CAUSEWAY

Unlocking new design efficiencies

Streamlining design to transform performance

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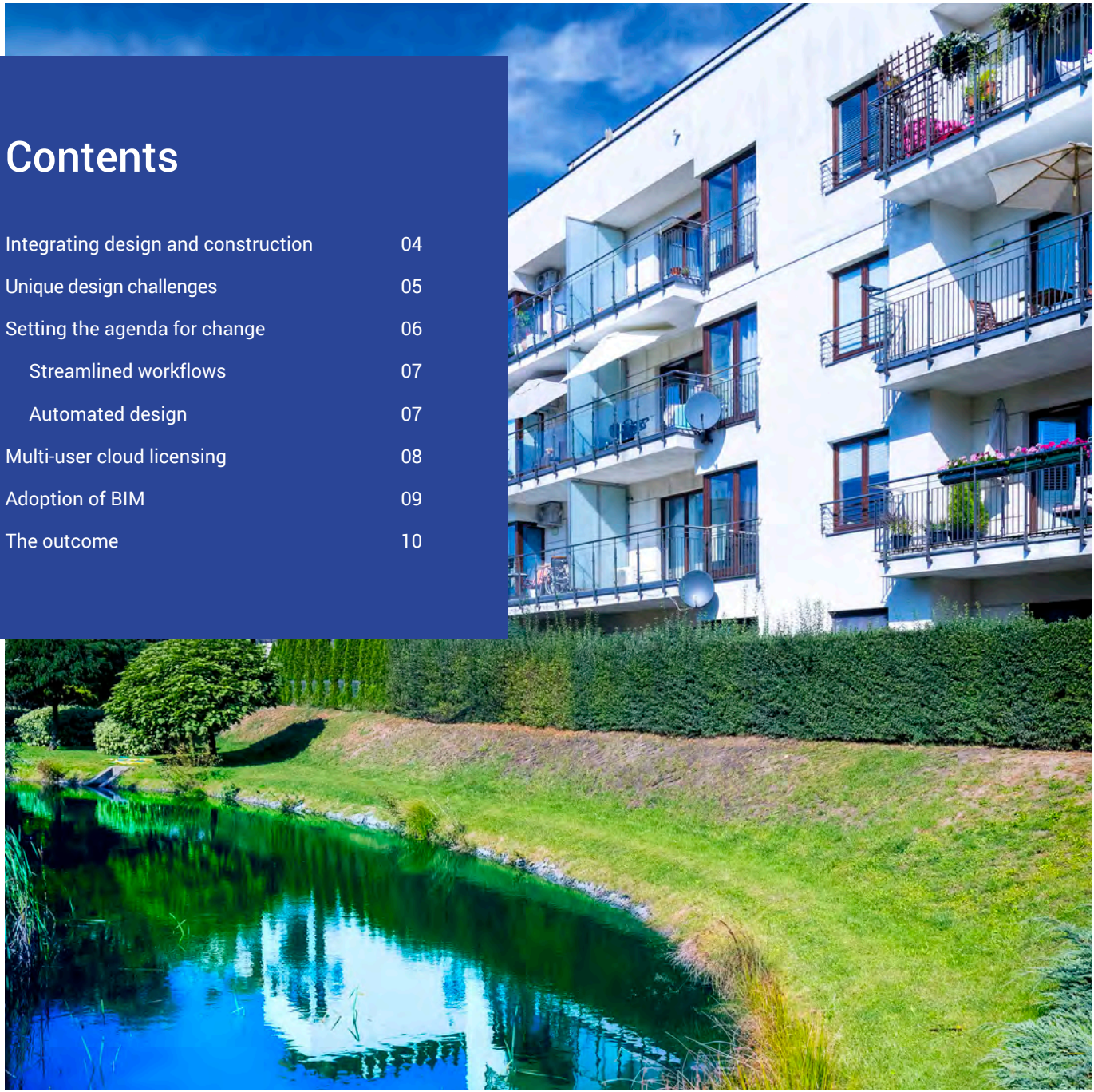

Introduction

As the construction industry embraces digital transformation and moves towards a more joined-up collaboratve approach, each sector has a key role to play to ensure productivity is increased across the entire construction lifecycle.

