Archaeology South-East

ASE

BELFRY ROOF STRUCTURE
BATH ABBEY, SOMERSET

Historic Buildings Assessment

Commissioned by:
Bath Abbey

NGR: ST 75127 64769

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ASE Project No: 240405
ASE Report No: 2024181

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Date of Issue:	Aug 2024		
Version:	1		

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SUMMARY

In July 2024, Archaeology South-East (a division of the UCL Centre for Applied Archaeology) carried out an assessment of the belfry roof structure of Bath Abbey, Somerset. The work was requested by the Cathedrals Fabric Commission for England in order to assess the date, historical development and heritage significance of the belfry roof structure, so as to inform future planning applications relating to its alteration.

The belfry lies at the crossing of the abbey, between its nave, choir and north and south transepts. It was constructed in the decades either side of 1500, before suffering during the Dissolution of the Monasteries in 1539. Known restorations of the church likely to have affected the belfry occurred in the mid-16th century, in 1814, in 1864-74 and most recently in 1947. Other works focusing on the bells and bell frame also occurred during these centuries, which may have been the occasion for wider works to the roof structure.

The flat roof of the belfry comprises a pair of substantial cross beams, dividing it into three bays which are spanned by shorter axial beams, which in turn carry the smaller joists that bear the sarking boards of the lead roof above. A further three cross beams are present at a lower level to the roof. The structure is the result of four principal phases of development: the rebuilding of the abbey c.1500, or perhaps its restoration c.1550, 18th century repairs (perhaps in 1814), using timbers scavenged from earlier contexts, more extensive repairs in the later 19th century under George Gilbert Scott, and the replacement of the sarking boards either then or when it was re-leaded in 1947. The three lower cross-beams are probably 18th century (?1814), probably installed for structural support or as a bell-hoist.

This study has concluded that the earliest phase of the roof structure is of high overall heritage significance, and that its 18th and later 19th century phases of repair are of moderate heritage significance. The sarking boards and 20th century timbers are afforded low heritage significance. There are not considered to be any setting issues in relation to this structure.

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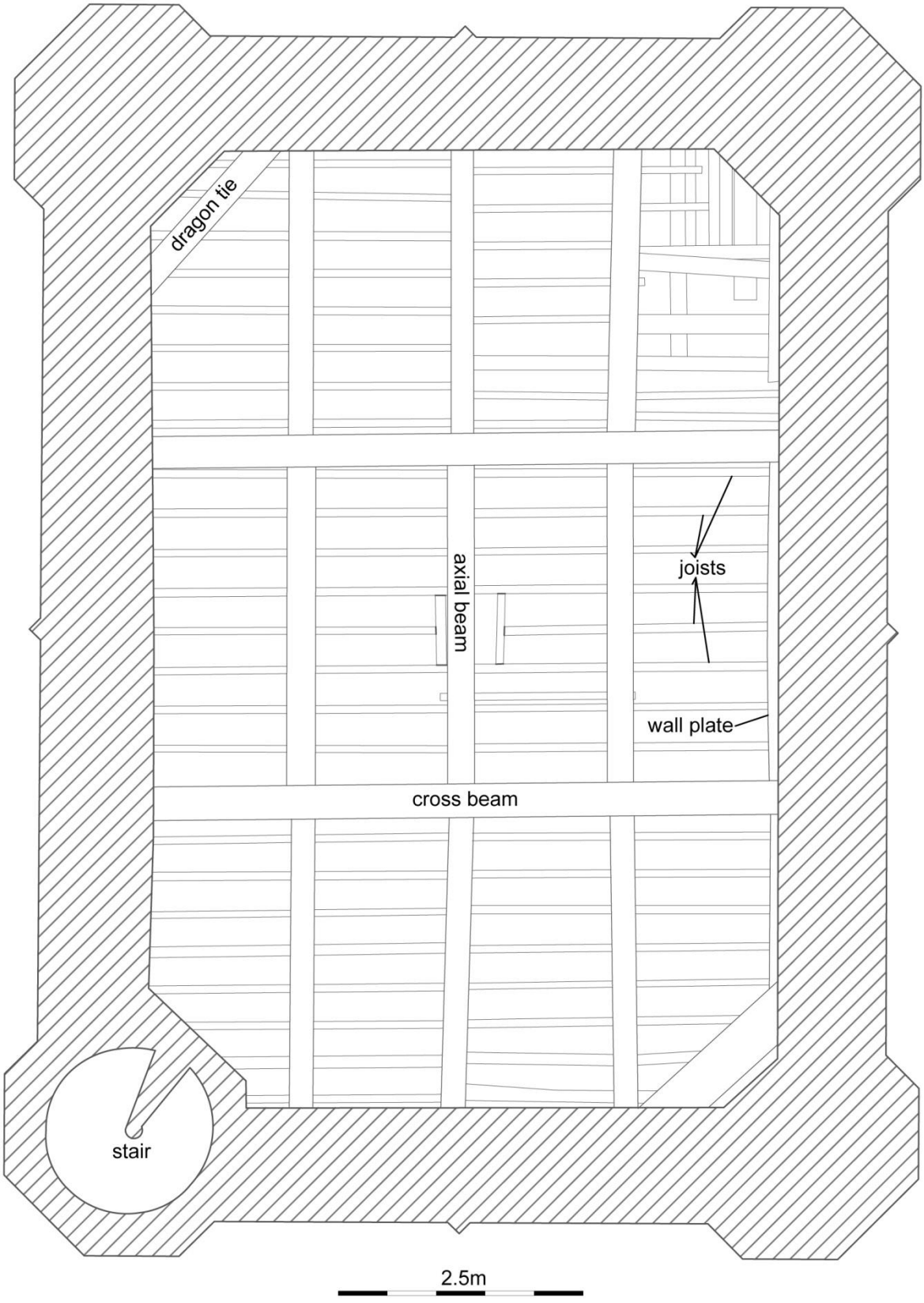

1.0 INTRODUCTION

1.1 In July 2024, Archaeology South-East (a division of the UCL Centre for Applied Archaeology) carried out an assessment of the belfry roof structure of Bath Abbey, Somerset BA1 1LT (NGR ST 75127 64769; Figure 1).

