EBOOK BY

CLESTRA

A GUIDE FOR BETTER WORKSPACES

How to Integrate **Modular Construction** in office interior fit-outs

CLESTRA

Beginning in 1913 with the creation of the first relocatable partition by American founder Earl F. Hauserman, its products became globally recognised in 1931 when they were used within the Empire State building.

From then onwards, the company grew globally and adopted the name CLESTRA, symbolizing its international vision.

Now a leading modular interior construction provider, CLESTRA is over 100 years old. It continues to innovate with its circular approach to build future-proof office spaces and advanced facilities around the world.

As the world emerged from COVID-19, the climate crisis and rising geopolitical tensions have added a layer of uncertainty for businesses worldwide.

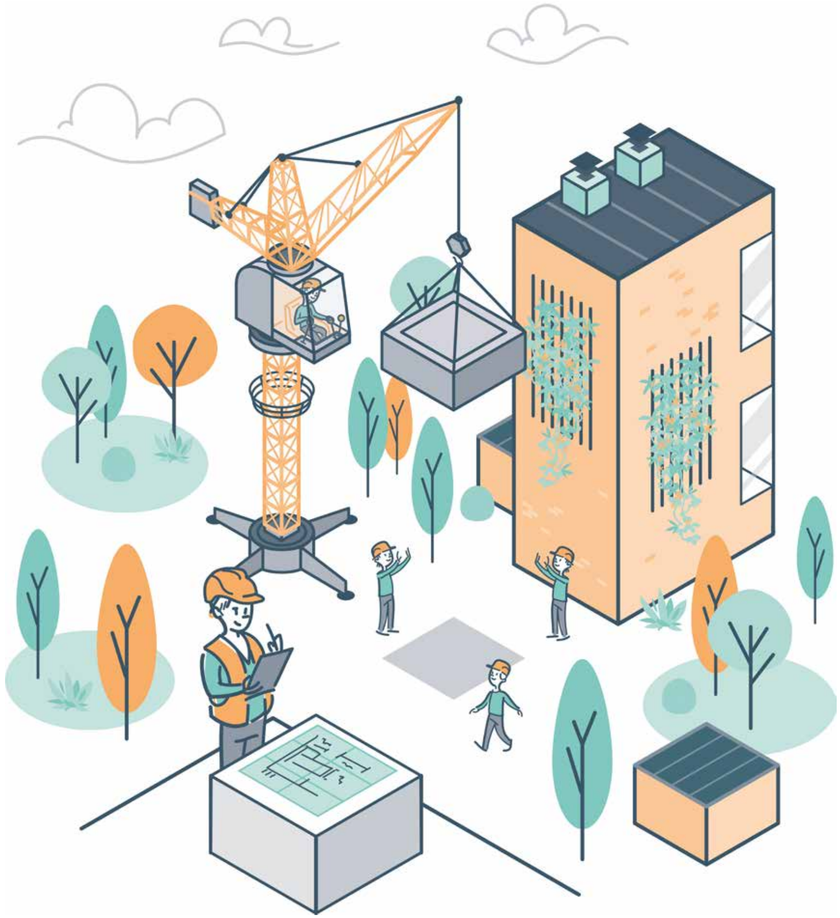
Companies must now navigate unpredictable market conditions, shift toward more sustainable business models, and reduce emissions. These challenges will transform industries for the next decades.

For the corporate real estate sector, the impact of work-from-home policies has had cascading effects. Corporate investments in real estate have plummeted, and design norms are shifting. Moreover, employees' expectations about their work environment have drastically changed. We are different from the people we were in 2019, and there is no return to old ways for companies.

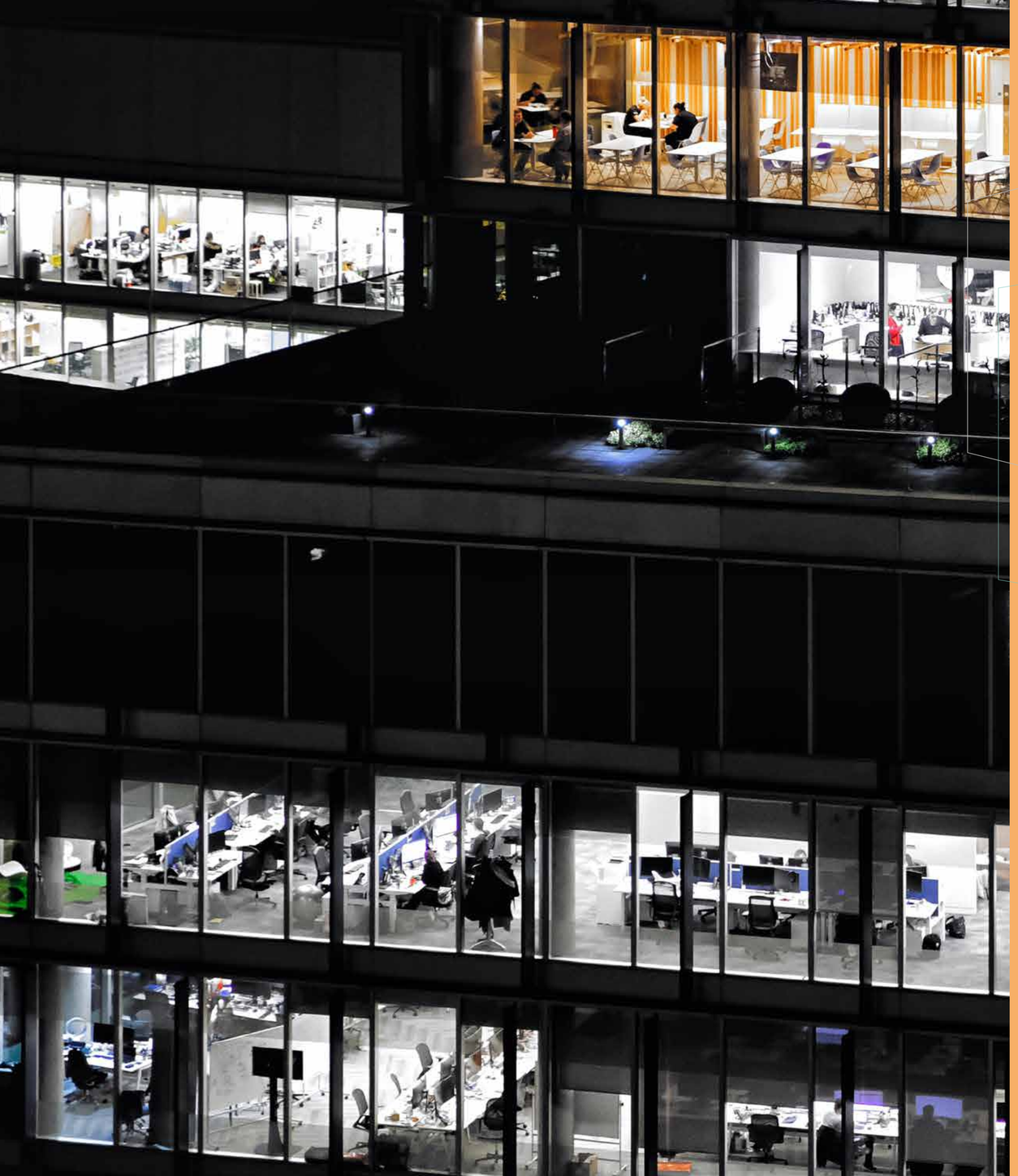
Hybrid work has become part of the weekly routine of most office workers nowadays, so much so that talents are putting flexible work arrangements as a top priority when choosing their next company.

