Viewpoint®

Connected Modular Construction

Redefining Modular Construction for a New Era

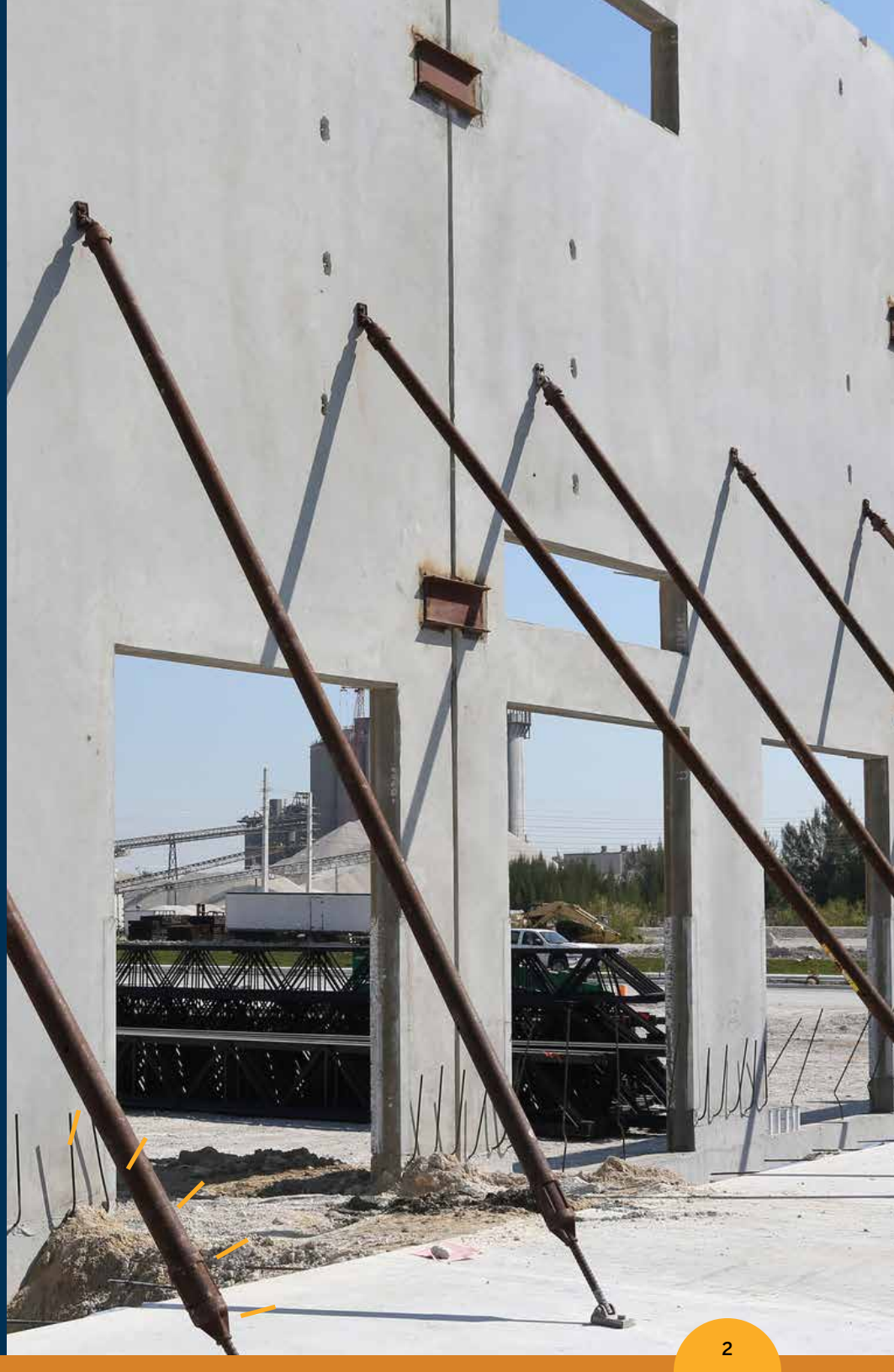
Managing Through Change

Trimble® Construction

Modular construction is expected to have a global worth of around $142 billion by 2024, according to Business Insider.

