

## **Saint Peter's Church, Stetchworth** **Observations on the roof during internal repairs** **October 2014**



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## **Introduction**

Observations were made of the timber roof structure at St. Peter's Church, Stetchworth, during renovation works being carried out in October 2014. This followed a request from English Heritage (now Historic England) to have an assessment made of the chronology of the roof. Access to the roof structure was achieved via an internal scaffold and all measurements and observations were made at close quarters.

## **Brief Historic Background**

Saint Peter's parish church lies a little to the north and east of the main body of Stetchworth village (figure 1). The earliest reference to a church at Stetchworth is 1191 when the rectory was annexed to Ely Priory and a vicarage was ordained (VCH 1978). It was known as St Peter's in the 13<sup>th</sup> century.

The VCH records that the church has:

... a chancel, aisled nave, and west tower. The chancel, which has lancet windows, dates from the 13<sup>th</sup> century. The chancel arch and nave of four bays were rebuilt towards the end of the 14<sup>th</sup> century, and the tower arch dates from the same period, although the tower seems to have been altered or rebuilt in the 15<sup>th</sup> century.

The Listed Building description (the church is Grade II\*) adds:

*The octagonal font is 16<sup>th</sup> century, although the base may be older. After the mid-18<sup>th</sup> century a south porch and doorway were removed, as was the chancel screen, and the 'odd square Presbyterian' east window was replaced by one in 14<sup>th</sup> century style, and two quatrefoil windows were inserted in each aisle. The nave and aisles were restored in 1894, when the roof was partly rebuilt, although the original tie beams remain.*

As it stands today the structure above the nave is a Victorian version of a trussed rafter roof, falling within Brandon and Brandon's second division of open timber roofs (1849: 17). The roof type is also discussed in detail by Banister Fletcher (1945: 388-9).

## **Observations and Results**

For ease of reference the elements of the roof have been numbered from west to east, Tie Beams I – IV, rafters 1 – 31 (figure 2).

### ***The Upper Roof Structure***

The roof structure consists of 31 pairs of trussed common rafters, each pair with a collar and four struts (figure 4). The lower struts rest on an inner wall plate, the ends of the common rafters appear to rest directly on the top of the nave wall (there is no sole plate), but have a birds mouth notch to fit over an outer wall plate consisting of two courses of brick and a wooden plate, set 380 – 450mm from the back of the front one. The timber of the main construction (common rafters, collar and struts) is saw cut and uniformly 120mm wide and belongs to the reported rebuild of 1894.

### ***Surviving Elements of the Earlier Roof***

Although the main roof structure is late, it incorporates several much older elements. Principal amongst these are all of three and part of one of the four tie beams and their associated wall posts, the inner wall plate and a section of outer wall plate (figure 3).

#### ***Tie Beams***

There are four tie beams in the roof, located beneath rafters 8, 15, 22 and 29. Tie beams I and II appear largely intact; however III has seen significant damage to its upper face. Tie beam IV, whilst retaining its original lower moulded part has had the top replaced with a saw cut squared timber broadly similar in appearance to the 1894 roof timbers.

<b>Tie Beam</b>	<b>Surviving Length</b>	<b>Ave. Width</b>	<b>Depth at centre</b>	<b>Depth at ends</b>	<b>Notes</b>
I	6.79m	230mm	300mm	250mm	
II	6.82m	240mm	302mm	278mm	
III	6.80m	250mm	-	-	Depth not measured due to damage
IV	5.97m	220mm	-	-	Depth not measured – replacement timber

Table X: Tie Beam Dimensions

The two best-preserved Tie Beams (I and II) are canted with a thickness difference between the middle and the ends varying between 50 and 76mm.

Tie Beams I, II and III lie across the top of the wall with the inner wall plate tenoned into mortices on either side. At Tie Beam IV, the end of the beam sits in a notch in the inner wall plate and does not extend as far back as the outer plate. The nave walls at this point are c. 115mm further apart than at the west end and it is possible that this has influenced the arrangement. This difference in width (most probably due to movement in the north wall over the centuries), however, does not really explain why this tie beam is not as long as the other three.