1.2 The work was requested by the Cathedrals Fabric Commission for England (CFCE) in order to assess the date, historical development and heritage significance of the belfry roof structure, so as to inform future planning applications relating to its alteration.

2.0 SCOPE & METHODOLOGY

2.1 The intended purpose of this assessment is to give an overview of the date and development of the roof structure. It should not be regarded as a detailed archaeological record, nor should it be taken as definitive. Further research, particularly that undertaken during subsequent building works, is likely to refine and extend the understanding of the structure and may require the re-assessment of its significance. Unless noted to the contrary, the assessment involved a visual inspection of the fabric, both internally and externally.

2.2 The site was visited by Michael Shapland on July 23rd 2024 in order to carry out the assessment.

3.0 SITE LOCATION

3.1 The abbey stands in the eastern part of the historic core of Bath, adjacent to the former site of the east gate of the walled city. The abbey's precinct and associated bishop's palace formerly occupied much of the city's south-eastern quarter, between Cheap Street and Stall Street. The only substantial element of this complex now standing is the abbey church, which is accessed off the Abbey Churchyard.

3.2 The belfry lies at the crossing of the abbey, between its nave, choir and north and south transepts. It comprises three stages above the crossing of the nave and chancel: a ringing chamber, an intermediate chamber and a bellchamber, accessed via a newel stair within the corner of the tower. Above, the flat roof of the tower is accessible as a viewing platform.

4.0 STATUTORY DESIGNATIONS

Listed buildings

4.1 Bath Abbey was listed at Grade I on 12th June 1950, most recently amended 15th October 2010 (National Heritage List ref. 1394015).

4.2 List descriptions must not be treated as comprehensive schedules of those elements which are legally protected as, no matter what the grade, the legislative cover not only relates to both the interior and exterior, but also extends to any building within the curtilage which predates July 1st 1948.

Conservation Areas

4.3 The cathedral is situated within Bath Conservation Area, as originally designated by the City Council in 1968. The accompanying 'Conservation Area Appraisal' document was most recently updated in November 2015.

World Heritage Sites

4.4 The City of Bath – including the Abbey – was inscribed as a World Heritage Site in 1987. In 2021 it received a second inscription as one of the Great Spa Towns of Europe.

Other Designations

4.5 There are no known scheduled monuments, registered parks and gardens or other statutory heritage designations relevant to this site.

5.0 HISTORIC BACKGROUND

5.1 The abbey has been the subject of numerous previous historic and archaeological studies (e.g. Page 1911; Davenport 1996; Hylson-Smith 2003; Monckton 2006; Taylor 2022). The first record of a religious house in Bath occurs in 675AD, when King Osric of the Hwicce gave 100 hides of land to a 'convent of holy virgins', although this is likely to represent the re-foundation on a pre-existing British church. The Anglo-Saxon monastery was re-established as an episcopal see in 1090, and rebuilt as a cathedral church during the first half of the 12th century.

5.2 The present church is traditionally thought to have been rebuilt under Bishop Oliver King (1495–1503) from 1499, although new research has pushed this back to the early 1480s (Monckton 2006). Work had continued as far as the crossing by 1503, but momentum stalled with King's death and the west front was not completed until c.1518. The Dissolution of the Monasteries claimed the site in 1539, by which time the work to replace the 12th century Lady Chapel at the east end of the church had been abandoned.

5.3 The priory was sold into secular hands in 1539, and shortly afterwards the bells, iron and the lead from the roof were removed from the church, leaving it unfit for worship. It is unknown whether the belfry roof was affected. The church was finally transferred to the city authorities as a parish church in 1559, with repair recorded there during the 1570s. It was re-consecrated in the 1590s, with the final stages of tidying up the ruined east end carried out in 1616. New bells were also purchased for the belfry around this time. Work to the nave, south transept and west window was also carried out around this time. Subsequent work of potential relevance to the development of the belfry is as follows:

- Late 17th century: donations sought for maintaining the timberwork supporting the bells (the bell frame bears a graffiti date of 1674).
- 1700: the six bells of the tower were recast into eight bells. The bell frame bears a further graffiti date of 1713.
- 1770: the tenor bell fell through the belfry floor.
- 1774: two more bells were acquired, completing the present set of ten. The tenor bell may have been re-hung as part of this work.