But what makes this new age of offsite construction bigger and better than its predecessors? What can this generation of modular buildings deliver that prefabrication failed to do? And how will technology help modular construction become a serious player in all property construction?

This eBook aims to answer questions and explore how modular construction can reach its full potential over the coming years.



What is Modular Construction?

Modern Methods of Construction

To understand the increasing popularity of modular construction, we need to understand the role that Modern Methods of Construction (MMC) have played in this.

The UK government has offered a framework for MMC in the form of a spectrum from 1-7; where 1 is a 3D structure assembled fully in a factory setting and installed onsite, and 7 is the use of technology onsite that aids workers to make productivity improvements, such as drones and field productivity tools.

Modular housing methods sit between 1 and 5 on the government's spectrum, so it is no wonder that modular has become the poster child of MMC.

Definition of Modular Construction

Modular construction, or offsite construction, is a method of construction where components are predominantly assembled in a factory setting and finalised on-site. The initial process that takes place in a factory is also sometimes referred to as Off-Site Manufacture for construction or OSM.

In an industry that is responsible for global infrastructure, any method of construction that promises a faster turn around and safer buildings is worth a second look. Modular construction is an exciting addition to construction's increasingly modern portfolio, with benefits ranging from quicker project completion to improved quality in modular buildings.

The Origins of Modular

Modular construction has been around for a long time. Its first recorded use was back in the 1600s. In 1624, an English fisherman brought a house with him to Cape Ann in the USA, and went on to disassemble and reassemble it several times after that. On a larger scale, the first modular housing scheme can be traced back to the 1920s, when the 'Dymaxion House' was planned for use in America during World War II. This never came to full fruition, but the benefits of modular housing have been known for centuries.

So, where does prefabrication fit into it all? More recently, ‘prefabrication’ is the term that springs to many minds for buildings that are finalised on-site. However, over the years the reputation of prefabrication has gone from a new and exciting innovation from America to seen as outdated and in need of a major facelift.

When Winston Churchill’s government envisioned using prefabricated housing as a way to make up for housing shortages after WWII, the scheme never intended to make this housing permanent. The cross-party Burt Committee in 1942 built around 156,622 prefabricated homes over the coming years. About 700 of these are still in existence, long past their intended 10-year lifespan.

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This illustrates the main issue in the UK's involvement with prefabrication—it has traditionally been used as a temporary solution to an urgent housing need. Because of this, public perception of prefabrication has eroded over time. In a HOME group survey in 2018, 41 percent surveyed believed modular homes to be less durable than homes built by traditional means.

However, the new wave of modular construction is different: It is technology-led and innovative in its designs and uses. More importantly, safety regulations have come a long way since the days of Churchill, meaning materials have to be safer and more durable on modern-day modular buildings than their prefab predecessors. Modern Methods of Construction are still being championed by the government as a quicker way to tackle the housing crisis, but these structures are built as permanent solutions and not a temporary fix.

As we've discussed, modular is by no means a new style of building, but this new generation of offsite construction pushes the boundaries of design, engineering, and sustainability—qualities that will prove essential for construction and its image in the coming years.

Benefits of Modular Construction

It seems like there is always a new story in the media about the pinching margins of construction, a quality-related court case or an overrun project. Put simply, the reputation of construction over the past few years has been far from shining. The benefits of modular construction could be vital for construction to reshape its image into something more enticing for younger talent, and more positive in the public eye.

Quicker Turnaround

The adage of 'time is money' has never been truer than in construction. Anything that can help projects a.) stick to their original timeline and b.) reduce project timelines going forward is attractive to builders.

Read the **Colmore Tang Case Study »**

One advantage of offsite construction is that it minimises time on site and therefore reduces a project's length. If done correctly, this means subcontractors won't have to wait around for other subcontractors to finish their tasks on the build before getting started. By their very nature, these builds are efficient, meticulously planned and usually utilise modern technology to ensure there aren't any delays once construction does begin on the final site.

The "Great British Weather" is infamous on building sites. Whether you're a brickie or a plant operator, you've probably experienced at least one on-site delay due to adverse weather. With off-site construction, a larger proportion of the project is completed in a factory setting, which means the chances of the on-site portion of the project being delayed due to adverse weather are reduced. Although weather stoppages are something often factored into construction insurance, it nevertheless causes a ripple effect of delays that can affect far beyond the original project.

