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## **LITTLE WIGBOROUGH ST NICHOLAS**

Observations ancillary to the Colchester Archaeological Trust  
excavation reports 2005

Fabric assessment, observations and theories, by D. Andrews  
E-mail correspondence following the completion of the second CAT report

### **Little Wigborough, St. Nicholas. An assessment of the fabric**

The Royal Commission on Historical Monuments dates the church to the 15th century. Their criteria for dating were usually dependent on the mouldings and windows. At Little Wigborough, these are consistent in style and indicative of a 15th-century date. More than that, the church is uniformly built of Kentish Ragstone ashlar in rather small blocks. Rag was probably most commonly used in Essex churches in the 15th century. But masonry of this small size, and also so well cut, is unusual. There can be no doubt that this masonry is original and not part of the 19th century rebuild, partly because it would have been difficult to replicate. The investigatory hole examined by the Colchester Archaeological Trust in the north-west corner of the nave has revealed that the nave wall has foundations about 1.12m deep, below an offset 170mm wide and about 230mm below floor level. These foundations are made of coursed stones, mainly flint, and are unquestionably medieval. A problem with the 15th-century build is the presence of five buttresses on the north side, whilst there are only three on the south. Whilst it would be logical to regard these as dating from after the earthquake, they look integral to the medieval church walls.

It can be conjectured, therefore, that the church is a complete rebuild in the 15th century of an earlier building, either stone or wood, on the original site or possibly to one side of it, and within a pre-existing graveyard. Significant interventions after the 15th century, and before the 19th century, are not readily apparent. The roofs, however, may have been constructed in the 17th century. A moulded string course at the top of the chancel walls is an anomalous feature which would fit better with a parapet and cambered or almost flat roof. It is almost certain that the chancel once had such a roof. The nave roof is of butt purlin type, with two purlins and two collars. The lower collars once suspended ceiling joists; whether this was the original arrangement is uncertain. From below, it is difficult to assess the age of the principal roof timbers, but they are probably original. Butt purlin roofs in Essex are usually 17th century in date. This raises the question as to why it was necessary to replace a 15th century roof after only 2-300 years. The nave may well have had a parapet and a low roof originally, but it is less possible to be confident about this than in the case of the chancel.

A brick repair to the buttress east of the north door may pre-date the earthquake. After the 1884 earthquake, the roofs were substantially replaced (the rafter feet look 19th-, not 17th-century). The top of the north wall of the nave has been rebuilt in brick, apparently bonded with a cement mortar, as it has become detached from the medieval masonry of the wall. This looks almost like a ring beam, and presumably was done when the roof was rebuilt, though it may be more recent. The late 19th-century masonry is recognisable by the use of septaria. This occurs at the top of the tower, in the gables at the west ends of the nave either side of the tower, and in the gable of the east wall of the chancel. The investigatory hole in the nave shows that the tower arch was underpinned in brickwork. An asphalt damp course at the base of the tower walls indicates that the tower must have been underpinned. There is evidence for two modern phases of tile flooring. The existing glazed dark red floor tiles are overly slightly larger and thicker than floor tiles, which were probably laid after the earthquake.

The western part of the north wall has moved outwards, especially at the north-west corner, where, as noted above, it has become detached from the wall top rebuilt in brick. It is difficult to isolate reasons for this, beyond the underpinning of the tower which is likely to have provoked differential movement, but the following might be worth taking into consideration:

- Shrinkable clay subsoil. A core from a test borehole consisted of brown silty clay.
- Geological and archaeological features. The former could be, for instance, an infilled channel. In the test hole in the church, the clay was disturbed to a depth of at least 1m. Carl Crossan notes that Bakers found the hole easier digging on the south side, where the clay contains charcoal. The rebuilt 15th-century church might overlie earlier graves.
- Tree roots. Although these might have contributed to the problem, I cannot see them to be the prime cause.
- The profusion of buttresses on the north side. If original, then the builders were aware of some problem here. Previous investigation has shown the buttresses at the north-east corner to be rebuilds. Why is there no movement in the south side?
- How thick is the Rag ashlar facing? Is it keyed back adequately to the main wall core? Are there voids in the wall?
- Could a change in roof design have aggravated the problem (i.e., greater deflection from a steeply pitched roof)?
- The extent and nature of the underpinning which has been carried out. The parish registers apparently record underpinning with steel girders, ?c.1908, but no evidence for this has been seen in any of the investigations.