- 1814: the churchwardens oversaw the repair of the turrets, roofs and ceilings. The bell frame bears further graffiti of this date.
- 1830s: the tower gained its four crocketed spires.
- 1864-74: general restoration of the church by George Gilbert Scott, including the recasting of one of the great tenor bell.
- 1908: further replacement of the turret's spires.
- 1947: the tower treated for deathwatch beetle, including some removal and replacement of the timbers. The lead roof was also repaired.[1]
- 1950s: the bells were removed and re-hung.
- 1974: cracking reported to the tower, although no record of action taken.[2]
- 1999: detailed proposals for the roof to be repaired and re-leaded, and six 'sound lanterns' to be installed, standing proud of the leadwork. This appears never to have been carried out, although the flagpole was replaced at this time.[3]

6.0 DESCRIPTION OF ROOF STRUCTURE

6.1 The belfry is of ashlar stone construction, pierced by pairs of louvred openings in each of its four walls (now partially infilled with modern concrete blocks; Plates 1-6). Large square putlog holes are present around the wall, at the level of the springing of each of these openings. The space is almost entirely occupied by the great bulk of the bell frame, with its ten bells. This is dateable to at least the late 17th century on the basis of a graffiti date of 1674 on a straight brace, and bears repeated episodes of apotropaic markings to deter malign spirits, including overlapping circles and Marian marks (Plate 7; Easton 2016). The core of the frame is probably of earlier date, however, conceivably original to the early 16th century tower, since here the braces are curved rather than straight (Plate 8).

6.2 The flat roof of the belfry is essentially constructed in a similar manner to a medieval or early post-medieval floor, comprising a pair of substantial cross beams which run the full 6.4m width of the rectangular structure, dividing it into three bays of c.3.0m apiece (Plate 9). Each of these bays is spanned by shorter axial beams, which in turn carry the smaller joists (c.1.3-1.4m apiece) that bear the sarking boards of the lead roof above. Diagonal dragon ties are present at wall-plate level to the north-west and south-east corners; the other two corners are occupied by the newel stair and a redundant pulley system relating to the abbey clock. A further three cross beams are present at a lower level to the roof, and do not form a part of its structure.

Upper cross beams

6.3 The two cross beams belonging to the roof itself are supported on the tower's side walls by faceted stone corbels, which appear quite fresh and recently replaced (Plate 10). The southern cross beam is of oak, and has a chamfer decorated with step-and-runout stops to its ends, as well as where it articulates with the central axial beam (Plates 11-12). Stops of this type are known from the late medieval period, and remained in common use until the early 17th century (Hall 2005, 158-160). The date and coherency of these stops makes it highly likely this principal timber is original to the roof, or at least to its mid-16th century restoration.

[1] Bath Abbey Archives, ref. BA/4/RES/5/9/1/6
[2] Bath Abbey Archives, ref. BA/4/ABB/5/1/3
[3] Bath Abbey Archives, ref. BA/4/ABB/5/1/3/39

6.4 The northern of the two cross beams still appears to be of oak, but it bears a combination of step-and-runout and simple runout stops to its chamfers, and is markedly crisper and straighter than its southern counterpart, suggestive of machine sawing (Plate 13). On the evidence of the corbels, it is likely that it dates to the late 19th century restoration of the church under George Gilbert Scott.

Axial beams

6.5 The roof has three axial beams to each of its three bays, which are either jointed into the cross beams or rest atop the masonry of the belfry's end walls (Plates 14-17). All three axial beams to the belfry's southern bay appear to be original: they have the same step-and-runout stops as the southern cross beam, they are oak, and they have a consistently aged patina and irregular finish (Plates 14, 17 & 18). Interestingly, a row of redundant mortices can be glimpsed to the upper face of the central of these three axial beams, meaning that it has been re-set. This implies that the entire roof was originally jointed together (as would be normal during the 16th and 17th centuries), and that the present lapped arrangement is a more recent intervention.

6.6 Three other axial beams are also probably original: the western beam to the middle bay and the western and eastern beams to the northern bay. The remainder are markedly crisper than the others, and their patina is different. Vertical saw marks can be discerned to the central beam of the northern bay, which is evidence that it has been processed using a mechanical reciprocating saw, rather than the diagonal markings diagnostic of a traditional pit saw. Reciprocating saws became widespread in the mid-/late 19th century, which would fit with the period of Gilbert Scott's restoration.

Joists

6.7 The intermediate joists run between the axial beams, either jointed in or lapped over the top. Only a handful of these appear to be original to the structure, concentrated within the southern of the three bays (Plates 17-18). They are of oak, they are irregular in form rather than machine-cut and crisp, but most diagnostic is that they are flat and broad in proportion to their depth. This is counterintuitive to modern engineering, where thick but relatively slender joists and rafters are known to be the most efficient use of timber; in the medieval period timbers were set flat rather than deep, becoming increasingly square in section during the 16th and 17th centuries. None of the early joists here appear to be in their original positions, and several have clearly been rotated to cohere with the slender-and-deep orthodoxy of the later post-medieval repairs. This is useful in revealing that they had flat mortices positioned at the upper face of the timber, rather than central or vertical mortices as became typical later on. The remaining early joists appear to have been chamfered, but no clear chamfer-stops could be discerned.

6.8 The majority of the joists are markedly deeper in proportion to their breadth, and are likely to date to the mid-/late 19th century restoration of the roof (e.g. Plate 19). Most are machine sawn to a consistent size, and lack chamfers. A handful are of much rougher timber, implying they have been cut-down from earlier timbers on the site. The re-use of timber was particularly common in England during the 18th century, due to shortages caused by the demands of the Royal Navy, but before the height of the later 19th century Imperial project meant that plentiful good quality timber could be extracted from the Empire. It is therefore plausible that these joists

were replaced during the known repair of the turrets, roofs and ceilings in 1814 (the bell frame also bears graffiti of this date).

