Future building green:

Advice from construction experts about sustainable building

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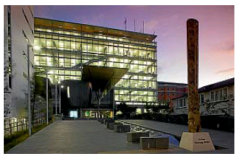

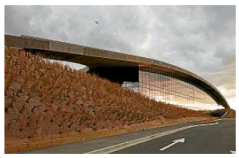

Clockwise from left:
1. Using only a third of the average energy of an equivalent new building, the 6 Green Star design for The University of Auckland, Human Sciences Building B201, achieves the highest NZGBC sustainability rating ever awarded to a building in NZ (Artist impression from Jasmax).
2. Foodstuffs North Island Head Office, one of NZ's first 6 Green Star-rated buildings.
3. Tiaho Mai Acute Mental Health Unit at Middlemore Hospital utilised a carbon calculator in all phases of construction.
4. Zespri Head Office, Mount Maunganui, built using sustainable principles.
5. The Christchurch Civic Building was a major redevelopment of the 1970s building. It was the first completed 6 Green Star-rated building in NZ in 2010 and NZ's most innovative building at the time, achieving four out of five points for innovation within the Green Star rating system.

OPINION: Building more sustainably has gained traction in the commercial sector over the past five years, with significant construction projects and developers understanding the wider value and long-term positive impact of a greener, more sustainable building.

Sustainable building is not just about a low carbon footprint, or stereotypical green considerations. It does encompass practices and systems that lessen environmental impact, but it also involves more holistic considerations that lower running costs, create healthy attractive work environments, achieve net zero-carbon targets, and incorporate resilience against hazards such as earthquakes, storms and flooding.

New Zealand architects are now working with developers and corporate clients to create these future-proofed buildings. The best outcomes are achieved when the contractor or builder commissioned for the project is involved upfront, consulting on the design phases, which allows experienced sustainability advocates with practical construction experience to advise on the options available around materials to meet different price points.

Likewise, those interested in building their own residential sustainable projects will benefit from seeking advice, asking the right questions through the design process, and understanding the materials and options on offer.

Based on our experience, the following points itemise what will create a positive environmental outcome for any sustainable project:

Thermal envelope

A building's thermal envelope is the most important consideration for long-term sustainability, as it affects many other environmental considerations. A well-considered thermal envelope will make the building less expensive to heat and cool, require less energy overall, plus create a healthy environment inside the building. High-performing glass providing thermal stability, well-insulated ceilings and walls using low-carbon products available, and building orientation, creating shade and air tightness are some ways to ensure a high performing building facade.

Heating and cooling systems

An energy-efficient heating and cooling system which performs well in the conditions of the building's location is important. Different systems work in different building designs, and choosing the one to give the best output becomes quite specific to the construction, so experienced advice is needed. How you plan to use the building plays a key part in system selection; being able to open a window for passive ventilation works well in some cases, but in other environments mechanical ventilation such as full air conditioning are more suitable.

Low energy electrical fittings

Electrical fittings will have an impact on your energy footprint and cost of consumption. On a large building there are thousands of individual fittings, and their placement and design affect how comfortable the building is to use and its overall energy consumption. For example, maximising the natural light available paired with energy-efficient LED fittings and integrated lighting control systems with smart features such as daylight sensors will mediate the light based on ambient conditions. Centralised lighting control also gives the user the ability to adapt and fine-tune the lighting within each space.

Low carbon and environmentally sustainable construction materials

Concrete can be maligned for its environmental impact, yet there are products on the market that reduce the aggregate content and therefore the carbon footprint. For example, adding fly ash, plus choosing cement from a plant powered by renewable energy makes a significant difference. Similarly, you can specify timber framing certified from the Forest Stewardship Council, tracing its origin back to sustainable forestry, or choose steel from a factory which has sustainable practices, uses renewable energy or recycled content, or has achieved an Environmental Product declaration.

Budget

Every consideration comes at a different price point, so budget is also key. To achieve the most sustainable outcome, ensure you have the right advice to navigate what will work best for your project, be mindful of the budget and have a clear rationale on what can or cannot be comprised. Finding a partner with systems in place to trace the materials during the build will help to quantify what has been specified at the end of the project, to ensure you are delivering to your environmental objectives.

Many of Hawkins' clients plan to hold their buildings for long periods, so there are also tangible financial advantages to building green as the value holds over the lifecycle of the project. There are feel-good benefits about reducing environmental impact, plus a green building is a highly attractive proposition for tenants, who are increasingly seeking these considerations for their businesses.

New Zealand architects are creating some progressive designs which is evident by the 6 Green Star-rated buildings such as Foodstuffs new HQ at Auckland Airport and the University of Auckland's Human Sciences Building. Hawkins is focused on helping clients with the buildability of that project, so we can work through any issues and build with intent from the outset.

There are many sustainable options on the market, so with the right advice and stewardship, the future looks bright for a sustainably built environment in Aotearoa.