Tie Beams I, II and III have been cut short to accommodate the later outer wall plate. It was observed that at both ends of Tie Beams I and III and at the south end of Tie Beam II this had cut through a mortice in the upper face of the beam (figure 5). The lower struts of rafter pairs 8, 15 and 22 make use of a second mortice in the top of the beams, c. 400mm inside the outer one. The outer mortice indicates the position of the common rafters in the earlier roof. There is no evidence that any of the tie beams supported a central pillar as seen in some roofs of the type.

The lower edge of each tie beam (including IV, of which only the upper part has been replaced) has a moulded decoration extending for the entire length (figures 5, 10). At each end is a solid curved brace, effectively an integral brace and spandrel or spandrel bracket. These have carved decoration on both faces as noted below; four distinct designs were noted (figures 6-9).

TBI – east face - north and south ends match (design 1); west face - north and south ends match (design 2) (i.e. the front and back of each spandrel has a different design).

TBII – all spandrel brackets the same (design 3)

TBIII - all spandrel brackets the same (design 3)

TBIV - all spandrel brackets the same (design 4)

The spandrel brackets are a single piece of shaped timber (100mm thick, 810mm high, 796mm long) fitted into a slot cut into the lower moulding on the tie beam and into the shaped front of the short wall posts (1.14m long), themselves resting on carved corbels below. At the south end of TBIV, where the bracket has pulled away slightly, iron nails have been inserted in an effort to keep the brace in place. These are remedial rather than original components.

#### *Inner Wall Plate*

The front face of the plate has a moulded decoration (figures 5, 10) and extends 110mm forward from the wall face. The timber is 250mm high and a maximum 190mm deep. Where the inner wall plate meets Tie Beams I, II and III it is tenoned into mortices cut in either side of the beams. As noted above at Tie Beam IV it continues beyond the beam with a notch cut in to receive the end of the tie beam.

#### *Outer Wall Plate*

A single section of the original outer wall plate is still *in situ*, although not in use (figures 5, 10). It is located at the west end of the north wall, between Tie Beam I and the tower wall. The plate is tenoned into a mortice on the west side of TBI. There is a matching mortice on the east side but the timber is missing. The present wall plate at this point is made up by a single course of bricks on top of the old plate with a wooden plate on top.

Cut into the front face of the plate are six notches varying in width from 160mm to 190mm and set on centres varying between 540mm and 520mm (compared to the regular 510mm on centres of the 1894 roof). The face of the notches are angled at c. 66°. The wall plate timber is cut slightly shorter than the distance to the end wall leaving sufficient space for a further notch to have been present. This would indicate that the earlier roof, whilst not perhaps as regular as the later, contained the same number of trussed rafters.

#### *Evidence of earlier roofline*

At each end of the nave, but rather clearer at the west end on the tower wall, are “ghosts” of the line of the earlier roof (figure 11). These both indicate that the earlier roof was pitched just a little lower than the replacement and that the seven-sided tunnel effect sat a little lower on the wall. It proved possible to take measurements of both length and angle on some of these ghosts, which have been used together with information from the other *in situ* timbers to recreate the trusses as shown in figure 4.



## **Discussion**

The evidence present in the surviving elements of the older roof indicates that the 1894 version probably replaced the old with, in effect, a copy. There are some differences in that the mortice positions in the tie beams and 'ghost' marks on the walls at the west and east ends of the nave indicate that the older roof had a slightly lower pitch, but the overall impression from below would have been that little had changed.

The roof is of a single framed or trussed rafter type, of which many survive in churches across England. It is thought likely that the intent of the roof form was to form headway or a space to accommodate pointed vaults, but the main effect is to present the appearance of an arched tunnel-like ceiling, heptagonal in shape (Brandon & Brandon 1849: 17). In many instances this is boarded and often decorated. Many have no tie beams, but in earlier versions the tie beams are retained such as at St Leonards' Church at Sandridge in Hertfordshire, which also has short wall posts resting on corbels beneath the tie beams. The construction at Sandridge, however, is much "chunkier" and the tie beams support central posts which the Stetchworth ones did not.

The form of the roof seen at Stetchworth is likely to be 13<sup>th</sup> or at the latest 14<sup>th</sup> century in date. As noted above the nave, originally 13<sup>th</sup> century in date, was rebuilt in the 14<sup>th</sup> century including the pointed chancel arch. Given that the 'ghost' roof line at the east end sits above the top of the chancel arch, easily accommodating its point as is suggested was one of the purposes of such roofs, it is proposed that the roof probably belongs to this 14<sup>th</sup> century rebuild phase, a little late for some roofs of the type, but still within the time span suggested for them. A firm determination of the date can only be made by use of dendrochronology.

