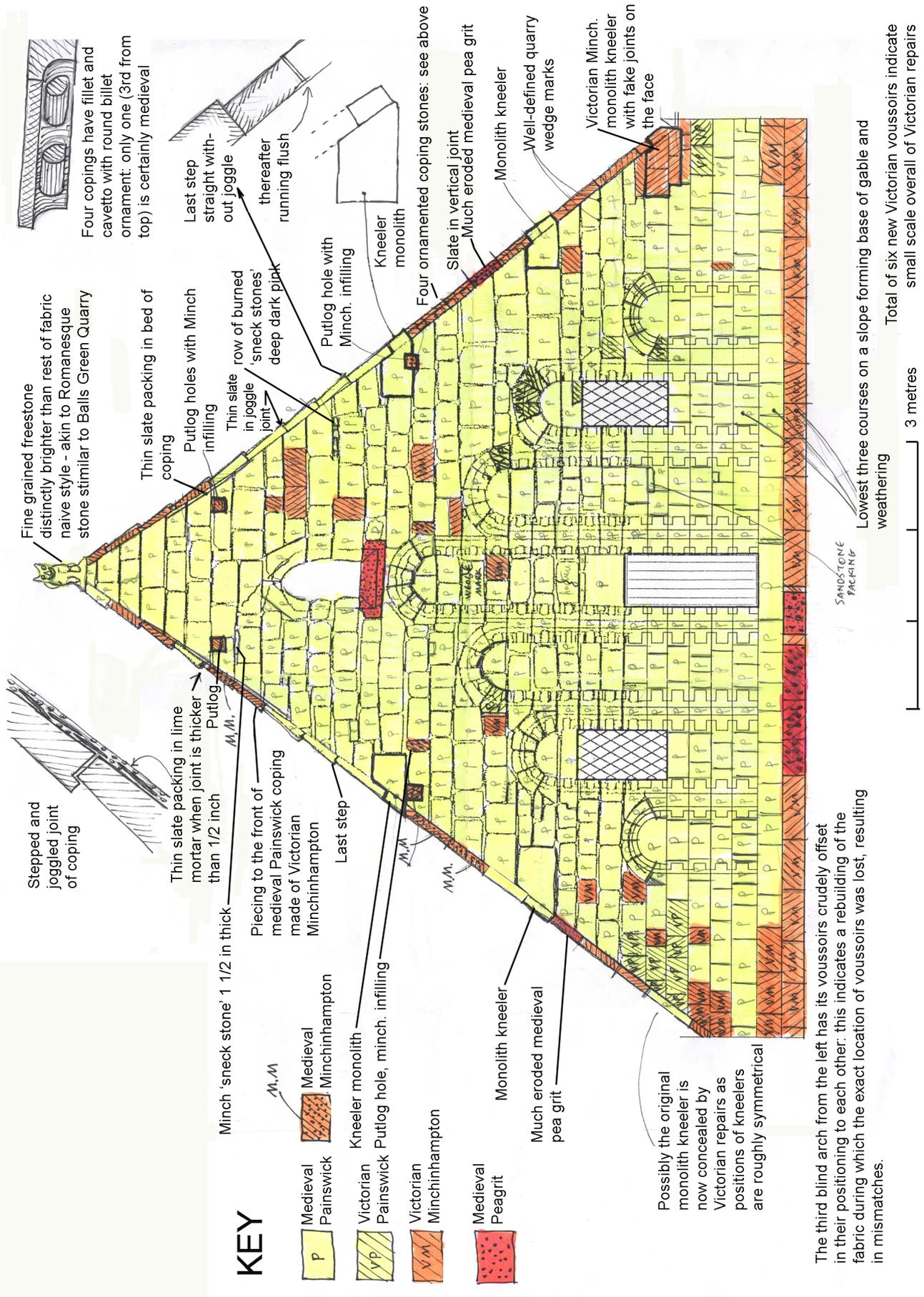


2  
North elevation of north transept: interpretation. The blind arcading was probably in a similar position on the Romanesque gable and was re-set in the 14th century. Most of the ashlar in the gable were re-used Romanesque with some new 14th century stone.

- Late 11th century
- Early 12th century
- 14th century: parapets and spires, also gable and north window.
- Rebuilt in 14th century using mostly Romanesque materials.