> We use Field View to track the full life-cycle of the product, from the moment it is manufactured, to when it arrives on-site and is handed to us as a finished unit.
> — Stuart Millichamp, Senior Project Manager, Colmore Tang

Sustainability

Construction does not have a strong track record with issues of the environment. The UK Green Building Council predicts that around 10% of the UK's carbon dioxide emissions are directly associated with construction activities.

According to The Waste and Resources Action Programme (WRAP), up to 67% less energy is required to produce a modular building from start to finish, compared to a traditionally built building. Not to mention, modular projects are completed quicker and use less energy at the project site.

WRAP predicts modular construction can reduce building materials by up to 90%. By the nature of modular buildings, many can be disassembled and moved elsewhere at a future date. This means they're durable, reusable and contribute to a modern climate of construction that minimises waste.

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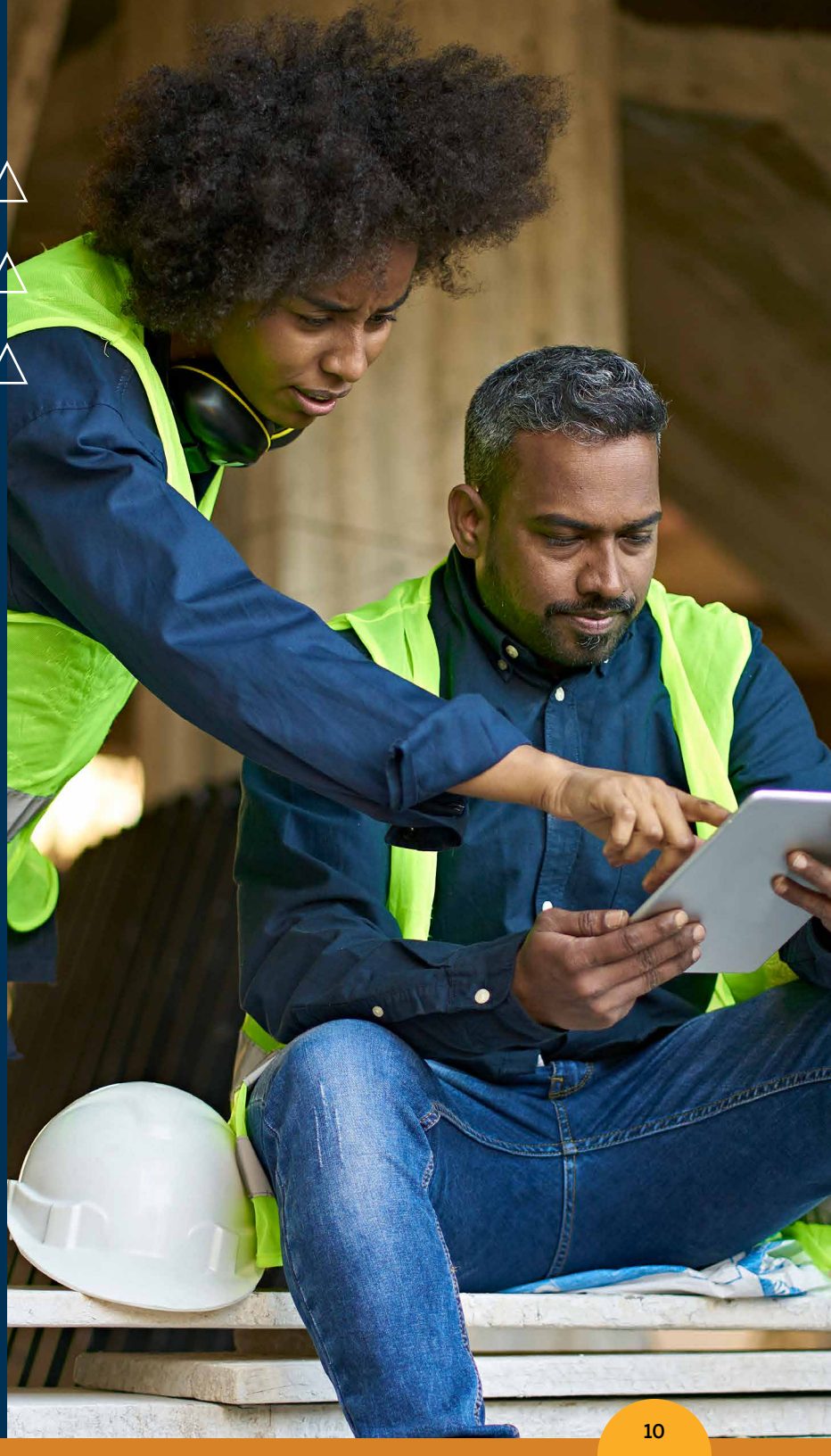
Repeatable Quality

To make predictable profits in construction, the projects themselves must be predictable.