## **Acknowledgements**

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*Site work was conducted by the author. Graphics by Vicki Herring and the author, photographs are by the author. The works were monitored for the DAC by Dr Tim Reynolds, DAC Archaeologist.*

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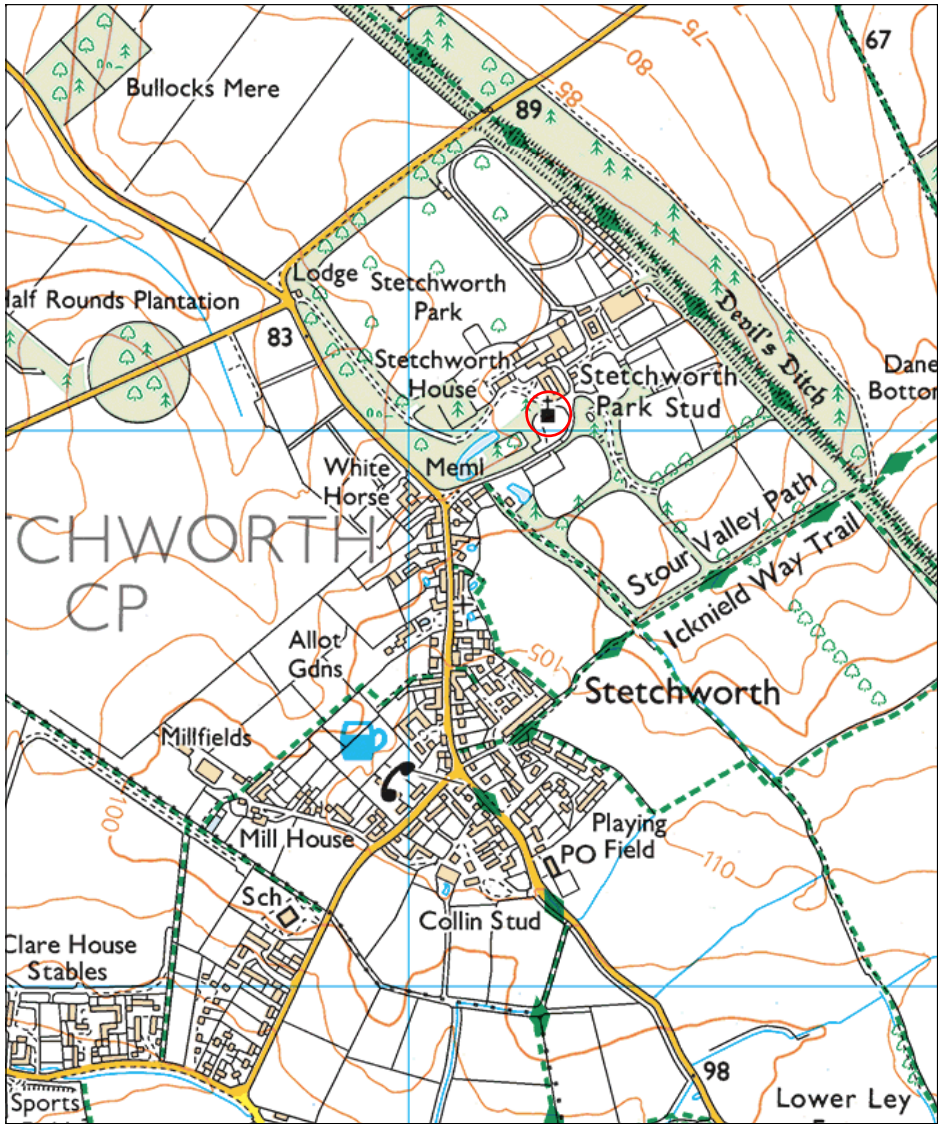
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Figure 1. Site location