It is likely that the movement in the north wall has been caused by a number of factors. Further investigation could comprise:

- Checking the registers in the Essex Record Office.
- Geophysical surveying to check for geological and archaeological anomalies (though personally I would not be hopeful of obtaining very clear results).
- Investigating the top of the north wall for further information on the roof construction, on whether the Rag is tied back to the wall core, on whether or not there are voids in the wall core, and on the rebuild of the wall top.
- Test pits to see if the buttresses against the north wall are original and if there is underpinning (e.g., with steel girders)?
- Test pits against the exterior of the tower to determine the nature of the underpinning.
- Examining the roof timbers to check their date.

*[This report largely hypothetical based on a rapid examination of the church]*

D. Andrews  
March 2005

## Little Wigborough

*Trench by south door* Nave has massive Ragstone foundations bonded with lime mortar. The former had similar foundations but not so deep, cut by a grave. The soil here is a well mixed clay loam.

*Conclusion:* the 15th-century church was provided with very deep foundations of exceptionally large Rag blocks.

*Trench against south side of tower* The west wall of the nave has massive foundations. A crack runs through them and there is slight evidence of subsidence. The tower has deep foundations of concrete underlying red frogged bricks. A cut can be seen for the rebuilt foundation.

*Conclusion:* the tower has been totally underpinned or more probably rebuilt after the earthquake.

*Trench against north chancel wall, adjacent to intermediate buttress* The wall has very deep Ragstone foundations as seen on south side, but there is concrete underpinning beneath them and the Rag is bonded or pointed with cement mortar. The soil here is heavy clay, though brick/tile inclusions indicate it is not natural.

*Conclusion:* The wall has been underpinned. Since the Rag can hardly be underpinning, it looks as if the old foundation has been cemented up. The buttress has similar foundations and they look as they might butt the chancel foundations. The buttress must represent a rebuild, but possibly a late medieval one rather than a 19th-century one.

*Trench against north nave wall, adjacent to intermediate buttress* The foundations are as in the trench to the east, and the conclusions are the same. Similarly, the buttress looks possibly added.

**General conclusions** The masonry of the church is medieval. The apparently total 15th-century rebuild could imply that the previous church was in a very poor condition.

The north-east corner of the chancel has been rebuilt, angle buttresses replacing a diagonal buttress like the one at the south-east corner. The top course of the plinth is at a different level and is chamfered, not hollow chamfered. The foundations of large blocks of Rag are similar to the unquestionably original foundations seen on the south side, and presumably therefore are a different date to the rebuilding of the tower. This could represent a late medieval repair.

The north wall has been underpinned in concrete and the original deep foundations pointed or repaired with cement.

The tower has been completely underpinned or rebuilt?

The soil on the north side has in places a much greater clay content than on the south. Soil conditions are rather variable round the church and probably within its footprint.

Tree roots do not seem to be a problem.

The depth of the foundations means that little can be achieved by underpinning?

### Little Wigborough, St Nicholas. Some theories

By taking a very simple, and possibly simplistic view, of the observations which have been made and the information we now have, I suggest the following interpretations of some of them:

- The neatly coursed flint wall seen inside the church *looked* typically 12th- or 13th-century, and could be older than the external Ragstone masonry. It could be that the church was rebuilt in the 15th century incorporating some of the earlier masonry and walling, possibly over some of the old foundations. If this earlier fabric had been in a poor condition, or experienced structural problems on the north side, this might explain the extra buttresses present on this side.
- North wall underpinning. My feeling is that the large Ragstone blocks are medieval but have been repointed and possibly to some extent rebbed with cement, and underpinned with concrete, after 1884.
- Tower underpinning. David's point is correct. Underpinning is done in sections, and the brick footings are not made that way. There are two possibilities: that the tower was completely rebuilt on new foundations, or that the brickwork is built up round the old foundations. In the past, what could be called concrete ring beams have been put round church foundations. We have encountered them at Eastwood and St Osyth. Close examination of the fabric of the tower should clarify whether it is 15th-century or post-1884. One problem is what date should be assigned to the septaria rebuild at the top. It is this which makes me think that the tower was not completely rebuilt.
- In view of the concrete (F9) found right at the very bottom of test pit 1, I should think that the obstruction found during the piling was more of the same but on the north side of the tower.

