Profile

Paul Fast and his 2016 Institution Supreme Award-winning firm, Fast + Epp, are blazing a trail when it comes to using timber in building design. He talks to Jackie Whitelaw about the risks and rewards of forging new paths.

More than 20 years ago, Canadian Paul Fast went on an engineering tour of Europe to explore the design thinking of the era's greats. He visited the practices and projects of Richard Rogers, Norman Foster, Chris Wise at Arup, Renzo Piano, Jörg Schlaich, Nicholas Grimshaw and Anthony Hunt, learning from the world's leading practitioners about the design of concrete, steel and exposed tension structures. What he picked up fed into the early work of his firm, solidifying the notion that without risks, there could be no engineering triumphs.

Fast should now expect similar visits from aspirational UK and continental European engineers. He and his firm, Fast + Epp, are producing leading-edge work using timber – at a time when the push for zero carbon emissions in infrastructure will focus attention on wood as a building material, following the Paris Agreement in 2016. In Britain, for instance, current thinking is that the country will be relying in large measure on the use of carbon-storing timber in buildings to help hit its 2050 zero emissions commitment.

Timber innovator

Paul Fast's push for wood to be a viable building material on the world stage has led his firm to produce structures that are described as 'the longest spanning', 'the most slender', 'the tallest', and 'one of a kind'. Several have achieved world records, along with more than 100 engineering awards – including the 2016 Institution of Structural Engineers Supreme Award for Structural Engineering Excellence for the firm's Grandview Heights Aquatic Centre (Figure 1) in Surrey, British Columbia.

This pool complex features the world's longest-spanning pure catenary timber roof with a structural depth of just 300mm for a 55m span. The award judges described it as 'a design [that] defies convention and demanded design excellence'.

Grandview Heights marries timber with concrete and steel and is, for Fast, where he 'hit the sweet spot' as an engineer. It is an example of how using wood in structures, in combination with other materials, can create 'a building that is economical, efficient and a beautiful testament to great architecture and engineering'.

'We aren't purist about wood,' he says, 'the typical approach is to employ strong materials such as concrete and steel for heavy lifting and timber for the lighter lifting to add warmth, richer colour and expression – although at times we part from convention. Wood is tricky to work with; you have to respect its strength and weaknesses – it's a living organism that can twist and split. But it is beautiful, grows quickly, and from a carbon and embodied energy perspective, is the most sustainable material to use.'

The practice prides itself on combining materials – but only to add value. 'We try to add value wherever possible by having structural components do more than simply support loads. They double as acoustic elements, conceal mechanical and electrical components or serve as thermal mass and enhancing aesthetics,' Fast says.

Figure 1
Grandview Heights Aquatic Centre

SEAGATE STRUCTURES / POLLUX CHUNG

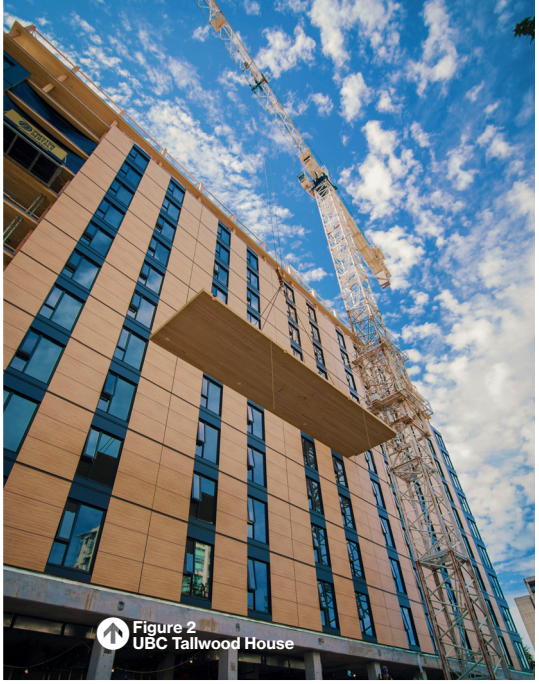

Figure 2
UBC Tallwood House

SEAGATE STRUCTURES

Figure 3
Richmond Olympic Oval

STEPHANIE TRACEY

At Grandview Heights, the undulating shape of the timber roof reduces the amount of air to be heated and dehumidified, so cutting operating costs, while steel tube columns in the facade cleverly serve a double function, resisting wind loads and acting as ventilator ducts.

Fast, 60, was born, raised and works in Vancouver – in a country known for the quantity, size and quality of its trees. Subconsciously, he admits his natural environment has drawn him to using timber in his projects.

'We have such a strong timber industry, so why not? During the 70s, 80s and 90s exposed steel and concrete were all the rage. But it's only over the last decade or so that exposed timber has developed a following.

'It was around the mid-90s that we sensed a need for more warmth in buildings, so we started working more wood into our structures. Now it's a big wave across the globe and it is gratifying to know that we contributed to that in the architectural and engineering world.'

Daring but disciplined

Fast studied civil engineering at the University of British Columbia (UBC) but very early focused on the structural side. 'The hand fit the glove; what was a bit of a stab in the dark as a career turned out to be right.' Fast was not one of the many engineers who came to the profession in the footsteps of their parents. His father was a dentist 'and I didn't like the look of that'. He credits much of his creativity to his German mother 'who's always been an out-there thinker but with the determination to get things done'.

His parents' determination and propensity for hard work took root, along with their advice to avoid the temptation to let work rule. Fast is father to nine children and has 12 grandchildren, and firmly believes in the importance of work-life balance.