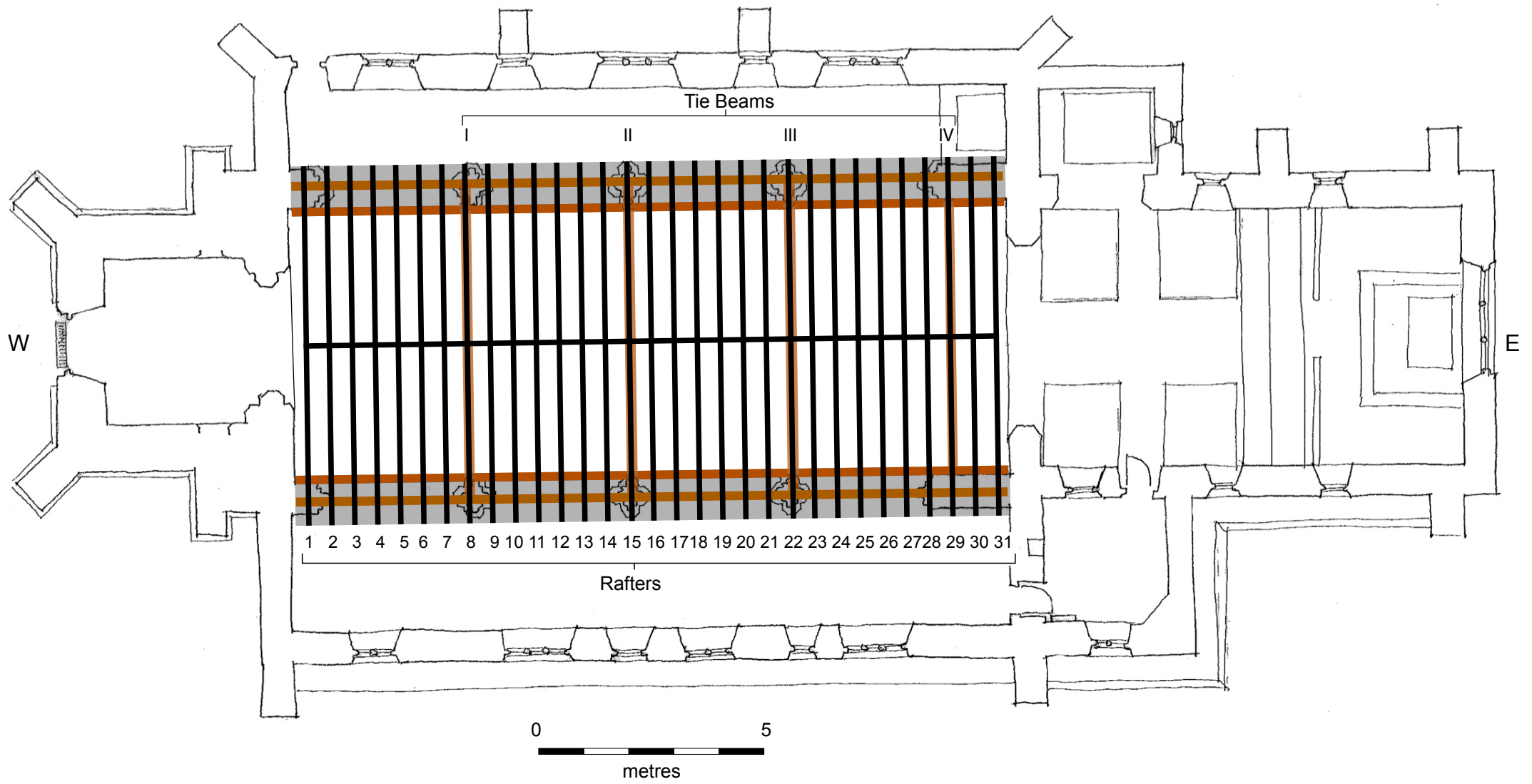


Figure 2: Plan of Existing Roof Structure