Embracing change will allow forward-thinking corporations to meet their employees where they are. In the hybrid era, redefining the purpose of the workplace and finding ways to balance flexibility and collaboration will be a source of competitive advantage. Real estate professionals now need to deliver spaces that are both agile and sustainable. Luckily, modern construction methods can help you solve the equation and remain cost-efficient. Modular Construction is at the forefront of these transformations.

Beyond the buzzword, Modular Construction can address pressing issues faced by corporate occupiers.



This ebook will define what Modular Construction is about and how it might change the way you plan and deliver your workspace projects in the future.



NAVIGATING THE POST-COVID WORKPLACE LANDSCAPE

No other event has shaken up the world of office design quite like the pandemic did in 2019.

Suddenly, we found working remotely the norm, and collaboration software became the only link between you and your colleagues. Following the aftermath, employees were progressively encouraged to return to offices.

Many corporations are rethinking their office portfolios to accommodate the new habits in the workplace. For instance, they expect the mass adoption of hybrid work schemes will reduce their office footprint. Underutilization of space looms, as hybrid-scheme workers typically spend 2 to 3 days a week in the office.

In a 2022 report on real estate, McKinsey Global Institute measured that office attendance in major cities remains 30% lower than pre-pandemic levels.

Office attendance in major cities remains 30% lower than pre-pandemic levels

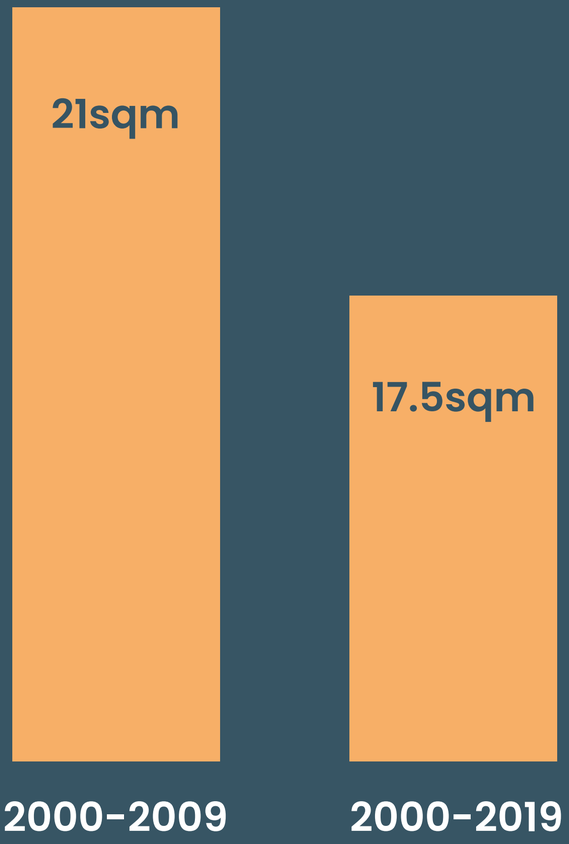
"The future of work after Covid-19"
McKinsey Global Institute, 2021

Hybrid work is here to stay. Around 63% of surveyed workers declared they benefitted from at least one day of remote work per week, with 44% having more than two days per week. This shift in working habits will inevitably impact how companies plan their next generation of office space. Flexibility has become a mantra for many companies as an answer to a shift in their employees' aspirations since the pandemic.

Flexible work arrangements are now considered an integral part of an excellent work-life balance. 91% of employers declared adding such arrangements to their employee benefits in 2021.*

The last decades have seen the exponential rise of open-office designs. Thought to increase communication and transparency between employees, open offices allowed companies to maximize occupancy across their portfolios. As a result, the total space per employee in modern offices has notably decreased over time. Estimations show individual space shrunk from 21 sqm in the first decade of the 21st century to a mere 17.5 sqm. Employees' well-being deteriorated as a consequence of these design choices.