0 5m

NORTH TRANSEPT  
The North Elevation, Interpretation  
(NE Turret to the Left)

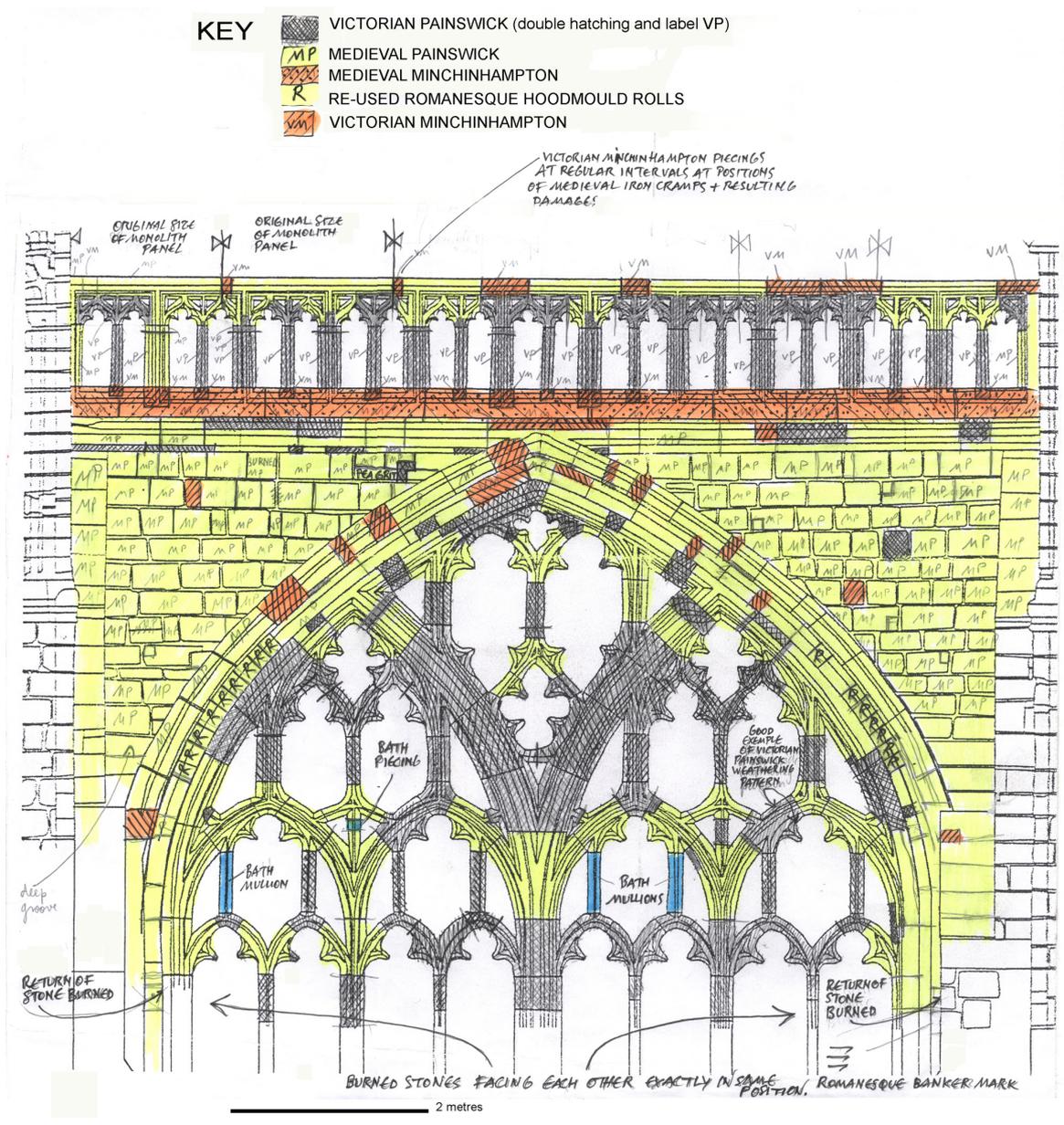




4  
Possible quarry wedge-  
marks on ashlar on the north  
face of the north gable,  
inside central panel of  
arcading.



