

## The Timber and Construction of Dragon Hall

Toppes used three or four very distinct types of oak timber in the construction of his fine timber hall. The majority of the floor joists and beams were small oak trees of less than ten inches or 25 cms in diameter. These were used whole after rough hewing with axes into rectangular beams and some were sawn.

Many of the wall posts and studs – or uprights - in the walls of the hall have been sawn out of large oak trees 2ft 6ins or 75 cms in diameter. These sawn timbers, nine by five inches or 23 by 12 cms in cross section and 13 and a half feet or 4.2 m long, were then dressed with axes so that few saw marks can be seen. Some of the roof timbers were also sawn out of these large oaks. Trees of this size were rare in medieval England and valuable; Toppes' use of them was clearly ostentatious.



*Floor joists of the first floor Hall*

The third source of timber was slow-grown radial planks, imported from the Eastern Baltic. The remaining dragon in a spandrel in the Great Hall was carved on these fine boards.



*Dragon carving in spandrel*

The last type of oak timber that may have been used in the roof, were rafter oaks. These were very straight oak trees, less than eight inches or 20 cms in diameter, that were mainly sapwood, that is the outside of the tree trunk. This was a common wood to use for rafters, but because it was sapwood was easily damaged by rot and insect attack.

Tree ring analysis of the timbers shows that the trees were felled in the early spring of 1427. This was carried out by a process known as dendrochronology whereby twenty three 15 mm diameter cores were drilled out and the growth rings analysed. Medieval oak was invariably used while still green enough to work so that we can also tell that the hall was built in 1427 or 1428.



The floor joists and spine or central beams and their joints were prefabricated and assembled on the ground to check everything fitted before being reassembled in their final position. The roof timbers were made in sets and then a set was used randomly. In three of the ground floor rooms you can see the carpenters' marks as Roman numerals used to identify each joint when the building was erected. The roof is of a crown post type with four braces to the purlin and collar above. "Crown" refers to the shape of the moulding at the top of the post.



*The crown post roof*

The wall posts or studs were placed much closer together than is structurally necessary and than in most medieval buildings, suggesting that Robert Toppe wanted to show off the cost of his trading hall. Likewise the decorative mouldings on the facing edges of the wall posts, of a type more commonly found in wealthy domestic buildings, were designed to impress his customers. In addition, brick infilling between the studs was used rather than the cheaper wattle and daub, although it is possible that the bricks were inserted later when the hall was converted into living spaces.



*Studs with brick infill*

The joints for the cross or tie beams, crown posts and arch braces are mortice and tenon with oak pegs to hold them together. One could say that with no use of screws, nails or glue the hall is held together by these pegs.

There were three large projecting oriel windows on the King Street side, now all removed, and on the river side – in addition to the large surviving window – there was probably an opening at the north end for goods access to and from the warehouse area below.

Richard Darrah, March 2011

**Further information**

*'Building with Timber in the 15<sup>th</sup> century' – a DVD by Richard Darrah (2016)*