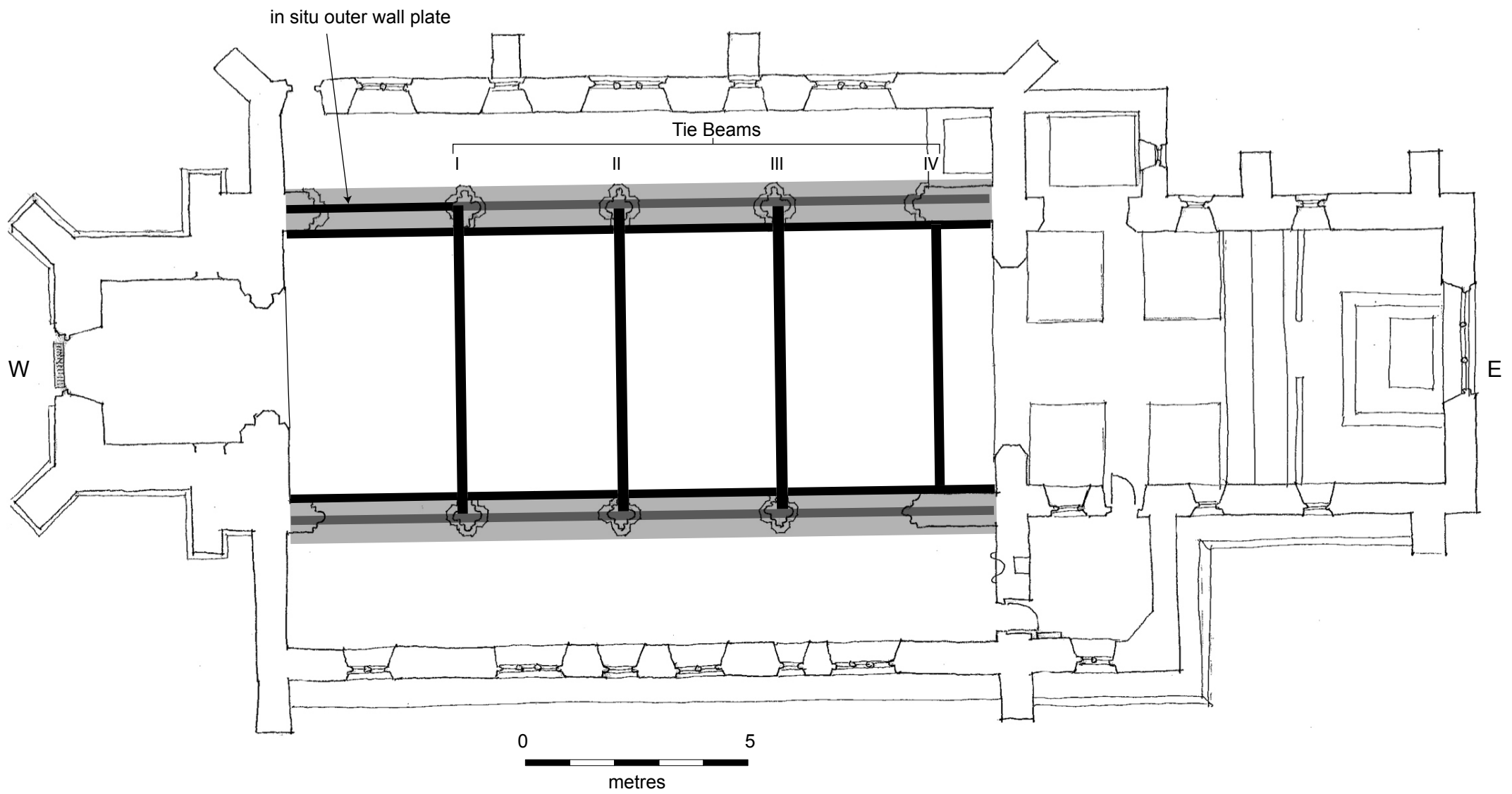
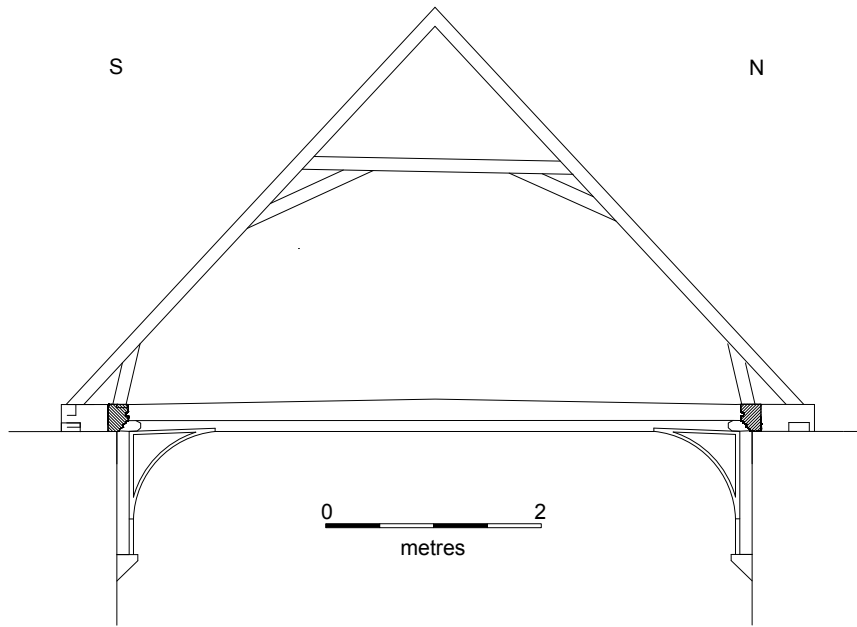
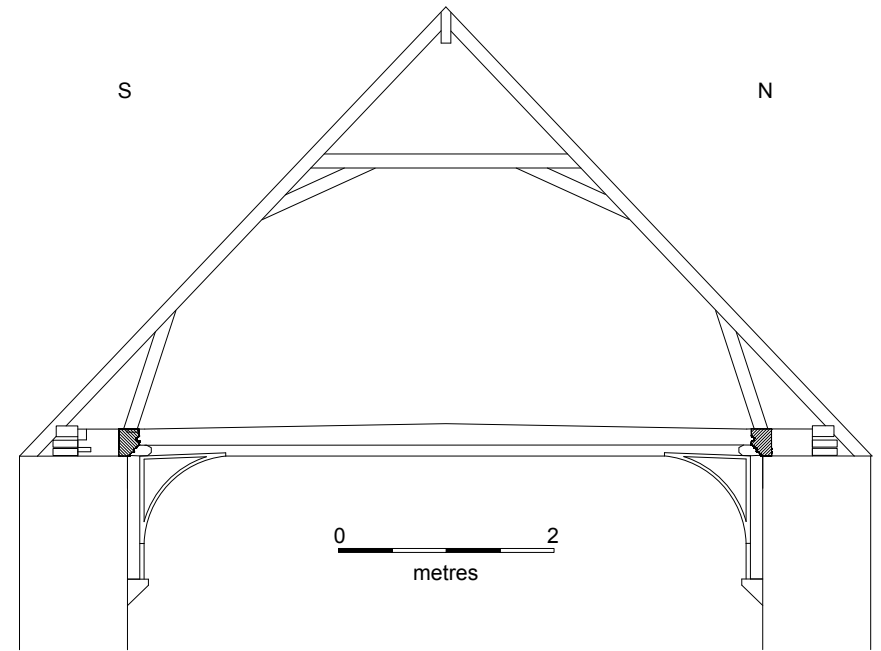


