



PER SPEC TIVE

EDITION 1 - 2023

**PEER REVIEW: A WILDLY
UNDERUSED TOOL THAT
CONTRIBUTES TO QUALITY
RESULTS**

**WOMEN IN CONSTRUCTION: A
FIGHT AGAINST INEQUALITY**

**RETROFIT: TODAY'S NEW
PROCESS WILL BE TOMORROW'S
BEST PRACTICE**

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Navigating Modern Day Mining Projects:
A QS Perspective



Connecting With Country



Fast-Tracking Construction Projects
Offers both Risk & Reward

WELCOME

When I began my career in the built environment over 30 years ago, I never imagined that our industry would be integral to the delivery of social change and helping reduce the impact of climate change, how we would be critical to the levelling up of gender inequality and play a key role in embracing the latest technologies and innovation.

As I sit down to write this introduction to our first edition of 2023 Global Perspective, it isn't lost on me what an amazing industry we work within and in my role of Global Chair of RLB, what amazing thought leaders we have at RLB who are sharing their insights on all these subjects, and more.

In the context of ever changing geo-political situations and stresses on supply chain and labour markets, we need professionals with understanding of the marketplaces they work within, expertise of their sectors and services and a steady hand to guide our clients through to their long-term ambitions. And it is these professionals I am meeting and chatting with daily here at RLB, whether in our Oceania or Stateside offices, over in Mainland China, in the African regions or in our European offices. I am proud of the independence of our collective thoughts, our insights and our intelligence that help shape the built environment and the world around us.

In this publication we hear from my global colleagues about technical issues such as mining projects for renewable energy regeneration and BIM maturity in terms of policy, people, technology and process, in addition to articles around wellbeing within the workplace and how we utilise peer reviews to drive best practice.

I hope this edition of Perspective educates, inspires and challenges you and your outlooks on the world we work within. As always, if you have any comments, thoughts or would like to discuss any of the subjects further, do reach out to the individual authors or myself as Global Chair, as we always welcome conversations to help create a better tomorrow.



ANDREW REYNOLDS
RLB GLOBAL CHAIRMAN



PER SPEC TIVE

Perspective

is the global magazine of
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With a network that covers the globe and a heritage spanning over two centuries, Rider Levett Bucknall is a leading independent organization in cost management and quantity surveying, project management and advisory services. Our innovative thinking, global reach, and flawless execution push the boundaries. Taking ambitious projects from an idea to reality.



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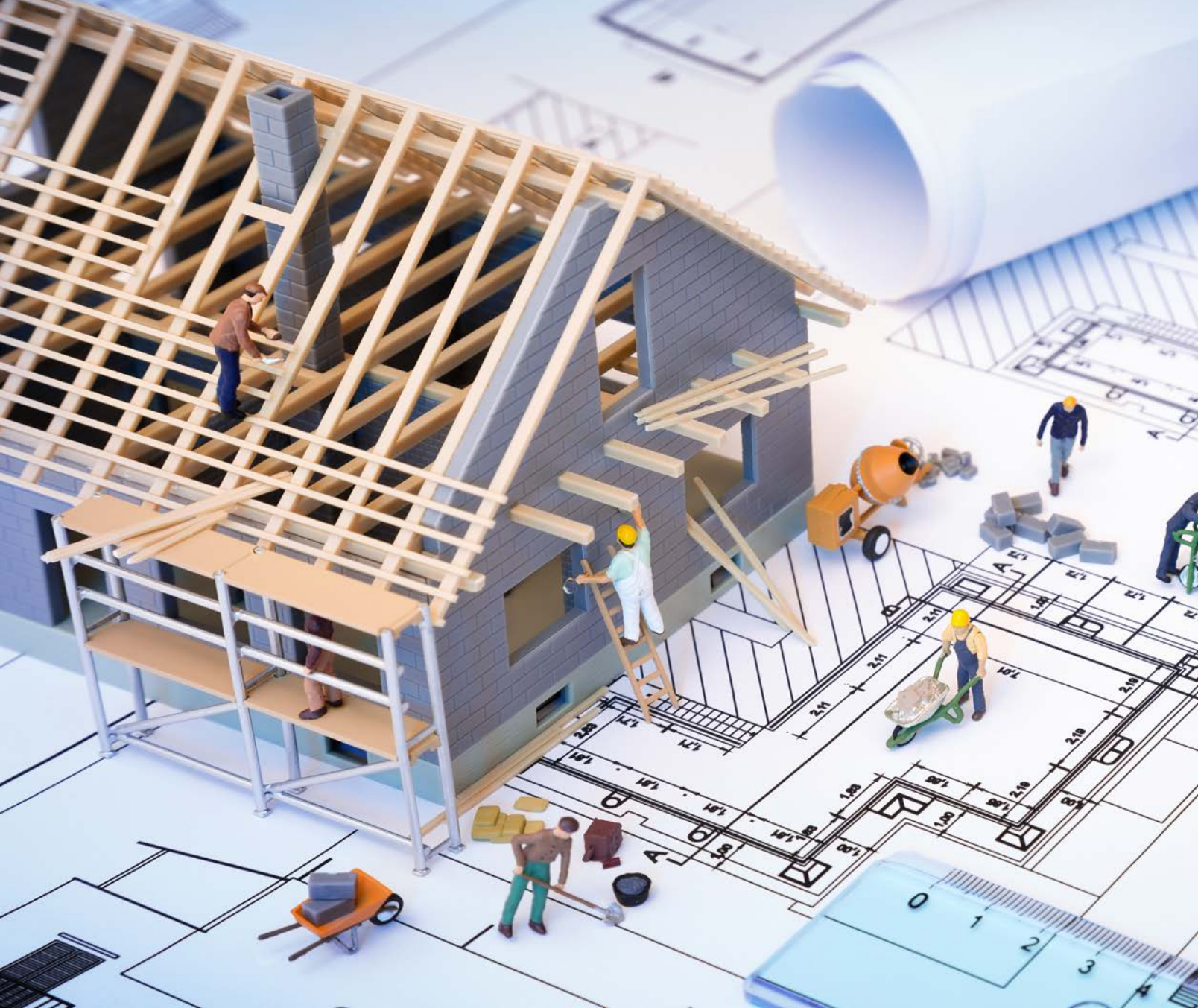
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PEER REVIEW

A WILDLY UNDERUSED TOOL THAT CONTRIBUTES TO QUALITY RESULTS

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These days there just doesn't seem to be enough architects to handle the number of projects out there, with aggressive timelines for projects, owners and their teams want things done efficiently and effectively. Keeping projects on time, budget and with the highest level of quality becomes even more difficult when operating with a lean team. Routinely doing peer reviews, where accredited professionals review all the nuts and bolts of a design, would seem to be the antidote to addressing any questions before a build begins. Peer review is a process by which experts review a project and offer suggestions and observation, bringing a level of predictability to the project before it goes to bid.

A peer review can save time, rework, and issues of liability down the road, not to mention the possible cost later of correcting elements of the design that are missing or wrong. Unlike a constructability review which can take place at almost any time in the design process, a peer review has deadlines. It's the absolute last stop in the construction document stages.

Design documents are the peer reviewer's key to a successful evaluation of a project. A good reviewer will read the plans and specifications cover to cover, taking notes as he or she goes along. Sometimes they pick up omissions, like contracts with RFIs but no deadline for responding. Deadlines are absolutely required so all the T's get crossed and the I's get dotted, and everything comes together at once. Peer reviewers will not sign off on a set of construction documents that's not 100% complete.



Even with so many new technologies at hand, construction is complex. Design teams are routinely asked to make revisions and updates and a peer review can be a reassuring, second set of eyes and help improve designs, save time during construction, or prevent any rework.

To keep track of all the changes, architects would benefit from their own teams of outside consultants – electricians, masons, etc. – to make sure all the plans are as they should be. To be avoided are instances where, for example, a major piece of ductwork gets left out of the lobby drawings, or where elaborate waterproofing is called for in the project specifications, but the drawings don't indicate where it goes. In a recent example, drawings called for a room to hold flammable materials; explosion-proof light switches designed not to spark were recommended in a peer review.

WHO IS THE RIGHT PERSON TO EXECUTE A PEER REVIEW?

The best candidates to do a peer review are seasoned industry professionals from various facets of design and construction who have at least a couple decades of hands-on experience in all kinds of projects, including on-site experience that is considered invaluable. For anyone who has worked in the field and managed construction projects, a successful peer review almost becomes instinct. That instinct translates to an ability to immediately identify items missing from drawings, or places where things can be done simpler.

For anyone who has worked in the field and managed construction projects, a successful peer review almost becomes instinct. That instinct translates to an ability to immediately identify items missing from drawings, or places where things can be done simpler.

The experience of years working on an actual construction site sharpens a peer reviewer's eye in incalculable ways, and goes a long way toward forging astute professionals – Are there walkway pads? Are there enough? Is there a rainwater leader boot on the downspout to protect it from getting dented? Is there a trap primer to prevent toxic sewer gas from seeping up into a building? This kind of field experience is imperative; they learn so much out in the field that working from drawings alone can't possibly teach them.

While they are not interchangeable, both the constructability review and the peer review will have core teams of hyper-specialized professionals to consult, depending on the type of project. If it's an infrastructure or transportation project, an expert doing a peer review will bring in a specialist with expertise in those categories. Same with health care facilities or air terminals – just about everything requires specialization. Experienced

professionals will know all the requisite building codes or ADA requirements, for example, as they might be specific to the type of project.

Any omissions in plans today may be a function of the way drawings are done -- which is not nearly as good as they were before computerization, according to some construction veterans.

Architects used to draw everything by hand but since computerization, practitioners rely on a vocabulary of icons they can drop into any project drawing. It's much less expensive than doing things manually, but the nature of the software is such that designers end up expressing even the most important idea with a simple graphic that leaves little room for subtle details.

Maybe it's time the industry began training professionals to do peer reviews. Without it, interesting profitable projects will be replaced by smaller ones executed to lower and lower standards. As they say, reputations get ruined the way one goes broke or gets sick: slowly and then all at once. Just like a good medical check-up, healthy projects start with early prevention. **P**

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NAVIGATING MODERN DAY MINING PROJECTS

A QS PERSPECTIVE

By: Craig Hall

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Global warming and climate change are arguably in the top 5 most important problems facing the world today. Countries, sectors, industries, and individuals alike are focused on and striving for net carbon zero targets in the very near future and must work towards reducing the carbon being produced. This has led to a global focus on the transition from energy derived mainly from fossil fuels to energy derived from various renewable sources, such as solar power, wind energy, hydropower, geothermal energy, and bioenergy.

The supply of raw materials will be at the center of efforts to decarbonize and electrify the global economy as we move from fossil fuels to renewable energy generation, examples being copper for electrification, nickel for electric vehicles, lithium and cobalt for batteries, tellurium for solar panels, and neodymium for the magnets used in wind power generation. The demand for raw materials is driving the resurrection and growth of the global mining sector, as metals and mining companies

strive to provide the vast quantities of raw materials required for the energy transition.

All of this is of course good news for the mining and engineering construction sectors as expansion projects are rolled out across the globe, and these projects require any number of construction professionals during the planning, design, and implementation phases. Once again, this is good news for companies like RLB providing project management, cost management, and quantity surveying services to mining and engineering projects. But how is the role of the quantity surveyor changing to meet the needs of these projects?

Mining and engineering projects in the modern world are very different to what they were 20 or 30 years ago. Whilst they seek to achieve the same goal - extracting, processing and refining raw materials at the most efficient and cost-effective price - the method of execution is very different with a key focus being "getting to production as



soon as possible". Gone are the days of having the time to produce an accurate definitive cost estimate, to go through a rigorous value engineering process, to follow rigid procurement process, or to follow traditional tried and tested construction methodologies. Projects have moved from being capital sensitive to being time sensitive, and consequently those traditional timeframes for implementing various phases of a project are significantly reduced. Of course, money will always be important, especially if you're "signing the cheques", so the balance between these much-reduced time frames and managing the budget has become an extremely important exercise.