*Health & Wellbeing Touchstone survey", PWC, 2021



From 21 sqm space per employee to 17.5 sqm

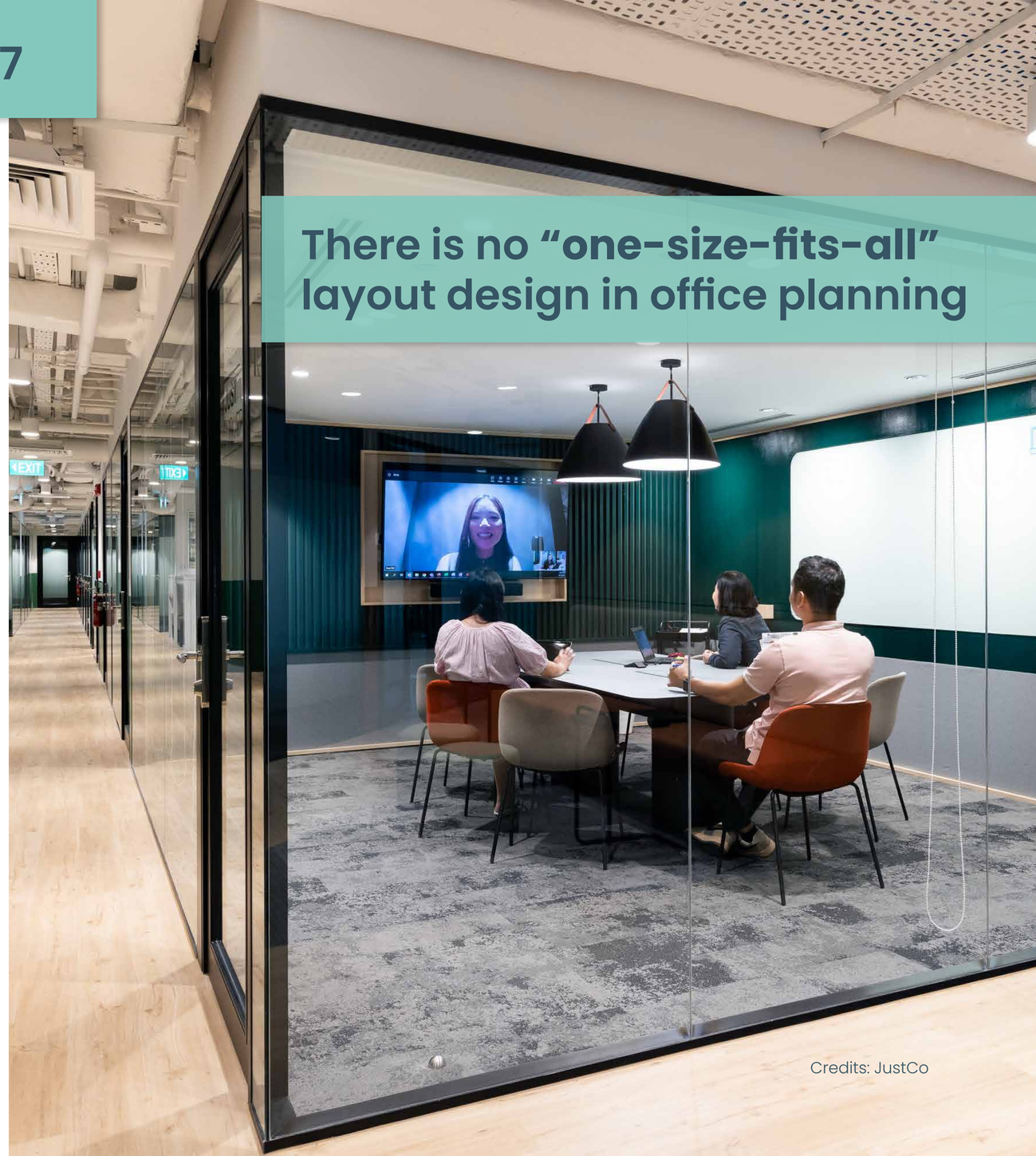
The Truth about Open Offices. Harvard Business Review, 2019

Open office spaces precisely led to the opposite of the original intent, hindering collaboration and interactions rather than enabling transparent communication. This issue has been so critical that many solutions appeared on the market trying to address it. Companies extensively deployed phone booths, acoustic cabins, or noise-cancelling devices to provide employees privacy.

Though helpful, these solutions are not a definitive fix. The general lack of enthusiasm surrounding the return to working within an office proves that designs now need a radical shift. Previous formulas will not cut it in the post-covid era.

Organizations now need to reassess their workplace strategy and start rethinking tomorrow's office layouts to be places for collaboration, development, and creativity.

There is no "one-size-fits-all" layout design in workspace planning. Yet, making allowances for the future will enable you to be prepared for any scenarios and to adapt to the changing nature of office work.

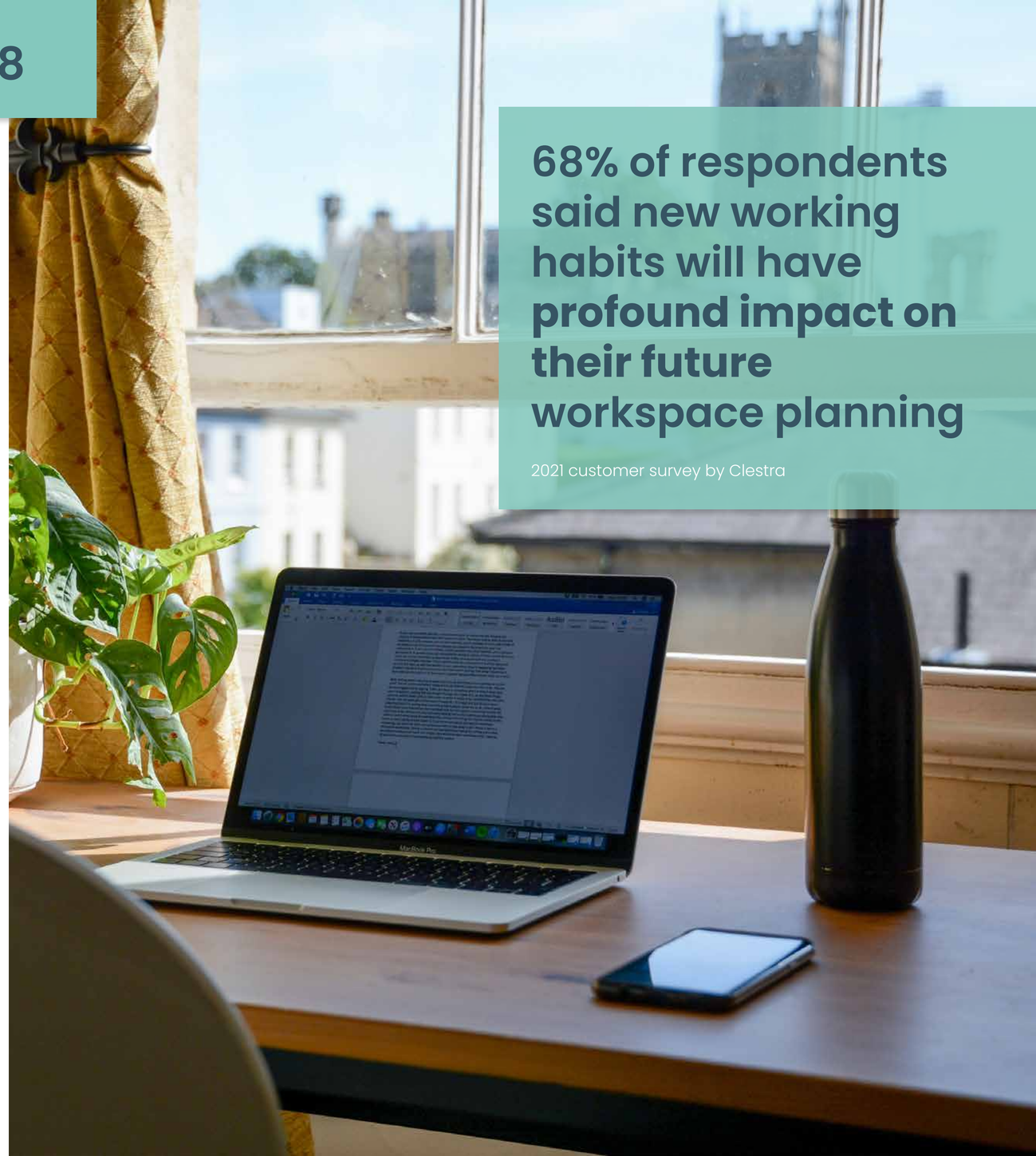


In 2021, Clestra conducted an industry survey across Asia; 68% of respondents said the transformation of working habits will have the most significant impact on how they plan their workplaces in the future, followed by 59% for user well-being.