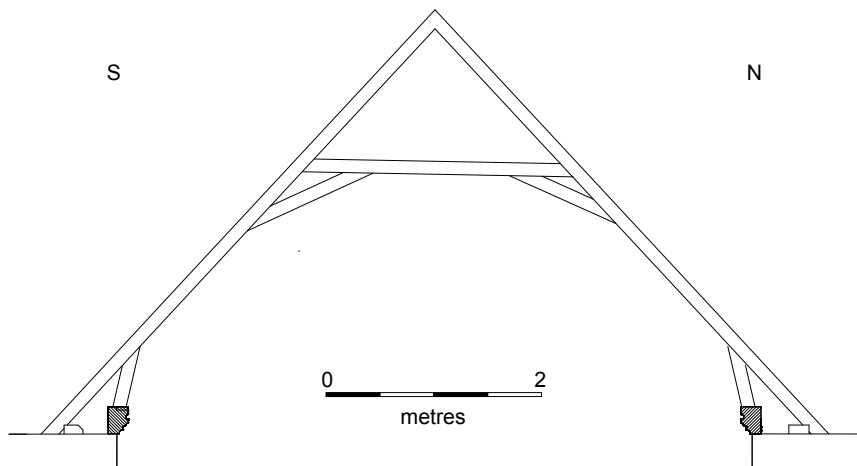
Figure 3: Surviving Elements of Older Roof Structure