6.9 The joists sit atop a wall-plate to the belfry's side walls, where many are held in place with wooden chocks. From what can be seen from below, both wall-plates are consistent with a late 19th century date.

6.10 The north-east corner of the roof has been reconfigured to accommodate the pulley system relating to the weights which formerly powered the abbey clock (Plates 20-21). A lean-to structure occupies the roof above. The pulleys themselves appear to be 19th century, and parts of this structure have been secured using mass-produced iron bolts. This area has been placed within the late 19th century phase of this roof, although its timbers are surprisingly heterogeneous, raising the possibility that some have been re-set.

Dragon ties

6.11 Two diagonal dragon ties are extant within the roof, designed to carry the joists where they met the corners of the towers (Plates 22-23). That to the north-west corner is nicely chamfered oak, and may well be an original timber, although it has clearly been re-set. That to the south-east corner is formed from a piece of re-used timber, so can be tentatively dated to the repairs of 1814. The dragon tie to the north-east corner appears to have been removed when the clock mechanism was installed; the presence of the newel stair in the south-west corner made a diagonal tie here unnecessary.

Sarking boards

6.12 The plank-like sarking boards which are laid across the joists are of a crispness, narrowness and consistency to indicate they all date to the late 19th century repairs to the roof, or perhaps the 1947 repairs to the leadwork. It is difficult to be confident from a distance, but their relatively wide grain is suggestive of softwood rather than oak.

6.13 Several loose planks are present within the belfry. One is of oak, and may be an original (or at least early) sarking board that is indicative of those which were formerly present (Plate 24).

Lower cross-beams

6.14 Three cross-beams are present c.0.8m below those of the primary roof (Plates 25-28). They have been cut into the walls of the tower rather than resting on corbels, indicating that they belong to a later phase. They bear simple runout stops to their chamfers, which are more typical of the 18th century than the earlier period. They are also formed of relatively poor quality wood, which is indicative of the timber shortages during this period: one cross-beam is essentially a half-sawn tree trunk, and the others have extensive sapwood and waney edges.

6.15 The lower cross-beams are structurally independent of the roof. It is possible they were installed to tie the side walls of the tower together, which does have a long history of cracking and subsidence. They are embedded into the masonry of the tower, whereas the upper cross beams belonging to the roof simply rest upon corbels and therefore provide little lateral support.

6.16 Several of the lower cross-beams have been used as ad-hoc supports to prop the roof structure above. This includes a length of what appears to be a former axial beam, which has been laid across the northern two lower cross-beams; it has a chamfer, and redundant mortices along its upper edge for former joists.

6.17 A third possibility is that the lower cross-beams were needed to lift the massive tenor bell back into position following its fall in 1770, together with its two new companions, and left in place subsequently to facilitate future hoists.

7.0 STATEMENT OF SIGNIFICANCE

7.1 The *National Planning Policy Framework* (Section 16: 'Conserving and Enhancing the Historic Environment') requires that the significance and setting of a historic building should be considered as part of the planning process:

> *200. In determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance.*[4]

7.2 The foregoing discussion of the building's significance and setting is based on the understanding of its development related above, using Historic England guidance and terminology (English Heritage 2008; Historic England 2017a; Historic England 2019). Within each of the categories of heritage value explored below, the following degrees of significance are adopted here:

- Exceptional: elements of the place that are of key national or international significance, being among the best or only surviving examples of an important type of monument, or being outstanding representatives of important social or cultural phenomena.

- High: elements that constitute good and representative examples of an important class of monument (or the only example locally), or that have a particular significance through association (although surviving examples may be relatively common on a national scale) or that make major contributions to the overall significance of the monument.

- Moderate: elements that contribute to the character and understanding of the place, or that provide a historical or cultural context for features of individually greater significance.

- Low: elements that are of low value in general terms, or have little or no significance in promoting understanding or appreciation of the place, without being actually intrusive.

- Negative: elements that are actively detrimental to the significance of the place, or which detract from its character, setting or comprehension. Recommendations may be made on their removal or on other methods of mitigation.

[4] https://www.gov.uk/guidance/national-planning-policy-framework/16-conserving-and-enhancing-the-historic-environment (updated December 2023)

Historical value

7.3 Historical value derives from the way in which past people, events, and aspects of life can be connected through a place to the present. This includes associative, illustrative and representational value, and encompasses among other things rarity of survival, the extent of associated documentation, the ability to characterise a period, and association with other monuments.

7.4 An assemblage of 17th century timbers survive from the roof, mostly principal beams, but also a number of joists. These have clearly been re-set during previous repair work, with several of the joists in particular having been rotated and lapped over the rest of the structure rather than jointed into it. There is also some doubt as to whether these timbers are original to the roof, or whether they date to its post-Dissolution repair. This said, these timbers represent a coherent survival from the earliest decades of the abbey's present incarnation, and are well-crafted examples of their type, particularly the decorative flourishes to the beams. Their historical value is considered to be *High*. This is equally true for the joists as it is for the larger beams.

7.5 A number of the roof timbers are thought to date from a broadly 18th century phase of repair, perhaps that recorded in 1814. Much of this work is ad-hoc and does not represent a good illustration of the Georgian work to the abbey as a whole, although they are of undoubted age, with many of the timbers re-used. The low cross-beams are a more coherent and interesting feature, and may be telling us something about either the level of structural problems within the tower at this time, or how the bells were hoisted into place. The historical value of this phase is considered to be *Moderate*.

