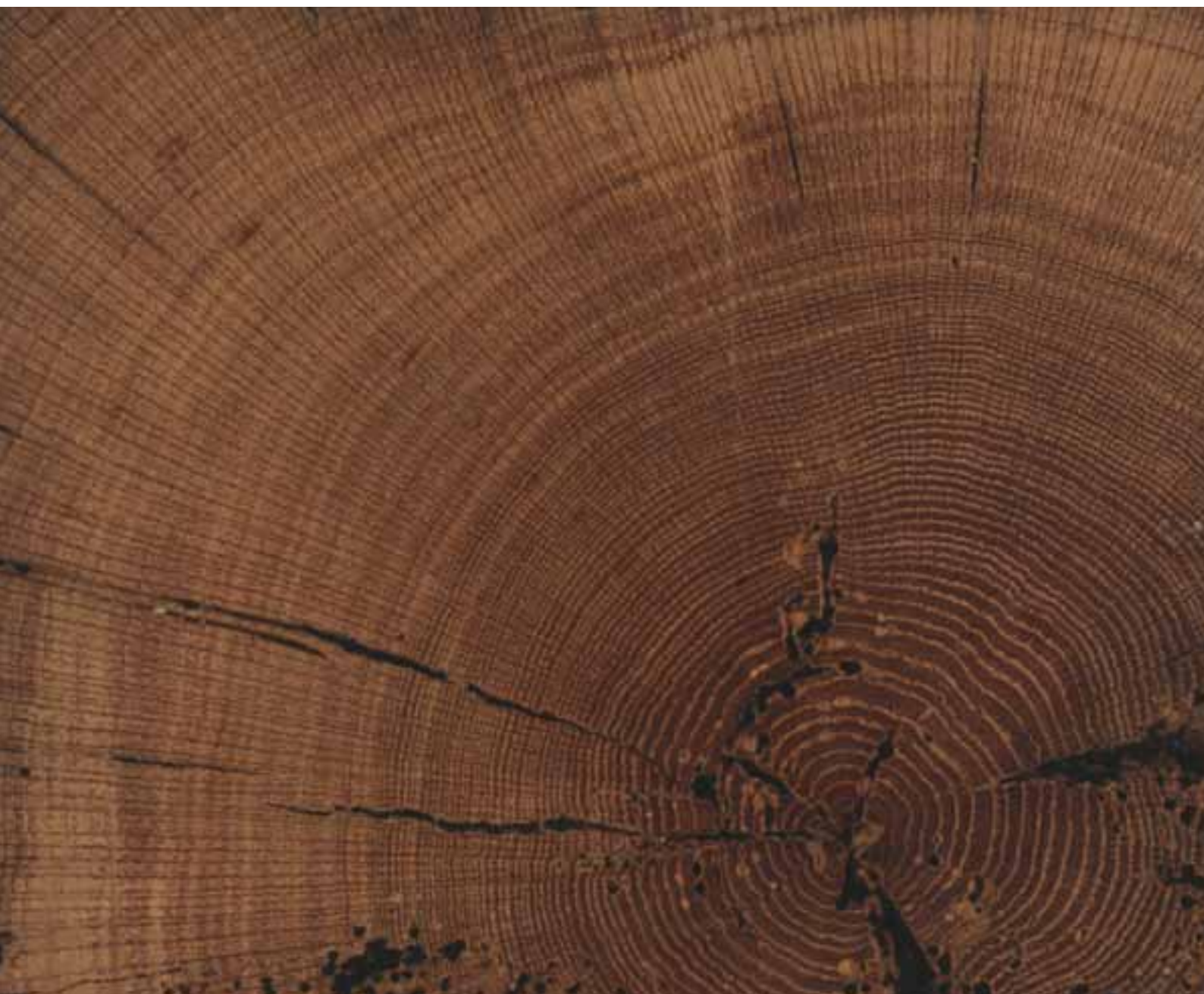


WHITE HORSE PUBLIC HOUSE,  
116 GREEN STREET, ENFIELD, MIDDLESEX  
**TREE-RING ANALYSIS OF SHORT TIMBER POSTS**

SCIENTIFIC DATING REPORT

Martin Bridge



Research Department Report Series 81-2008

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NGR: TQ 355 971

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## **SUMMARY**

Assessment of the building revealed that most timbers had too few rings to be dated dendrochronologically. Two jowelled posts on the first floor were of particular interest, and these did look as if they may contain sufficient rings for further analysis. The potential importance of these two posts in relation to the historical development of the site led to the decision to sample these timbers alone. One timber contained too few rings to be analysed further, and the other timber failed to date.

## **CONTRIBUTORS**

Dr Martin Bridge

## **ACKNOWLEDGEMENTS**

This work was commissioned by Dr Jane Sidell of the Scientific Dating Service, English Heritage. Kim Stabler arranged access and accompanied me on the initial assessment. Russell Craig of BEAMS was also in attendance. I thank Stephen Trenwith of Inland Homes Ltd and Mike Lake of DLA Town Planning Ltd for their enthusiasm and assistance in allowing access. I thank Cathy Tyers (Sheffield University) and Dr John Meadows (English Heritage) for useful comments on an earlier draft of this report.