We have puzzled over the character of the Ragstone masonry. Similar Rag ashlar can be seen in the south aisle of Rochford church.

D. Andrews  
April 2006

**David Andrews ESB HB&D Sp AdES**

**From:** Kate Orr [kateo@catuk.org]  
**Sent:** 25 April 2006 12:04  
**To:** david; Simon Wood; HUGHES, Trudi  
**Cc:** David Andrews; Ed Morton; jack@van-elle.co.uk  
**Subject:** Re: Little Wigborough

Dear David,

I have talked to Howard about the tower/underpinning and I think I understand what you are getting at. I think we used the word 'underpinning' in our report somewhat loosely and that the archaeological evidence (both from our test-pit 1 and the trench dug around the piles) could support either of Simon's theories. Yes, the brickwork and concrete **could** be supporting a complete rebuild of the tower. The only thing that makes me think the brickwork and the concrete underneath are not contemporary with each other is a cut for a trench (F4) which was just discernable through the post-earthquake working layer (L2). The cut extends to the bottom of the brickwork but not to the bottom of the concrete. In the two test-pits on the northern side of the church there was no cut through L2. We did not speculate as to whether the tower was a complete rebuild or not as the archaeological evidence does not give a definite answer either way.

The hole dug inside the church in Feb 2005 shows that they have kept the original stone foundations on the return walls of the tower and replaced the foundations of the tower arch with brick. However this does not answer the question of whether the brickwork we recorded under the exterior wall of the tower goes all the way through or is a facing for the original fabric.

As for the impenetrable ragstone foundations at the angle of the tower and the north western nave wall, I don't think there was a question about them being underpinning. They are more likely to be the original 15th century foundations (see appendix of our report). One piece of foundation stone was shown to a geologist. He confirmed it to be a limestone from the south coast of Britain. Although not Ragstone, it may derive from the same deposit in Kent (information from Keith Oak). Most of the nave foundations seen here appeared to be of this type of limestone.

I hope this helps.

Kate Orr  
 CAT

----- Original Message -----

**From:** david  
**To:** Simon Wood ; HUGHES, Trudi ; Kate Orr  
**Cc:** David Andrews ; Ed Morton ; jack@van-elle.co.uk  
**Sent:** Monday, April 24, 2006 9:35 AM  
**Subject:** Re: Little Wigborough

Thanks Simon

The brickwork is continuous into the nave, because you will remember seeing the new foundation under the tower arch responds in the internal trial hole: This is complete with an asphalt DPC on the inside. I would not have asked anyone to dig under the tower arch load. All virtually impossible with underpinning and certainly not economic or practical. Then there are the straight joints between the tower walls and nave return walls as further evidence of new build.

David

----- Original Message -----

**From:** Simon Wood  
**To:** HUGHES, Trudi ; david ; Kate Orr  
**Cc:** David Andrews ; Ed Morton ; jack@van-elle.co.uk  
**Sent:** Monday, April 24, 2006 9:17 AM

**Subject:** RE: Little Wigborough

What struck me most about the brickwork was how good it was - it was not typical of underpinning, rather almost facework in quality. It appears, although I am not sure whether the archaeology backs it up, that a concrete pad was laid and then the brickwork built up and the tower built anew on top of that - alternatively the concrete was put in and the brickwork you see is merely supporting the facework of the tower to whatever depth the brickwork is - so there might be an original structure still behind the brickwork.

Regards

**Simon Wood**

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**From:** HUGHES, Trudi [mailto:Trudi.Hughes@english-heritage.org.uk]  
**Sent:** 24 April 2006 09:00  
**To:** david; Kate Orr  
**Cc:** Simon Wood; David Andrews; Ed Morton; jack@van-elle.co.uk  
**Subject:** RE: Little Wigborough

All

I do agree with David's observations with regard to the practicalities of building (paras 1 & 2 refer).....