7.6 Much of the roof in its present form is thought to be later 19th century, and to date from its restoration under George Gilbert Scott. The fact that care was taken to replicate the decorative elements from the original timbers into the new work, and that some of the early timbers were retained in-situ, makes it likely that Scott had personal oversight of this work, despite its sequestered location. This elevates it above the importance afforded to more general repair work of this date, meaning that the historical value of the principal beams from this phase is considered to be *Moderate*. The joists from this phase are far more utilitarian in execution, and of *Low* historical value.

7.7 The sarking boards may likewise date to the later 19th century restoration of the abbey, or more probably to its re-roofing in 1947: close scrutiny may bear this out. These boards are functional and relatively ephemeral, and are thought to contribute little to the historical value of the roof. Their value is considered to be *Low*.

Aesthetic value

7.8 Aesthetic value derives from the way in which people draw sensory and intellectual stimulation from a place. This includes not only formal visual and aesthetic qualities arising from design for a particular purpose, but more fortuitous relationships of visual elements arising from the development of the place through time, and aesthetic values associated with the actions of nature.

7.9 The belfry as a whole is an enormously charismatic space, with its massive bell frame and exposed medieval stonework. The roof structure makes a significant

contribution to this, due to its characterful amalgamation of timbers of obviously different dates in a way that nevertheless presents a good picture of the original appearance of this space. The aesthetic value of the belfry roof structure is therefore considered to be *High*.

Evidential value

7.10 Evidential value derives from the potential of a place to yield evidence about past human activity. The roof is of multifarious importance in this respect. Its form and decoration reveal aspects of the original execution of the timberwork for the 16th century abbey, and the finesse and status afforded to a relatively inconspicuous location. No early mortice and tenon jointing is visible from below: it is likely that the roof was originally pegged together from the top, which should become apparent when the roof is stripped of its lead. It is probable that many of the timbers bear diagnostic saw markings, but the difficulties of access mean these would only be visible with close scrutiny. Dendrochronological and other analyses of the timbers could establish their exact felling date, and potentially their origin, which may conceivably have been re-used from the earlier medieval church. The re-used timbers from the suspected 18th century phase of repair work may have been re-set from the 16th century roof, or have come from elsewhere. Aspects of its development repair may be informative regarding wider questions of the structural stability of the belfry tower through time, and the degree of care visited upon this comparatively remote location during the 18th and 19th centuries.

7.11 A more general point is that the present limited access to the belfry roof means that there is considerable potential for close scrutiny of its timbers to reveal more about the roof's date, development and changing function and appearance through time. Its evidential value is therefore considered to be *High*.

Setting

7.12 Closely allied to the building's heritage values is the contribution its landscape setting makes to its significance, and how it is experienced within the context of its wider surroundings. Whilst this is predominantly a visual consideration, it is also influenced by environmental factors such as noise and smell, as well as by a deeper understanding of the historic relationship between places, even where there is no line-of-sight between them (Historic England 2017a).

7.13 Nothing of the belfry roof structure is visible either externally or from elsewhere within the abbey. There are not considered to be any setting issues in relation to this fabric.

8.0 DISCUSSION

8.1 The belfry roof of Bath Abbey is the result of four principal phases of development. A number of timbers survive from the rebuilding of the abbey c.1500, or perhaps from its restoration in the middle of the 16th century. These include around half the current principal beams, which are chamfered and decorated, together with a number of lesser joists. The roof then appears to have been repaired during the 18th century, perhaps in 1814, using timbers scavenged from earlier contexts. A row of three lower cross-beams was also probably installed around this time, probably for structural support or perhaps as a bell-hoist. The roof was then extensively repaired in the later 19th century under George Gilbert Scott, work which seems to have faithfully replicated the form and decorative flourishes of the original, and which retained many of its principal beams, although the majority of the joists were replaced, and are now lapped over the axial beams rather than jointed into them. The sarking boards may likewise date to this phase, or to the re-leading of the roof in 1947.

8.2 This study has concluded that the earliest phase of the roof structure is of high overall heritage significance, and that its 18th and later 19th century phases of repair are of moderate heritage significance. The sarking boards and 20th century timbers are afforded low heritage significance. There are not considered to be any setting issues in relation to this structure.

8.3 The circumstances of this study meant that close scrutiny of many of the timbers was not possible, meaning that these is considerable potential to refine our understanding of the date, development and nature of this structure as any future repair work progresses. A number of avenues for future research have also been suggested, including the good potential for dendrochronological analysis.

9.0 ACKNOWLEDGEMENTS

9.1 Archaeology South-East would like to thank Antony Feltham-King for commissioning this historic buildings record on behalf of the Bath Abbey, and for supplying drawings of the roof, Christian King for facilitating access, and Cathryn Spence for providing additional background information.