5  
North transept north gable  
before scaffolding in 2007:  
the mouldings of the blind  
arcading are an unusual  
Romanesque form called here  
'T-mouldings'.



6 Survey by Pascal Mychalysin of the stone-types and other details of the north part of the north window. Scale approximate.





9  
The well of the north transept window, looking west, showing sawn-off original parapet: evidence that the library which now replaces the parapet was not then in existence or immediately planned.



10  
The well of the north transept window looking east, showing the eastern stub of the sawn-off parapet.

11

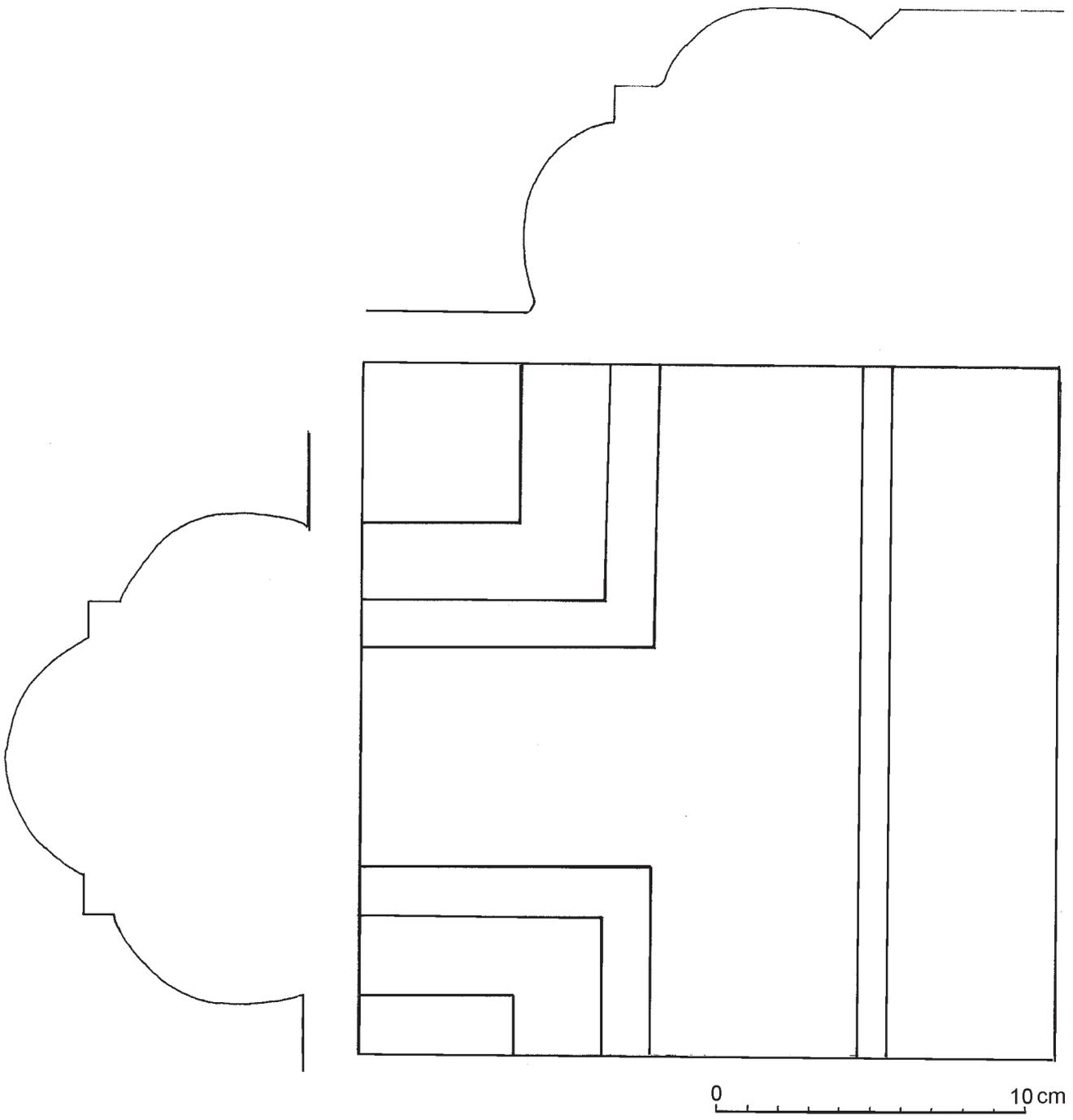
T-moulding after replacement with new stone: the T-moulding which it replaced, WKS 340, is pictured in the two photographs below.