Consequently, the role of the cost manager or quantity surveyor on these mining and engineering projects has also changed. The estimating or feasibility phase is often carried out with very little design information from which to estimate, and in some cases is a factored exercise using projects of a similar nature. With ever increasing frequency, the estimating phase is carried out concurrent with an early procurement phase, specifically for long lead items and early construction activities such as bulk earthworks and basic site services. The project procurement phase in fast-track projects is an accelerated process where enquiry documents need to be prepared in a short time. The measurement of drawings is less important than it would have been in earlier years, and the extraction of quantities is largely done electronically by

the design engineers from their 3D modelling. Similarly, the production of bills of quantity is regularly done by the design engineers who pass on already populated bills of quantity for checking and verification, and occasionally reformatting, by the quantity surveyor. The period allowed for the adjudication of tenders and award of a contract is kept to an absolute minimum, thus requiring the cost manager or quantity surveyor to work smarter in order to properly contribute to the process and minimize risk to the client and contractor alike.

In the post-contract phase, construction programmes are again kept to a minimum with very little float, and the design and engineering teams are under pressure from the start to produce construction drawings to meet these programmes. The quantity surveyor's role is one that focuses more on contract administration and contract management, attending to contract amendments as the scope is confirmed and finalized, managing an aggressive cashflow forecast, and of course managing the budget and keeping an accurate forecast of the expected final account value.

Thankfully, the modern-day quantity surveyor is well trained and the transition to this "new" role is easier than it first appears. Working under pressure is not new to quantity surveyors in general and certainly not to mining and engineering professionals, so adapting to these conditions is not difficult if the quantity surveyor plans and executes his work correctly according to this plan. Generally, quantity surveyors understand contracts and how to work the specific terms and conditions in order to effect proper contract administration and management when allowed to do so. There are also many electronic quantity surveying and contract management software systems available to rely on to carry out any number of tasks, and if properly set up and utilized from the start, can greatly reduce the time spent on even the most basic activities.

So how is the role of the quantity surveyor changing in the context of modern-day mining and engineering projects? I would suggest that it hasn't changed that much. Whilst the importance of the various tasks performed by the quantity surveyor may have changed over time, and whilst the methods employed to carry out these tasks, and time available to do so may have transformed, at its most basic level, the role is to act as a gate keeper for construction project finances and contractual relationships, thereby ensuring that the financial and contractual positions of construction projects are effectively controlled and accurately reported. And the person best qualified to do so is the professional quantity surveyor. **P**

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A PRESSING NEED FOR FACILITIES MANAGEMENT STRATEGY

IN THE UAE'S EXISTING BUILDINGS

By: Nick Constantine

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Facilities management (FM) is a critical aspect of the built environment that deals with the maintenance, repair, and ongoing supervision of a building's physical assets to ensure the preservation of that property's value. In the United Arab Emirates (UAE), there is a widely publicised narrative that promotes alignment of the asset and facilities management sectors with global industry best practices. This narrative includes the emphasis on sustainability, the increase in adoption of smart technology and the importance of analysing the performance of assets over the whole life cycle. Buzz words and phrases such as life cycle cost modelling, BIM (Building Information Modeling), CAFM (Computer Aided Facility Management) and the IoT (Internet of Things) are constantly mentioned within articles published on this topic or during property-based exhibitions held in the region. As important, well intentioned and forward thinking as these dialogues are, the unfortunate reality on the ground, however, is far from the picture being illustrated. That is not to say that all FM service providers in the UAE are not delivering in these key areas, but rather the market overall is not and, crucially, investment from property owners in supporting such measures is noticeably absent.

DIAGNOSIS

The majority of multi-occupancy assets in the UAE utilise very little to no technological innovations in the delivery of facilities management services. Life cycle planning – a systematic, comprehensive approach to managing a building over its entire life span – is seldom considered and if it is, it is not done holistically and often focuses on short-term CAPEX expenditure forecasting. The reason for this is largely due to a prevalent, short term cost saving mind-set which is preventing the improvement of existing built assets in the UAE. Doing 'more with less' has been taken too far, with the result being simply less being done! Satisfying the minimum statutory requirements has become the norm in the UAE and not the minimum expectation as it should be.

As an example, a three- or five-year facilities management contract would not be uncommon in other markets. It is, however, rare in the UAE. FM contracts in the Emirates are often procured annually with owners expecting asset managers to re-tender the provision each year. This only serves to propagate short-term thinking and, as FM providers cannot guarantee a consistent workload, there is little incentive for them to invest in the resources necessary to adequately maintain the asset.

When combined with a very competitive FM market incorporating a wide disparity in competence, the result is a commercial race to the bottom that has damaging consequences to built assets. The assets are then left with long lists of deferred maintenance, inefficient plant and equipment and poor-quality documentation. With each change of provider, the FM service delivery approach changes and as-built records, often put under the custody of the service provider, become increasingly inaccurate or lost altogether.

CONSIDERATIONS

Understandably, a building owner's leading interest is often commercial. However, the field of view by which their commercial interests are traditionally measured is too narrow. Commercial interests will always be integral to the procurement of FM services but satisfying such interests should not be at the expense of the physical asset and its effective operation. Ironically, prioritisation of the short-term commercial interests of owners and stakeholders ultimately leads to the dissatisfaction of the very same owners and stakeholders due to dilapidation of the asset, manifestation of health safety risks, reduced appeal to owners or tenants and escalation of repair and renovation costs associated with deferred works or substandard, cheap and quick-fix maintenance.

A clearly defined facilities management strategy would be the prescription to this.

REMEDY

It is well-known that considerable value can be added to a project when facilities management consultancy services are engaged at the very beginning of a project's life cycle. That is not to say, however, that the value which can be added by developing and implementing an FM strategy for an existing asset is inconsequential. In fact, having been operational for a period of time, the existing asset, its users and the strengths and weaknesses of its current processes and procedures provide a wealth of data, allowing a strategy to be better defined as a result. According to Architecture 2030, approximately two-thirds of global building stock for 2040 is already in existence today. This means that there are bigger gains to be had by focusing on improving the operation of our existing buildings than upcoming assets.

A well-defined FM strategy is symbiotic with the objectives of the owners and stakeholders and becomes the reference point from which

the long-term management aims, and property life-cycle plans are delivered. Such a strategy should cover, as a minimum, a definition of the owner's objectives for the asset, service requirements for the asset, roles and responsibilities, standard operating procedures to be followed, contract selection, procurement, document management, performance management, change management, life cycle cost modelling, risk identification and management, business continuity, along with overall strategy monitoring and review.

Given the huge costs expended in designing and constructing assets in the UAE, a comparatively small investment in developing an FM strategy would provide a more wholistic view of costs and prioritise long term cost efficiency. It would also provide road maps to achieve stakeholders' long-term objectives and weed out incompetent service providers, thereby improving the standards of operation and maintenance and, most importantly, protecting and extending the service life and relevance of the asset. **P**

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Building for the future

Appointed in 2015 by Everton Football Club - one of the founding members of the Football League, RLB has been providing cost management services for the Club's transformational project to build the Everton Stadium at Bramley-Moore Dock.

Combining a new iconic football stadium and community-led legacy plans, this innovative scheme is delivering one of the largest packages of public benefits ever seen in the North West. This will generate a £1.3bn boost to the economy, create tens of thousands of jobs and attract 1.4million visitors, annually, to the Liverpool City Region.

The project has already won plaudits and accolades with its eye-catching design which brilliantly blends the modern with the traditional. The stadium has also been shortlisted as part of the UK and Ireland's UEFA EURO 2028 bid.

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AIRPORT CONSTRUCTION TAKE OFFS

HOW TO ENSURE A SMOOTH PROCESS

By: Scott Macpherson
Executive Vice President,
North America



With a dramatic downturn in passenger traffic in early-to-mid 2020, the industry has observed a steady return of activity close to pre-pandemic figures. An easing of Covid restrictions has brought long lines and hours-long waits to airports around the globe as passengers jump on the opportunity to travel again after two years of being grounded. Between this growing demand for airline travel, along with the pressure for airports to strive for net zero carbon emissions, there are many things to consider addressing these changes without sacrificing profitability.

While the last few years of travel have hardly been normal, it may be something of an indication of what is to come. Worldwide, airport passenger traffic is set to double to 8.2 billion by 2037 from

3.979 billion in 2017, with the Asian market showing the greatest gains.

To meet the staggering demand, airports around the world are wisely updating at a rapid pace. Los Angeles' LAX is on a massive \$6 billion upgrade schedule, not just in advance of the 2028 Olympic Games but because the city has become a tourist destination of its own in the past few years. New York's LaGuardia Airport continues apace with its long overdue \$8 billion re-do, while JFK's planned \$9.5 billion upgrade includes a much-needed new international terminal.

The Infrastructure Investment and Jobs Act (IIJA) is also addressing these needs and supporting airport improvements with a \$5 billion Airport Terminal Program, one of three aviation-specific

programs created by the IJJA. With a strong return in passenger count and a renewed focus on sustainability, automation, futureproofing, and passenger experience, interest continues in aviation-related construction.

SUSTAINABILITY AND THE PASSENGER EXPERIENCE

The aviation sector as a whole is pushing for net zero carbon emissions by 2050 and airports are already reflecting the changes. In 2010, Logan Airport in Boston was the first to be fully LEED certified by the U.S. Green Building Council and most other airports are falling into line as sustainability gains steam in airport design and operations. Some of the measures Logan took include recycling construction and demolition waste, adding a reflective roof membrane and installing light shedding systems within the terminal. LaGuardia, Chattanooga and Istanbul are three other airports that also have LEED certified components, and overall, certification is becoming the standard as the industry's position on sustainability and environmental impact evolves.

Sustainable building practices help manage public perception as well as helping achieve that net zero status. Many of the green building practices help address the noise and air pollution related to the 24-hour-a-day operations. The materials and technology used also help efficiently address the large volumes of air-conditioned space and the overall energy usage too.

For example, temperature control is a key issue, and for many airports, the goal is to reduce air conditioning use by preventing a terminal from heating up in the first place. A reflective roof membrane like the one at Logan can help keep a terminal cool, and photovoltaic panels are also a highly recommended addition to the design. They cost half what they used to, and can provide cheap electricity to augment what comes from a municipal power grid, keeping operating costs down.

Triple-glazed windows that darken with the rays of the sun -- like photochromic sunglasses -- can also make a huge difference. They help keep interior temperatures lower by blocking hot sun but not blocking desirable natural light or expansive views of nature like Mt. Rainier at Seattle-Tacoma International Airport. There will also be green roofs and interior gardens for anyone wanting to forest bathe while waiting for takeoff, and Seattle's Sea-Tac also has a rainwater harvesting system that will save an estimated two million gallons of water annually.

Trees are not just making an impact in green spaces, but also as a building material as more airport architects are specifying timber framing. Portland International Airport has an extraordinary timber ceiling that mimics the forests in the Pacific Northwest, complete with natural light filtering through the protective canopy to the area below. At Sea-Tac, a vast coffered ceiling and central pillar constructed of Douglas Fir timbers frame a concourse with amphitheater seating, amenities inspired by Seattle's famous markets, and views that take advantage of natural light and the natural beauty of the surroundings.

Timber framing has environmental advantages and contributes to creating healthy interiors, especially in the wake of the Covid pandemic. It's obviously a renewable resource, but wood also has carbon capture benefits, low thermal conductivity and fewer toxic emissions. Another advantage of timber is that it doesn't represent any great labor cost increases as contractors typically know how to work with timber framing materials.

Much of the talk around the aviation industry being carbon zero by 2050 centers on the plane fuel, but airports are also taking measures to encourage passengers to leave the cars at home. Gatwick is instituting a drop-off fee to encourage passengers to take public transportation, and airports like Tampa and Dulles International have added multiple electric vehicle charging stations in anticipation of growing demand and most airports have adopted electric people movers.

Sustainable building practices historically had been thought of as adding costs without a measurable return on the investment. Today, there is a real understanding about what the true value beyond that capital cost.

TECHNOLOGY

Every airport has its own technology masterplan and future proofing is critical to help avoid unnecessary disruptions. That means installing multi-use conduits for electrical wires and fiber optic cables that will be adaptable as technology changes, avoiding the need for massive, costly structural changes at a later point. Where a uniform attendant once stood, there's now a machine, but the conduits and cables behind the scenes are the same if the installation has been done right. A return on this type of investment in the future is something you don't see straightaway, but savings later on will be considerable when you have to update screens or other equipment as new ones come to market. Being able to do it without a major remodel is a distinct cost advantage while

guaranteeing less disruption to passengers.

