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Sustainable procurement of building components: Melayway Glass Assemblies

Summary

When the Royal Botanic Gardens at Kew, Surrey, began to develop plans for an extension to its world-class research facility, the Jodrell Laboratory, it was determined that the finished building would reflect the organisation's environmental concerns. The project team – which included award-winning architects Wilkinson Eyre and contractor Walter Lilly – called upon specialist contractor Melayway to deliver a high-performance, sustainable and recyclable building envelope. Melayway's experience enabled it to procure the necessary materials and assemble them with the minimum environmental impact.

Background

Operating as a non-departmental public body under Defra, the Royal Botanic Gardens Kew is a scientific, amenity and educational organisation devoted to plant and fungal conservation. Kew's mission is to "enable better management of the Earth's environment by increasing knowledge and understanding of the plant and fungal kingdoms – the basis of life on earth." To achieve this mission, RBG Kew realises that its operation should be undertaken with minimal adverse impact on both the local and global environment. Environmental considerations are therefore at the centre of RBG Kew's corporate strategy. The organisation's environmental policy aims to minimise waste, reduce emissions and better manage its use of resources.

Specialist contractor, Melayway Glass Assemblies (MGA), was founded in 1993. The company offers design, manufacture and installation of specialist glass solutions for commercial buildings in the UK and overseas.

The company has gained a reputation for its commitment to quality, and its ability to respond to and incorporate new industry standards and regulations. Current projects range in size from £50,000 to £5million.

The need for change

Although MGA was not involved in the very early stages of design for the Jodrell Extension project, the brief made it clear that the client had very exacting environmental requirements. MGA faced the challenge of sourcing high-specification materials with the minimum possible environmental impact.

The solution

MGA's approach was to work closely with its existing supply chain, because a degree of trust already existed between them. This reduced the time MGA needed to research and source materials. Meanwhile MGA's technical team worked closely with the architect (Wilkinson Eyre) and structural engineer (Michael Barclay Partnership) on the detailed design of the timber-framed curtain wall and glazing system.

Implementation

MGA already had some experience of the benefits of curtain walling that combined the various advantages of timber, aluminium and glass. Once the design was agreed, MGA's technical team provided a detailed brief to Seufert Niklaus, its preferred supplier, which sourced the materials and managed the manufacturing process. Once the pieces were ready for shipping, MGA took over, handling delivery to site, on-site storage and handling of materials, and assembly and installation.

Results

The Jodrell Laboratory at Kew was completed in June 2006 and has been praised as a fitting addition to the Royal Botanic Garden's collection of landmark buildings.

All aspects of sustainability have been taken into consideration, ranging from the reduced footprint of the extension (by in-filling a colonnade), to the opportunities for recycling the structure at the end of its useful life.

The thermal mass of the building is used for night-time cooling; while the low U-values and superinsulation of the building fabric help to even-out the peaks and troughs in indoor temperature.

The aluminium/timber-framed curtain walling integrates with the surrounding gardens on the outside, while inside the aluminium elements create a modern feel. Overall, the made-to-measure envelope means that there was minimum on-site waste and fewer defects.

Traditionally, glazing is a major source of heat loss from a building, not just because of the poor insulating qualities of glass, but also because window frames present opportunities for heat loss and cold bridging. Aluminium frames potentially lose more heat than conventional wood frames. However, aluminium is both structurally stable and recyclable, so it is a good choice for structural applications. Combining the aluminium frames with timber cladding is even better, because the external timber insulates the metal frames. All three principal components of the curtain walling – glass, metal and wood – are recyclable and designed to have a 60-year lifespan.

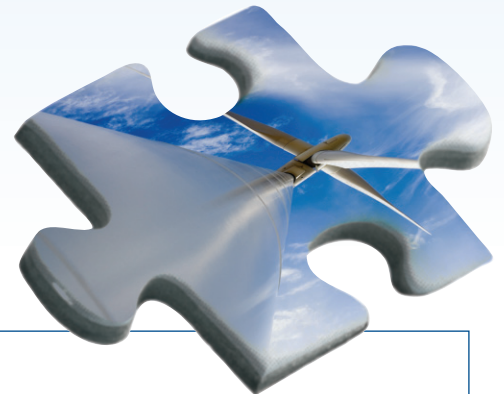
Procurement of timber from sustainable sources can be a significant challenge, with various standards in operation. MGA's preferred contractor sourced the timber from a well-known supplier in Canada which supplies timber to Forestry Stewardship Council (FSC) standards. The timber is Oregon Pine, which is a high-quality material that is known to be relatively knot-free and ideal for applications that involve lamination.

The glazing is industry-standard high-performance plate glass with low-emissivity coatings to minimise heat loss, and an external coating to reduce glare.

Looking ahead

MGA learned valuable lessons about sustainability and procurement during this project – lessons which are already being applied. Key points to note include:

- the design must be 100 per cent fixed before the materials are ordered, because there is no room for errors in this made-to-measure process
- it is essential to prepare the site for handling the timber, which must be kept dry
- the building envelope needs to be made water-tight as quickly as possible to minimise damage (and therefore waste) to components
- none of the environmental benefits could have been achieved without the enthusiasm of the client, who was determined to procure a low-embodied-energy, highly energy-efficient, recyclable building.



For more information

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