Unique challenges in the infrastructure design sector can be solved by embracing new technology and digital solutions. Solutions which enable practical improvements that promise numerous benefits to SMEs, enabling them to work more efficiently and to maintain good client relationships despite the ongoing skills shortage.

Integrating design and construction

The design sector plays a key role in enabling a more joined-up productive industry, particularly by embracing BIM to ensure data is right from the start.

SMEs form the backbone of UK construction industry but their adoption of BIM (building information modelling) across various sectors has been slow. As many as 75% of SMEs are still working on traditional project management workflows involving 2D drawings and production[3]. And despite a recent UK government push to encourage BIM adoption among construction industry SMEs, many remain 'BIM-unready'.

With such a large proportion of design work in the UK undertaken by SMEs, the shortfall in BIM uptake represents a significant missed opportunity. As Causeway chief executive Phil Brown warns in the company's recent Construction's Digital Frontline report[4]: "As long as design remains completely disconnected from construction across the project lifecycle the real win that BIM offers will be missed and that's a big problem."

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Phil Brown,
Chief Executive and Executive Chairman, Causeway

[3]https://www.researchgate.net/publication/310714608_A_BIM_Readiness_Implementation_Strategy_for_SME_Construction_Companies_in_the_UK
[4]Construction's Digital Frontline (Causeway report)

Unique design challenges

The UK construction industry is in the grips of a skills shortage which is both limiting construction activity and increasing labour costs[1], with employers in the civil design sector, in particular, suffering as a result.

The skills shortage is particularly prominent in the drainage design sector that requires a unique skill set currently underrepresented in the UK & Ireland. A recent industry survey[2] suggests widespread concern for the future of the water industry, with 81% of employers seeing increased turnover of staff and 70% saying that skills shortages had resulted in a reduced ability to complete projects on time and on budget.

Yet, it is here where the biggest regulatory changes are taking place: strict requirements in response to fluvial and pluvial flooding and climate change, with particular emphasis to SuDS as an ecological long-term solution mean clients are increasingly demanding more specialist design input. As a result consultants are frequently required to provide more complex phased design submissions from the pre-planning stage through to final submissions approval to satisfy these requirements and ensure compliance for approval.

With client relationships integral to the success of any business, engineers working for SMEs report working ever-longer hours in order to deliver work to deadlines and keep their clients happy.

70%

AGREE THAT SKILLS SHORTAGES HAD RESULTED IN A REDUCED ABILITY TO COMPLETE PROJECTS ON TIME AND ON BUDGET.

[1]https://www.constructionglobal.com/mission-critical/skills-shortage-uk-construction-industry
[2]https://wwtonline.co.uk/news/water-sector-employers-concerned-over-engineering-skills-gap-/2931)

Setting the agenda for change:

The benefits of adopting new technologies for SMEs in the structural and civil engineering design sectors are in fact manifold:

Streamlined workflows

Integrated design software simplifies significantly the iterative design cycle from outline design all the way through to detailed design, reducing errors and increasing both productivity and profitability. It empowers engineers, consultants, developers and approving authorities to deliver an efficient, compliant and cost-effective design, as well as freeing up time at every stage in the design process. And time savings are among the most significant benefits being realised through digital design solutions. Nevertheless, of the respondents to Causeway's research report only 38% currently have an integrated solution in place.

Automated design

Automated design has major potential to increase efficiencies within the industry - 55% of respondents to the Causeway's report agree that automated design is the next generation technology set to have the biggest impact on the construction sector in increasing efficiencies, with auto-updating and optimisation technology ensuring that changes to a design are made seamlessly across an entire network as a project evolves, removing any risk of error.

Given the site dependency of drainage design and the lack of one single set of guidelines from approving authorities, automated design offers obvious benefits in terms of ensuring compliance as well as design consistency.