Technology can be used to keep airport operations running efficiently during any renovation projects too. The smooth movement of passenger traffic has to be the top consideration during any construction because airports can't close, nor can any airport in a major city be razed and rebuilt from the ground up. To keep them running as well as possible, renovations should be designed with 3D modeling that creates a digital twin, allowing architects to see what works and if all necessary components are present before the section is actually built. This helps all stakeholders, from airline personnel to concessionaires, understand the phasing and cost of the closure of any section. From a passenger point of view, it enables the airport to plan ahead, minimize disruption and keep things moving smoothly.

CONSTRUCTION LOGISTICS

With airport work, phasing and coordination are often the biggest drivers of cost, especially with renovations where owners must find the sweet spot between budget, schedule, and scope of construction to maximize the efficiency of the project. Because airport operations can't be interrupted during renovation, it can be a major driver of costs and can run up to 50 percent more than new construction. But, when well planned and executed, the risk of diminished productivity is reduced which is always a major goal for everyone involved.

To make a minimal impact on airport operations, construction is most often conducted at night. Overnight work brings its own set of logistical concerns that can slow down the process, including finding and retaining a workforce to work the off hours. Other airport-specific challenges including offsite parking requirements which double the time spent in transit, and correspondingly reduce the time spent at work. Staging material deliveries at a time and place that minimizes the disruption to airport activity is also a challenge. Other logistic challenges including securing security clearances for the construction work force on site and can often be more of a problem than expected, along with overall compliance with TSA and FAA protocols.

With the construction unemployment rate at 3.5 percent, contractors will likely struggle to find enough workers as demand for construction outpaces the availability of the workforce, especially with the challenging logistics of airport work. Inconsistent material lead times also can be a challenge, as it is difficult to secure the

tradesmen for those materials that drive airport schedules and costs, like major mechanical and electrical equipment, curtain walls and roofing. Given that, thorough consideration of alternative procurement approaches such as bulk-buying, early-release packages, and pre-purchasing need to be considered.

Realistic budgets need to be set and expectations adjusted as necessary, as budgets set even just six months ago may change due to the rollercoaster supply chain we've seen in the past year or so. It's important to use both real-time and historic data to predict cost trends and ensure the schedule captures project risks.

ENSURING A SMOOTH LANDING

While every airport construction project is unique, they share a common goal: to deliver a superior passenger experience through modern, responsive facility design. With costs climbing to ever-increasing altitudes, achieving that target requires a knowledge-based costing strategy that is simultaneously detail-oriented and focused on the big picture, and applied with skill and vision. **P**

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CONNECTING WITH COUNTRY

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Gurriny Yealamucka means “good healing waters” in the language of the Gunggandji peoples – and the health service that bears its name is a place that helps the people of Yarrabah in Far North Queensland to heal and reconnect with Country.

In 2021, when the Gurriny Yealamucka Health and Wellbeing Centre on Workshop Street first opened its doors, it bore little resemblance to a typical health centre. Missing were the institutional finishes, long corridors and enclosed spaces that are common to healthcare design. Instead, people were enfolded in the welcoming embrace of a building that echoes the culture, landscape and identity of the community it serves.

The community of Yarrabah on the Cape Grafton Peninsula, just south of Cairns, is surrounded by water from the sparkling turquoise of the Pacific Ocean to the freshwater springs that flow from the rainforest that rises sharply from the coastline.

Breath-takenly beautiful as it is, Yarrabah carries a complex history. For many years the town was a mission where generations of Aboriginal, South Sea Island and other First Nations people were forcibly relocated. For generations, the people of Yarrabah were deprived of their culture and identity and many bear deep emotional, mental and physical scars.

By 2014, Yarrabah was the largest Indigenous community in Australia and one of its most disadvantaged. Determined to change the town's trajectory, the Gurriny Yealamucka Health Service Aboriginal Corporation became the first remote community in Queensland to assume responsibility for its community's primary health care, as Yarrabah Health Council in 1991.

A new chapter of Yarrabah's story could unfold – one told by the community in their own voices.

DESIGNING WITH COUNTRY

The Gurriny Yealamucka Health and Wellbeing Centre outreach facility at Workshop Street was

designed by two architecture firms in collaboration, People Oriented Design (POD) and Coburn Architecture. RLB provided cost management and quantity surveying services during the design phases.

The centre offers treatment, general and specialist consulting rooms, group meeting and counselling rooms, as well as staff offices.

“While it’s a small building, it has made a big difference to the community – and that was in part because of the collaborative process we undertook during design,” says Coburn Architecture’s Director Alanna Coburn.

‘Country’ – with a capital C – is an important term used by Indigenous Australians to refer to the land and its spiritual, cultural and physical connections. Country encompasses land, skies and waters, but it is much more than geography. The term also captures complex ideas about law, custom, ancestral knowledge, language, spiritual belief, cultural practice and family. Connection to Country is central to identity and is passed down from generation to generation through story, song and ceremony.

How do non-Indigenous practitioners design in a way that respects and heals Country? This was one of the challenging questions for the design team that delivered the centre.

While ‘human-centred design’ is a common principle of contemporary architecture and planning, Indigenous people often think differently about design. An ‘eco-centric’ approach sees humans as a part of the natural system, and of equal value to animals, resources and plants, rather than first in a hierarchy.

POD’s Dr Shaneen Fantin holds a PhD from the University of Queensland on the relationship between design and culture in Indigenous housing. She has applied this research knowledge to many Indigenous housing and health projects, including the Gurriny Yealamucka Health and Wellbeing Centre.

“As non-Indigenous people, we don’t have rights to, or proper understanding of, traditional knowledge,” Dr Fantin says. “Therefore, our role is to create an open and safe place for First Nations people to share their ideas, identity and culture.”

Dr Fantin, as project manager, led stakeholder engagement, the co-design and review process, and contract administration on site. “Yarrabah had been a place where people were sent and the history of making the community has been through a colonial framework. The non-Indigenous

superintendents and project leaders would make decisions about building, education, and work, and people were expected to go along with what they were given. There was almost no consideration for Indigenous culture,” she reflects.

“We turned this upside down by building respectful relationships that put First Nations views at the centre of the project.” This process can take time and can be unexpected for people. “There can be a lot of anxiety around sharing ideas and culture. But when you create a safe space, you can enable people to write their own story.”

LISTENING AND LEARNING

Community consultation can often mean turning up to a meeting with a fully formed design, leaving people with little option but to object or approve. But the Australian Government, which funded the project, didn’t “simply hand us a brief,” Alanna Coburn notes. “We spent a lot of time working with all the stakeholder groups to understand the needs of the community and how that would require a different health centre.”

Several community organisations were engaged in the design and construction process, including the Yarrabah Arts Centre, the Gunggandji Land and Sea Rangers, the Yarrabah Aboriginal Shire Council, elders’ groups and Traditional Owner representatives, a First Nations building contractor and the client.

From these meetings, a clear design brief and concept began to take shape. The building and landscape were to be “of their place” – with materials, colours and landscaping that echoed the surrounding environment, and by telling the story of Yarrabah’s protector, Guyula the sea hawk.

As both a registered architect and landscape architect, POD’s Belinda Allwood provided key input into the design of the building form and integration of the landscaping. She says the materials palette was carefully selected to mirror the turquoise ocean, the lush green rainforest and the ochre of Guyula’s wingtips. Local plants were chosen with guidance from the senior women’s group. And Guyula is etched into the building’s rust-coloured fa ade in a design by acclaimed local artists Wayne Connolly and Philomena Yeatman.

HEALING WATERS

The theme of ‘good healing waters’ flows through the building in everything from the fa ade artwork to the landscaping. For instance, the building is sited on a sand dune and slopes away from an old wetland. “To honour Country, we ensured the

stormwater would flow in its natural path,” Dr Fantin says.

The architects “cracked open” the building so those inside could look directly to the spectacular ranges behind or maintain sightlines to the sea. “The spatial organisation means people can feel safe by connecting back to Country and the natural environment that surrounds them,” Ms Coburn adds.

With multiple entries and exits, people have the freedom to come and go – something at odds with most security-conscious health services. But this flexibility offered unexpected advantages during the worst of the Covid pandemic, with easy separation of services. The multi-modal ventilation and operable louvres also allow the building to be flushed with healthy sea air each day.

The building’s organic curves create a safe cocoon for visitors. “Curves always attract a price premium, as they are challenging to deliver, but we worked through these challenges,” notes RLB Manager Brad Bell.

A yarnning circle – a gathering place for stories to be told and knowledge shared – and a bush tucker garden are special features. The project team established a strong relationship with the Gunggandji Land and Sea Rangers who manage the natural and cultural values of Country surrounding Yarrabah. The rangers’ gift of a grass tree was an important cultural exchange that represented support from Traditional Owners for the project, Dr Fantin observes.

“It is a beautiful relaxing space,” Ms Coburn adds. “You can see out to the mountains, take in the fresh sea breeze, and enjoy the natural finishes. The building is more like a wellbeing retreat than a health centre.”

CELEBRATING CULTURE

After a competitive tender process, the centre was constructed by First Nations building contractor HC Building and Construction. The builder engaged local trainees and Indigenous suppliers and sub-contractors. The economic spend from Indigenous suppliers amounted to 8.7% of the budget, equivalent to almost \$220,000. “This strengthened skills development and built business opportunities within the local community, contributing an extra layer of value to the project,” Mr Bell says.

Projects in remote regions incur higher construction costs. “This can be primarily attributed to attracting and keeping skilled labour, additional transport costs, and accommodating a workforce.” Despite this, the builder was able to deliver on time and budget, “which was a real credit to their business,” Mr Bell adds. “While the location was not without its challenges, the project was very rewarding.”

“From the landscape design to the faÁade artwork to the building contractor, this project was a collaboration with the First Nations people of Yarrabah. The result is a modern and culturally appropriate facility for the Yarrabah community.”

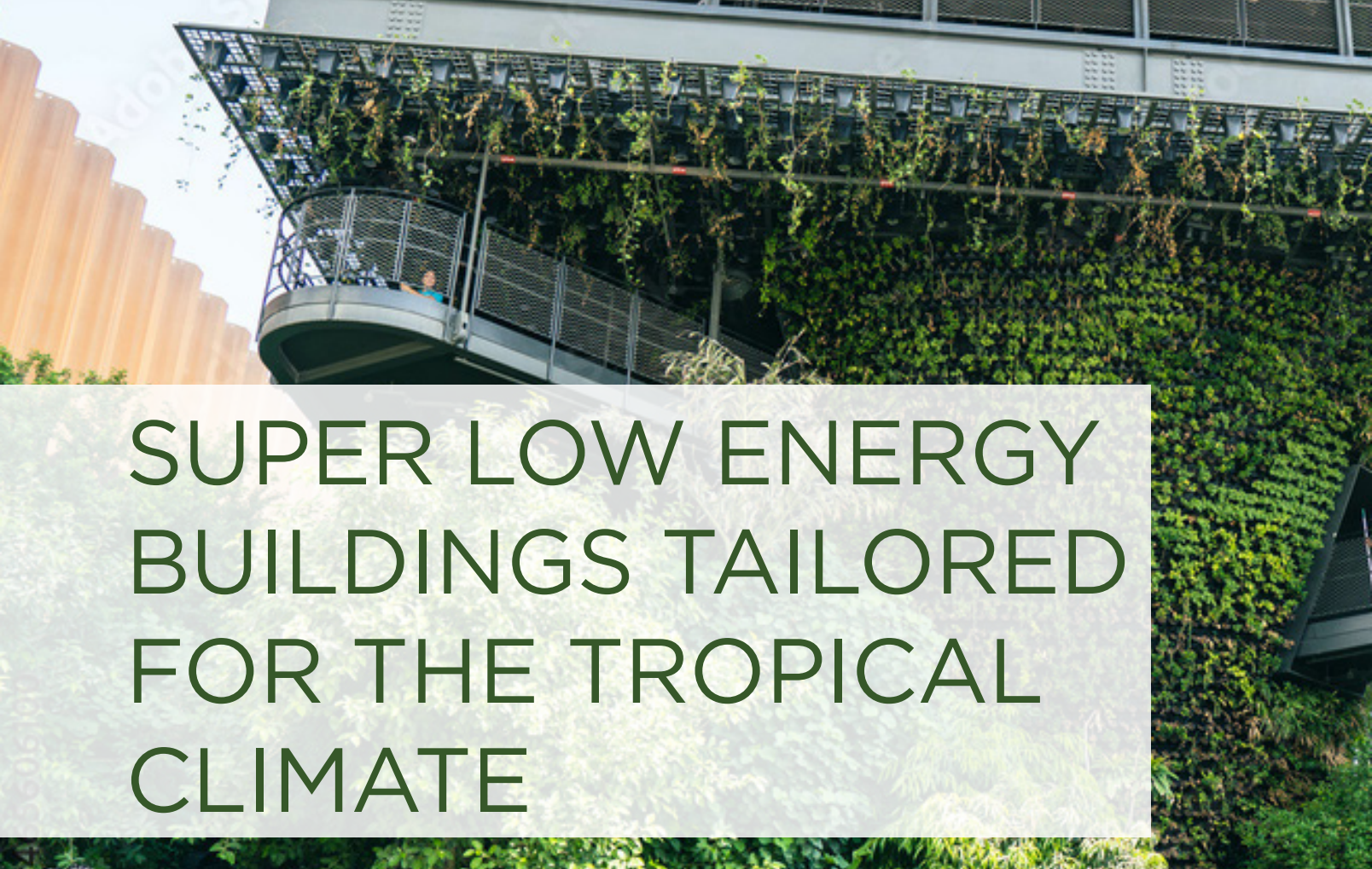
Dr Fantin says the lessons learnt in Yarrabah can be applied to projects around the world.

