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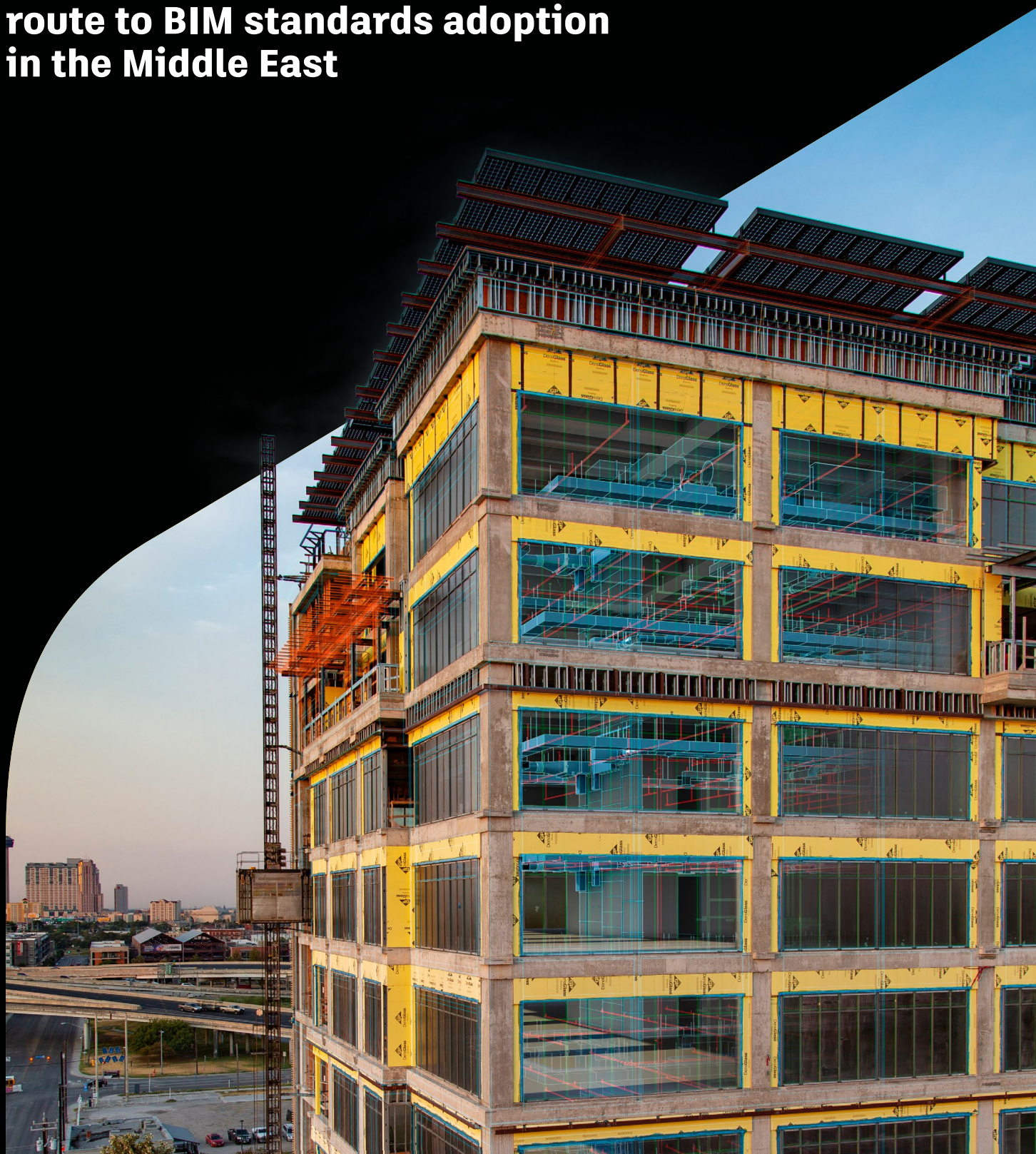
Navigating Standards Misconceptions

Unpacking ISO 19650 and the route to BIM standards adoption in the Middle East



The role of BIM mandates and standards in driving digital transformation

The technology used to design and construct projects has come far in recent years, with the architecture, engineering, construction and operations (AECO) industry now having digital tools that provide the ability to leverage an increasingly intricate level of detail.