12  
WKS 340



13  
WKS 340: this is a Romanesque roll, recut to a Romanesque style 'T-moulding' in the 14th century.



14  
T-moulding: a copy of the masons' template of one of the new T-mouldings from a jamb of the blind arcading on the gable.



15A  
Round billet on coping stone of north transept, probably re-used from the Romanesque gable.



15B  
The rear face of the 14th-century gable, showing the rebate to take the roof.

16  
Romanesque masons mark, view to west, on jamb of north window; for position see Fig 7. The dark colour is encrusted dirt which survived cleaning. This mark is one of the most prolific of the 11th-12th century at the abbey.



17  
Re-used stone with Romanesque masons mark on inside (east facing) face of buttress



18  
Lion sculpture on the apex of the north transept gable: possibly Romanesque; in a good hard white freestone which has thus weathered very evenly.



19  
The repairs programme: repair of cornice roll mould with stainless steel dowels 5/8 ins diameter.



20  
An ancient roof-line against the north transept chapel and the north transept north-east turret. Looking west.

## APPENDIX I

### ARCHAEOLOGICAL AND PETROLOGICAL SURVEY OF THE NORTH TRANSEPT NORTH ELEVATION

Pascal Mychalysin  
(8 June 2007)

#### THE LION SCULPTURE

The Lion sculpture at the top of the gable is made of a very distinct type of limestone. After cleaning operations it appeared very much brighter than the rest of the fabric. It is a fine-grained oolitic limestone pale cream/white homogeneous texture with little shells more similar to Ball's Green Stone/Nailsworth than usual Painswick types used on the Cathedral. What makes it stand out is not so much the finer grain than its unusual white colour. It was obviously selected for its Freestone/carving quality. The depth of the coping section of the carving is 2" deeper than copings underneath (23" to 21").

#### THE COPINGS

The copings have three different profiles:

- 1: one with steps and joggle joints covering vertical joint
- 2: one with flush top on the rake and cavetto section ornamented with round billets at regular intervals
- 3: Finally a plain section without any of the above mentioned.

All three sections have both medieval and Victorian parts and it is not straightforward to reconstitute the original date of construction of each type.

My own guess is that the plain section is the oldest coming from the first phase of construction (Romanesque) the cavetto section with round billets could come from another Romanesque construction phase. Both these types have pea grit stone amongst their constituent parts, suggesting a Romanesque date. It is very probable that the moulded section with cavetto and round billet was reused in the 14th century from somewhere else. It is also the smaller constituent – only four stones.

Finally the stepped and joggled copings which are to be found only at the top of the gable is probably, to my mind, the completion of coping work by 14th-century masons following their own fashion presumably when they

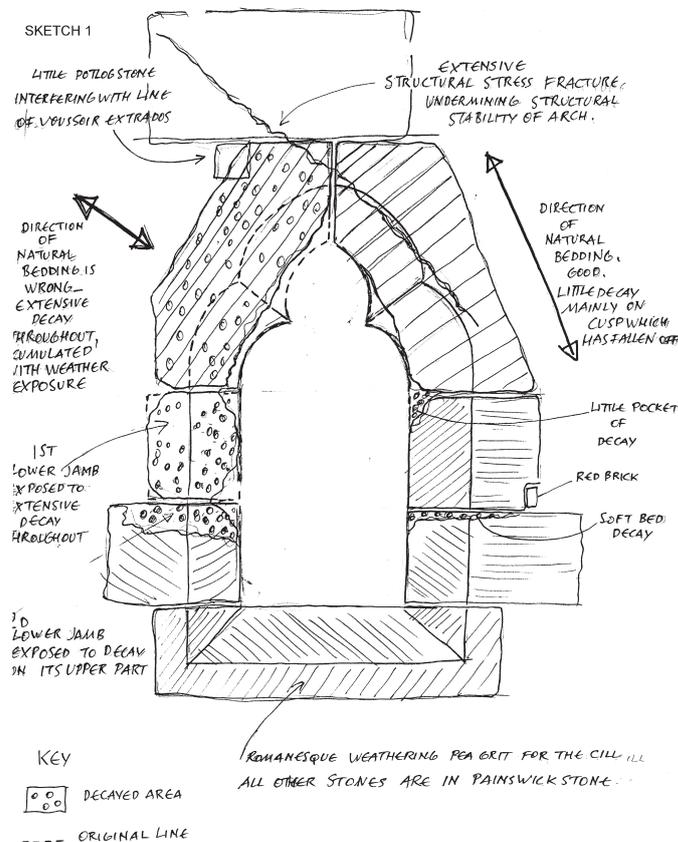
had run out of Romanesque material to reuse.