“There are many important stakeholders on projects like these, and to do the work well you have to build strong relationships with all of them. The key is to value the knowledge that all the different groups can bring. Then a place is not made by one organisation or one funding group, but by everyone. When we can do this, we decolonise the process of design.” **P**

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SUPER LOW ENERGY BUILDINGS TAILORED FOR THE TROPICAL CLIMATE

THE SINGAPORE ANSWER

By: Tay Wan Ding
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In half a century, global energy consumption more than doubled from 68,792 terawatt-hours (TWh) to 176,431 TWh. In comparison, Singapore's energy consumption per capita increased 4.5-fold in the same period, placing her in the top 3 energy consumers in the world per capita.

At first glance, the fact that a small city-state with a population size of 5.64 million could consume close to 8 times more energy per capita than global norms, does not add up. However, when we consider that manufacturing and services are the twin engines of growth in the Singapore economy which consume close to 80% of the total energy, the numbers may not come so much as a surprise.

Similarly, energy consumption in the built environment sector is also trending upwards – the Singapore construction sector saw a 22% Year-on-Year growth in electricity consumption in 2021. Furthermore, buildings count for over 20% of total carbon emissions. The challenge therefore is lowering energy consumption without interrupting nor compromising business and economic growth.

Singapore's green building journey begun in 2005 with the introduction of the BCA Green Mark, which

remains the anchor reference for Green Mark energy savings to date. Since then, the Green Mark certification has undergone numerous reviews, with the latest paradigm shift introduced - the Super Low Energy (SLE) programme. This is the “next wave of Singapore's green building movement” pushing the envelope of environmental sustainability, with ambitious low energy use targets being set.

The challenge is that buildings in the Southeast Asian tropical climate require cooling year-round as annual average temperatures remain above 32°C, coupled with high humidity and rainfall. Further, with global annual temperatures rising faster and the 10 warmest years on record all occurring in the years since 2010, demand for cooling is heating up. Notwithstanding this, the Green Mark: 2021 (GM:2021), with its calibrated standards, has introduced a minimum of 50% energy savings above 2005 building codes for new buildings, and more than 60% energy savings for the SLE category. This is a daunting challenge for our small, land-scarce island nation.

Our current strategy relies on a combination of passive and active design strategies, featuring smart energy management strategies and the use of renewable energy.



With these, an energy efficiency improvement of over 50-60% may be realised. The balance of 40-50% to achieve Net Zero Energy, remains Singapore's biggest challenge, if carbon offsets are not being considered.

Passive design considerations for SLE buildings include allowing for non-air-conditioned areas within the building (more than 25% of the gross floor area), which requires some clever designs to bring natural air flow through the open areas and at the same time introduce green spaces and natural daylight in the midst of the concrete jungle.

At the same time, the concrete jungle is designed to mimic a lush forest with the addition of plants to towering blocks, taking "greening" literally. Vertical gardens, living green feature walls and urban rooftop farms help improve urban environment by mitigating urban heat island effect and improving air quality. Biophilic designs also improve people's physiology and mental health through increased connectivity to the natural environment.

Other "age-old" tropical passive designs include a North-South building orientation and the use of overhangs, sunshades or screens to reduce its cooling load. Reducing glazing areas in the sun path and the use of low emissivity, double glazed dark glass with the fins and shades can reduce the Envelope Thermal Transfer Value (ETTV) to 38 W/m² or less.

Apart from the selection of more energy efficient mechanical and electrical plant and equipment (i.e., Air-Conditioning Total System Efficiency at 0.68 or lesser, use of LED lighting, etc.), harnessing of renewable energy has become more prevalent as a choice of active design. In the Singapore context, solar energy is one of our most

promising renewable energy sources, which has led to many existing and new buildings installing photovoltaic panels, reducing reliance on non-renewables. Vertical panels to facades are even being introduced, even with their low efficiency, to harness as much as we can.

The capacity of grid-connected installed solar grew more than 5-fold in as many years from 2016 to the end of the first quarter of 2022. The Singapore Energy Market Authority (EMA) reported that the majority (61.7% or 413.1 megawatt-peak) of solar capacity was accounted for by non-residential private sector buildings. By 2030, Singapore aims to deploy at least 2 gigawatt-peak of solar energy, enough to power 350,000 households for a year. Solar farms on our public housing buildings, water reservoirs and even marine solutions are being considered.

Through the launch of the SLE Challenge in 2018 where developers/ building owners voluntarily commit to achieving at least one SLE project within the next 5 years, the number of Green Mark certified SLE buildings increased from 18 in December 2019 to 65 in just 5 years. More impressively, 40% of which are either Net Zero or Positive Energy buildings.

All of the above, comes with an increase in upfront capital costs. The additional design strategies to achieve an SLE building comes with a cost premium of an estimated 8% over a GM:2021 Platinum building (55% energy savings above 2005 building codes for new buildings), with the bulk of the cost due to the selection of more energy efficient mechanical and electrical plant and equipment. As evident from the growth in SLE buildings in recent years, developers are confident that energy cost savings during the operation will outweigh the upfront investment costs.

At present, green buildings are focused on the reduction of operational carbon. As electricity gets greener, operational carbon savings have become the baseline of green buildings as seen in GM:2021. The industry is just beginning to recognise the carbon impact of the entire construction process - from embodied carbon to emissions from the construction itself. Embodied carbon calculations, recovery of and/or the use of crushed concrete waste and tier-based certified green products and services are key sustainability features in GM:2021 as well.

In the near future, emerging green technologies will push more buildings towards super low energy usage or even zero energy or positive energy emissions. Technology advancements in high performance glass such as smart glass, which allows light into a specific spot in a building at a specific time, as well as alternative low-carbon energy sources look set to transform the future of the built environment industry. We are excited to be part of this transformative journey and through our global knowledge and strength, will be ready for the challenge. **P**

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WOMEN IN CONSTRUCTION: THE FIGHT AGAINST INEQUALITY

By: Lichelle Neethling

Director,
South Africa



It is a fact: women are severely underrepresented in the construction industry. And although it has been a male-dominated field for many years with women facing numerous challenges and obstacles in trying to break into this space, it seems that even in this day and age the struggle persists and very little is done to catalyse the opposite.

The fight for equality in the construction industry is a long and difficult one, but it is a fight that must be fought. By advocating for change, we create an environment for people to be heard – all in pursuit of a more equitable working environment. Females are – and continue to be – an incredible asset to businesses, bringing a distinctive, empathic culture and creative way of thinking to the proverbial table.

Despite these challenges, women are breaking down barriers and proving that they have what it takes to succeed in this demanding field.

SOUTH AFRICA AND OTHER STATISTICS

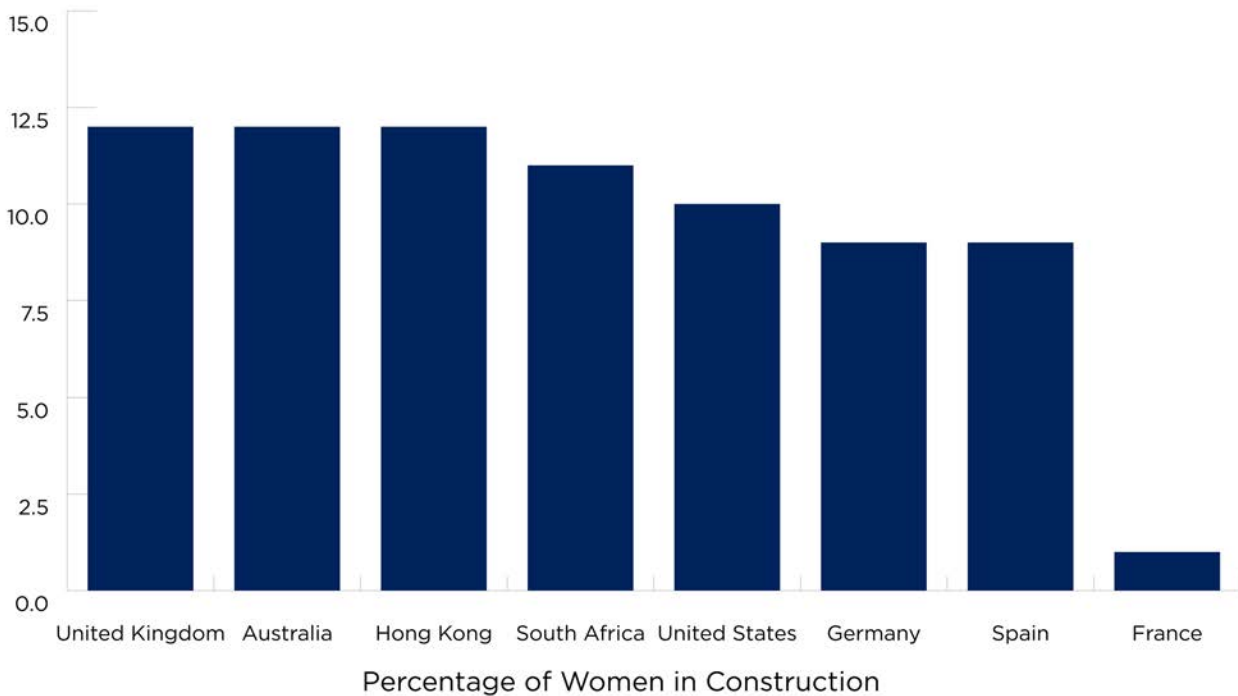
It is said that companies that fall within the highest bracket of gender-diverse workplaces tend to outperform their competition by a significant margin. In South Africa, women make up just over 10% of the construction workforce, a statistic that is mirrored in many other countries around the world. This disparity is often attributed to a lack of access to education and training opportunities, and a persistent cultural bias that views construction as a “man’s job”.

One of the main challenges faced by women in the construction industry is the lack of support, respect and mentorship from their male counterparts.

Women often face sexism, discrimination and unequal pay, making it difficult for them to advance in their careers. For those females in leadership roles, the scale of work-life balance comes into play and then, inevitably, less assertiveness when negotiating remuneration packages or seeking promotions, because “you’re a mother first”.

The graph below depicts the percentage of women that make up the construction sector in various countries. Although some countries have shown great improvement over the past decade, most continue to fall just short of 10%.

The UK’s efforts to create a more diverse and inclusive construction sector are steadily shifting the needle. Several government initiatives such as the Women in Construction program, and industry partnerships such as Women in Property and the Women’s Engineering Society, are a few of the contributors to creating the change that is so desperately needed.



WHY THIS IS IMPORTANT

By fostering a culture of inclusiveness, the construction industry can create a welcoming environment that attracts and retains a diverse range of talented individuals, including women. This not only benefits women, but also benefits the industry as a whole by bringing in new perspectives and ideas that can drive innovation and growth.

What is so often overlooked is the unique set of skills and attributes that females bring to the workplace – essential for creating a diverse and inclusive environment:

Strong communication skills – women tend to be more effective communicators and are better at building relationships with their colleagues. This makes them valuable members of any team and helps to promote a positive work environment.

Collaborative approach – women are often more collaborative and work well in teams, which can lead to improved problem-solving and decision-making processes.

Emotional intelligence – women are (or so they say) more in tune with their emotions and the emotions of others, which helps to create a more empathetic and understanding workplace.