It will place significant stress on companies' resources to reinvent our work environments in the years to come. Overreliance on fixed construction and long-term office leases have turned any interior renovations into an insurmountable burden.

Besides the operational hassle, companies must also consider the environmental impact of such changes. Yet, extensive office redesigns will be necessary to accommodate deep work transformations better.

Game-changing innovations in construction methods have the potential to deliver this seemingly impossible feat: building offices that have the potential to evolve and adapt to their occupants' needs over time without compromising on the environmental footprint.



68% of respondents said new working habits will have profound impact on their future workspace planning

2021 customer survey by Clestra

DEFINING MODULAR CONSTRUCTION

Industry-wide trends are reshaping the global built environment, and the pandemic acted as a fantastic accelerator of change for the entire ecosystem.

Historically, the construction industry has a long track record of low productivity levels and a need for more innovations. New methods are reinvigorating the sector, encouraging its players to improve processes, quality, and work conditions.

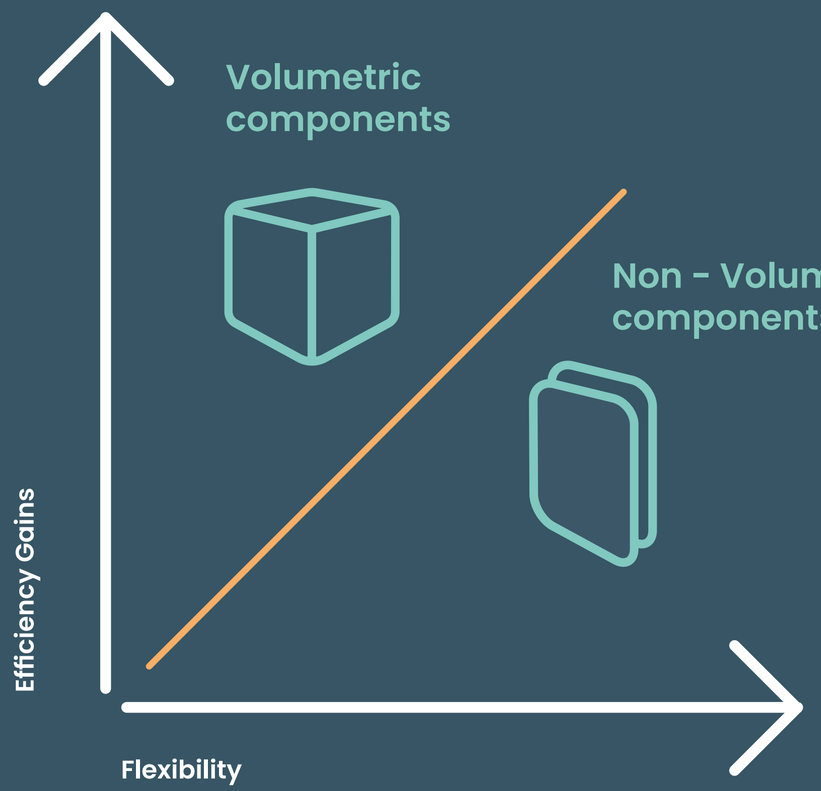
Modular Construction has seen a renewed interest these last few years. It answers the shortcomings of conventional construction, mainly its lengthy execution time and cost overruns. Unlike the latter, Modular Construction shifts work from the job site to the factories, with building components simultaneously manufactured in a controlled environment before being assembled onsite.

Projects of all sizes and types can capture the benefits of offsite manufacturing. It results in higher quality builds and shorter lead times and reduces environmental footprint while providing onsite workers with improved conditions. From post-WW2 pre-fabricated houses ordered through catalogues to today's modular skyscrapers, the sector has drastically transformed thanks to technological advancements. The depth of Modular Construction techniques and applications is now more extensive than ever.

To summarize, there are two main approaches when it comes to offsite Modular Construction:

Volumetric construction
Non-volumetric

Volumetric construction consists of fully assembled modules lifted with cranes stacked like giant Lego bricks. They are essentially fully-finished 3D units, serving either as non-structural or structural elements. This approach is particularly beneficial for multiunit residential or hospitality projects with high levels of repetitiveness in the design. Think of hospital room units, or bathroom pods assembled in factory.



Using volumetric components will result in higher efficiency, whereas non-volumetric components offer more design flexibility.

In 2017, Marriott International, in partnership with a local Modular Construction specialist, opened a 97-room hotel complex in California. They reported a reduction in project lead time of up to five months compared to the initial 14-month schedule.

Non-volumetric Modular Construction, on the other hand, offers increased versatility in design and layout. Instead of using fully pre-fabricated modules with fixed volume or shape, building components are smaller and more flexible. They can be wall panels, flooring elements, ceilings or other building components, assembled and interconnected to form a complete structure. Modular systems typically integrate mechanical junctions, significantly reducing the need to add sealants or binding materials during the assembling stage.

The main difference between the two approaches lies in the labour distribution: factory work tends to be more intensive when building volumetric modules than non-volumetric components. However, transportation and manufacturing costs will be significantly lower for the latter.

Marriott reported a 5 months leadtime reduction over the initial 14-month schedule

