BSkyB
Believe in better building

As a provider of hybrid structural solutions, which are optimised in terms of cost, performance and sustainability, B & K Structures takes full advantage of offsite manufacturing techniques by exploiting Design for Manufacturer and Assembly (DfMA) protocols. DfMA is used as the foundation for concurrent engineering processes to simplify and fully optimise the structure wherever possible, to reduce manufacturing and assembly costs and to value engineer. This process helps to identify, calculate and eliminate waste or inefficiency in the building design.

Offering a complete package of material services, across a wide range of structural products including glulam, cross laminated timber, timber cassettes and steel frame, as part of their hybrid structural solutions - B & K Structures has an outstanding, award winning portfolio across a range of sectors, including the recently completed BskyB educational facility.
Believe in better building

Under the banner of Believe in Better Buildings (BiBB), BskyB’s new educational facility for graduates, apprentices and staff training, reflects the company’s sustainable aspirations. Based at the Campus at Osterley, West London – the 3,800m² development encompasses a three storey linear building with an additional storey housing a restaurant and a roof terrace, all providing an inviting multi-functional amenity.

The educational facility is the first in a series of initiatives using the power of television, creativity and sport to help young people achieve their potential by gaining the skills, experience and inspiration needed to help prepare them for the world of employment. The objective of the project is to construct a low energy structure within a short time period – making solid timber and timber cassettes the optimum rapid and sustainable solution.

BskyB’s own sustainability strategy shaped the building philosophy – keeping sustainability at the forefront was important – so the exposed engineered timber structure left no ambiguity as to the buildings construction.

In addition to sustainability, speed and ease of construction were the driving factors on this project, whilst not compromising on the quality of design and materials. The new educational facility incorporates a Combined Cooling Heating and Power Plant (CCHP), along with BskyB’s existing wind turbine. The educational facility is the first building to be completed in a series of three in the BskyB Believe in better building project at the site.
Optimised Hybrid Structure

Mace appointed B & K Structures to provide an optimised hybrid structure for the build — comprising a glulam frame with cross laminated timber (CLT) floor, roof and stability walls, together with perimeter wall cassettes. The structure was designed to deliver permanent quality, adaptability and long term energy efficiency, to meet the sustainability objectives. The build was to be completed in time for BSkyB's 25th anniversary celebration making speed and ease of construction vital — however, it was important not to compromise on the quality of design and materials as a result.

An engineered timber industrial system was specified as it allows for rapid assembly and offers excellent airtightness through insulated panel facades. The solid timber frame was able to meet the natural look and feel that BSkyB were looking for and timber cassettes were again able to offer the low thermal resistance and high airtightness that the structure required to meet the design brief.

The building was positioned to sit at the centre of Sky's Campus and therefore is testament to the company's core values and ecological ethos. BSkyB had specific sustainability targets mapped out for the structural framing options. The targets included a 15% reduction in embodied carbon of construction, 27% of recycled content, responsible sourcing of materials through PEFC or FSC timber and 80% of key materials by mass manufactured within a given radius, depending on density.

Due to construction taking place in the midst of Sky's fully operational headquarters, extensive planning was essential — particularly with regard to noise levels and safety. Flexibility was also crucial to the project's success, as part of the brief stated that the spaces should be adaptable over the long term.

The structure took the form of a glulam frame with visible grade CLT panels providing core stability to the walls and floors, which were to be left largely exposed within the finished structure. The building featured a green roof with a CLT structure, covered with PV Panels and sedum. The timber cassettes were used to erect the walls, ranged from 0.7m – 2.5m in width to 1.5m – 12.5m in length to accommodate the window arrangement. The connections used were galvanized steel bracketry, with connection timber plugs and covers - boarded to provide fire protection to the connections.

Shell and core cost for the building was £14.5M. The fit-out contains state-of-the-art IT and media equipment, pushing the total project cost (including adjacent plaza) to £25M.
The Challenges

Challenges for this build included following a strict programme of works in order to complete the structure on time, while causing minimal disruption to the surrounding areas.

Tolerance of the connections proved challenging due to the 28m height structure — the connection interface between components needed to be exact to ensure that it was erected in the same manner that it was designed. This was particularly important because of the differing materials that B & K Structures utilised and the interface between them. Designing the propping for the CLT panels was also difficult because of their large size.

The Solutions

In order to overcome these challenges, careful planning and coordination were executed at the early stages of the development. This included forward planning of propping the CLT panels. The design process was made simple and repetitive in order to be completed within the strict build time. B & K Structures robust supply chain made the preparation more efficient when it came to management of the products.
BIM

Building Information Modelling (BIM) technology and CNC machines were used to ensure the structures were manufactured to exacting tolerances to guarantee the details of the connections were precise. Architects and engineers worked together in a shared office – allowing them to make real time decisions.

BIM goes beyond the planning, design and construction phases to the whole life cycle analysis of the project and can provide the end user with information from conceptual ideas and building design to cost management and construction management. BIM has changed the dynamic of the construction business, enhancing efficiencies, delivering well-coordinated and well-designed projects.
Carbon Calculations

B & K Structures’ Carbon Calculator is an innovative digital resource which delivers carbon estimates to help clients assess the most viable lowest carbon solution. Relevant information influencing the calculation is entered into the system - such as material volumes and transport factors.

The Carbon Calculator produces carbon estimates to act as guidelines for different project scenarios – enabling professionals to gain early information about the environmental impact of their proposed development.
Project Highlights

“This was a truly an exciting build,” commented Nick Milestone, Managing Director of B & K Structures. “It really gave us the opportunity to showcase our extensive product portfolio and specialist services – coming together to deliver an optimised structure. It was great to work with such a pioneering client and we look forward to continue to work with Sky in the future.”

According to Timothy Snelson, Associate Engineer of Arup, the big timber facilitated the best build for this project, with the CLT slabs and insulated panels providing the ‘real big win’ in programme terms.