Attention to detail – women are generally very detailed-orientated and meticulous. This is incredibly important when the focus is on ensuring that projects are completed with the required accuracy and quality.

Creativity – women bring a unique perspective to the workplace and are often able to come up with innovative solutions to problems. This truly springs from the fact that men and women think so differently and diversity brings a range of perspectives to the table.

DIVERSITY AND INCLUSION IN RLB

RLB has a strong focus on building a diverse workforce and closing the gender pay gap. The diversity and inclusion strategies and policies that form part of the global business are not only driven by governance, but by the need to do what is fair and ethical. The deliberate actions of our senior leadership teams across all offices to increase our female workforce, in particular, is astounding. It is as a result of these decisions within the core business that RLB proudly strives to create a positive and inclusive working environment.

CONCLUSION

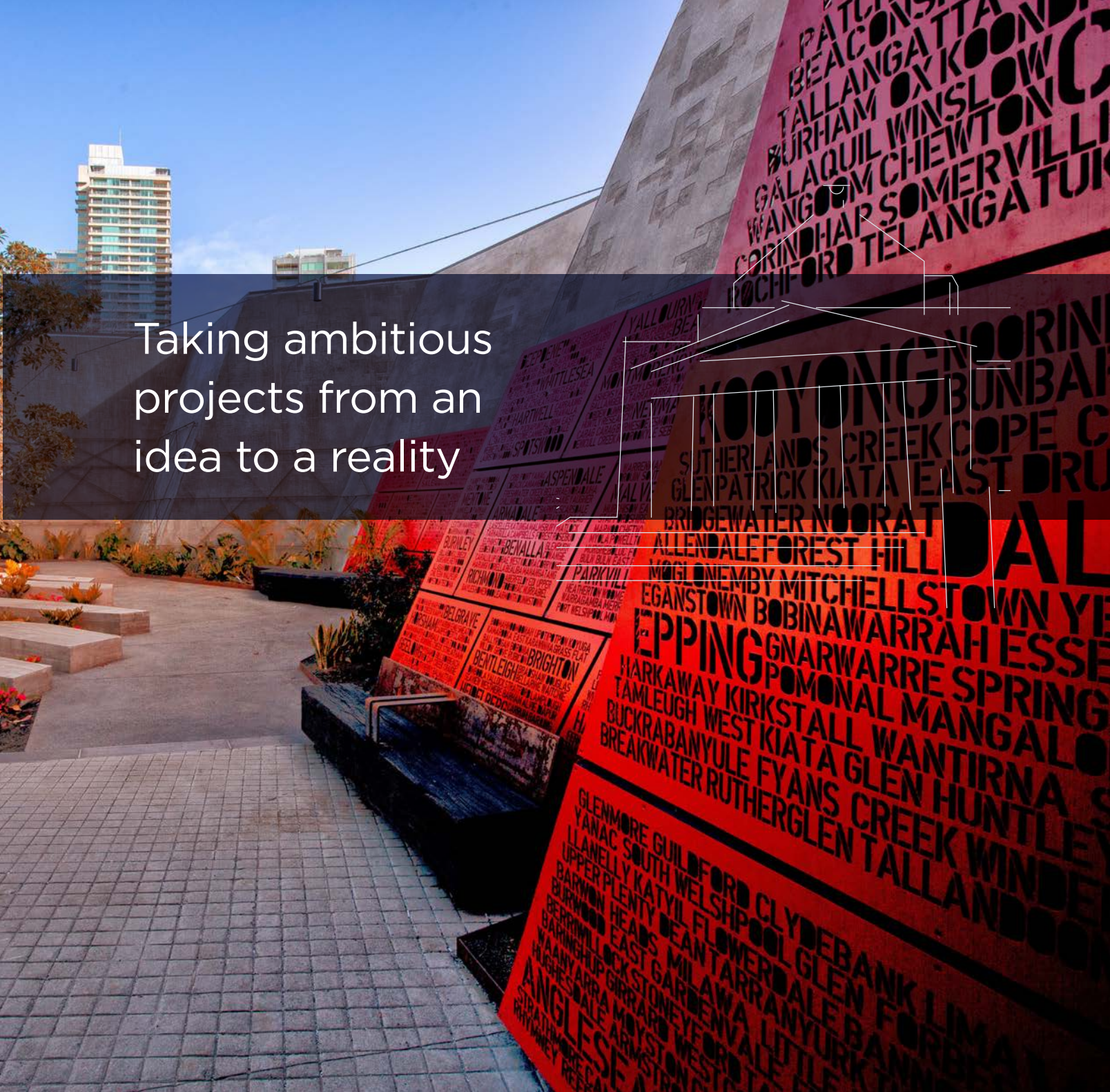
Even though women are making significant progress in the construction industry, there is still much work to be done to ensure that they have equal opportunities and the kind of support that encourages an inclusive working environment. In truth, there is a lot that can be done.

It is time for companies, organizations, and society as a whole, to recognize the valuable contribution that women can make in the construction industry and work together to eliminate the barriers that prevent them from achieving their full potential. **P**

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Taking ambitious projects from an idea to a reality

RLB has built a strong reputation for costing challenging architecture – and the Galleries of Remembrance in Melbourne, Australia certainly met the brief. With the centenary of the Anzac landing looming, the project team had a hard deadline with no time for redesign. This demanded close collaboration between RLB and the design team to ensure we delivered comprehensive cost plans from the outset. Together, we tested each element of the design to ensure the boundary-pushing architecture also met a tight budget.

ESG REPORTING IS GOOD FOR SOCIETY & YOUR BOTTOM LINE



By: Aaron Woodward
Associate Principal,
North America

As the business world increasingly embraces the importance of [Environmental, Social and Governance \(ESG\)](#) reporting, it's noteworthy that the idea that companies should focus on not only revenue and society but also the planet which should be nothing new. In fact, the idea is very old. Within the last two hundred years alone, we see many examples of how business leaders have realized that being kind to the world is simply good business. Charles Dickens even writes in 1843 that the common welfare of "charity, mercy, forbearance and benevolence" should be the first of a company's goals.

While the nomenclature of ESG may be relatively new, according to Nancy Koehn, Harvard Business School professor and historian, "The arc of history in business is all about companies that had social ambitions and aspirations as well as commercial benchmarks and ambitions." Seemingly, the omission of commercial symbiosis with the environment has increasingly been left behind and forgotten.

Indeed, from Josiah Wedgwood's successful pottery business in the 1700s that helped provide food, housing and training for employees to AT&T organizing blood drives for the Red Cross in the 1960s, doing good for society has happily been part of the fabric of many businesses.

Gradually, the idea of doing good beyond just people and profits began a long slow rise into our culture, and customers and clients became more and more interested not just in what companies did, but in how they did it and what the impacts to the environment were.

In 1989, the [New York Times](#) reported that, “a growing number of consumers are basing their purchases on environmental concerns...and companies are beginning to devise marketing strategies that address them.”

Today, now more than ever, our engineering and construction clients remain laser focused on the bottom line yet are now also expecting business to be better stewards of the environment and of all people. The public and investors are expecting to see this transparently incorporated through three contemporary focus areas – environmental, social and governance.

Moreover, [according to Bloomberg](#), “a company’s assessment of ESG performance is increasingly becoming a key indicator alongside financials to inform customers, stakeholders and employees about the resilience and long-term viability of an organization.”

The development of an ESG program within a company demonstrates dedicated and socially aware leadership, which can result in an improvement in your brand and ultimately in your financial status. Indeed, while it may not seem obvious, doing good and accurately reporting on it can also improve your financial foundation.

As [Harvard Business Review reports](#) “mounting evidence shows that sustainable companies deliver significant positive financial performance, and investors are beginning to value them more highly.”

BEING GOOD TO THE ENVIRONMENT

Within the engineering and construction industry, we all more so now increasingly understand the value of constructing environmentally friendly buildings, not just to save on energy costs for example, but by comprehending the positive impacts that reducing emissions does have on our planet.

According to the [Office of Energy Efficiency & Renewable Energy](#), buildings owned and operated by businesses, federal, state, and local governments account for 18 percent of U.S. primary energy use and \$190 billion in energy expenditures every year. Commercial buildings consume 35 percent of electricity and generate 16 percent of all U.S. carbon dioxide emissions. On average, 30 percent of the energy used in commercial buildings is wasted. In addition, buildings are responsible for around 40 percent of global energy consumption, a quarter of global water usage, and a third of greenhouse gas emissions.

As you can see from these numbers, energy reduction in commercial buildings can have significantly smaller negative impact on the environment, but results in an improved financial outcome. In addition, by developing and incorporation of sustainability and green building best practices, our industry can create demand for more skilled jobs and careers.

Leaders in the engineering and construction field have an incredible opportunity to significantly reduce the industry’s GHG emissions. [For example, according to a recent report](#), if our industry were to cut GHG emissions by 80 percent by 2050, we could contribute significantly to fighting the changes to our climate as we continue to witness rising temperatures, severe weather, drought, and wildfires.

A new model noted in Science Daily concluded that reaching this target will require the “installation of highly energy-efficient building technologies, new operational approaches, and electrification of building systems that consume fossil fuels directly, alongside increases in the share of electricity generated from renewable energy sources.”

[According to the United States Green Building Council](#), green buildings and communities reduce landfill waste, enable alternative transportation use, and encourage retention and creation of vegetated land areas and roofs. By building green, we can simultaneously reduce the negative impact our buildings have on climate change while also building resilience into our communities.

Moreover, there may be added incentive to going green. A new bill signed by President Biden provides significant funds to commercial interests battling climate change. The bill includes \$60 billion for growing renewable energy infrastructure in manufacturing like solar panels and wind turbines. [Whether it is utilizing solar or wind energy](#), constructing buildings with more energy efficient materials, reducing greenhouse gas emissions and the managing energy consumption, it is important to be transparent to your key stakeholders and the best method is to prepare comprehensive ESG reporting.

UNDERSTANDING THE SOCIETAL IMPACT

Beyond reporting key environmental ESG results for your company, it’s important in ESG development to conduct and report on the societal opportunities of your work.

For example, it will be key to elaborate within your ESG reporting about how you are training employees, how you may be developing wage equality across your organization, as well as programs and initiatives to improve workplace health and safety.

In addition, especially in this industry, detailing transparency efforts within the supply chain can go a long way in earning stakeholder trust. Examples of such supply chain transparency include disclosing responsibly sourced raw materials, partnering with minority/women/small/veteran owned businesses, and suppliers that implement humane labor practices and promote diversity. Customers may have taken such things on faith, but increasingly these stakeholders are making choices based upon a company’s social reputation when purchasing products. Products from companies that report such insightful data are selected over similar products from companies that are not so focused.

WITHIN THE CONSTRUCTION INDUSTRY, THERE IS GROWING DIVERSITY AND INCLUSION.

As noted earlier, readers of our ESG reports must understand exactly how we support the health of our employees (the recent pandemic taught us all how important such initiatives can be). And just as necessary, is for us to detail our progress in racial equity within our organizations. To grow and be profitable, we need to provide greater inclusivity in our workforce and offer access to these important services to more in need. Moreover, strong social ESG systems positively influence the growth of a diverse pipeline of potential employees which in this current jobs market is key to the future growth and health of the engineering and construction industry

PROVIDING ETHICAL GOVERNANCE

Governance in an ESG report may not seem as dramatic and exciting as environmental or societal impacts, but it is just as important. Governance engages the company’s stakeholders and leadership to examine the organizational values, how to prepare for environmental and social risk, as well as a company’s sustainable performance and remuneration over the long-term.

Organizational leadership has a direct connection to company culture and its performance outcomes. The ESG report’s credibility is centered on the organization’s commitment to the successful implementation of sustainability focused programs and initiatives organizations. It is also important to reflect upon how your leadership and board are committed to improving the company’s ESG metrics by linking job performance and compensation to organizational sustainability success. If the C-Suite does not truly believe and invest in the sustainable values and culture that are advertised, negative ESG performance as the inevitable outcome will hurt the long-term financial performance of the business.

Ethical governance must also include how the organization interacts with regulatory and policy environment. Company’s that walk the walk are organizations that are engaged in local and regional policy development. These activities address sustainability in a meaningful way that advances businesses interests by focusing on the opportunities that improve organizational performance within ESG and can be measured and reported. Leaderships involvement in shaping industry policy is a best practice and can help advance the company’s reputation as a leader in the industry.