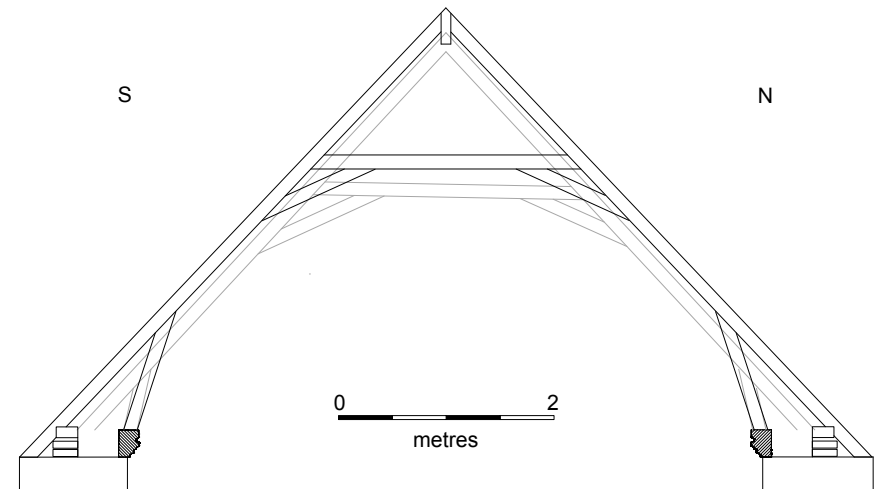
Trussed Rafter 8 and Tie Beam I (reconstructed)



Trussed Rafter 8 and Tie Beam I (existing)



Typical Trussed Rafter (reconstructed)



