How to conserve concrete buildings

When it came time to assess the future of their 50 Bridge Street, Sydney office tower built in the 1970's, developer and asset manager AMP Capital did something remarkable.

They chose to repurpose the reinforced concrete structure, rather than demolish the building and start again.

Quay Quarter Tower (QQT) reuses two-thirds of the existing building and grafts onto existing slabs to double the square metres on site from 45,000 m² to 90,000 m². AMP Capital's delivery partner Multiplex constructed the new tower using several innovative methodologies, and their design architect 3XN designed high performance façade and external shading hoods to reduce heat and glare.

We made a commitment to make QQT Zero Carbon from Day 1 of operation, and we're pleased to say we achieved that goal.

Chris Nunn, Head of Sustainability and Operations, AMP Capital

Embodied carbon savings by repurposing the tower

Around 7.7 million kilos of carbon have been saved during the construction process by retaining 66% of the building's existing columns, beams, and slabs and 95% of its internal walls. Around 50% of the existing building's resources were reused. This is equivalent to saving 2 years of operational emissions from the building services, including air conditioning, lighting, lifts, etc.

We managed to retain about 70% of the original reinforced concrete structure, effectively doubled the size of the building, and gave it an additional 50 years of life. From an asset point of view, this is the type of thinking that supports our investor base.

Murray Middleton, Head of Development, AMP Capital

Reuse makes economic sense

The reuse of materials from the original building saved $130m in construction costs.

Not only was adapting the reinforced concrete structure more sustainable and economical, but it also allowed the construction team to complete the project 14 months earlier.

Sustainability and wellbeing at its core

The AMP Capital development team worked closely with Danish architecture firm 3XN, ARUP engineers and Multiplex builders to achieve 5.5-star NABERS energy rating and a six-star Green Star design rating.

Fundamentally, it's a design that seeks to strike a difficult balance. The building faces north, is unshaded to the north, and has spectacular views. That led to that beautiful vertical and horizontal shading structure.

Chris Nunn, Head of Sustainability and Operations, AMP Capital

The high-performance façade and external shading hoods reduce the amount of heat coming through the windows by 30%.

Even the **3,000 tonnes of JAS-ANZ accredited 3rd Party Processor Certified steel reinforcement** supplied to the QQT project had **96% recycled steel content** through the electric arc furnace manufacturing process.

Structurally, it's just magnificent in the way that it ties the new to the old.

Chris Nunn, Head of Sustainability and Operations, AMP Capital

Conserve concrete buildings with the Guide

One of the tools the QQT design team used when assessing the structural properties of the old tower was the *Guide to Historical Steel Reinforcement in Australia*.

We receive about three to four calls a week from designers seeking technical information on past steel reinforcement. Back when we were putting the Guide together, the QQT design team phoned us requesting information on the steel reinforcement used for the old tower at 50 Bridge Street.

Scott Munter, CEO / Executive Director, SRIA

SRIA Steel Reinforcement Institute of Australia

Order your copy of this invaluable hardcover publication at sria.com.au