The coping work has been structurally stabilised by larger monolith stones, "kneelers", at regular intervals, probably in the 14th century. Four of the kneelers are original facing each other left to right. One is a Victorian replacement in Minchinhampton stone (at bottom of gable, right hand side). The left-hand counterpart kneeler is possibly concealed by extensive ashlar cladding from Victorian repairs.

In many places in the joints of the copings thin Welsh slates have been used as packing material showing that the whole coping work was repaired and relaid by Victorian masons.

#### THE GABLE WINDOW

The top window of the gable has a trefoil design (sketch 1). It is redundant as pitch of roof was changed. The cill of the window is of Peagrit Stone. On repair it was apparent that the cill had been raised and renewed. Also apparent was that the structural stress fracture seemed to be linked with rusty ferrous nails found in the bedding of the horizontal joints of the jamb stones underneath the trefoil arch: these nails were probably used to secure the wood oak panel which blocked the window.



GLoucester Cathedral. NORTH TRANSEPT GABLE. ELEVATION  
TOP WINDOW OF GABLE SURVEY 22<sup>nd</sup> 05 OF PM.

## STONE TYPES

As in other parts of the Romanesque fabric and 14th-century fabric reusing Romanesque fabric there is no homogeneity of stone types. If they mostly all fall into Painswick type generically they show wide variety of grains colours erosion patina etc. The 14th-century fabric on the window tracery and parapet is far more consistently of one particular type of Painswick showing a much narrower sourcing from possibly only one quarry. It is evident that different Painswick quarries were used at different times, and that sequences of use and re-use based on this information could one day be established.

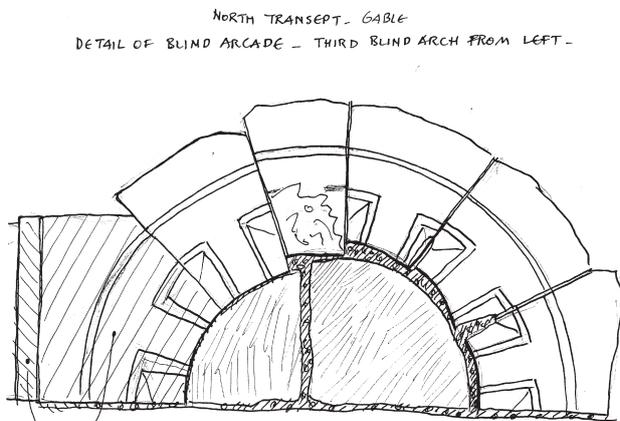
Several quarrying wedge marks were recognised on the Romanesque fabric of the gable. The best two are located near the floodlight at the back of the gable right hand side (sketch 2). They are identical to similar marks found on Romanesque ashlar on the south transept south-west and south-east turrets.

## DESIGN

Generally on the gable there are few evidences of 14th-century fabric – some lengths of stepped and joggled copings, the kneelers, and perhaps the trefoil arch of the window which stylistically doesn't appear Romanesque.

