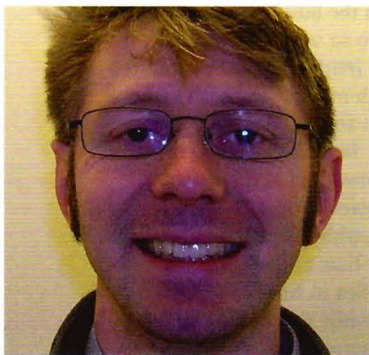


## TALKING TIMBER



### IN THE FACE OF AGGRESSION

*Timber is the obvious material to use in aggressive environments, says **Iain Thew***



During my working life I spend a lot of my time inspecting timber buildings and structures, and recently I inspected a large industrial storage building, constructed from some impressively sized glulam arches.

The building environment was extreme owing to the materials being stored in it and the atmosphere had a very high salinity. In fact it was so corrosive that after a couple of days of inspection, the digital

camera I was using had packed in, my clipboard was rusting and the buckles on my safety boots were corroding!

But despite all this, the 50-year-old glulam arches were in good condition, with only minimal surface deterioration (defibration), caused by the high concentrations of salt accumulating and degrading the wood cell walls. In fact, the at-risk element in the structure was the bolted steel connections. This had been recognised in the original design, and plywood boxing had been specified around the connections, to protect the bolts and prevent accumulation of salts against them.

Another recent inspection carried out on an old timber quay had similar issues. The quay structure, which we estimated had been constructed in the early 20th century, was formed of greenheart posts and beams. The condition of the greenheart elements was very good, but the bolted connections and chains had rusted away, in some cases to nothing. The specifying of the repairs consisted for the greater part in detailing new stainless steel bolts and brackets to replace the original corroded fixings.

The strong long-term performance of the timber structure in these environments is in stark contrast to steel frame buildings in similar saline environments. I have a colleague who inspected a steel frame with a tannery located in it, and was somewhat alarmed to discover they could put their hand through the holes in the supposedly solid webs of the steel stanchions, such was the level of corrosion!

These examples illustrate that there are many situations where, even ignoring the environmental arguments for using it, timber is the best engineering material for the job.

You might be thinking "yes, so what? I know timber is great", but sadly this has not been the attitude of many engineers in my profession. It has often been treated with suspicion and seen as a difficult material to design in, strictly for 'specialists'. My own experience in education illustrates the problem. During my degree course a decade ago we spent large chunks of the course learning about the performance and design of steel and reinforced concrete structural elements, but the content on

**Author caption:**

**Iain Thew is project engineer at Structural & Civil Consultants Ltd and a board member and secretary of WTS**

timber as an engineering material was, you could charitably say, rather sparse.

Timber engineering is certainly enjoying a renewal of interest. It is great to see more high-profile timber buildings and wood being used for more diverse structures such as the 42m-high, arched glulam Recycling & Energy Recovery Facility in Leeds, which opened in November 2016 and which is reputedly Europe's largest timber structure of its type.

The best way to increase the use of timber in construction is through education and greater dissemination of information. The Timber Engineering Notebook series, produced by the Structural Timber Association and published in the Institution of Structural Engineers monthly magazine over the last few years, has been a very positive example of greater engagement by the timber industry with structural engineers.

The timber industry, as a whole, needs to continue and increase its engagement with designers, specifiers and especially architecture and engineering students, extolling its virtues in order to make the most of the opportunities available from the increasing interest in the possibly not yet quite so obvious material ... wood. ■

*Below: The greenheart element of this quay remains in good condition, while the bolted connections have rusted away*



**The Wood Technology Society**

A Division of the Institute of Materials, Minerals and Mining