It's not possible to eliminate mistakes and change orders entirely, but by reducing the amount of construction that is undertaken on-site, more checks can be carried out in a factory setting and therefore improve first-time quality on materials.

When paired with a field productivity and quality tool, such as Trimble Viewpoint's Field View, this culture of first-time quality and accountability can be carried through a project.

Construction is changing dramatically, and the opportunity for contractors to work alongside technology offers an exciting advantage of repeatable quality for customers and the end-users.



Growth of Modular

What are the day-to-day reasons that construction businesses are focusing on modular more than ever?

Fewer Costs and Bigger Profit Margins

Modular construction costs are often lower than traditional construction projects, due to fewer resources and less time required to complete a project.

Any time something has to be retrospectively fixed or changed, a construction project loses money. By reducing time onsite, costly rework is also reduced. Using field software alongside the final assembly stage of the project ensures that any snags or issues are resolved as the project moves along, minimising the chance of delays and unaccounted for costs.

Government Initiatives

Greener Construction

In recent years, the UK government has set aside funding for construction projects that encourage the use of Modern Methods of Construction,in a bid to make the construction sector greener. Modular construction forms a large part of these plans, as the government actively seeks and favours partnerships with contractors who specialise in this type of construction for its projects.

Affordable Homes Programme

The government has committed to building 300,000 new homes for the UK yearly. In reality, this target has been falling short since its proposal in 2017.

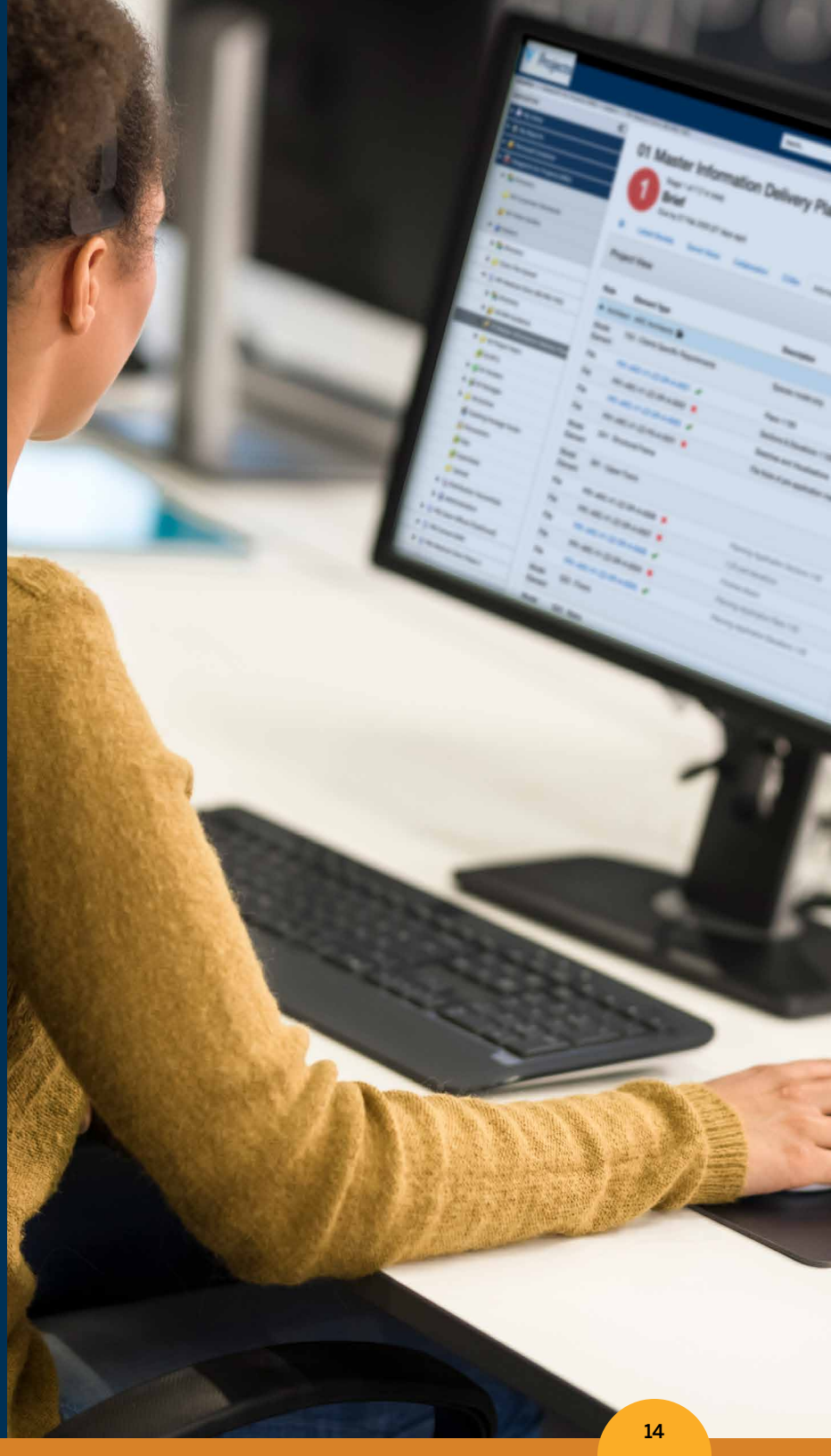
Relying on traditional building methods alone to meet these targets is a tall order. In 2020, Mark Farmer, the government's MMC champion, stated that the government should aim to build 75,000 modular new homes a year. This goal was taken on board by the next AFP period of 2021-2026, with a target of 25% of all new-build homes to be completed using modular construction.