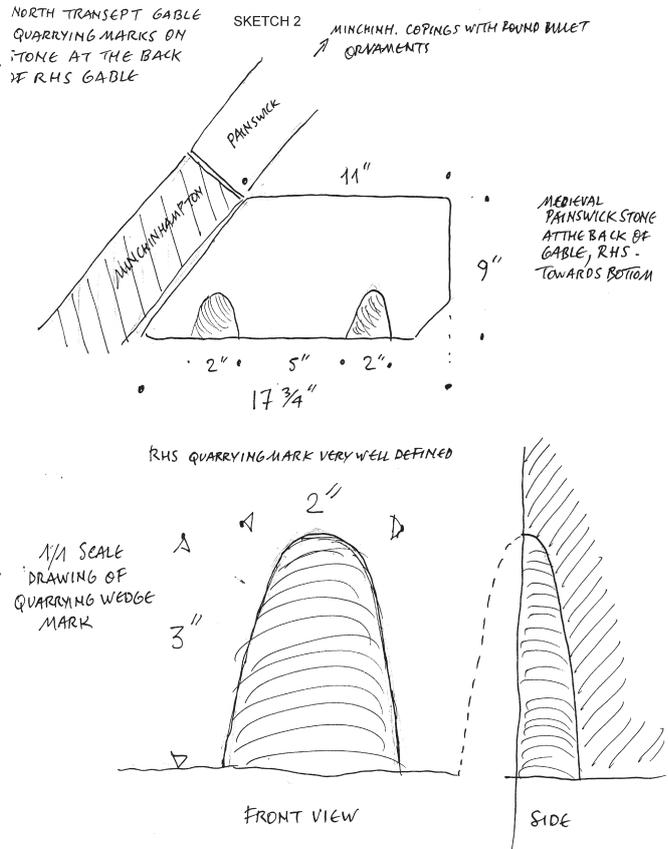
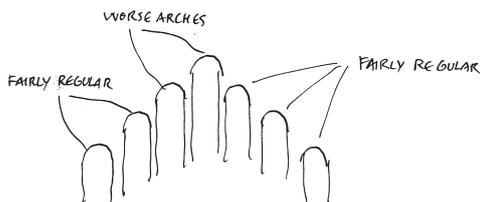
The Lion sculpture is of a very naïve and charming style which I have difficulty in reconciling with what I see of 14th-century masonry.

## SKETCH 3



VICTORIAN REPAIRS  
IN PAINSWICK STONE

THE SOFFITS OF VOUSSOIRS DO NOT MATCH EACH OTHER APART FROM THE FIRST TWO TO THE LEFT THIS ARCH IS THE WORST CASE. THE CENTRAL ARCH IS SLIGHTLY BETTER. IT COULD INDICATE THAT DURING THE RECONSTRUCTION OF THE GABLE THE XIVC MASONS HAD DIFFICULTIES IN THE HIGHER STAGE OF BLIND ARCADING RUNNING OUT OF MATCHING MATERIAL PERHAPS.



The lower parts of the arcading was successfully replicated from the Romanesque design but the 14th-century builders ran into difficulties completing the arcading; the voussoirs of the two highest are grossly offset (sketch 3).

Overall the 14th-century reconstruction re-used Romanesque stone and adapted the Romanesque design. The scale of Victorian repairs is minimal.

## PARAPET

The parapet very much conforms to Gloucester's 14th-century fabric patterns; including use of Minchinhampton Weatherstone for base of parapet, and huge monolith panels including coping sections and several trefoil tracery panels

The Victorian repairs on the coping, made of small Minchinhampton piecings, probably indicate the locations of 14th-century vertical joints between panels and consecutive damage resulting from iron cramps or dovetail-shaped irons grouted in lead.

The surviving medieval monoliths to the left of parapet show the typical very large scale of 14th-century coursing (see survey drawing, Fig 3).

Practically all mullions but one have been replaced with extensive repairs also on tracery panels.

## WINDOW

There was also very extensive repairs on the tracery window by the Victorians involving complete rebuilding reusing some medieval material.

On the main arch of the tracery window directly below the hood-mould section can be found 16 small stones forming a roll-mould section around the tracery. These are very probably reused Romanesque. This would be very much in keeping with 14th-century practice of integrating Romanesque moulded stones into a 14th-century design, although compared with the south transept this re-use is on a very small scale and doesn't involve more than one sort of design (a roll as in sketch 4).