"From projects to products", McKinsey Global Institute, 2019

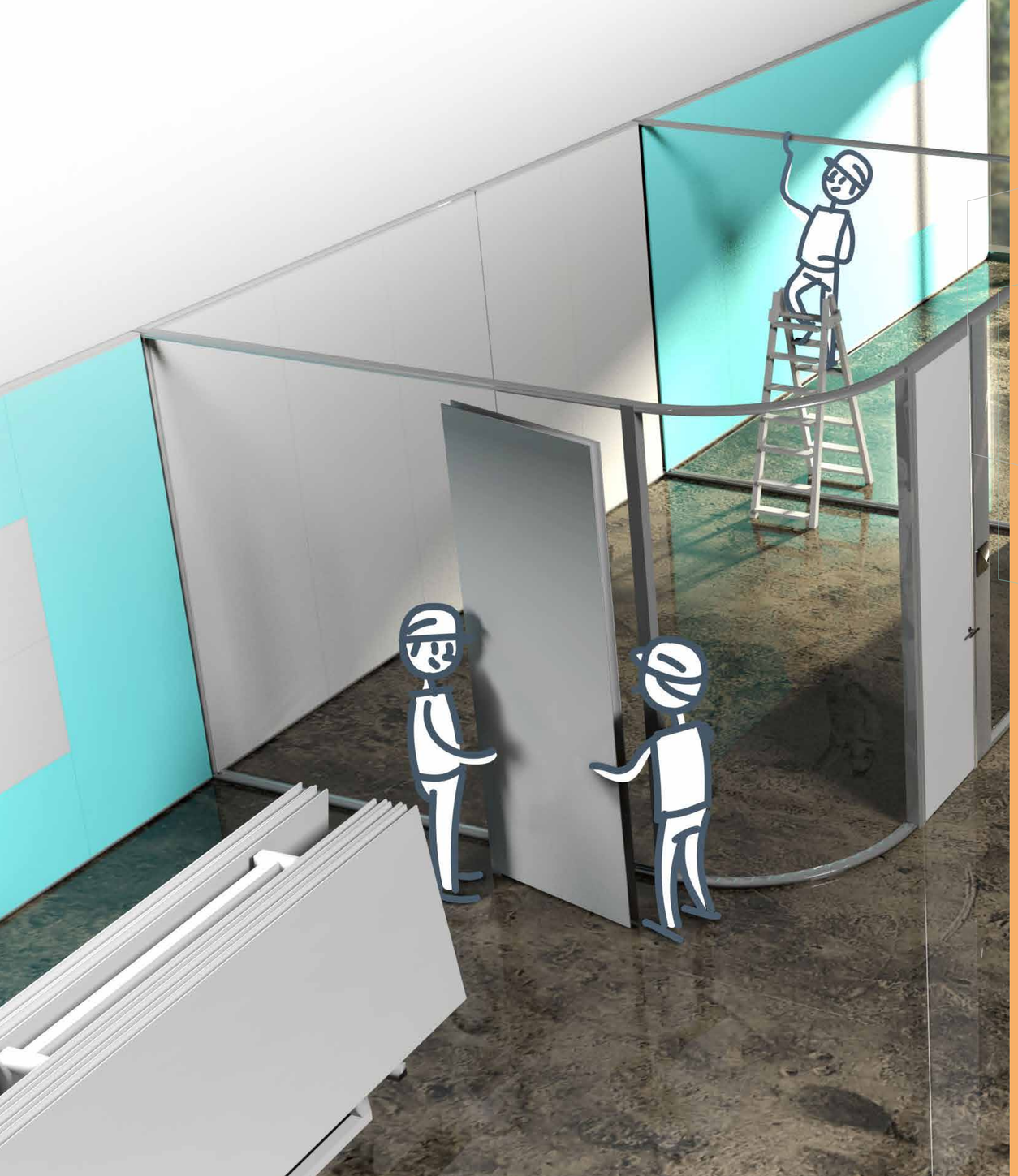
Shipping factory components do not require specific logistical arrangements. Each approach has its pros and cons, and successful projects can use a combination of both to maximize efficiency gains where it is necessary.

Despite the approach, Modular Construction brings additional benefits after the initial installation. Components that are easy to disassemble make allowance for future expansions, reconfigurations, and relocations—making it possible to rearrange modular builds within several days with little disruption involved.

In the case of tertiary workspaces, any renovation will likely occur in existing commercial buildings where defined ceiling heights, spans, and floor plates exist. Volumetric construction would not be adapted here because spatial constraints would be too cumbersome.. The variety of work areas and room functions require a less rigid approach. By contrast, non-volumetric Modular Construction is a relevant alternative.

Let’s find out what benefits to expect for your workspace fit-outs.

Components that are easy to disassemble make allowance for future expansions, reconfigurations, and relocations

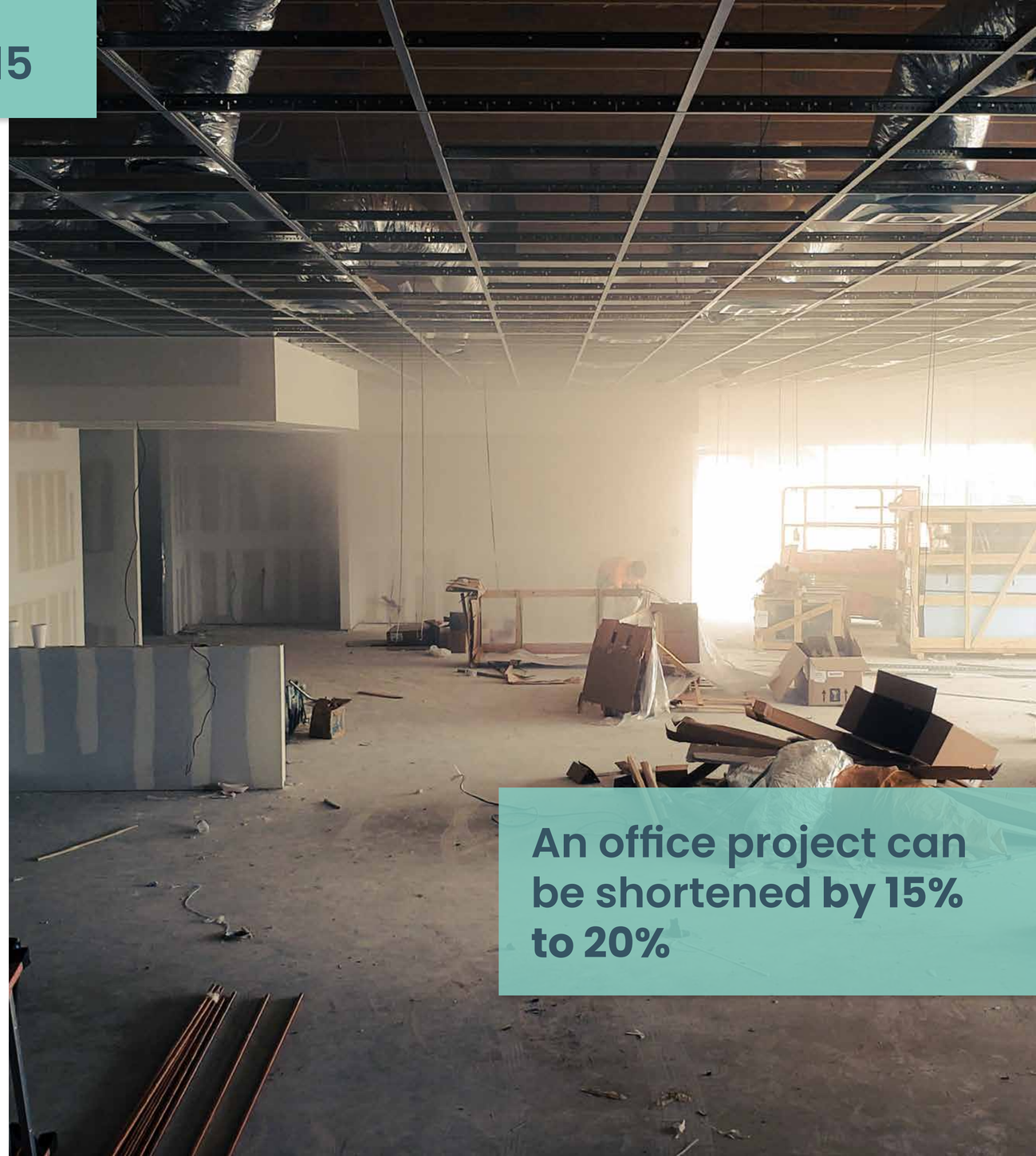


MAXIMIZING EFFICIENCY FOR TERTIARY WORKSPACE PROJECTS

Office construction is not immune to the usual shortcomings of conventional building methods.