'You don't have to be a workaholic to run a successful practice. It is important to trust and empower younger staff, delegating where necessary and allowing others to rise to the challenge. I was cut a lot of slack when I was young and believe in doing the same for my engineers. It's the only way they'll grow.'

This faith in the potential of youth seems to come from his own experience – Fast's first jobs were with two Vancouver consultancies, but in little more than four years he had set up his own office in 1985. 'Rather too soon in hindsight but if I'd waited longer, who knows, maybe I would have missed the boat.'

However, he couldn't deny his heritage. 'When I look back and see what strands of DNA I have, I believe I inherited the stereotypical Teutonic discipline along with the Wild West pioneer spirit of my forebears who first came to Canada,' he says. 'That drove me to independence.'

'I get bored with the same old, same old predictable solutions. When you have to figure things out and explore, that's what switches me on. It's great to go on the adventure but you still need to land the plane, and that's when you need discipline.'

In search of excitement

Fast's early adventures included working with innovative engineer Bogue Babicki, such as on a novel double-layer geodesic dome for the Vancouver Expo 86 Preview Centre, now called Science World. 'That experience really opened my mind. He helped me understand that just because something hadn't been done didn't mean it could not be done. I learned to try new things, never to just tick the box. Having a mentor like him formed the thought patterns I use to make decisions, even today.

'I learned that young engineers need to be willing to accept the risks of being bold – nothing ventured, nothing gained. Read all you can, be inspired by the greats, and don't be content with the status quo.'

Armed with this mentality, Fast partnered with Gerald Epp a few years later, and over the decades their practice grew steadily. 'We started with small jobs but pushed to get into really interesting structural engineering challenges. Peter Rice said something along the lines of "people complain when they don't get interesting projects, but it starts with the simple ones and then you sniff around for opportunity like a hound following a fox. Eventually people come to buy 'surprise'." That's what happened for us.'

The young pair's first big success was the EBCO Aerospace Centre when Fast + Epp were presented with the challenge of designing a facility that would reflect the hi-tech nature of the manufacturing operation. 'We proposed an exposed steel tension structure – the first in Canada. We were just kids in our late 20s, it was stressful with many sleepless nights but people realised we were into cool stuff.'


MATHIAS FAST

Figure 4
Kingsway Pedestrian Bridge

Design before dollars

The pair have now parted amicably after more than 25 years – with Epp going off to run a high-end timber design-and-build fabrication facility the pair had established, leaving Fast as sole owner of the consultancy, which is now around 60 strong.

'It's a good size. Another 10 to 20 engineers would give us that bit of extra depth. We can design landmark projects but 70 to 80 people would make us even better.'

Fast + Epp is based in Vancouver but has offices in New York, Seattle and Edmonton, as well as in Frankfurt, Germany, to allow the business to 'cross-pollinate' with European technology. 'I speak fluent German, which helps,' Fast says, 'and we have a German partner who totally represents our philosophy. The office is gaining traction.'

Current projects in Canada and abroad include the UBC Tallwood House (Figure 2), an 18-storey structure that will be the tallest mass timber hybrid building in the world at 53m when completed, as well as the proposed Vancouver Art Gallery with Herzog & de Meuron – the architect's first job in Canada. Fast + Epp has also been involved with upgrade concepts for the restoration of the Frei Otto-conceived Mannheim Gridshell in Germany, originally designed by Arup as a temporary structure.

The Fast + Epp ethos is to be fresh thinkers who combine creativity with economy, to be adventurous, never having preconceived solutions, and to find the 'other way'. Fast says, first and foremost, the firm strives to practice good design rather than chase profits.

'We are optimists and we can deal with failure – you have to be if you are going to be courageous,' Fast says. 'Some engineers don't want to touch the adventurous but focus more on maximising profit. Our priority is to look at everything and see where we can shine, then, often, the profits follow.'


NIC LEHOUX

Figure 5
VanDusen Botanical Gardens Visitor Centre

Clients like the approach and many come directly to the firm. 'We are not always competing on fees,' Fast reports. 'A number of our projects do become world firsts but that is never our aim. The records are the result of good, adventurous design.'

FAST'S TOP FIVE PROJECTS

GRANDVIEW HEIGHTS AQUATIC CENTRE, Surrey, BC
The Institution's Supreme Award for Structural Engineering Excellence winner is an exemplar of how wood can be used as long-spanning tension cables (Fig. 1).

UBC TALLWOOD HOUSE, Vancouver, BC
The 18-storey mass timber hybrid building is designed as a kit of parts comprising 16 floors of five-ply cross-laminated timber floor panels and a concrete core (Fig. 2). 'It's not just a demonstration project, more an answer to a question: "Could we do it at a price that would compete with concrete and steel?"' Fast says. 'The wood structure was up in just nine weeks.'

RICHMOND OLYMPIC OVAL, BC
This multipurpose sports and recreation facility initially served as the long-track speed skating venue for the 2010 Winter Olympic Games (Figure 3). The 2.6ha roof structure features hollow, triangular-shaped composite wood-steel arches that span 95m and novel prefabricated timber roof panels.

KINGSWAY PEDESTRIAN BRIDGE, Burnaby, BC
The one-of-a-kind construction consists of a timber-steel arch with a post-tensioned segmental precast concrete walkway acting as a tension tie (Figure 4). The bridge spans 44m across a major arterial road.

VANDUSEN BOTANICAL GARDENS VISITOR CENTRE, Vancouver, BC
***World Architecture News* named this orchid-inspired structure (Figure 5) its Top Engineering Project of 2012. The challenge here, says Fast, was to design and erect VanDusen's free-form wood roof panels, each with varying geometry. Engineers simplified the complex form into manageable prefabricated panels that were lifted into place on site.**

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