Growing through smarter innovation

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Built environment firms are banking on robots, digital tools and eco-friendly building methods to grow and stay resilient for the future

An autonomous robot assisting with intricate paint work may sound like a movie scene. But at The Gear, it is just another day at the office where employees trial construction innovations in real settings before they reach the market.

Opened in 2023, The Gear (short for the Kajima Lab for Global Engineering, Architecture & Real Estate) is Kajima's flagship research and development (R&D) and innovation hub in Singapore. Situated in Changi Business Park, it houses the Kajima Technical Research Institute Singapore (KaTRIS).

With multiple R&D labs, KaTRIS is where new technologies – from robotics to digital platforms and automation tools – are co-created and trialled, helping to speed up their adoption across the construction industry.

Past innovations include a concrete finishing robot jointly developed with JTC and Nanyang Polytechnic, and alternative cooling systems trialled in collaboration with the Building and Construction Authority (BCA) and the Singapore Green Building Council.

Recognising Kajima Overseas Asia (Singapore) (KOAS)'s transformative efforts, BCA chief executive officer Kelvin Wong notes: "Innovation is at the heart of KOAS' vision, as exemplified in its initiatives. To stay competitive and develop long-term capabilities, built environment firms must transform how they build and operate."

KOAS was named Company of the Year in the large firms category at the BCA Awards 2025, an accolade reserved for businesses with the greatest commitment to transforming Singapore's built environment sector.

Its managing director Lim Chong Lai says: "Our R&D labs serve to drive technological advancements, leading to the co-development of new products, processes and technologies that can improve the quality of life for individuals and societies."

KOAS is embedding smarter construction methods into its pipeline of projects, including the Toa Payoh Integrated Development.

The firm exemplifies the kind of long-term capability building that the new $100 million Built Environment Technology and Capability grant aims to strengthen. Announced by the BCA in March 2025, the grant will support firms in developing enterprise, technology and manpower competencies.

"We are encouraging firms to go beyond what is common in the industry to enable more impactful and sustained transformation within the firms, and in turn, in the sector," says Mr Wong.

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- Mr Lim Chong Lai,
managing director of Kajima Overseas Asia (Singapore)

Collaborating for impact

Breakthroughs in the built environment sector also hinge on how stakeholders can coordinate together, says Mr Wong. One example is Corenet X, a one-stop integrated digital platform for building project approval. It helps project teams and government agencies stay aligned from the start of the design process, thus resolving problems upfront and reducing costly rework and delays.

From this October, all companies are required to make submissions through Corenet X, starting with large-scale projects. The platform is expected to shorten approval timelines by up to 20 per cent, Mr Wong adds.

The same idea is now being used in contracts.

With collaborative contracting, everyone involved in a project shares the risks and rewards more fairly.

The sector is already making progress: More than 15 projects in both the public and private sectors are piloting a collaborative contracting option under BCA's Public Sector Standard Conditions of Contract. One example is the Punggol Digital District (PDD), where the approach helped resolve and settle claims faster, allowing the team to stay on track despite pandemic-related delays.

"Together, Corenet X and collaborative contracting will reshape our day-to-day working relationships from silos to integrated problem-solving from the start, enabling us to deliver better projects while building a more resilient built environment," Mr Wong says.

Building sustainably for the future

As climate change intensifies, green buildings have become more critical than ever in achieving Singapore's national climate goals.

Notes Mr Wong: "They help reduce embodied carbon through sustainable construction materials and lower operational carbon through energy-efficient design and operations."

Kimly Construction, the Company of the Year winner in the small- and mid-sized firms category, has put this into practice at the Singapore Institute of Technology Campus Court project in the PDD. For example, its food court incorporates building-integrated photovoltaic glass modules that allow natural light to enter while generating solar energy simultaneously.