## FURTHER COMMENTS

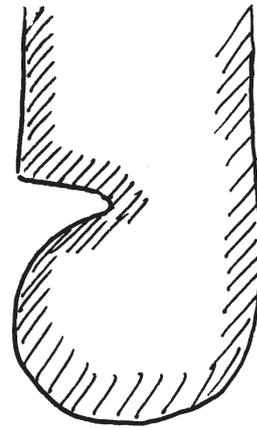
It is worth noting that for the entire elevation very little Bath stone was used; only three short minor mullions and a small piecing. All the rest was done reusing vernacular stone emulating medieval patterns of stone use.

On either side of the north tracery window are buttresses abutting to the north-east and north-west turrets. These are faced with mainly Romanesque material; a number of banker marks are recognisable, all well-known from other parts of the building. It is clear that the 14th-century masons refaced the buttress sides (i.e. representing the cut-back Romanesque walls) with re-used Romanesque ashlar complete with their banker marks.

On the return side of the buttresses are a small number of deeply burned stones. It is intriguing to see that these burned stones tend or seem to face each other. Both are deep dark pink and the adjacent area seems to have suffered too, albeit to a lesser extent. Could this indicate a fire to a timber structure of a fabric prior to the 14th-century window?

Towards the bottom of window on the side of a master mullion are two charming Victorian graffiti probably the work of a bored apprentice mason of the time!

SKETCH 4



## APPENDIX 2:

### A ROOF-LINE EAST OF THE LIBRARY

In the angle of the north transept north-east turret, and the chapel of the north transept, there is at library roof level the line of a steep pitched roof (base angle about 43 degrees).

The roof is pitched against both walls with the apex just below the 14th century parapet (P1020175; Fig 20 above).

The scar is very weathered, indicating that it has been out of use for a long time.

## DATE

The roof postdates the heightening of the east transeptal chapel which was raised in the 14th century.

It predates the westward part of the library. The eastern and earliest part of the library was built after the north transept had been refurbished in 1368-74 (Welander 1991, 234). The north transept window must have been finished for a time before the library was planned, as that window was originally built with a parapet, which can still be seen (P1020172 and 173, Figs 9 and 10 above), cut off when the library was constructed. Thus the library was built in the 1380s or later.

The library was built over a vestry or muniment room above the slype, referred to as the 'upper slype', which Welander says was of 13th century date (p 234). The muniment room and the slype below originally occupied only the transept width.

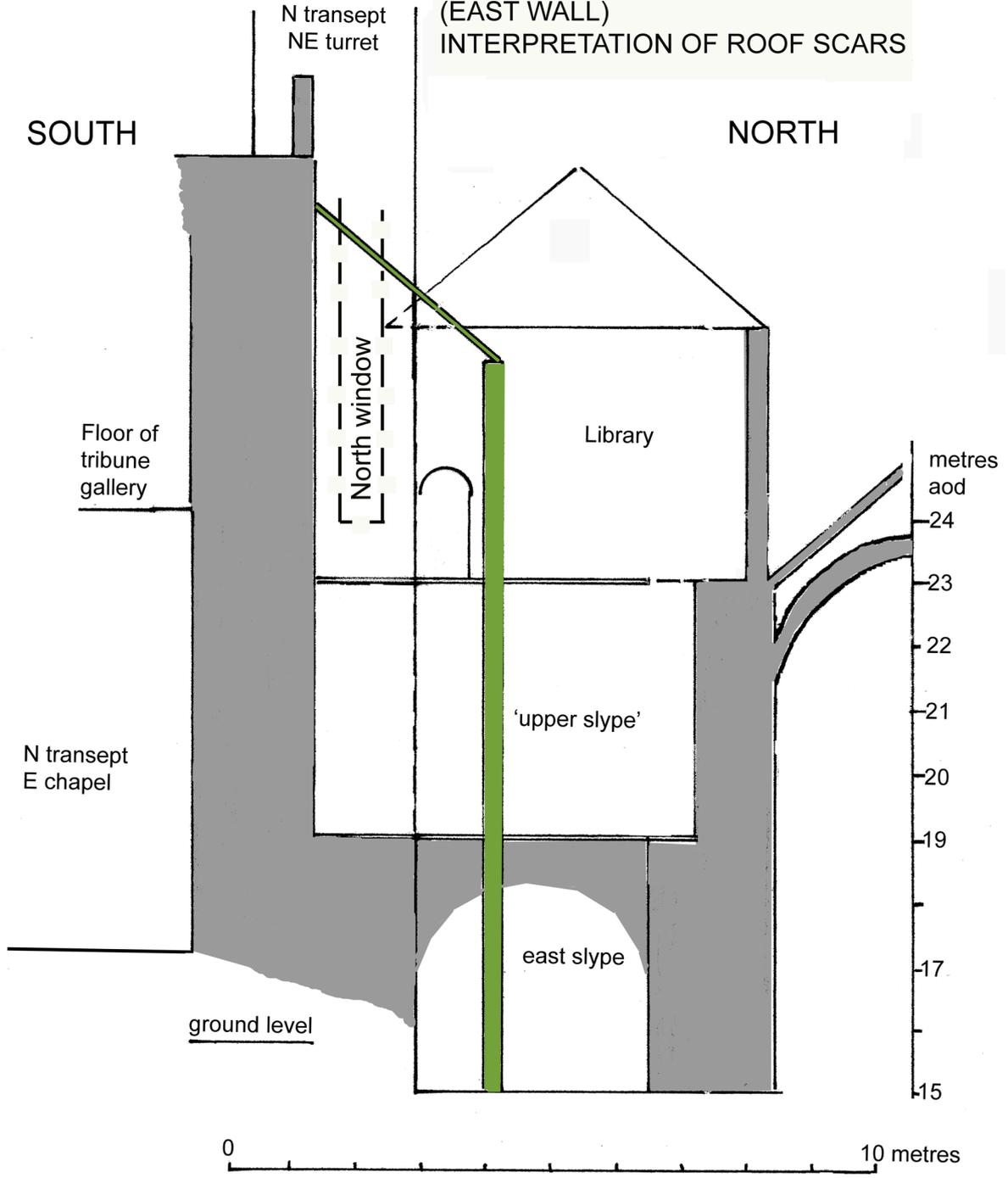
Welander's library sequence is rather confusing. He implies (p 321) that a library had already been built when both library and muniment room below were extended to the east in the late 14th century. Yet he attributes the building of the library to Abbot Frocester (1381-1412), though there is no direct evidence for this.