Typical Trussed Rafter (existing) - reconstructed in grey for comparison

Figure 4: Existing and Reconstructed Roof Structure

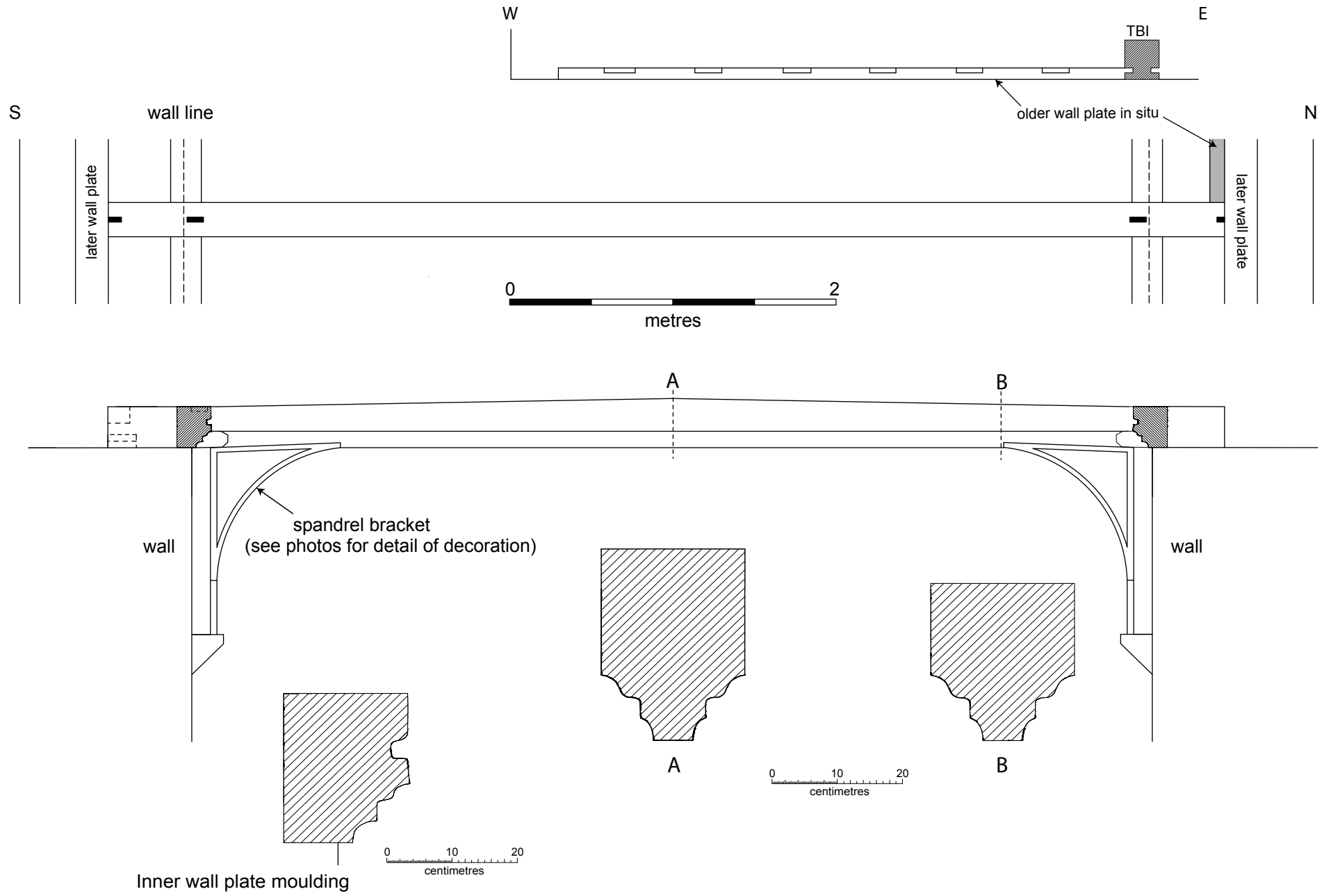


Figure 5: Tie Beam I and Wall Plates with details





Tie Beam I southeast (design 1)



Tie Beam I northeast (design 1)



Tie Beam I southwest (design 2)



Tie Beam I northwest (design 2)

Figure 6: Tie Beam I Spandrel Bracket Decoration Details





Tie Beam II southeast (design 3)



Tie Beam II northeast (design 3)



Tie Beam II southwest (design 3)



Tie Beam II northwest (design 3)

Figure 7: Tie Beam II Spandrel Bracket Decoration Details





Tie Beam III southeast (design 3)



Tie Beam III northeast (design 3)



Tie Beam III southwest (design 3)



Tie Beam III northwest (design 3)

Figure 8: Tie Beam III Spandrel Bracket Decoration Details





Tie Beam IV southeast (design 4)



Tie Beam IV northeast (design 4)



Tie Beam IV southwest (design 4)



Tie Beam IV northwest (design 4)

Figure 9: Tie Beam IV Spandrel Bracket Decoration Details





(a) Inner wall plate moulding detail



(b) Tie Beam I moulding detail



(c) Earlier outer wall plate tenoned to TBI



(d) Front notch in earlier outer wall plate

Figure 10: Photographs





Tie Beams II, III and IV from Nave floor looking East



Tie Beams III, II and I looking West

Figure 11: Roof Structure Before and in Early Stages of Work (photos supplied by Freeland Rees Roberts Architects)

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### Project details

Project name	St Peter's Church, Stetchworth
Short description of the project	Observations were made of the timber roof structure at St. Peter's Church, Stetchworth, during renovation works being carried out in October 2014. The results indicate that the present upper roof structure (dating to 1894) largely replicates a much older roof, elements of which remain in situ. This is a trussed rafter roof, with four tie beams and the original probably dated to a rebuild of the nave in the 14th century.
Project dates	Start: 22-10-2014 End: 27-10-2014
Previous/future work	No / No
Any associated project reference codes	ECB4504 - HER event no.
Type of project	Building Recording
Site status	Listed Building
Current Land use	Other 2 - In use as a building
Monument type	ROOF Medieval
Significant Finds	NONE None
Methods & techniques	"Annotated Sketch","Photographic Survey"
Prompt	Conservation/ restoration

### Project location

Country	England
Site location	CAMBRIDGESHIRE EAST CAMBRIDGESHIRE STETCHWORTH St. Peter's Church
Postcode	CB8 9TN
Study area	0 Square metres
Site coordinates	TL 64249 59028 52.2045254641 0.40391578022 52 12 16 N 000 24 14 E Point
Height OD / Depth	Min: 103.00m Max: 103.00m



**Project creators**

Name of Organisation	Cambridge Archaeological Unit
Project brief originator	Diocesan Archaeologist
Project design originator	Alison Dickens
Project director/manager	Alison Dickens
Project supervisor	Alison Dickens
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Name of sponsor/funding body	St. Peter's Stetchworth PCC

**Project archives**

Physical Archive Exists?	No
Digital Archive recipient	Cambridge Archaeological Unit
Digital Contents	"none"
Digital Media available	"Images raster / digital photography","Text"
Paper Archive recipient	Cambridge Archaeological Unit
Paper Contents	"none"
Paper Media available	"Drawing"

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