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## INTRODUCTION

This former public house (NGR TQ 355 971; Fig 1) was apparently formed when three seventeenth-century timber-framed cottages (incorporating earlier building fabric) were knocked together in the early twentieth century. Although the building has since been heavily altered over the last century, it is thought that some of the older elements have survived. Of particular interest was a pair of short jowelled posts on the first floor that were thought, stylistically, to be much older than seventeenth century. Chamfered ceiling beams in the middle section of the building were also of interest. Dating of the building was requested by Kim Stabler of the English Heritage London regional office to inform proposed changes to the building.

## METHODOLOGY

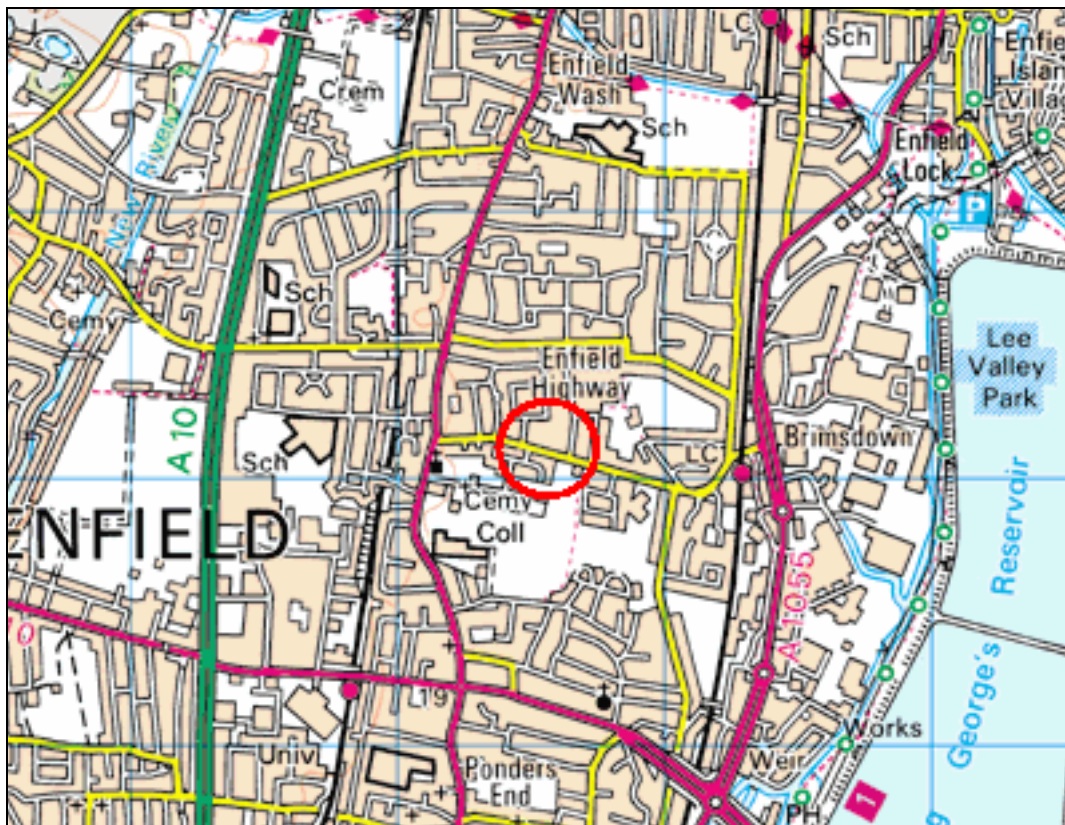
The site was visited in December 2007. In the initial assessment, accessible oak timbers with more than 50 rings and where possible traces of sapwood were sought, although slightly shorter sequences are sometimes sampled if little other material is available. Those building timbers judged to be potentially useful were cored using a 15mm auger attached to an electric drill. The cores were glued to wooden laths, labelled, and stored for subsequent analysis.