CHALLENGES AND OPPORTUNITIES

So far, the focus of this article has been on the importance of combining profits with societal good (which it turns out is a fantastic duo), and then reporting on it in a transparent way. But we also need to address some of the [challenges in ESG reporting](#).

Providing true quantitative measures in your reporting is necessary, but unfortunately, some ESG reporting can include grey areas that may make it hard for investors or customers to truly understand your company's positive impact on society.

Because there are no specific regulated standards for ESG reporting, some companies unfortunately have taken advantage of the system by inflating their sustainability or social progress initiatives.

In fact, for publicly traded companies, the SEC has developed a climate and ESG task force to investigate potentially fraudulent claims contained in an ESG report. Obviously, such oversight is positive progress, but they have no jurisdiction over private firms that do not voluntarily report.

Experts agree that there needs to be increased transparency, a better criterion for providing ESG information, developing appropriate and measurable sustainability taxonomies.

While it is generally easier to set standards and goals for environmental reporting, it is more challenging create an enforcement framework and organization to do so in a regulatory effort. Fortunately, there are several ESG reporting formats that support companies unique reporting challenges. These reporting systems have improved markedly over the years and now support ESG reporting that reflects industry norms. Embracing the reporting movement will contribute to stakeholder confidence and attract investment allowing for sustainable growth of your business.

Effective ESG programs now go beyond traditional philanthropy work, investment in environmental protection and restoration, supporting the diversity and equity values meaningful to employees and communities in which your

company resides, and investment in policy making are all examples of how business is no longer simply traditional. Leaders should realize that it is a wholistic approach that spans many different aspects of your company. If done well, the financial implications of integrating ESG performance into the overall business strategy can allow you to sustainably manage both growth as well as risk. **P**

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PRESERVING OLD MEMORIES & MAKING NEW ONES

By: Shane Kelly
Associate,
Oceania

When work began on the new Galleries of Remembrance project at Melbourne's Shrine of Remembrance, it had all the hallmarks of a challenging project: an immovable deadline, an ambitious design, and a sacred heritage building dedicated to Australian service and sacrifice. Any one of these elements could put pressure on the budget. How did RLB's team rise to the challenge?

The 25 April 1915 holds special significance in the hearts of Australians. It was on this day that Australian troops landed at Gallipoli in Turkey, as part of First World War. The Shrine of Remembrance, located in Melbourne's Kings Domain, honours the nearly 26,000 Australians who were killed or wounded at Gallipoli, as well as the service and sacrifice of other Australians in war and peacekeeping.

In 2014, with the centenary of the Anzac landing looming, the Victorian Government commissioned acclaimed ARM Architecture to develop a \$45 million gallery space at the Shrine of Remembrance.

RLB has built a strong reputation for costing challenging architecture in Australia – and the Galleries of Remembrance certainly met the brief.

Elevated above the surrounding park, the Shrine sits upon massive brick columns. The architects proposed to transform the empty void underneath – all 1,600 square metres – into an exhibition space that would add new layers of functionality to the Shrine.

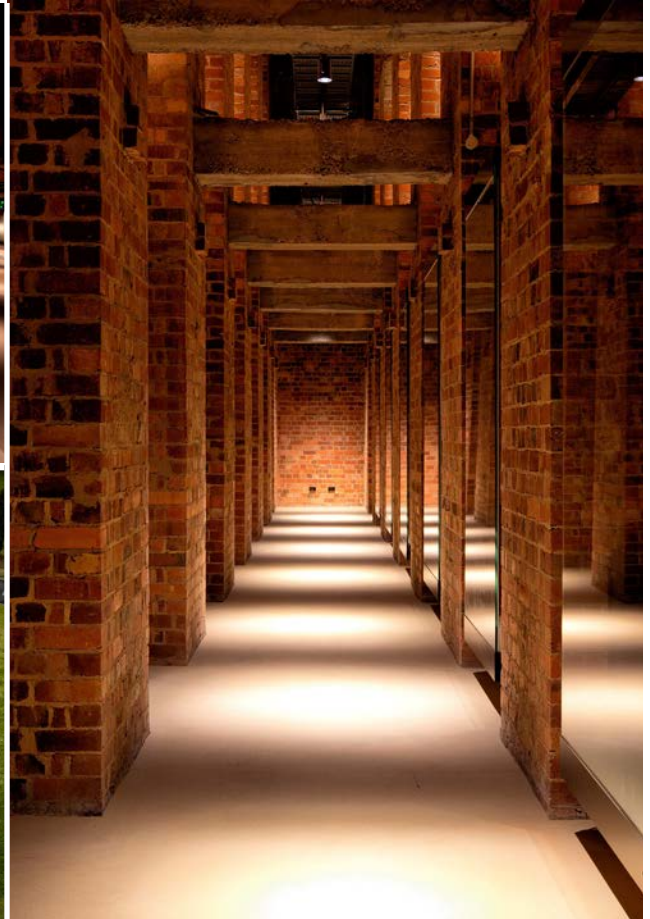
With a hard deadline, there was no time for redesign. This demanded close collaboration between RLB and the design team to ensure we delivered comprehensive cost plans from the outset. Together, we tested each element of the design to ensure the boundary-pushing architecture also met a tight budget.

ORIGINAL THINKING AND OUT-OF-THE-BOX ARCHITECTURE

The Galleries of Remembrance project has created space for new stories to be heard – stories that may otherwise sit silently in historical archives.

The new visitors and education centre features an auditorium, learning pods, staff offices and courtyards for tranquil contemplation, expanding the memorial's role beyond that of a monument.

The irregular-shaped courtyards, made from high precast walls on both vertical and horizontal angles, create space for quiet reflection, but took patience to cost. The north-western courtyard features





plants and materials that echo the battles of World War I, with a central olive tree that is both specific to the Dardanelles and a symbol of peace. The south-western courtyard is planted with species native to the Pacific and South East Asia, while the walls are textured to evoke the Australian Army's camouflage.

In the student courtyard, visitors can thread poppies through the perforated holes of the courtyard walls, the pin pricks in the metal panels spelling out Binyon's Ode of Remembrance in morse code. A giant poppy shade in the student courtyard is as much art as it is architecture, and to cost this accurately RLB's team returned to first principles.

Every element of the project was chosen after careful costing, from the quiet mechanical services and fabric duct work that preserve the sacred silence of the space to the granite cladding for the courtyard walls, which was sourced from the same quarry used for the original Shrine building.

THOUGHTFUL COSTING CREATES A RICH VISITOR EXPERIENCE

RLB's team was as innovative in its approach to costing as ARM Architecture was in design. With RLB's fresh perspectives, the project could incorporate a full refurbishment of the existing visitor centre to ensure a seamless transition between the existing and new parts of the building.

RLB's team successfully managed costs through construction and could hand back savings to the Shrine to be used for future projects.

The lifeboat on display in the Galleries was used during the Gallipoli landing on 25 April 1915. Now on permanent loan to the Shrine from the Australian War Memorial, the lifeboat could only be installed with the help of a specially constructed loading tunnel. Disguised under a lawn-covered trapdoor, the loading tunnel was brilliantly designed but challenging to cost.

Transporting the lifeboat itself also proved a logistical challenge – and RLB stepped in to provide costings for the complex transportation process from the Australian War Memorial in Canberra to ensure the precious cargo arrived safe and sound.


The project team's perspiration and persistence paid off. In 2015, 85,000 people gathered at the Shrine for the Anzac Day Dawn Service.

It is both personally and professionally satisfying to work on a project as significant as the Shrine. Australia's national identity was forged in the wars that are memorialised in the Shrine of Remembrance. RLB is proud of our role creating a spectacular space that will share the stories of the past with many generations to come. **P**

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Bringing imagination
to life

RLB was involved in the development of a new 9,300m² distribution and office facility to consolidate sustainable technology company, Rubicon, into new headquarters in Richmond Park, Milnerton, Cape Town. The new headquarters benefits from boosting brand awareness due to the exposure Richmond Park provides with its accessibility along upgraded access from both N1 and N7 highways. The facility combines Rubicon's operations, currently dispersed across six different sites within Cape Town, into a tailor-made, multi-million-rand facility that includes a 7,900m² warehouse and a 1,400m² office, incorporating a 250m² showroom with an option to expand a further 1,200m².

RLB provided full quantity surveying services for this unique project.

[RLB.com](https://www.rlb.com)

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RETROFIT

TODAY'S NEW PROCESS
WILL BE TOMORROW'S BEST
PRACTICE

By: Heather Evans

Partner, UK Head of Sustainability
United Kingdom

Christopher Hartley

Partner.
United Kingdom



At the beginning of 2023, the UK Government published 'Mission Zero'. This independent report was commissioned to review the UK government's approach to delivering its net zero target, aimed at identifying how the UK could meet its net zero commitments in an affordable and efficient manner, specifically one that is "pro-business, pro-enterprise and pro-growth". The review was clear in its findings – 'we must grab this opportunity, there is no future economy but a green economy'. With no less than 129 recommendations the report was urging that we need to go faster and further on decarbonisation.

The decarbonisation agenda – and more importantly how to deliver it – is clearly a global issue. At the end of the COP26, over 90% of the world's GDP had committed to a net zero target but now the time is for swift action to move towards achieving the net zero goal.

The UK has its own particular challenge, and the clock is ticking. Not only was it the first G7 country to sign a commitment to have net zero emissions by 2050 but it also has the challenge of an old, energy inefficient estate. In fact, it is estimated there are 27million domestic properties in the UK and the majority require energy efficiency improvements (Source: Retrofit Academy). So, the decarbonisation and retrofit of existing buildings to avoid stranded assets* and increase energy efficiency and performance, is a huge part in helping to meet net zero goals.

In the UK, legislation has driven a retrofit framework with robust standards PAS 2035 and PAS2036 to measure the process and a requirement for those undertaking the work to be accredited. Retrofit not only includes improving energy efficiency, reducing energy usage and moving away from

fossil fuels, it also covers upgrading properties be they domestic, commercial or public and providing better living and working conditions.

The built environment industry is focused on upskilling and training the supply chain and creating sustainable solutions but arguably this needs rapidly increasing public and private investment, to keep up with the ever-growing demand.

RETROFIT IS ONLY SET TO GROW

Not only is there a huge demand to retrofit existing assets but ultimately new construction will start to slow down and in some regions of the world, land supply is rapidly dwindling. The global investment market is turning its attention to the benefits that result from retrofit; improving the operating performance and increasing energy efficiency across a portfolio of assets can produce huge savings. Improving existing assets supports a sustainable business strategy and the all important Environmental, Social and Governance (ESG) metrics as it avoids buildings becoming classed as stranded assets.



AN END HAS A START

We are actively encouraging our clients to think about retrofit at the start of project, at inception or business case stage. There are many lessons we can learn from retrofit, if we consider the 60-year life span of a building at the design stage. For example, considering future flexibility and space demand, designing for deconstruction and considering future technology within the present day designs. We are seeing space being put aside for heat pumps even though not needed now and specifications for logistics sheds with the space for photovoltaic panels which might be installed later. This does require a shift in mind set, to move from the short term to really consider the long term impact and how this can be mitigated. Considering each project, programme and strategy from a whole life value perspective is key to ensuring long term sustainability and value creation beyond the traditional drivers of time cost and quality to incorporate planet and people too.

FABRIC FIRST NOT TECHNOLOGY FIRST

It is really encouraging to see the major strides in innovation and technology around energy efficiency solutions such as air source heating, energy monitoring sensors and façade treatments, particularly as we continue to deal with escalating energy costs. However, a challenge can be avoiding shortcut decisions to invest in technology rather than addressing the basic structure of a building. Without a fabric first approach, it's easy to just heat the atmosphere as energy leaks through an inefficient building. That's why a holistic approach is critical for long term gains.

DATA, DATA AND MORE DATA

The more asset data we have, the more analysis can be made on the options available for decarbonisation - from deciding on which buildings to upgrade to making procurement decisions. Retrofit is a fast-moving sector and with new processes and innovations being trialled and piloted this enables the ability to incorporate new solutions throughout an assets lifetime that weren't possible at the outset. Monitoring and analysing data throughout a project are essential to enable holistic decision making, and market engagement can ensure the vision of installing new technology such as installing photovoltaic panels can be met by the reality of the supply chain being able to deliver.

The gathering of data, and more importantly its analysis, is hugely beneficial to the built environment industry as a whole. Gathering

data such as embodied carbon enables robust benchmarking; the more we know about embodied carbon, the more we know what good looks like and the more we can inform progress. We have delivered embodied carbon benchmarking across the whole of UK national grocery retailer Tesco's estate, building on our involvement across its development and engineering projects nationally.