Trudi Hughes  
Historic Buildings Surveyor  
Bedfordshire & Suffolk Team  
English Heritage  
T 01223 582739 (office)

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**From:** david [mailto:david@suffolk-architects.com]  
**Sent:** Thu 20/04/2006 11:26  
**To:** Kate Orr  
**Cc:** Simon Wood; HUGHES, Trudi; David Andrews; Ed Morton; jack@van-elle.co.uk  
**Subject:** Re: Little Wigborough

Kate

Thanks for this. Can I beg a bit more of your time to help us understand the building sequence? Looking again at your photo 0024 I would assume that it is an excavated trench with continuous concrete strip and stepped brick work foundation typical of new 1886 construction. An underpinning would never be done like this, so I would like to

25/04/2006

know of other evidence that has led you to state it is definitely an underpinning.

Underpinning is done in three foot alternate section to avoid collapse and therefore day work joints are visible in the brick and concrete work. Steel bars are used to connect the sections of concrete together (being pushed half their length into the sub-soil and later exposed for the next section of footing). On photo 0031 the tight joints strongly suggest entirely new build from footing up: If underpinning it is impossible to achieve a tight straight joint where hardening up to the existing. In this photo we see very tight brick joints neatly bonded passing, that protrude into the church for the depth of the north west return wall (impossible if underpinning) and the dpc in a straight line with all the stone work neatly and tightly bonded starting at a precise distance below the ground level.

During this phase of underpinning it was proposed to cast a continuous piled raft under the corner masonry; Jack Yareham reports in writing to Ed Morton that it took four operatives one day to make two holes 200mm deep and "granite must be present"! We know ragstone is literally rock hard and could not have been previously cut out for underpinning and produce such neat straight lines that exist and show in your photographs as attached. The through depth slab was abandoned and the concrete cast against the walls with tendons, diamond drilled through the wall for support. We are forwarding as built drawings when further information is received from Jack and Ed.

I would like to record on the drawings the depth of ground water as it is an influence on on-going movement on the remainder of the walls and floor (which maybe the next phase of repairs).

I am asking Simon Wood, Ed and Trudi to verify this practical construction interpretation of the evidence in the construction and to ask if the sequence of builds can then be judged against the evidence of cuts in the soil.

David

----- Original Message -----

**From:** Kate Orr

**To:** david

**Sent:** Wednesday, April 19, 2006 10:21 AM

**Subject:** Re: Little Wigborough

Dear David,

We recorded an obstruction at 1.2- 1.4m below ground level in the two piles nearest the tower. Perhaps the obstruction could have been something similar to the hard concrete surface encountered at the base (1.3m) of our Test-pit 1 which was dug by the tower (F9, see first photo attached). This was underneath the concrete underpinning which in turn was below the brick underpinning. The obstruction was probably was not the buttress/nave foundation because when the contractors dug the trench around the piles, the foundations were seen to have just one offset and they tapered in towards the tower. Of course if the trench had been dug deeper we would know whether the buttress/nave foundations were wider deeper down (see the appendix of our report and the two other photos attached).

I am afraid I have no record of what depth the water was recorded but I could ask Dave who was on site whether he remembers. The type of ground recorded during the drilling of the remaining piles outside the church was just mud I believe with no artefactual material to indicate it being anything other than natural alluvium or london clay.

Best Regards

Kate Orr

CAT

----- Original Message -----

**From:** david

**To:** Kate Orr

**Cc:** Ed Morton ; John Drage

**Sent:** Thursday, April 13, 2006 4:48 PM

**Subject:** Little Wigborough

Kate

We have at last received the piling logs for verification and I would be grateful for any comments from your watching brief.



Pile	Diameter	Date Drilled	Date Concreted	Pile Length	Soil Type	Ground Water Depth
Remarks/Obstructions						
1	200	12/12/05	12/12/05	8		
2	200	12/12/05	12/12/05	13.4		
3	200	16/12/05	16/12/05	8		
4	200	16/12/05	16/12/05	8		
5	200	15/12/05	15/12/05	9.4		DTH
2.5						
6	200	15/12/05	15/12/05	8		DTH
2.5						
7	200	13/12/05	15/12/05	11.4		
8	200	13/12/05	15/12/05	8		

I assume the 2.5m obstruction is the church foundation that was encountered, that caused extra cost.

The log is signed off by S. Thompson of van Elles on 16th December 2005 as numbers and depths checked.

I would like to know the depth of ground water to mark on the as built drawings, but understand a drain or water course hampered the work and de-watering was required? Also the ground type at the depths noted.

David

Yours sincerely

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