The cores were prepared for measuring by sanding, using an electric belt-sander with progressively finer grit papers down to 400 grit. Any further preparation necessary, eg where bands of narrow rings occurred, was done manually. Suitable samples had their tree-ring sequences measured to an accuracy of 0.01mm, using a specially constructed system utilising a binocular microscope with the sample mounted on a travelling stage with a linear transducer linked to a PC, which recorded the ring widths into a dataset. The software used in measuring and subsequent analysis was written by Ian Tyers (2004). Cross-matching was accomplished by a combination of visual matching and a process of qualified statistical comparison by computer. The ring-width series were compared for statistical cross-matching, using a variant of the Belfast CROS program (Baillie and Pilcher 1973). Ring sequences were plotted to allow visual comparisons to be made between sequences on a light table. This method provides a measure of quality control in identifying any errors in the measurements when the samples cross-match.

In comparing one sequence or site sequence against another,  $t$ -values over 3.5 are considered significant, although in reality it is common to find  $t$ -values of 4 and 5 which are demonstrably spurious because more than one matching position is indicated. For this reason, it is necessary to obtain some  $t$ -values of 5, 6, and higher, and for these to be well replicated from different, independent chronologies and with local and regional chronologies well represented, unless the timber is imported. Where two individual sequences match with a  $t$ -value of 10 or above and visually exhibit exceptionally similar ring patterns, they most likely came from the same parent tree.

When cross-matching between samples is found, their ring-width sequences are averaged to form an internal 'working' site mean sequence. Other samples may then be incorporated after comparison with this 'working' master until a final site sequence is established. This is then compared with a number of reference chronologies (multi-site chronologies from a region) and dated individual site masters in an attempt to date it. Individual long series which are not included in the site mean(s) are also compared with the database to see if they can be dated.

The dates thus obtained represent the time of formation of the measured rings in each sample. These dates require interpretation for the construction date of the phase under investigation to be determined. An important aspect of this interpretation is the estimate of the number of sapwood rings missing. Sapwood estimates appropriate for this region are based on those proposed by Miles (1997), in which 95% of oaks contain 9–41 rings. Where complete sapwood or bark is present, the exact date of tree felling may be determined.