A recent report of Farmer's saw a 40% reduction in emissions from modular projects. In other words, favouring modular construction for use in new builds helps the government cross off two items on their agenda.

The Case for Modern Construction Software

Although naturally more efficient than traditional construction, modular construction could very easily become difficult to track between multiple sites and teams. On-site construction may be reduced, but that doesn't mean that modular projects are immune to setbacks and delays. There still needs to be communication between all of the teams involved, from manufacture to installation.

Offsite construction is good for the sector's image. It's greener, quicker, cheaper and easier to guarantee consistent quality. Perhaps most critically, the golden thread of information is much easier to track when all parties involved are using software that implements compulsory checks, forms, and approvals to move the project along.



Software Adoption

Half of the battle with technology is getting people to embrace and consistently use it. This isn't just an issue with users—it is also an issue at board level. According to Khalid Kark, less than a third of all technology discussions at board level focus on technology-driven digital transformation.

To reach its full potential on a project, construction software technology must be embraced by all parties involved. Universal adoption of technology is a major hurdle that construction faces as an industry. Those who already use technology have a sizeable competitive advantage. But for technology to impact the industry with lasting modernisation, software and technological tools must become commonplace.

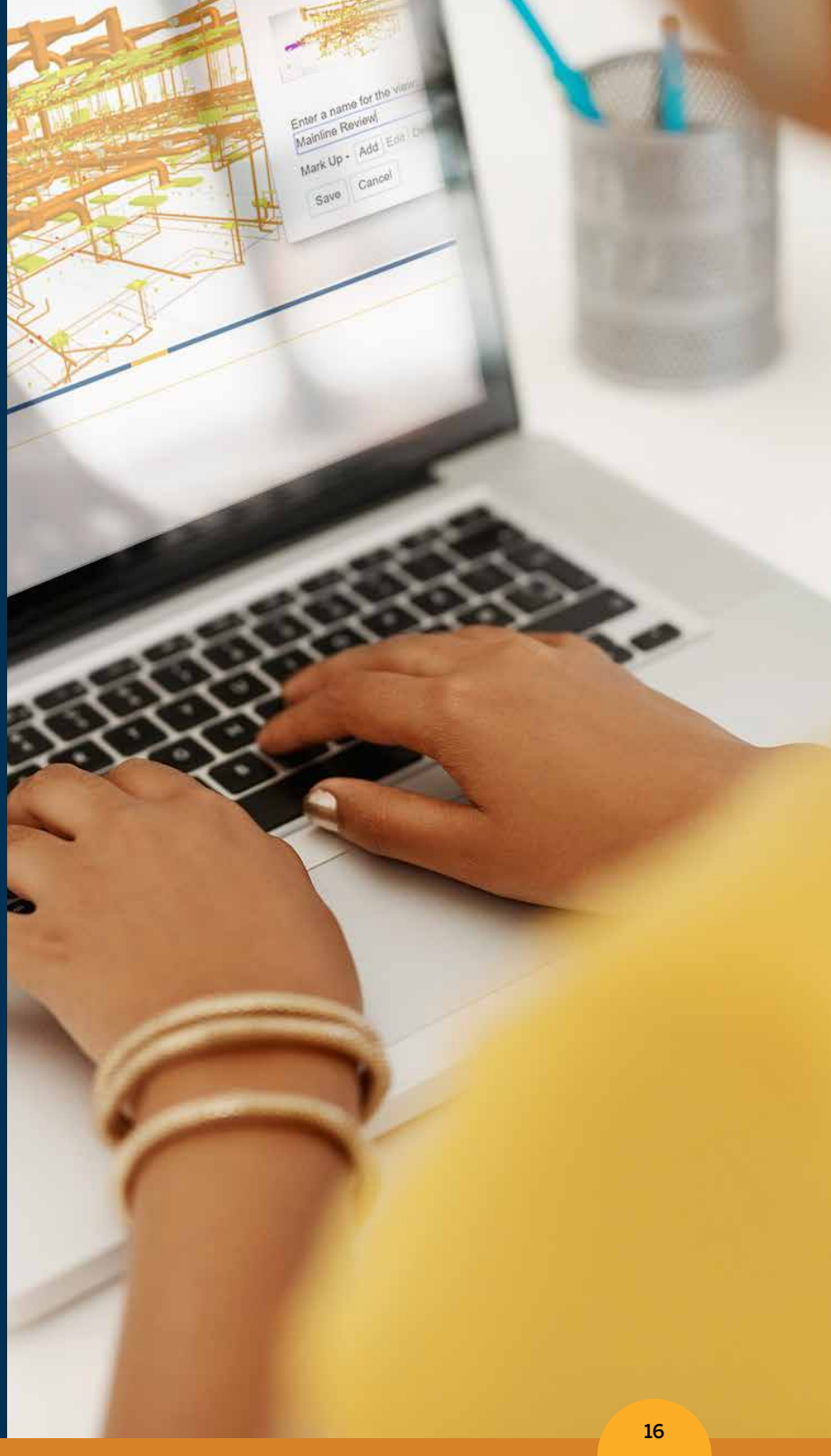
Choosing the Right Technology Partner

Much of the industry apprehension probably comes from bad experiences, or lack of experience, with technology. The wrong technology partner can be worse than no technology at all. Our role at Trimble Viewpoint is as both technology partner and business partner, with the ability to scale and long-term support from people with deep industry experience.

Trimble Viewpoint: Experience and Know-How

Trimble Viewpoint has been developing construction software for more than 40 years, have deep industry knowledge and experience, and we have helped thousands of companies reap the benefits of going digital.

Our solutions are ideally suited to modular and offsite building, and improve project profitability and visibility, manage risk, and effectively collaborate with the entire project team from the factory to on-site installation.