The parameters used for digital design can be adjusted to suit the requirements by approving authorities, and users can run an approval test before submission by varying these parameters. Seamlessly leading users through the design process from the outline to detailed design stages via a user-friendly graphical interface, such technology makes design revisions effortless as well as compliant.

62%

OF CONSULTANCIES DO NOT HAVE AN INTEGRATED SOLUTION IN PLACE

Multi-user cloud licensing

Further efficiencies can be found through the use of cloud-based licensing systems supporting multi-user access to software. Such systems are designed to provide global access for multiple users, wherever they happen to be, offering obvious benefits over the restricted access of machine specific, dongle based or location specific software. Enabling engineers to collaboratively work on different stages of a project simultaneously increasing productivity, while software supporting other application file formats offers numerous benefits, including the ability to import and export data collaborating with third parties.

Adoption of BIM (and the wider construction lifecycle)

Adoption of BIM gives SME civil and structural consulting engineers a competitive advantage allowing them to bid for a wider range of projects, collaborate on projects more effectively and save their clients' money by identifying clashes at design stage. Industry wide adoption of BIM is an essential part of the government's and business community's common goal of a fully digital built environment. Its benefits are widely acknowledged: BIM increases efficiency in projects, optimises the construction delivery and hand-over cycle and reduces waste and carbon imprint.

While some consultancies have started to embrace digital technologies, the need remains for many companies, particularly SMEs, to overcome the hurdles to innovation and understand the importance of investment at all levels. Businesses of all sizes and disciplines acknowledge the need for investment in digital innovation, and the increased levels of integration and productivity this would deliver. However, a number of factors not least low margins and the teething problems perceived to be associated with adapting to new technologies - are still blamed by many for holding back such investment.

The outcome

SMEs in the structural and civil engineering consultancy sector need to establish trust with their clients in order to build and maintain long-lasting relationships.

How they do this requires thinking more about how they invest in the upfront planning phase of a project and, just as importantly, how effectively and efficiently they can manage change. Disconnected design workflows and a lack of integration also mean too much time is being spent on low-value tasks, resulting in a significant reduction in overall productivity.

Yet despite the reluctance still exhibited by some in the UK construction sector, attitudes towards the adoption of new technology in design appear to have now have reached a tipping point: almost two-thirds of the design professionals questioned in the Causeway report said that an integrated design solution could help streamline their workflows. More than 80% agreed that adopting digital technology helped to optimise their resources. Added to this, 92% of respondents said that they could value engineer designs with the time saved from streamlined workflows, and be more responsive to their clients.

Client demand and competitiveness in the engineering consultancy sector is no doubt bringing about this change in attitudes. 'With clients wanting quicker response times and changes coming thick and fast, if you don't have decent software to pick this up and run with it, you will never keep up,' agrees Terry Stafford, senior partner at Stafford Infrastructure Engineering.

92%

CONSULTANCIES AGREE THAT STREAMLINING WORKFLOWS ALLOWS THEM TO BE MORE RESPONSIVE TO CLIENTS AND VALUE ENGINEER DESIGNS

A further major benefit from digitisation, particularly from a whole project perspective, is that clients increasingly expect all elements of a project to be designed using BIM compatible software.

This offers the potential to deliver benefits at all stages of a project from outline design, through construction to asset management.

The construction industry is changing fast and companies of all sizes need to embrace flexibility in their approach to work: there is no doubt that BIM-compliancy will give design SMEs a competitive edge on this front as well as maximising their access to more varied work and a broader range of projects.

Philip Hoare, CEO of SNC-Lavalin's Atkins business in the UK and Europe, another of the Causeway report's co-authors, describes managing change as 'the big killer' on all of his organisation's major projects. 'If you can manage change during the planning phase, rather than when it is on site,' he urges, 'the value that will bring to our customers in terms of time and on budget delivery is huge'.

Few will deny that change can be scary, but in the long-term, failing to embrace digital technology is scarier, particularly for the SME-dominated civil engineering design sector where being at the digital frontline promises so many benefits in terms of overall project consistency, quality and efficient execution.