Building information modelling (BIM) in particular has advanced, developing into a multi-disciplinary and holistic approach that is the foundation to the organisation of the entire digital footprint of an asset across its lifecycle, from the planning and design to construction and operations.

With more than $850bn worth of projects in the design or bidding phase in Saudi Arabia and the UAE, the scale and complexity of construction in the region is at an all-time high. This surge in development has already highlighted the urgency for greater efficiency across the industry, and BIM, if implemented correctly, can be one of the greatest project assets in this regard.

Industry players have repeatedly called for governments and project owners to mandate the use of BIM standards to ensure their adoption by all projects stakeholders, as well as to drive the development of more sophisticated tools from solution providers.

Still, even the most comprehensive BIM mandates and best tools will only see success in pockets if project teams do not have a shared language for managing the complexity of project data. Herein is the strong need for project teams to adopt strict adherence to common standards for organising and digitising shared building information.

This is precisely where the ISO 19650 standard plays a crucial role in delivering projects on time, within budget and with sustainable outcomes. Yet the industry's adoption can only go so far if misconceptions about the benefits and implementation of these standards persist within the AECO sector. Awareness is therefore crucial to bringing the wider industry on-board.

> *One of the key challenges is the lack of understanding at the senior project management level. Many senior leaders often associate BIM solely with 3D model coordination, overlooking its broader purpose as a structured process and a collaborative way of working. This misunderstanding impacts buy-in, as partners may view BIM as an optional technical tool rather than a strategic framework integral to project success."*
>
> **Derek Bourke,**
> Digital Construction & BIM Manager
> **Khansaheb**

Can the construction industry thrive without standardisation?

Standards in the construction industry define common specifications, methods and procedures, enabling collaboration and improving efficiency, transparency and risk management. They range from professional codes to international standards, such as those by ISO, which address project challenges and enhance workflows.

Standardisation can significantly reduce costs, particularly in large-scale projects, by providing a shared framework for diverse stakeholders, including architects, engineers, contractors, owners and management teams.

ISO 19650, for instance, establishes a common language to streamline communication, especially in complex, multi-disciplinary or international projects, where inconsistent terminology can create misunderstandings.

However, standards require widespread adoption to be effective, and this is why major clients – often government bodies – are rolling out mandates on the technology and standards that must be used on their projects. In fact, it was the UK Government's Construction Strategy that led to the creation of PAS 1192, and then ISO 19650.

In the GCC, while not all countries have mandates at the national level, more authorities have started mandating BIM. Dubai Municipality, for instance, mandated the use of BIM as early as 2013 for larger structures, and Abu Dhabi mandated BIM in 2019 for all major construction projects.

In Saudi Arabia, the National Building Information Modelling (NBIM) initiative was launched in 2021 to encourage BIM adoption across public projects. The Public Works Authority of Qatar then mandated the use of BIM on all public infrastructure and building projects in 2023 based on ISO 19650.

DID YOU KNOW?

The road to ISO 19650

To guide the application of BIM on industrial projects, the Switzerland-based International Organisation for Standardisation (ISO) developed the ISO 19650 international standard, building on industry best practices. Published in 2019, ISO 19650 was based on the British standard BS 1192 and PAS 1192-2, which had at the time already been shown to save up to 22% in construction costs.

BS 1192, introduced in 1990, outlined the Employer's Information Requirements (EIRs) and introduced provisions for 2D and 3D modelling, as well as BIM Execution Plans. PAS 1192-2, created in 2013, focused on information management during construction, forming a cornerstone of ISO 19650 for collaborative construction practices.

ISO 19650 makes project owners central to the selection and adoption of shared practices and ensures that projects are started with the end in mind. By implementing project mandates through an EIR, project owners can define the conventions and common rules, shaping the standards that will guide project planning, construction and delivery.

The benefits of adoption

To use BIM effectively, and to coordinate with other stakeholders, adherence to the same standards has many benefits.