When the east cloister walk had just been rebuilt (1351-77: Wilson, 1980, 260), the new cloister vaulting and wall panelling covered up the entrance to the slype from the cloister and a stair to give access to the library from that direction was installed in the corner of the chapter house (Welander 1991, 321).

Verey and Brooks (p 429) add to the confusion by saying that the stair in the chapter house was additional to the original library stair which they assume was that in the eastern extension of the slype. They clearly believe that the library is late 14th century and all the same date, though the windows are late Perpendicular.

The evidence for the chopped-off parapet outside the north window of the north transept makes it clear that, when the window was finished (about 1370), no library was there, or planned.

DIAGRAMMATIC SECTION S/N  
 AT N TRANSEPT NE TURRET  
 (EAST WALL)  
 INTERPRETATION OF ROOF SCARS



Therefore the library cannot have been in place, even in a shortened form, before about 1380.

The roof scar under discussion here represents a structure which predates the eastward extension of the library and muniment room but which relates to a building on the same level as the library. It indicates that there was, in fact, a room where the library is now, but the evidence of the chopped off parapet shows it cannot have been in existence before about 1380.

After the building represented by the roof scar was disused, the eastward extension of the slype, and of the muniment room above, could have taken place.

Therefore the library in its present form must be early 15th century at least.

#### PURPOSE

The two pitches indicate that the roof covered a rectangular or circular space. This space can hardly have been the width of the slype, since that would create a lean-to roof with rafters 10 metres long. There must have been a much smaller feature tucked into this corner, and the most likely suggestion is that it was a staircase tower (wooden or stone) which gave access from the east to the original (shorter) upper slype and library.

#### CONCLUSIONS

A summary of the sequence in this area is as follows:

1. Construction of 'muniment room' above the (short) east slype (?13th century)
2. Construction of north transept north window, late 14th century.
3. Construction of east walk of cloister, blocking entrance to east slype (late 14th century)
4. Construction of a (short) room above the (short) muniment room: Perhaps this is the first library. Access to it is by an external wooden staircase, whose roof is represented by the scar that we can see. (late 14th to early 15th century)
5. Construction of extension to east slype to east, extension of muniment room above, extension of library above that, all early 15th century.

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