

# CLEVER ENGINEERING, BEAUTIFUL STRUCTURES

Wimbledon College of Art achieved a BREEAM Outstanding rating. Its combination of lightweight timber frame and thin concrete floor plates meant the building was very light but had enough thermal mass to avoid the need for air conditioning. The architect was Penoyre & Prasad

**M**yrriad sketches are pinned to the wall of WebbYates Engineers' office. The postcard-sized bits of card depicting various structures and geometric shapes give the impression that this is an architect's studio, but then the Shoreditch-based engineer is not typical of the profession. Steve Webb, who founded the company 10 years ago with Andy Yates, reveals that each of the 30 staff attends sketching classes. WebbYates is part of a family tree of design-led engineers, which can be traced back to Felix Samuely, the Austro-Jewish visionary behind the De La Warr Pavilion and the Skylon tower. Accordingly, the classic tools of pen and paper remain fundamental to WebbYates' ethos of creating beautifully functional structures free from unnecessary ornament.

'Being able to draw is crucial in terms of presenting ideas to architects,' says Webb. 'It is very important to come up with a concept first. During their education, engineers tend to dive into calculations without thinking too hard about the arrangement.' Webb says this breeds 'passive engineering', where the engineer's role is merely to tell the architect what is and isn't possible. 'We try to come up with a structural design that is interesting, rational, economical, sustainable and attractive enough that you don't want to cover it in plasterboard.'

Prior to forming WebbYates, the pair worked on a variety of projects: from Wembley stadium with Foster + Partners to the redevelopment of Sadler's Wells Theatre. They founded

WebbYates in 2005, taking space in an old archive above Smithfield Market in Clerkenwell, armed with two desks and just the one computer. The firm's early work was predominantly adroit loft extensions, but it wasn't long before it landed its first big job: a two-storey factory by Fernando Olba Arquitectura y Urbanismo on the Fuente Del Jarro industrial estate in Valencia, Spain. The significant loads the structure had to support prompted the previous engineer to weigh in with a cumbersome and expensive traditional structure. Thinking there must be a better way, WebbYates split the trusses into V-shapes, creating a visually striking solution that reduced the span of the concrete floor slab from 8m to 4m. Correspondingly, the depth of the slab went from 400mm to 200mm, halving the amount of concrete needed. The concrete became the top chord of the truss, cutting the amount of steel needed by 30 per cent. Setting a precedent, WebbYates' creative approach led to what is the project's key architectural feature. 'If the engineering is very clever and addresses the constraints in a really good way then the results should be attractive,' says Webb. This kind of thinking has earned WebbYates a reputation within the industry as an engineer whose innovative solutions will elevate the seemingly moribund into something fresh and exciting.

Take the firm's work for developer Landid on Unilever's office in Leatherhead. As with Fuente Del Jarro, the practice was asked to look at the building's steelwork. The roof's structure needed to span 18m with the requisite stiffness to support glazed infill. WebbYates designed distinctive roof beams from standard metal sheets, forming a structure not unlike a Toblerone box. Again, what could have been a solid yet mundane element became the building's most memorable feature.

WebbYates has applied its methodology to a variety of projects ranging in scale and materials: from Brighton & Hove Albion FC's £64 million stadium roof to a 9-tonne stone stair for a private client in a listed building.

A standout in a roster of exemplar works is

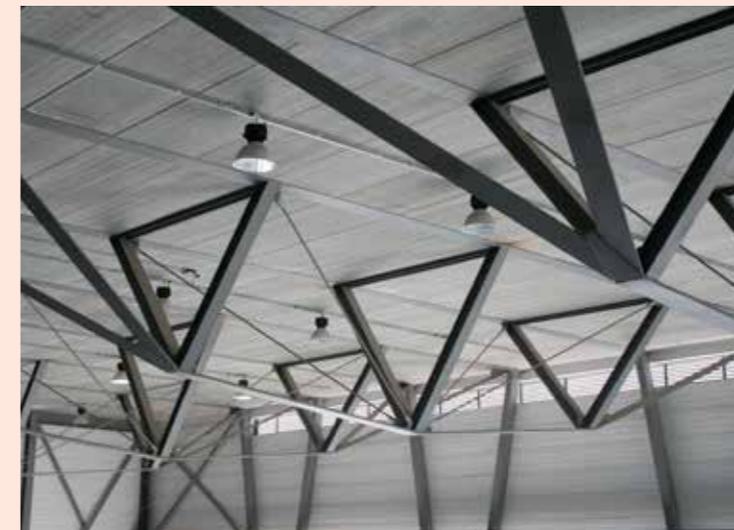
'If the engineering is very clever then the results should be attractive'



AGNESE SANVITO



JOHN HORTON



**Main picture** The award-winning Cow Bridge, designed with Amin Taha Architects, crosses the River Lea at Hackney, east London

**Bottom left** L'Argens Bridge in France, designed by WebbYates and John Horton and fabricated by John Horton

**Bottom right** V-shaped trusses in the roof of the factory at Fuente del Jarro, Valencia, Spain, reduced the amount of steel used by 30 per cent

the award-winning Cow Bridge for the London Borough of Hackney, which crosses the River Lea into Hackney Marshes. Substantial deterioration of the structure had led the local authority to close the bridge to vehicles. The intention was to build a replacement at a cost of £3.5 million. Instead, WebbYates designed an elegant, lightweight steel deck attached to the original abutments, with a pedestrian walkway slung alongside it at a lower level. Like a folded piece of paper, the parapets and the change in level became the structure. The project cost the council just £1.4 million.

The practice is well versed in a variety of materials – timber, stone, steel – applying its principled, creative approach to each in kind. Allied to this is a strong sustainable ethos that underpins the work. Webb points out that this is simply a byproduct of good engineering. Yates adds: 'A building's energy use is going down and down, but no one targets the building frame. If you make a comparable beam from steel it might cost 22kg of CO<sub>2</sub> per metre; if you make the same one from timber it has something like 5kg. We would always push people to use timber if they can for those reasons.' The rationale helped Wimbledon College of Art achieve a BREEAM Outstanding rating thanks to a meticulous prefabricated timber and concrete frame that allowed the building to be naturally ventilated.

WebbYates is so adept at this kind of work it can also deliver large-scale schemes that require patient analysis, as with its work on the Pinetrees Business Park for Aberdeen Property Investors and BUPA. Currently, the practice is refurbishing the Hoover Building in west London – 'the mother of all loft conversions' – and working on SelgasCano's Second Home extension in Shoreditch. After 10 years, though, both directors feel the company is primed to take on even larger projects. 'We want to continue to grow and get bigger projects,' says Webb. 'We want to scale these ideas up.'