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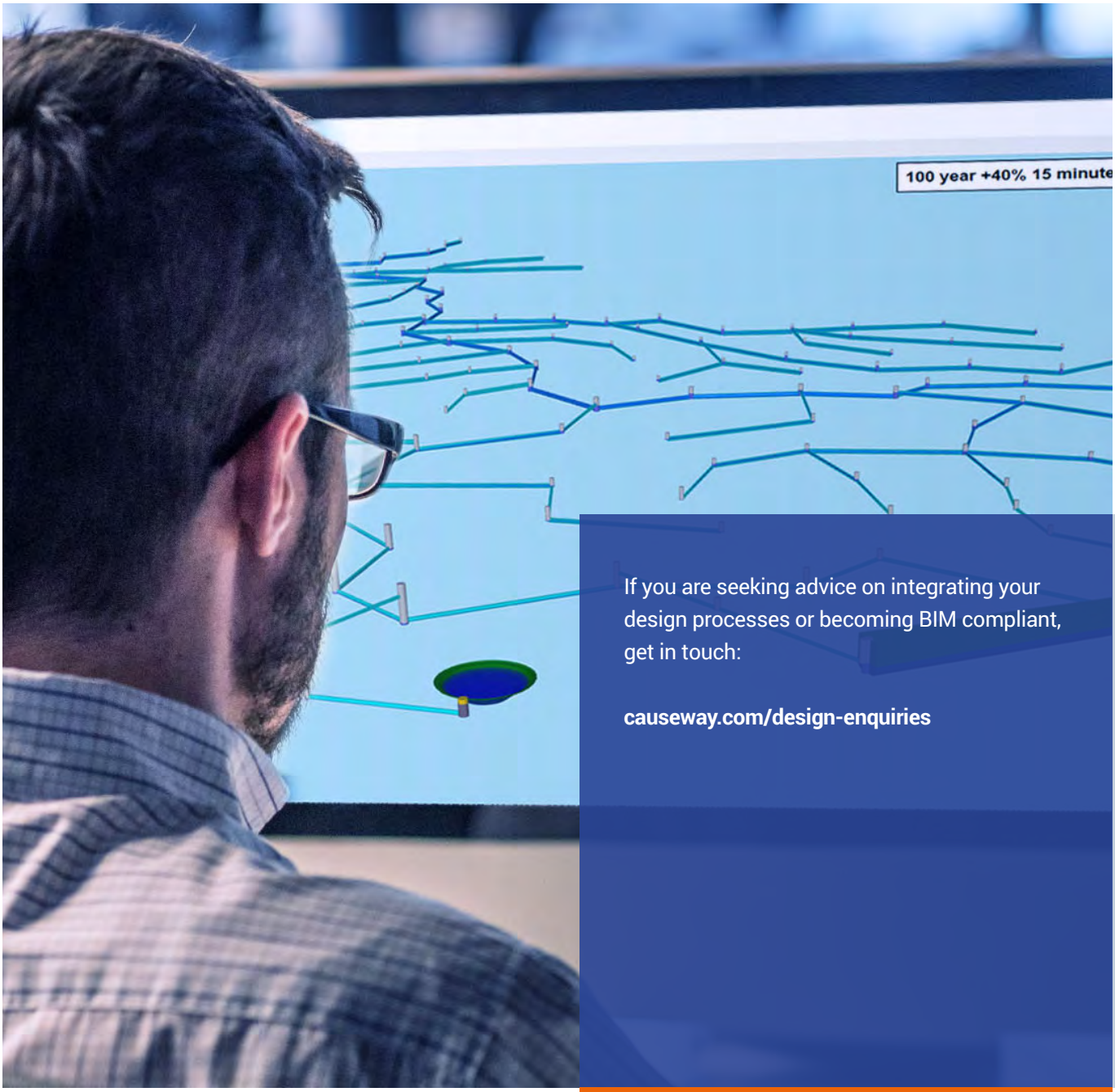
Phillip Hoare,
CEO, Atkins



If you are seeking advice on integrating your design processes or becoming BIM compliant, get in touch:

causeway.com/design-enquiries

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