Benefit 1: Operational impact

Operational costs (OpEx) account for about 80% of an asset's total lifecycle cost, making effective information management critical. Employer's Information Requirements (EIRs) and BIM Execution Plans (BEPs), aligned with standards like ISO 19650, play a key role in increasing the operational efficiency of the asset.

The EIR, a pre-tender document, outlines the information to be delivered and the standards to follow during a project. The BEP describes how the delivery team will implement BIM to meet these requirements. While the BEP is created early in the project lifecycle, it should be treated as a dynamic, evolving document that adapts as the project moves forward, rather than as a static one-time deliverable.

Together, the EIR and BEP ensure the operations team has the necessary data for efficient project handover, maintenance and eventual decommissioning, reducing delays and unforeseen costs.

Non-ISO-compliant projects often require expensive and time-consuming reality capture and validation of the asset information post handover. By contrast, compliance with standards enables optimal "as-built" results.

Benefit 2: Collaboration and transparency

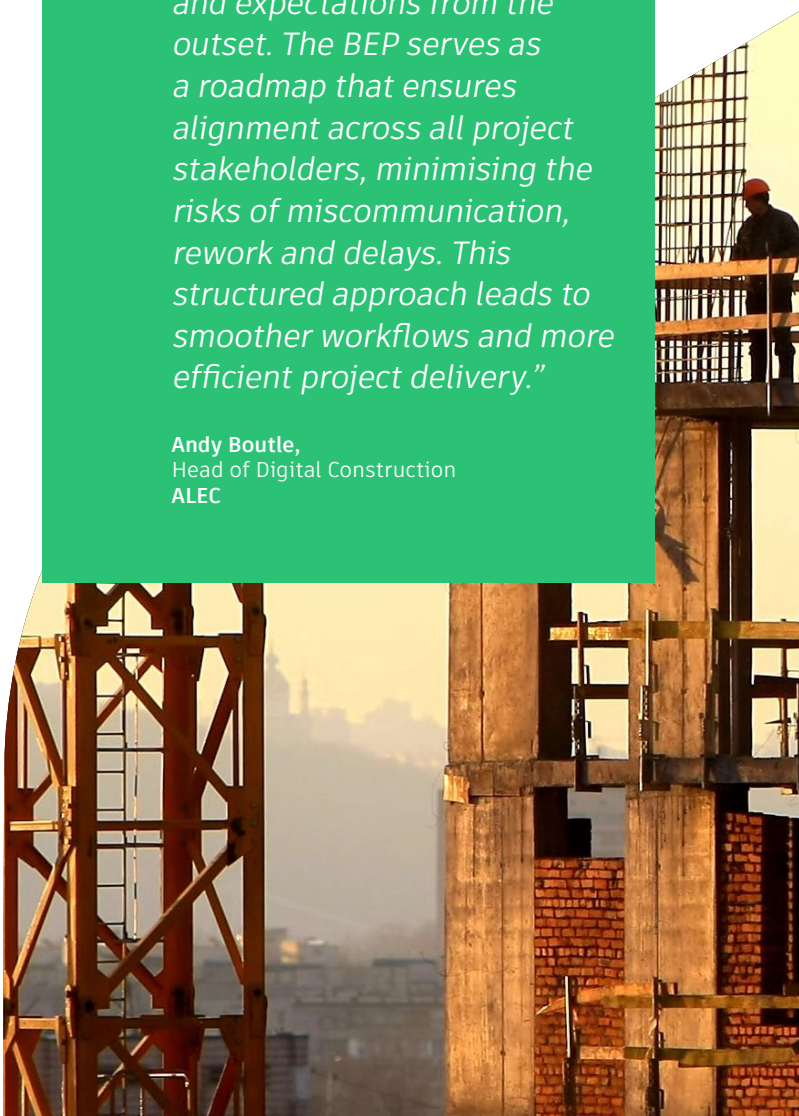
A Common Data Environment (CDE) serves as a shared, centralised platform for all project data, acting as a "single source of truth" accessible to stakeholders such as owners, contractors, architects, engineers and operations teams. Traditionally, organisations worked from their own plans and standards, leading to reduced interoperability and outdated information sharing. A CDE eliminates these issues by enabling real-time collaboration and ensuring data consistency.