RETROFIT ADDRESSES CLIMATE CHANGE ADAPTIONS AS WELL

Although energy efficiency is synonymous with retrofit, the process is really much broader than that. Retrofit addresses wider climatic change issues. For example, in the UK where we are now experiencing more extreme weather, when remedial work is carried out around window replacements, solar shading is often added. In building new car parks, additional drainage and vegetation needs to be considered to help with flooding.

With net zero targets in place, we know what we must achieve and by when. Taking a proactive approach whether looking at a single building or a placemaking scheme and learning the lessons from retrofit today will help us to build a better future.

*Stranded assets can refer to assets that are no longer attractive for sale, lease or operation due to carbon and energy performance. **P**

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Creating a better
tomorrow

RLB's presence in North Queensland, Australia stretches back to 1973. Since then, RLB's team has been part of the teams delivering the region's biggest projects - but it's often the smallest ones that have the biggest impact. Projects in remote regions often incur a price premium - but with careful cost management, can also add an extra layer of value to local communities.

"From the landscape design to the fa ade artwork to the building contractor, this project was a collaboration with the First Nations people of Yarrabah," says Brad Bell, Manager at RLB. "The result is a modern and culturally appropriate facility for the Yarrabah community."

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A BALANCED WELLNESS APPROACH IN THE WORKPLACE

By: Vuyolwethu Badi
Director,
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The Global Wellness Institute defines wellness as the active pursuit of activities, choices and lifestyles which lead to a state of holistic health. This definition suggests that wellness is not a static state or a destination but rather an active pursuit. Perhaps one would ask what a balanced wellness approach should look like, more specifically in the built environment. Before we can answer that, we need to understand balance in its own context. Balance is defined as a situation in which different things exist in equal, correct, or good amounts.

Balancing work with life has been a way of living we have had to prioritize, especially throughout and post the COVID pandemic. Businesses had to create space for wellness (activities, choices and lifestyles), not only as a benefit to employees but also as a reciprocal gain for the business itself. As we have come to realize, when human resources thrive in business, companies win.

HAS THE BALANCE, HOWEVER, BEEN ACHIEVED?

In some activities and choices, one would say yes. The experiences of the past few years have compelled most of us to acknowledge the fragility of life. Priorities have been centred around wellness and our workplaces have had to reflect our revised priorities. Being offered the choice to work from home is one example (combined with working flexible hours in uplifting environments).

The past year has refocused people's minds on what really matters in life – family, friends and community, health and wellbeing, personal fulfilment and individual values. It is reported that companies that recognized the need to adapt to people's changed expectations by creating a more balanced workplace have been most successful in the post-COVID world, attracting and retaining the best talent. The global trends have seen businesses which failed to adapt to these changes lose their key talent and fail to attract new talent.

The Global Talent Trend report conducted in 2022 saw the following outcomes from their talent driver's survey. Candidates ranked their priorities (as of August 2022) as follows:

1. **Compensation** - Excellent compensation and benefits
2. **Balance** - Organizational support to balance work and personal life
3. **Flexibility** - Flexible work arrangements (i.e.; when and where you work)
4. **Upskilling** - Opportunities to learn new, highly desired skills

The above findings indicate that candidates still value balance as one of the top priorities post the pandemic. The study also shows that wellness within the workspace needs continuous re-evaluation and should not be passive or driven by pandemic-related circumstances. Research shows that Organizations have had to reposition themselves for a more balanced workplace environment to entice and retain staff post-COVID. This not only helps organizations to re-establish their culture and foster collaborations but also assists organizations to be more aware and contribute towards the environment, social and corporate governance (ESG)

Organizations which move away from treating their workplace as a cost centre and view it as a business and people enabler, a physical manifestation of their brand, will be the post-pandemic success stories. A balanced workplace approach is a great place to start.

HOW SHOULD WE ENCOURAGE AND SUPPORT A BALANCED WORKPLACE APPROACH?

(Skinner, Ashley, 2021) suggests that people should be supported to lead fulfilled lives, where all aspects of their existence - work, family, hobbies and personal values - are embraced. But what does it actually mean and how?

1. **Work** - continue to encourage flexible working hours and working from anywhere under supervision. The Built Environment has enabling systems that allow working remotely to be possible.
2. **Family** - On an annual basis, managers and supervisors are to conduct discussions and encourage their teams to take annual leave or family responsibility leave without waiting for the leave to be lodged by employees. Checking in with your employees from time to time would be crucial and would only make this possible if you understand your employees' lives beyond the work environment. The promise of a more balanced workplace will help organizations retain staff and will also encourage employees to be highly engaged and productive. A balanced workplace boosts morale.
3. **Wellness programs** - As previously described, wellness is multi-dimensional. It relates to intention, action and activities - investing and introducing wellness programs in the workplace to better understand the needs of the employees.



(Institute, Global Wellness, 2020)

WELLNESS IN THE BUILT ENVIRONMENT

There is a clear link between workplace stress in the construction industry and the negative effects on the health of construction employees and their families. It is the responsibility of employers to be alive to this reality. Besides the improvement of better work performance, I believe employers also need to engage in dialogues and ask how employees are coping. Employees are sometimes reluctant to admit that it is in actual fact their mental health challenges that are affecting their work performance for fear of being labelled failures. Together with providing safe and uplifting spaces, employers in the construction and Built Environment could provide enabling software and technology. Incorporate compulsory leave to avoid burnout, especially on projects that span over 12 months. So, if you are feeling a little bit stressed you can still choose a suitable work environment to help with your mental wellness and clarity.

Provide break-away spaces that promote innovation and confidence. Introduce and incorporate voluntary medical assessments.

The construction industry and built environment on its own comprise various sectors and segments of professionals, contractors, subcontractors and clients. From a Quantity Surveying profession perspective, if you are not facing deadlines, accuracy in delivering your work, tendering processes and cost management, you are also chasing revenue. We tend to operate on auto-pilot and sometimes struggle with workload balance.

The introduction of occupational therapy can also act as an intervention that will enable employees to disclose their difficulties openly without any fear of losing their jobs. On the other end, the employer can provide specific employee requirements to assist them with remaining productive. **P**

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FAST-TRACKING CONSTRUCTION PROJECTS

OFFERS BOTH

RISK & REWARD

By: Sanaa Hussain
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Between the pandemic and the current economic situation, businesses of all kinds are rethinking the best way to get things done. Fast-tracking first gained broad awareness when used to develop COVID-19 vaccines, it is an effective strategy used in many aspects of business, including construction. For example, the technology industry is well versed in fast-tracking, not only in product development, but in their many massive data center and manufacturing construction projects too. There's a lot to be learned from the tech industry's approach to construction, as it is centered around the guiding principle of being first to market. While typical construction drivers are time (schedule), money (budget) and quality (product), with the right approach, fast-tracking a project can be done.

Construction is booming in the technology industry, especially as many companies are pushing more manufacturing capabilities to the U.S., resulting in more domestic construction projects. Data center construction, for example, reached \$1.4 billion through the first quarter of 2022, which is up nearly 30 percent year-over-year. Many of these projects are schedule driven, as tech companies are driving these construction projects like they drive product development. Seeing the success of these projects, other industries are following this lead, with more and more construction projects being

done with at least some fast-tracking techniques used. Understanding both the rewards and risk of fast-tracking a project can help owners, architects, engineers and contractors maximize the benefits of this strategy.

REDUCED CONSTRUCTION TIME CAN RESULT IN FINANCIAL BENEFITS

Ultimately, a faster schedule means a facility opens earlier, so a business can move in and start realizing revenue. There can be cost savings made through fast-tracking the project if careful planning and execution take place. With a compressed schedule moving a project along more quickly, inflation will have less impact on any potential increases in materials costs, given the materials are secured earlier in the schedule, which stabilizes those costs. This can be accomplished through use of a Letter of Authorization (LOA) or a Limited Notice to Proceed (LNTP). There is the potential to secure long-lead items in a timely fashion while ensuring the schedule is not delayed due to shipping, manufacturing, or procurement. Potential cost savings like these can reduce the cost and risk of financing these projects and contribute to making a project economically viable because of the quicker return on the investment.

Construction and design move concurrently through much of a fast-track project and often, construction decisions are made and in place before final design approval. As a result, minor changes like moving a wall or electrical may need to occur after they are built but having a fully integrated and communicative team ensures a reduction in such spends. Usually, the cost savings from fast-tracking significantly outweigh these type of changes and are an accepted part of a fast-track project.

When it comes to labor costs, a project's cost manager can lend a critical eye in understanding where there are hidden costs. Having existing relationships may help as some vendors may see a fast-tracked project as an opportunity to increase rates. For example, a review of labor costs should include analysis of how much staff, and at what level and rate the general contractor is carrying within the estimate. There may be allowances, holds, or yet-to-buys shown throughout an estimate that artificially inflate the cost. Additionally, increases in contingency percentages for the project, construction or design without contractual documentation add significant below the line values. Overall costs can be impacted by going direct to a vendor essentially reducing overall management costs. Having strong relationships with vendors can alleviate this issue as they understand the expectation of a job. The client (Owner) may not be savvy in reviewing such detailed items and having a Cost Manager can ensure cost savings throughout design phases and the construction project. Generating cost savings within a capital expenditure budget gives the client budget flexibility.

TEAMWORK AND COMMUNICATION

Relationships matter in getting a job on the fast-track as compressed timelines bring teamwork to the forefront in a project's success. One key component to relationship management during fast-tracking is communication with the design team. Designers have a separate schedule with each phase providing an increase level of information as the scope becomes more clearly defined. Conducting Owner Architect Contractor (OAC) meetings is imperative as this one meeting brings together all the players to share ideas, identify point conflicts, and discuss the project collectively. By working as a single team with one common goal, this kind of regular communication can help avoid disruptions that could cause serious time delays. It's beneficial if the architect, engineer, and contractor have worked together in the past because establishing a solid cultural fit and existing

relationships help with learning curves, metrics and client-specific standards. With fast-track projects, many aspects are changing simultaneously, requiring both regularly scheduled OAC meetings and open, ongoing communication to make quick decisions.

MANAGING VENDORS AND MATERIALS

Introducing an internal or external cost-control team as early as possible when a project is started is important to fast-tracking. When a cost manager is integrated into the team from the beginning, relationships are established immediately with the project managers, the administrative staff, architects, engineers and the general contractors. These relationships give a full picture of the project gains, giving a cost manager perspective of what the owner is driving for, while providing insight to contractual obligations. A cost manager will perform deep dive reviews on proposals, estimates, change orders, invoices and contracts, often using benchmarking data and client-specific metrics, to provide an accurate and valid value, in an effort to be fair and reasonable.

The construction industry looks anything but typical right now in terms of resource availability. Many owners lean into relationships with a set group of general contractors they regularly work with, knowing how they work, their standards, processes, and safety records intact. There are benefits to tapping into the intellectual knowledge that comes with hiring a familiar GC as long as you are not lulled into a sense of complacency when pulling estimates together, or not diversifying the bidding pool.

As we all slowly recover from the last two years of inconsistent resource availability, we are learning to adjust, especially when it comes to schedule delivery. Materials like steel, drywall, and furniture that have had long lead times, now lumber, mass timber, HVAC equipment, tile, doors and lighting are taking longer than usual to get onsite. To effectively fast-track a job, careful consideration must be given to material ordering. For example, some things need to be ordered early and stored onsite, or in shipping containers and that needs to be factored into the budget. While sometimes having money to expedite shipping can help, for the most part, expediting materials is a thing of the past because of resource shortages on the supplier side. Before construction, during the contractual finalization bridge funding and limited notices to proceed documents can be used to aid general contractors in ordering ahead of time.

At every phase, it's important to monitor and review estimates and timelines while reviewing against what the general contractor is providing. Getting perspective from others through peer reviews provides a checks and balance system to ensure cost effective trade values. A peer review will confirm if a final contract is lining up with a client's standards and current market rate value. It can help determine if percentage markups are reasonable, if the right value of contingency is provided or if there are agreed upon fees and insurance through the client. All these line items are considered when doing a peer review.