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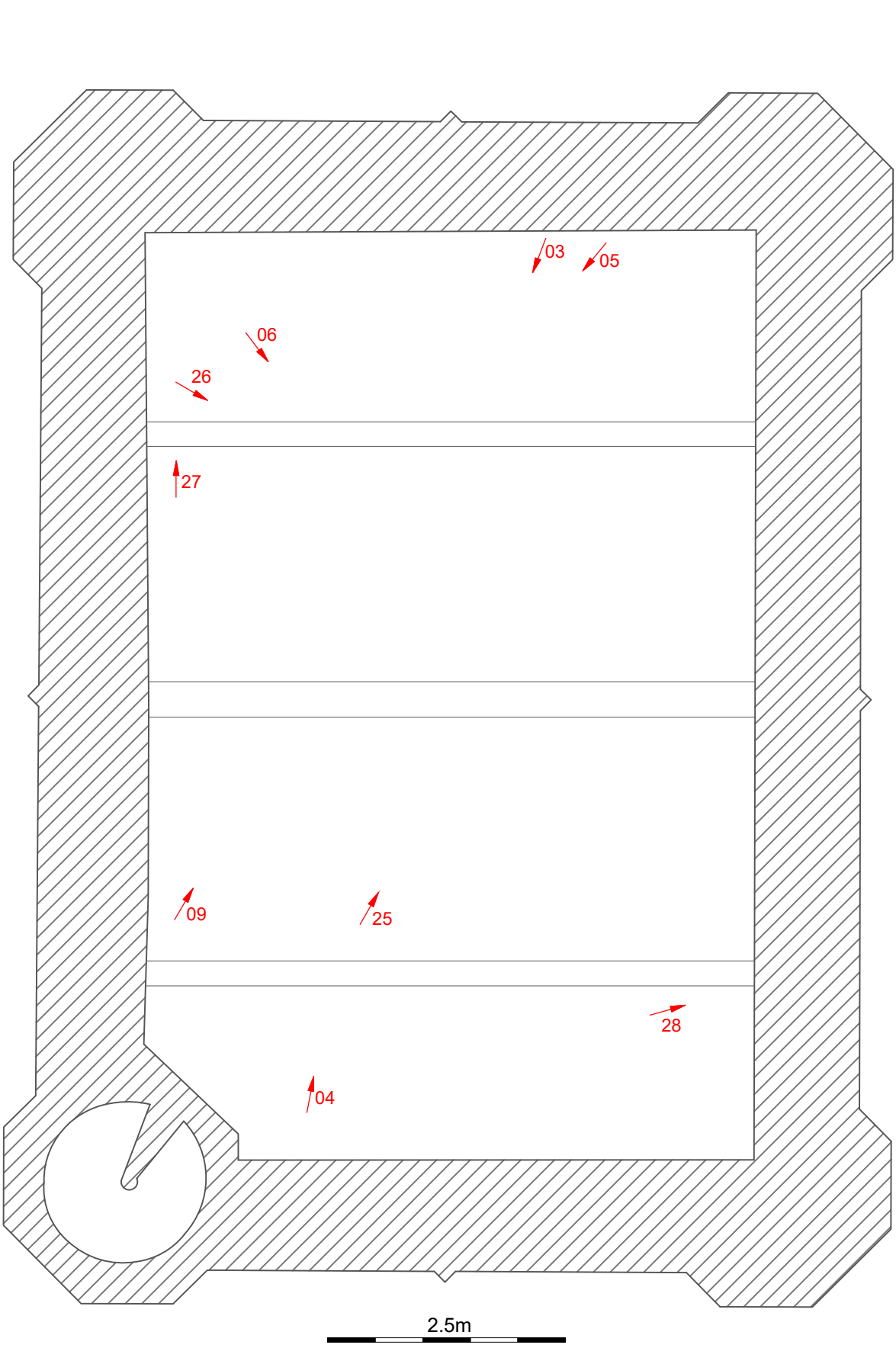
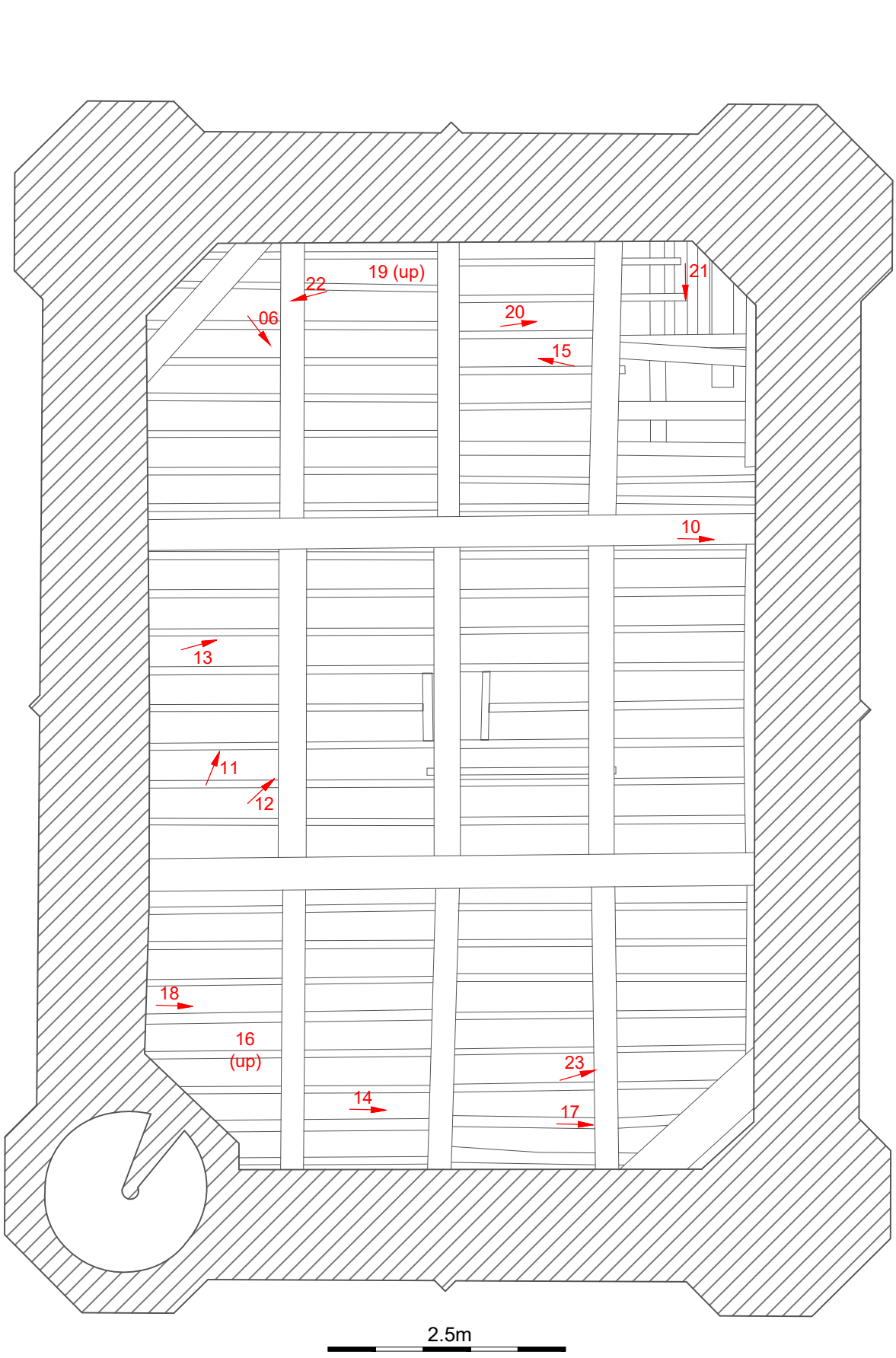
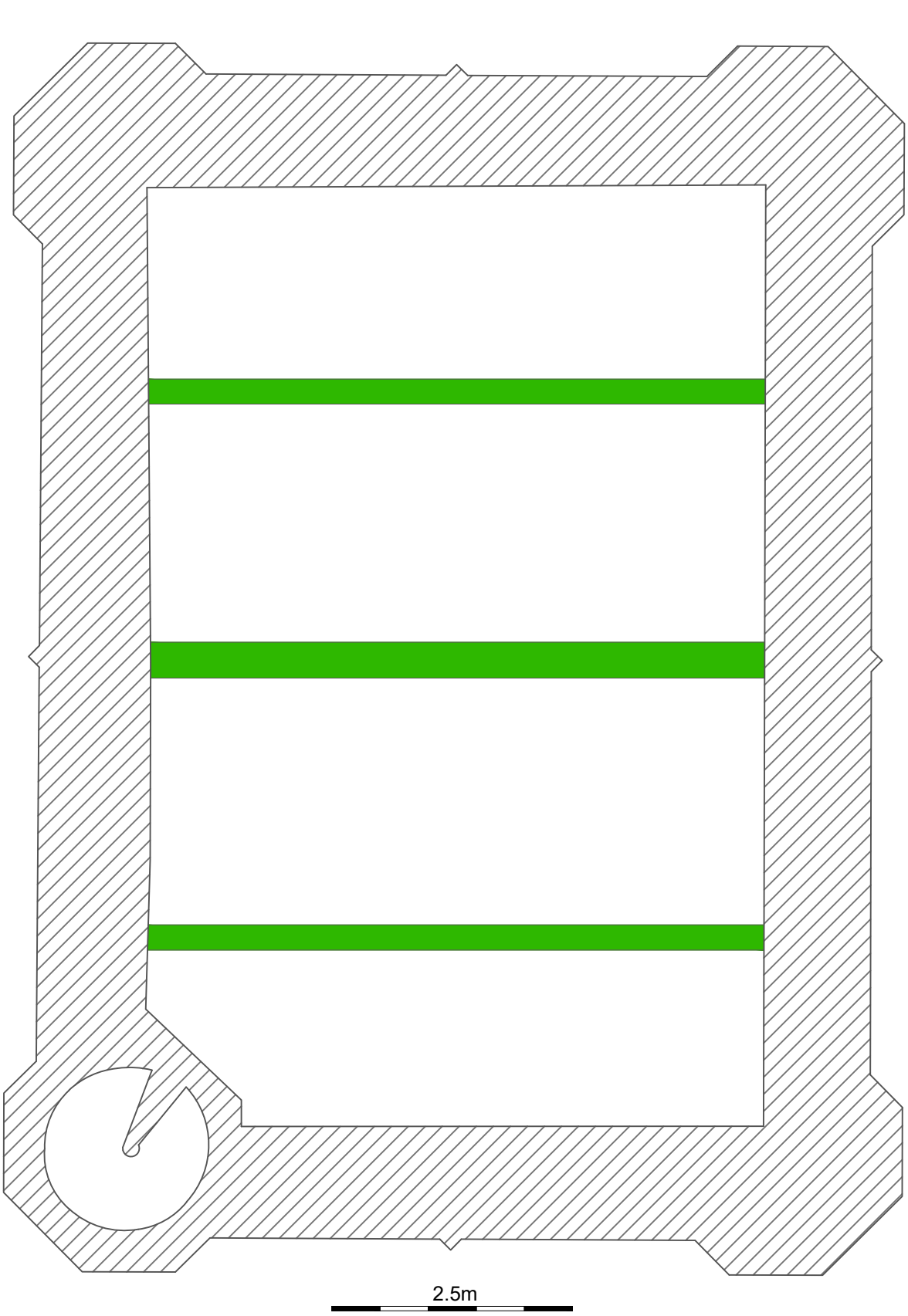
© Archaeology South-East		Bath Abbey: Belfry Roof Structure	Fig. 1
Project Ref: 240405	July 2024	Site Location	
Report Ref: 2024181	Drawn by: LG		