▲The Gear, Kajima's six-storey hub at Changi Business Park, supports collaboration and growth among start-ups and corporations. PHOTO: KAJIMA DEVELOPMENT

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- Mr Kelvin Wong,
chief executive officer of the Building and Construction Authority

It was also constructed using mass-engineered timber, which was fabricated off-site. Lighter and easier to install with fewer workers, these panels also generated less waste on site. Timber carries a smaller carbon footprint than conventional concrete too.

The project has been certified Green Mark Platinum, with both the food court and sports hall achieving the Super Low Energy (SLE) designation, two of the six buildings on the site to earn the accolade.

Mr Wong says: "We are calling on developers and building owners to aim higher – whether in pushing for Green Mark SLE standards in new projects or upgrading existing buildings to perform better."

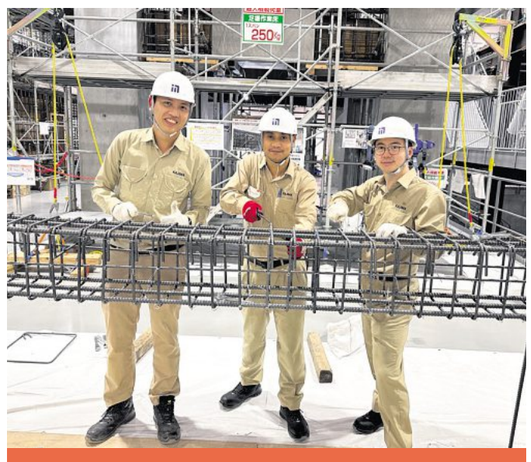
Kimly's upcoming projects, including a new Housing Board development in Kembangan, will implement innovative energy-efficient systems and low-carbon methods to meet the SLE standards.

This is the focus of the Singapore Green Building Master Plan (SGBMP), co-developed by BCA and the Singapore Green Building Council. The SGBMP aims to achieve three goals by 2030: to green 80 per cent of buildings, make 80 per cent of new developments SLE buildings from 2030 and improve the energy efficiency of best-in-class buildings by 80 per cent by 2030.

Mr Wong sums it up perfectly: "The future is about green real estate, and there has never been a better time to invest in sustainability." ■

▲Co-developed by the Kajima Technical Research Institute Singapore and its partners, the concrete finishing robot played a key role in building Kajima's innovation hub, The Gear. PHOTO: KAJIMA CORPORATION

◄At the Singapore Institute of Technology's Campus Court, Kimly Construction used photovoltaic glass panels that allow daylight in while producing solar power. PHOTO: KIMLY CONSTRUCTION



▼KOAS sends selected staff to its headquarters in Japan each year, where they pick up new construction best practices to pass on to their teams back home. PHOTO: KAJIMA CORPORATION

Inspiring new industry professionals

In Singapore's built environment sector, creating jobs and nurturing future talent is just as critical as adopting new technologies. Two of this year's Building and Construction Authority (BCA) Company of the Year award winners – Kajima Overseas Asia (Singapore) (KOAS) and Kimly Construction – are showing how long-term talent strategies can strengthen the industry's foundations.

At KOAS, employees grow through structured pathways such as a three-year graduate development programme that rotates fresh graduates across projects and departments.

Explains managing director of KOAS Lim Chong Lai: "This is one of the ways we identify and develop future leaders, preparing them to fill critical roles."

The company also encourages staff to trial new digital tools, ensuring that innovation is not only cutting-edge but practical on-site. Beyond the workplace, employees are sent to industry events like the BCA Young Leaders Retreat, and even to Japan (pictured, above) under an annual exchange programme, broadening their skillsets and networks.

Home-grown firm Kimly also has its own training unit. Besides that, it nurtures future talent through initiatives such as the iBuildSG Scholarship, the Singapore-Industry Scholarship and work-study schemes that give students hands-on exposure.

Its managers also serve as mentors through industry associations, guiding young professionals as they take their first steps in the sector.

Says Mr Louis Khoo, the firm's director: "Many of our employees have joined our long-term development initiatives, resulting in promotions and progression into more senior roles."