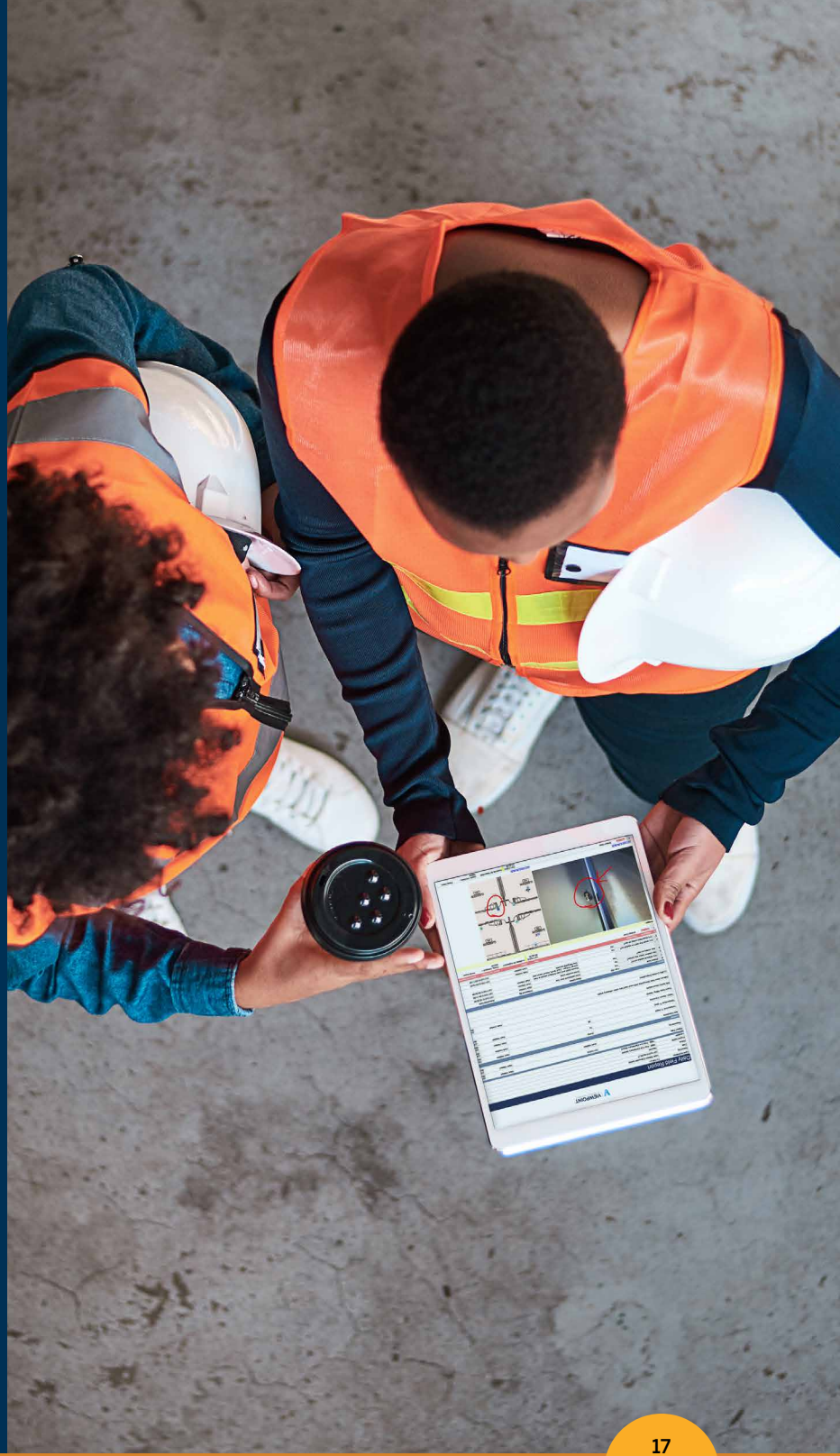


Our Solutions

Viewpoint Field View™ is a cloud-based mobile application that allows workers to capture, share and report data in the field. Field View allows contractors to quickly resolve issues, mitigate risks, and deliver higher quality projects. This powerful mobile field management solution helps manage tasks and snagging, QA processes track quality from factory to project site, and health and safety reporting offers visibility across all of your projects.

Viewpoint For Projects™ is a powerful collaboration solution for project management. This cloud-based document control solution helps contractors streamline documentation, reduce errors, mitigate risks, and avoid duplicating efforts.

Learn more about Viewpoint
Viewpoint.com



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ABOUT TRIMBLE VIEWPOINT

Trimble Viewpoint construction software solutions, part of Trimble Connected Construction, allow contractors to better manage their projects, processes and people, using the data gathered to lower risk and improve margins. With more than 40 percent of the ENR 400 on our platforms, Trimble Viewpoint innovations are transforming the construction industry by connecting operations across financial and HR systems, project management tools and mobile field solutions.

For more information, please visit Viewpoint.com

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