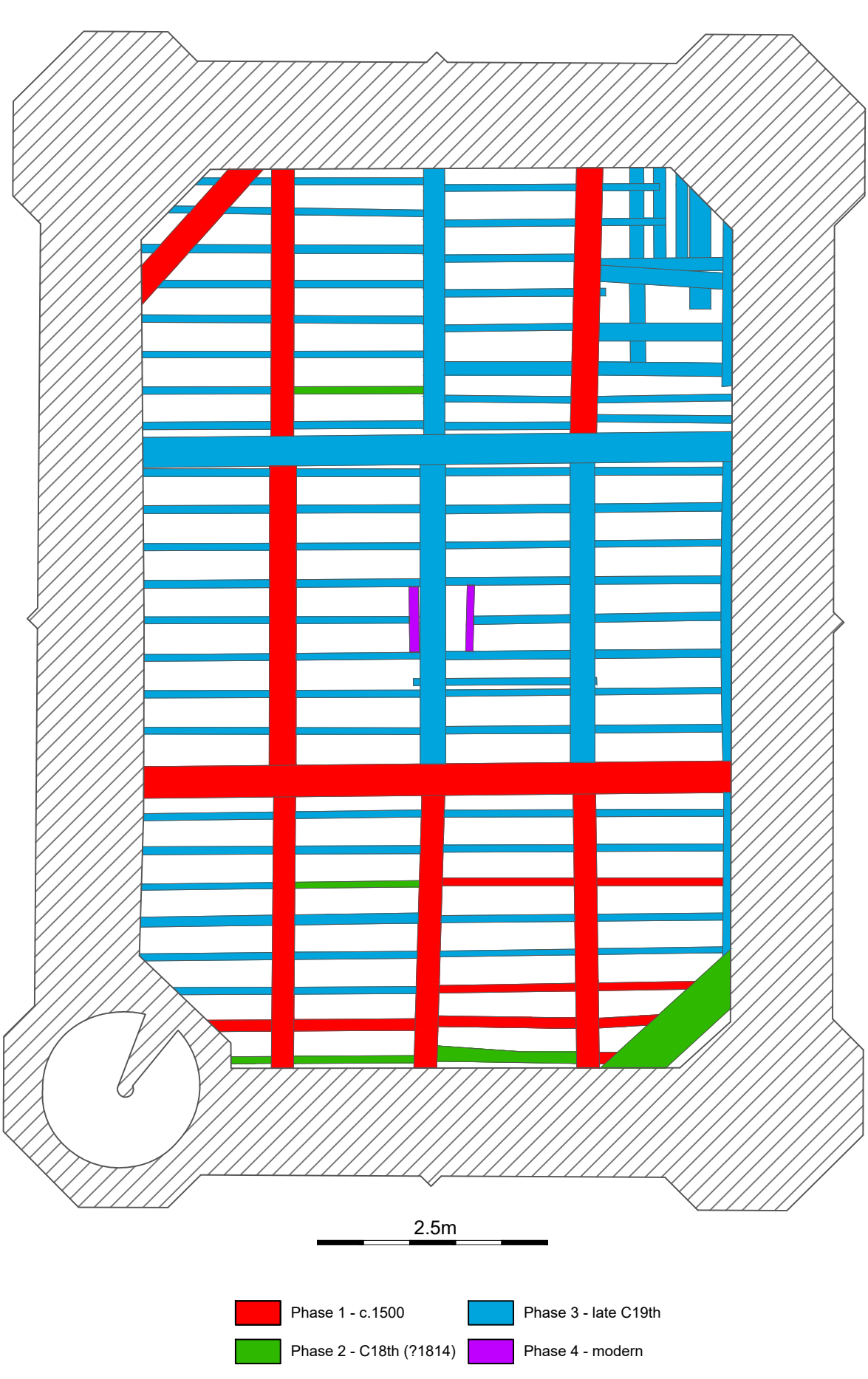
© Archaeology South-East		Bath Abbey: Belfry Roof Structure	Fig. 2
Project Ref: 240405	Aug 2024	Plan of the belfry roof, lower level, with photo locations (adapted from St Ann's Gate Architects Ltd, drawing ref. 1280-07-SK02)	
Report Ref: 2024181	Drawn by: MGS		



© Archaeology South-East		Bath Abbey: Belfry Roof Structure	Fig. 3
Project Ref: 240405	Aug 2024	Plan of the belfry roof, upper level, with photo locations (adapted from St Ann's Gate Architects Ltd, drawing ref. 1280-07-SK02)	
Report Ref: 2024181	Drawn by: MGS		



© **Archaeology South-East**		Bath Abbey: Belfry Roof Structure	Fig. 4
Project Ref: 240405	Aug 2024	Phase plan of the belfry roof, lower level (adapted from St Ann's Gate Architects Ltd, drawing ref. 1280-07-SK02)	
Report Ref: 2024181	Drawn by: MGS		



© Archaeology South-East		Bath Abbey: Belfry Roof Structure	Fig. 5
Project Ref: 240405	Aug 2024	Phase plan of the belfry roof, upper level (adapted from St Ann's Gate Architects Ltd, drawing ref. 1280-07-SK02)	
Report Ref: 2024181	Drawn by: MGS		

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