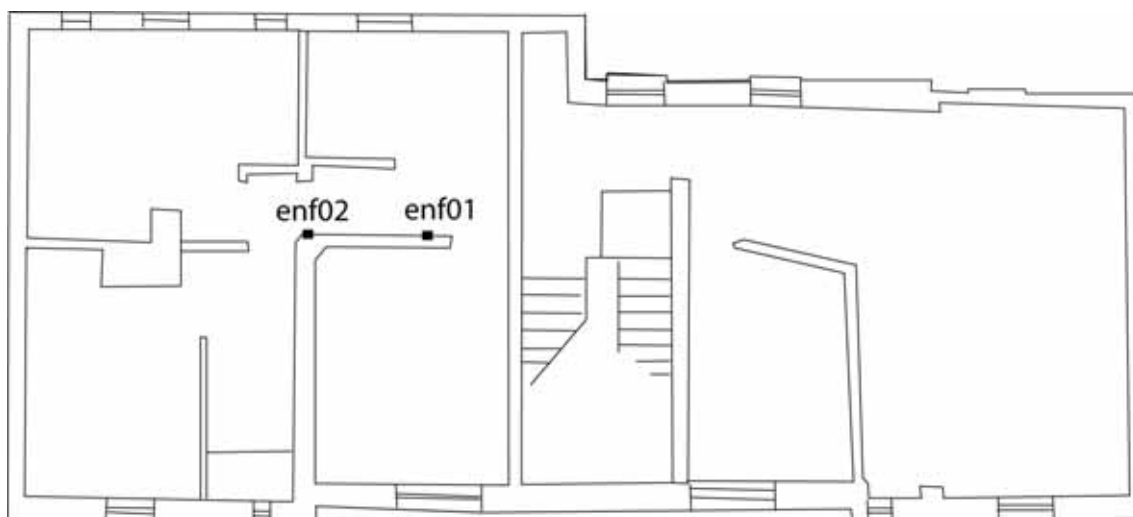
**Figure 1:** Map showing the location of the White Horse public house, Green Street, Enfield (centre).

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## RESULTS AND DISCUSSION

An assessment of all the exposed timbers was made in the presence of the English Heritage representative, Kim Stabler. This found that several of the timbers were probably reused from elsewhere, and nearly all the timbers had too few rings to be considered for dendrochronological analysis. This included the chamfered ceiling beams which were part of the original brief.

Only two timbers were judged to be likely to yield long enough ring sequences to be considered worthwhile coring (Fig 2). Usually, one would expect to core at least eight timbers to represent a single phase of building (English Heritage 1998). Two jewelled posts were thought, on stylistic grounds, to possibly pre-date the late sixteenth/early seventeenth century cottages and potentially represent an earlier incarnation of the building, and it was decided to go ahead and sample these two timbers as they could give an important insight into the development of the site. There is a good number of relevant local chronologies for London, which gives a better chance of obtaining acceptable cross-matching here than might be the case in other parts of the country. One of these posts is illustrated in Figure 3.



*Figure 2: Plan of the first floor, showing the approximate positions of the two jewelled posts sampled*

Based on a drawing by W J Macleod Architect





*Figure 2: The east post exposed at first-floor level.*

Details of the samples taken, which were both oak (*Quercus* spp.) are given in Table 1. Sample enf01 contained 96 rings and retained the heartwood/sapwood boundary. Sample enf02 turned out to contain too few rings to warrant further analysis. Comparison of the ring width series for sample enf01 with the dated reference material failed to establish an acceptable date for the series. It has not therefore been possible to date any of the timbers from this site.

*Table 1: Details of oak (Quercus spp.) timbers sampled from the White Horse public house, Green Street, Enfield*

Sample Number	Timber and position	No of rings	Mean width (mm)	Mean sens (mm)	Dates AD Spanning	H/S bdry AD	Sapwood complement	Felling seasons and dates/date ranges (AD)
enf01	East jowelled post on the first floor	96	1.72	0.21	undated	-	h/s	unknown
enf02	West jowelled post on the first floor	<40	NM	-	undated	-	h/s	unknown

Key: NM = not measured; h/s = heartwood sapwood boundary

## REFERENCES

Baillie, M G L, and Pilcher, J R, 1973 A simple cross-dating program for tree-ring research, *Tree Ring Bulletin*, **33**, 7–14

English Heritage, 1998 *Guidelines on producing and interpreting dendrochronological dates*, English Heritage, London

Miles, D, 1997 The interpretation, presentation, and use of tree-ring dates, *Vernacular Architect*, **28**, 40–56

Tyers, I, 2004 *Dendro for Windows program guide 3rd edn*, ARCUS Rep, 500b





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