Think about the standard process to deliver an office space: the tenant needs to navigate a complex network of vendors, general contractors, and program managers for a single project. These stakeholders will mainly rely on fixed construction to fulfil the design brief and deliver the workspace often without considering future requirements.

More importantly, the design choices do not make allowance for future transformations and renovations. Most tertiary workspace projects need rework even before the final delivery. Large office fit-outs take approximately eight months to complete. Traditional construction comes with extensive time, and any change in the design will prove very costly, essentially locking the user in the same layout for years.



An office project can be shortened by 15% to 20%

Modular Construction, on the other hand, relies on factory processes that are easily controllable and scalable. It becomes easy to perform project stages simultaneously: the production of components can start as soon as purchase orders are issued and designs are approved.

This means sub-trade work can even start while structural work is being completed, providing that onsite teams coordinate well and stakeholders trust each other. In a conventional approach, sub-trade work requires the completion of all previous stages. Any issues arising during the early stages will result in accumulated delays and cost overruns. An office project can be shortened by 15% to 20%, depending on the modular components used and the level of coordination between all trades.

Nowadays, lean manufacturing techniques and accurate quantity take-offs also reduce materials waste. Since most of the work takes place in factories, modular manufacturers have an incentive to produce the exact quantities needed to complete the project—no more, no less.

Project owners can achieve between 5% to 10% reduction in total material costs

"Buildings that last"
American Institute of Architects, 2019

Cost tracking, under a conventional approach, is more of an art than a science. Typical office projects are design-heavy, with complex features and unique customizations. Contractors tend to intensify onsite work to deliver such requirements, which then leads to opaque costs and increases the risk of inefficiencies. Inflated costs are hard to accurately detect by owners and investors when they happen during project stages.

Modular Construction builds, by contrast, are easier to quantify since all components are traceable and identified using Building Information Modelling (BIM) tools. Finally, transparency also helps investors to track the carbon footprint of their projects. Environmental data can be linked to each modular component using digital tools.

Clestra's systems are easier and faster to assemble than conventional building methods. Non-volumetric modular components provide flexibility in both design choices and transformation possibilities. We don't wish to see occupiers locked into obsolete designs, so we constantly evolve our designs.

Modular Construction builds are easier to quantify using Building Information Modelling (BIM) tools

COMON PITFALLS AND HOW TO AVOID THEM

Of course, Modular Construction is no panacea that would magically solve every issue in office construction.

It can help you thrive and achieve better projects when conditions align. It also comes with several drawbacks that can sometimes offset some of the benefits mentioned earlier.

Shifting work offsite means that manufacturers rely on factories to manufacture components with varying levels of complexity. Costs associated with manufacturing work are usually higher than raw materials procurement and transformation onsite.

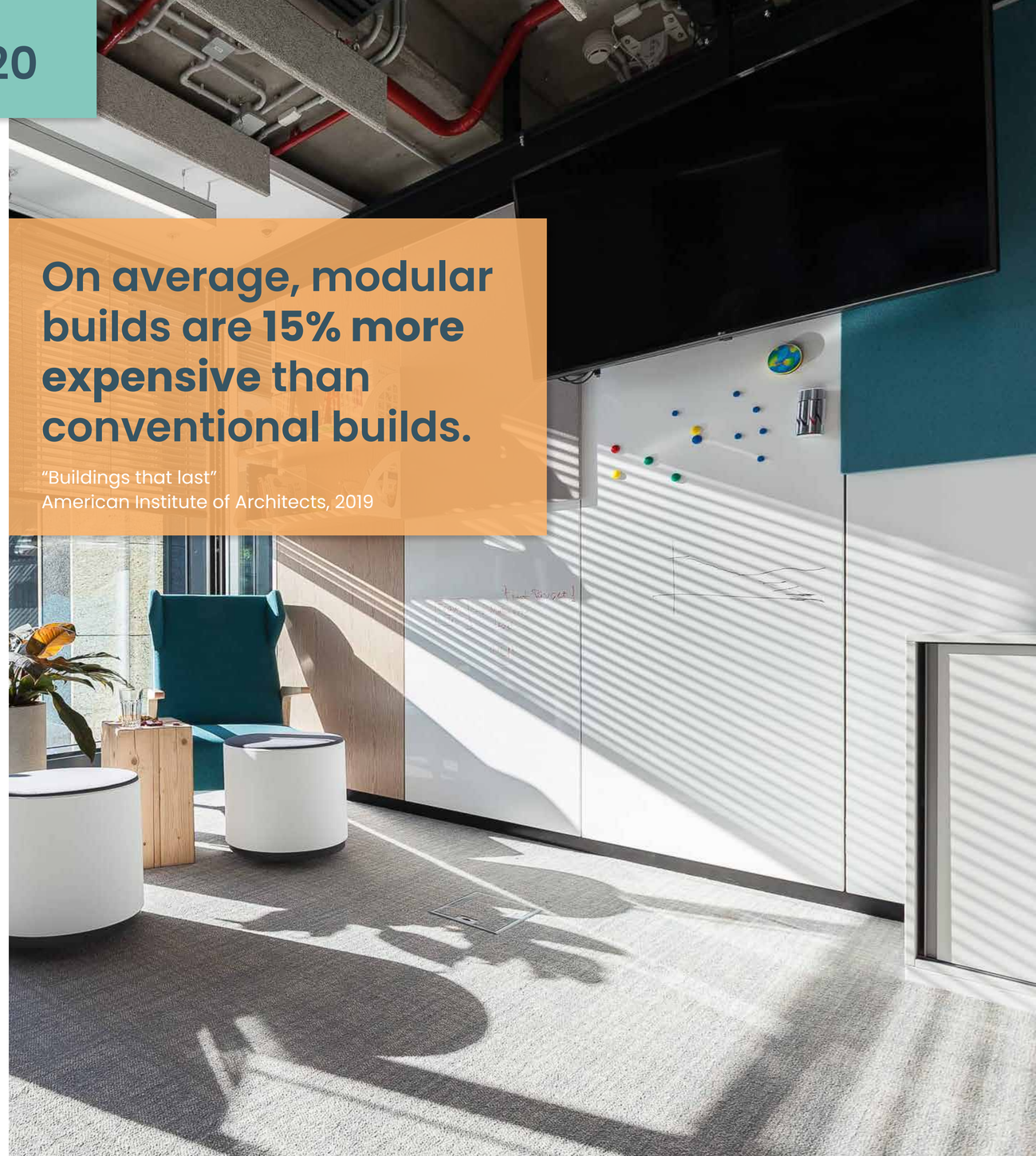
It is also worth noting that modular vendors must accommodate design flexibility and process efficiency.