As the construction industry continues to face a variety of challenges including labor shortages, supply chain issues and escalating material costs, implementing fast-tracking techniques into projects can help address some of these challenges and ongoing changes that continue to present themselves. Take a page or two out of the technology industry play book and consider implementing some aspect of fast-tracking into your next project. Understanding both the rewards and risk of fast-tracking a project can help owners, architects, engineers and contractors maximize the benefits of this strategy and can bring great reward on all fronts when managed properly. **P**

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BIM MATURITY LEVEL IN TERMS OF POLICY, PEOPLE, TECHNOLOGY AND PROCESS

By: Lily Chan

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According to [NBS National BIM Report](#), there has been a significant rise in the adoption of BIM in the past decade, with 73% of construction companies reporting that they are aware of BIM and are using it within their companies, which has risen significantly from a mere 11% in 2011.

The survey result proves that the Architecture, Engineering, Construction and Operations (AECO) industry is set for changes. Moving forward from mere conceptualization, digital construction and implementation is thriving around the world. A quantifiable evaluation system is needed to ensure one is on the right track toward this trend.

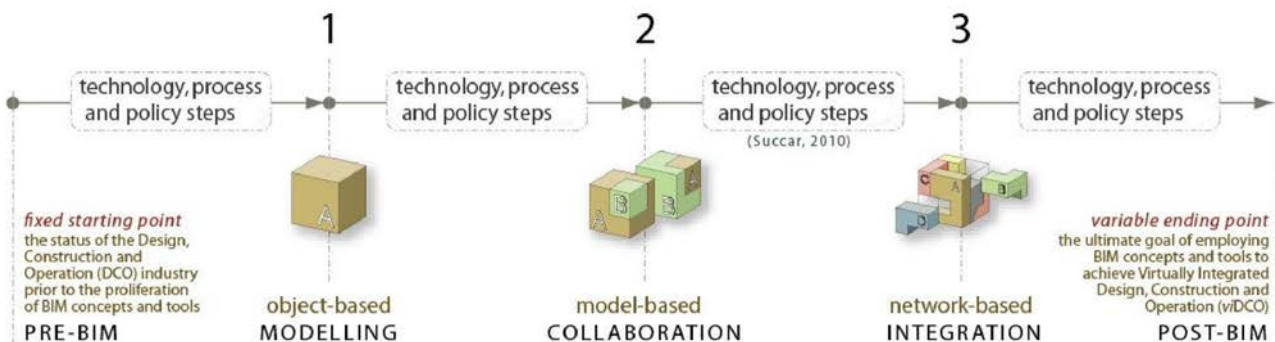
At RLB, we have been pushing BIM's capabilities, finding ways to amplify the benefits, potential and value on our projects by developing an automatic information extraction system from models that enables us to respond directly to client needs and thus achieving better cost management of projects. As one of the stakeholders in the AECO industry, we believe that a sound evaluation on the company's BIM capabilities is required. It will provide insights on areas for improvement, which helps determine focus areas of a company's development roadmap. In this article, we are going to share our experience of measuring the BIM maturity level of our Hong Kong office by using the [BIM Maturity Matrix \(BIm³\)](#).

BIM MATURITY EVALUATION

METHODOLOGY

Developed by [BIme Initiative](#), the BIm is one of the evaluation tools for identifying the current BIM Maturity of an organization. It is a research-based approach for assessing and improving the current performance of individuals, organizations and project teams. The matrix has two axes: BIM Capability Sets and the BIM Maturity Index (BIMMI).

BIM Capability Set is a taxonomy representing BIM Player's abilities to satisfy a BIM Requirement or generate a BIM Deliverable, while BIMMI is a metric to measure BIM Maturity of organizations, project teams and whole markets. BIMMI has five distinct BIM Maturity Levels: (a) Ad-hoc, (b) Defined, (c) Managed, (d) Integrated and (e) Optimized.



Key Maturity Areas at Granularity level 1	a INITIAL (score 0)	b DEFINED (max score 10)	c MANAGED (max score 20)	d INTEGRATED (max score 30)	e OPTIMIZED (max score 40)
BIM CAPABILITY SETS TECHNOLOGY based on Capability Set v5	Software: applications, deliverables and data Usage of software applications is unmonitored and unregulated. 3D Models are relied on to mainly generate accurate 2D representations/deliverables. Data usage, storage and exchanges are not defined within organisations or project teams. Exchanges suffer from a severe lack of interoperability.	Software usage/introduction is unified within an organisation or project teams (multiple organisations). 3D Models are relied upon to generate 2D as well as 3D deliverables. Data usage, storage and exchange are well defined within organisations and project teams. Interoperable data exchanges are defined and prioritised.	Software selection and usage is controlled and managed according to defined deliverables. Models are the basis for 3D views. 2D representations, quantification, specification and analytical studies. Data usage, storage and exchanges are monitored and controlled. Data flow is documented and well-managed. Interoperable data exchanges are mandated and closely monitored.	Software selection and deployment follows strategic objectives, not just operational requirements. Modelling deliverables are well synchronised across projects and tightly integrated with business processes. Interoperable data usage, storage and exchange are regulated and performed as part of an overall organisational or project-team strategy.	Selection/use of software tools is continuously revisited to enhance productivity and align with strategic objectives. Modelling deliverables are cyclically being revised/ optimised to benefit from new software functionalities and available extensions. All matters related to interoperable data usage storage and exchange are documented, controlled, reflected upon and proactively enhanced.
	Hardware: equipment, deliverables and location/mobility BIM equipment is inadequate; specifications are too low or inconsistent across the organisation. Equipment replacement or upgrades are treated as cost items and performed only when unavoidable.	Equipment specifications – suitable for the delivery of BIM products and services - are defined, budgeted-for and standardised across the organisation. Hardware replacements and upgrades are well-defined cost items.	A strategy is in place to transparently document, manage and maintain BIM equipment. Investment in hardware is well-targeted to enhance staff mobility (where needed) and extend BIM productivity.	Equipment deployments are treated as BIM enablers. Investment in equipment is tightly integrated with financial plans, business strategies and performance objectives.	Existing equipment and innovative solutions are continuously tested, upgraded and deployed. BIM hardware become part of organisation's or project team's competitive advantage.
	Network: solutions, deliverables and security/ access control Network solutions are non-existent or ad-hoc. Individuals, organisations (single location/ dispersed) and project teams use whatever tools found to communicate and share data. Stakeholders lack the network infrastructure necessary to harvest, store and share knowledge.	Network solutions for sharing information and controlling access are identified within and between organisations. At project level, stakeholders identify their requirements for sharing data/information. Dispersed organisations and project teams are connected through relatively low-bandwidth connections.	Network solutions for harvesting, storing and sharing knowledge within and between organisations are well managed through common platforms (ex: intranets or extranets). Content and asset management tools are deployed to regulate structured and unstructured data shared across high-bandwidth connections.	Network solutions enable multiple facets of the BIM process to be integrated through seamless real-time sharing of data, information and knowledge. Solutions include project-specific networks/portals which enable data-intensive interchange (interoperable exchange) between stakeholders.	Network solutions are continuously assessed and replaced by the latest tested innovations. Networks facilitate knowledge acquisition, storing and sharing between all stakeholders. Optimisation of integrated data, process and communication channels is relentless.

ASSESSMENT

The BIM Maturity is assessed in the fields of technology, process, policy and people.

TECHNOLOGY

There are 3 Key Maturity Areas under Technology.

1. Software

This Area is about the maturity in the selection/ use of software tools, which could enhance productivity. Besides, modelling deliverables should not be used for generating 2D drawings only, but tightly integrating with business processes for 3D views, 2D representations, quantification, specification and analytical studies. Data usage, storage and exchanges should focus on interoperability, documentation and monitoring.

2. Hardware

This Maturity Area highlights the importance of hardware investment for enhancing staff mobility and productivity. Therefore, solutions should be constantly tested, upgraded and optimized to become part of organization's competitive advantage.

3. Network

Network solutions are tools for communication and data sharing. Security requirements of stakeholders should be aware of and are regularly assessed and replaced by the latest tested innovation.

PROCESS

There are 4 Key Maturity Areas under Process.

1. Resources

The work environment is considered as a factor for improving staff satisfaction, motivation and productivity. Knowledge is an asset, therefore it should be harvested and documented, and made accessible and easily retrievable.

2. Activities & Workflows

This Maturity Area requires the ability to continuously upgrade the BIM roles and competency targets to match technology advances and align with organizational objectives. Steady flow of information ensures predictable and consistent productivity.

3. Products & Services

3D models deliverables should be specified and differentiated by BIM Specifications. This Area emphasizes the importance of evaluation and feedback loops which could promote continuous improvement.

4. Leadership & Management

Higher maturity level is achieved if BIM vision could be shared by all staff across the organization and/or project partner. Revisiting the BIM implementation strategy regularly with detailed action plans and monitoring regimes are required. Business opportunities arising from innovation/ BIM could be used in marketing to attract and retain clients.

POLICY

There are 3 Key Maturity Areas under Policy.

1. Preparatory

BIM training should be based on staff roles and respective competency objectives and will be continuously evaluated and improved upon. Training mediums and delivery methods are tailored and allow multi-model continuous learning.

2. Regulatory

This Maturity Area is about the continuous and proactive refining of modelling and documentation standards which can reflect lessons learned and industry best practices. It is necessary to repetitively revisit the quality target and benchmarks to ensure the highest possible quality in processes, products and services.

3. Contractual

Contractual models are needed to manage shared BIM intellectual property, confidentiality, liability and a system for BIM conflict resolution to achieve best practices and the highest value for all stakeholders.

PEOPLE

There are 3 Key Maturity Areas under People.

1. Organizations

BIM roles should be integrated into organization's leadership structures to allow for new technologies, processes and deliverables.

2. Project Teams

This Maturity Area requires the stakeholders to think beyond a single project. Collaborative projects are undertaken by self-optimizing inter-disciplinary project teams which include most stakeholders.

3. Markets

BIM components should be integrated into central repositories and could be retrieved in BIM software with source databases (for price, availability, etc.) linked.

EXPERIENCE SHARING IN ACHIEVING HIGHER MATURITY LEVEL

In Hong Kong, growing government initiatives of BIM adoption is contributing to the growth of the BIM market. The growth has enabled the BIM software market to expand significantly. Therefore, keeping an eye on the new software available in the market and revisiting software version's updates are needed to benefit from new software functionalities

and available extension, e.g. dynamo, programming, A.I. and dashboard.

By utilizing the data contained within the BIM model, accurate and efficient quantity take-off process can be achieved. The key to success in delivering is to adopt an integrated collaborative approach. The BIM requirements for cost estimation need careful liaison with the BIM-authors in different project stages in order to effectively solve project-specific issues. "RLB 5D BIM Standards for Use in Hong Kong" specifies and differentiates the cost-related information to be included in BIM models. Higher Maturity Level could be achieved by working with the Delivery Team from early stage of the project.

Besides, experience sharing sessions, including lessons learnt from previous BIM projects and industry best practices, can be conducted among internal project teams and cross-project stakeholders.

Holding BIM training based on staff roles and respective competency object is essential. This target-oriented approach sets out clear teaching and learning targets and enables staff to acquire higher standards of BIM knowledge and techniques in a timely manner. It is also beneficial to review the training materials with the shared knowledge gained in projects.

COVID-19 has been the catalyst for organization to accelerate digital transformation plans. Most organizations aim to ease the burdens placed on the traditional business model by remote working. The e-Tendering system provides solutions.

Last but not the least, top management support plays a vital role in the success of the BIM implementation strategy. Their supports help to get necessary resources (facility, capital, IT, and human resource) and ultimately upgrade the BIM Maturity.

THE WAY FORWARD

Having a good understanding of our maturity level, we can implement a strategic plan for improving our BIM process. Regular self-assessment should be carried out for continuous improvement. Furthermore, we would review our BIM approach from time to time to keep abreast of the industry trend. That helps us shape a better built environment in the industry through the application of technologies in digitalization. **P**

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Confidence today
inspires tomorrow

The University of Arizona Facilities Management has a mission to effectively and efficiently provide maintenance, operational, and utility services that support the faculty, staff, and students in pursuit of excellence in their individual and institutional academic research and community objectives. With more than 600 team members in their Facilities Management Department, it was critical to the University that the relocation of their headquarters be both timely and cost effective – as to not jeopardize the integrity of their services.

Rider Levett Bucknall provided cost estimating services at all design milestones for the University of Arizona Facilities Management's new headquarters. On behalf of the University of Arizona, RLB successfully and quickly reconciled each of these estimates with the design-build contractor.

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