Costs associated with factory work are higher than onsite work

This ubiquitous approach tends to inflate production costs and impact budgets, particularly for smaller projects requiring more work to generate economies of scale. Thus, the cost of modular builds is, on average, 15% more expensive than conventional builds.

Another reason is that Modular Construction systems are, in essence, finished products, with complex assembling and manufacturing completed upfront in the factory. In contrast, conventional construction transforms gross materials later in the process onsite. That explains why the initial budget for projects using high rates of pre-fabricated sub-assembly components can seem significantly more expensive at first glance.

A certain level of design standardization is required to keep costs down and maximize process efficiency. Yet, standardization doesn't mean stale designs and limited choices for your office. Modular manufacturers can achieve a whole range of creative designs through mass customization. Our Clestra systems offer multiple personalization options in materials, shapes, and integrations.



On average, modular builds are 15% more expensive than conventional builds.

"Buildings that last"
American Institute of Architects, 2019

Fully adaptable workspaces

The success -or failure- of implementing Modular Construction methods for your office projects depends on the design approach you are taking and the results you are expecting. Project owners and architects must adopt a clear design intent early.

The objective is to build for purpose instead of building to dispose. Considering Modular Construction as a lifecycle investment will help to mitigate higher upfront costs and increase acceptability.

On Day Two, this approach will be the most cost-efficient because it will enable your workspaces to be fully adaptable, thus saving time and resources for future redesigns.

BEST PRACTICES FOR EXEMPLARY IMPLEMENTATION: INSIGHTS FROM THE FIELD

Ed Peters, the founder of Enzyme Apd Architecture and Design Studio, shared with us his views on the current shifts happening in the world of office design and his experience with Modular Interior Construction.

Workplace design has seen radical changes in recent years, spurred on by the COVID-19 pandemic. This shift had begun earlier when specific industries and enterprises sought a more humanistic and adaptable workplace environment.

The work-from-home was a radical change. In the years of the pandemic, they established this trend as a health and safety policy that has now evolved into a norm for many industries and companies. Employees now consider work-from-home as a benefit to improve individual work-life balances.

Workplace changes that are now taking place are driven not only by considerations of employees' health and well-being but also by

> **Workplace changes are driven [...] by socioeconomic forces and sustainability goals**
>
> by: Ed Peter, Architect

socioeconomic forces and sustainability goals.

The flip side to this is to find ways to optimize employees' experiences whenever they do work in the office. The fit-out of office spaces now requires a considerable balancing of capital expenditure with the unpredictability of the business environment. Some companies may see rapid growth, and others will shrink because of unforeseen circumstances.

In any case, these potential 'shifts' can happen rapidly, and companies need to adapt. Implementing 'designed-in' future-proofing strategies aims at making offices agile, flexible, and sustainable altogether.

Businesses that can cater to ever-changing needs without fixed construction would mean a much faster turn-around, with little or no disruptions to their operations, the key to the future of workspaces.

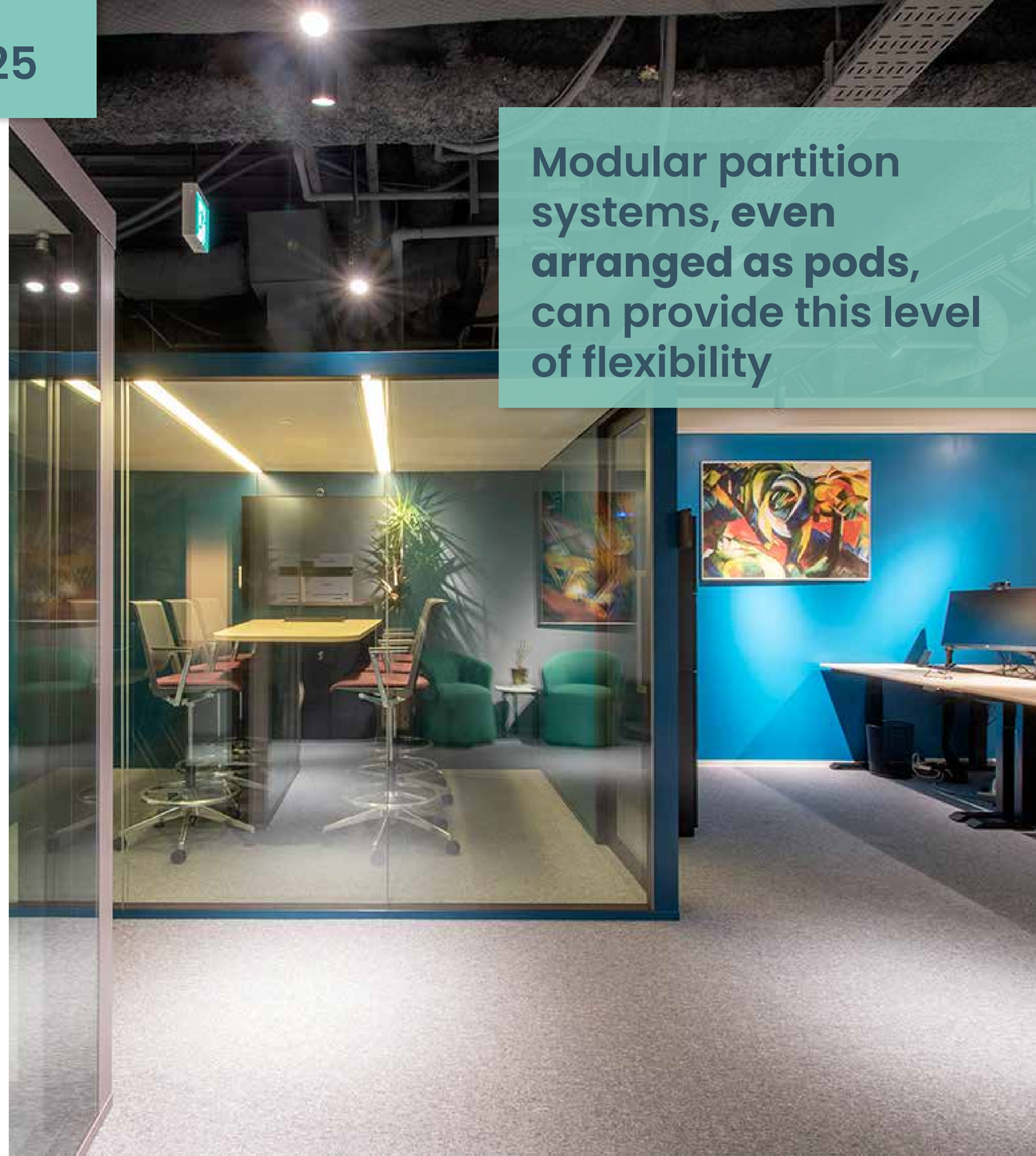
Designers must specify such systems as furniture, partitions, flooring, ceiling, and lighting to be modular and flexible. Scaling up

or down to meet occupancy ‘shifts’ and accompany change. We see many office furniture ranges already achieving this.

Manufacturers have long provided easy-to-disassemble office products made with good quality, recycled materials. Yet, these are often standalone fixtures that must be built or fixed permanently into the floor or walls. The challenge now for designers and CRE professionals is to use these principles for traditionally fixed items.

Modular floor-to-ceiling partition systems or even ones with ceiling enclosures arranged as pods, can provide this level of flexibility. Positioning pods in an open floor layout offers enclosed spaces for employees. They can serve different functions in the open area to accommodate work requiring creativity and collaboration or concentration and solo work.

Modular partitions, pods, and furniture systems make up a dynamic office environment, which improves business efficiencies and employees’ experience. When a tenancy cycle ends, all these systems would be easily relocatable to a new place of business.



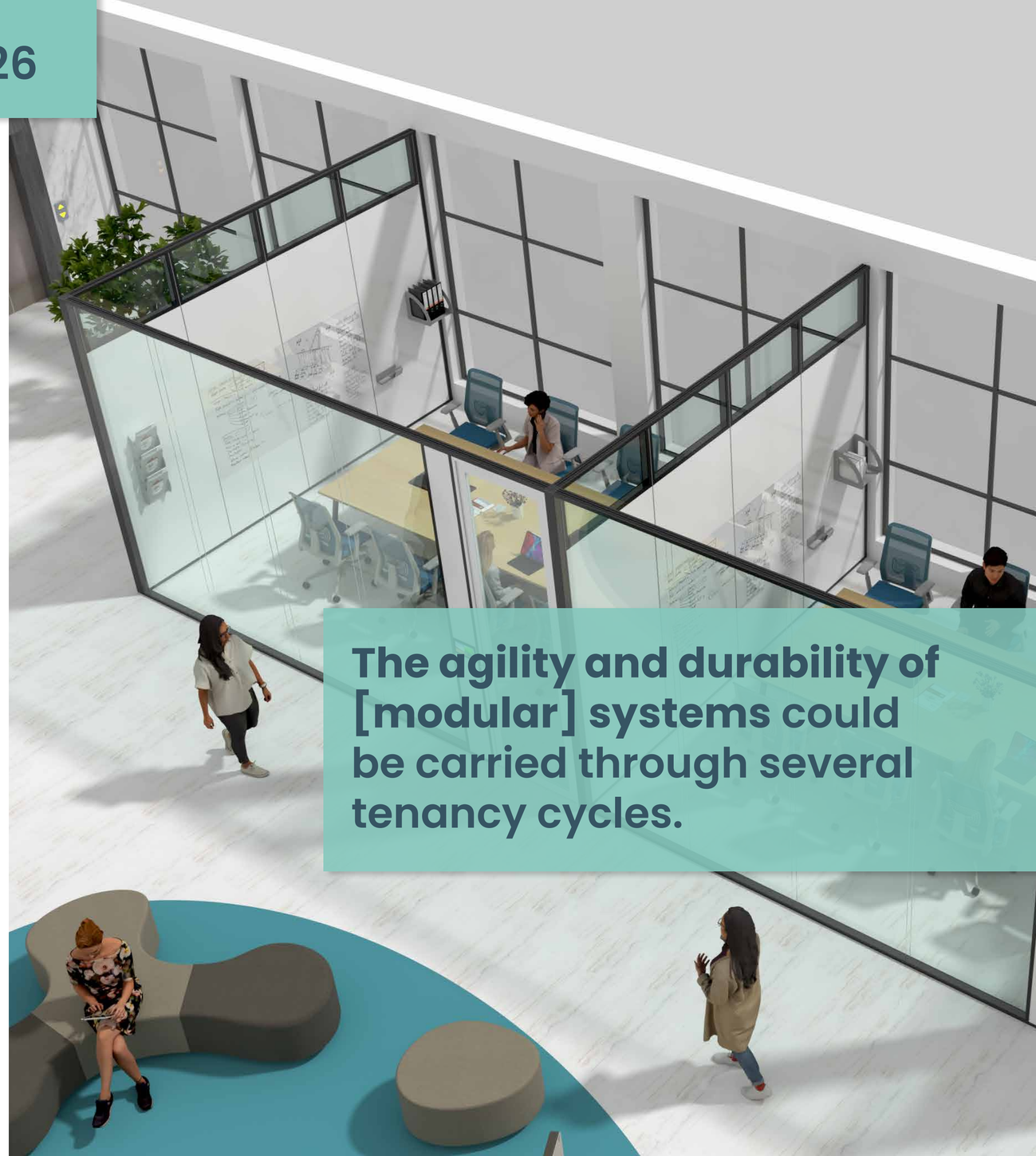
Modular partition systems, even arranged as pods, can provide this level of flexibility

Owners can also reuse and transfer them to fill a second-hand pool for other businesses. The agility and durability of the systems could be carried through several tenancy cycles.

There should be little or no wastage or demolition occurring in relocating the systems somewhere else. The future of workplace design will lean towards humanization, where partitions and pod structures segregate different environments. Employees can control lighting, acoustic insulation, and temperature within the areas they choose to work in.

Owners can make physical alterations to their office layout easily without construction work and within a concise timeframe. Every system and every element will be reusable at the end of the tenancy cycle. The choice of agility and modularity will come to the fore in whatever new environment they find home.

Social and environmental issues are now more pressing than ever. Office designs should encompass all these aspects to stay relevant and become essential company value drivers.



The agility and durability of [modular] systems could be carried through several tenancy cycles.

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