Mandating a CDE, supported by practices like ISO 19650 naming conventions, enhances file compatibility, reduces conflicts and fosters informed decision-making. It also prevents misunderstandings, promoting collaboration by ensuring all parties have equal access to up-to-date data.

Benefit 3: Quality assurance and risk mitigation

Adhering to international standards ensures a consistent level of quality, building client trust and enhancing brand reputation. Standardised workflows help clients and contractors manage risks in large or complex projects by enabling early identification of potential issues. Clear information exchange fosters a proactive approach, minimising delays and cost overruns.

> *A BEP clearly defines processes, responsibilities and expectations from the outset. The BEP serves as a roadmap that ensures alignment across all project stakeholders, minimising the risks of miscommunication, rework and delays. This structured approach leads to smoother workflows and more efficient project delivery."*
>
> **Andy Boutle,**
> Head of Digital Construction
> **ALEC**



Dispelling common misconceptions

So why is the adoption of standards not universal? There are a number of reasons.

Initial cost and resourcing, cultural resistance, skill gaps and a lack of standardisation across regions and sectors all serve to throw up obstacles in the path of adoption. The perceived issue of initial cost can prove deterring for smaller firms working on projects, while cultural challenges are a common phenomenon when working with professionals accustomed to a certain way of working and reluctant to change or abandon established workflows.

Leadership buy-in, good communication, education, training and increasing understanding are all key to overcoming the barriers to BIM standardisation by helping all project partners understand and embrace the advantages that adherence to standards brings.

Below, we explore four common misconceptions that can lead to the AECO industry's hesistance to adopt BIM standards such as ISO 19650 on projects.

Misconception 1

BIM standards don't have a place on my small projects; they only make sense for larger projects

The truth: Approximately 80% of a facility's total lifecycle cost is realised during operations. This means that while larger projects can save tens of millions of dollars by adhering to BIM standards and a BIM Execution Plan (BEP), smaller projects can also realise significant efficiencies throughout the project lifecycle, from design and construction through to operations.

Standards establish industry-driven best practice and with proper implementation, these frameworks streamline workflows by standardising processes and reducing rework, conflicts and delays. Standards ensure that the needs of the project's operator have been assessed and recorded from the start of the project, that the data has been collected wholly and accurately, and that it is formatted in a way that is accessible to the operator. This is essential for all projects regardless of their value or level of complexity or sector.

Rather than being an overhead, the application of BIM in accordance with standards ensures that all teams collaborate efficiently with clear expectations, minimising the relatively high costs associated with miscommunication or design errors.

A smooth BIM standards-enabled handover from the design and build teams to facilities management also means a project can come online fast and start generating revenue sooner.

Without standards in place stipulating the format of the Employer's Information Requirements (EIRs) and BEP, asset operator

> *There is the belief that smaller projects do not benefit from these standards. In reality, the principles of BIM and ISO 19650 are scalable and can enhance efficiency even in small projects by ensuring consistency and better coordination across teams. Moreover, smaller entities who adopt these practices position themselves competitively to take on larger, more complex projects in the future."*
>
> **Mina Nessim,**
> Head of Engineering & BIM
> **Binladin Contracting Group**

> *BIM frameworks, as outlined in the ISO 19650 series, help address challenges like limited resources and tighter timelines. For smaller projects in volatile or rapidly changing environments, the structured data and streamlined coordination BIM provides can make the difference between success and failure."*
>
> **Kendall Wilson,**
> Senior Manager – Digital Twin
> **Modon Real Estate**

companies often have to re-survey projects if they do not have access to the right plans and specifications. This can be due to the plans not being generated or being inadequately produced during the build phase, or due to the asset operator team being unaware of where to find the data.

Beyond the lifecycle of individual projects, adherence to the latest BIM standards on any project, regardless of size, also helps firms organise their experience for their workforce better and design and construct future projects.

Misconception 2

I already have my own standards, therefore I do not need to adopt ISO 19650

The truth: While internal, local or existing standards provide benefits when working with any partner that shares them, inefficiencies can occur when onboarding new partners. If the new partners have to be trained on uncommon, project- or locale-specific standards, precious time can be lost. Although it also takes time to adopt international standards, these sunk costs can be more readily amortised through implementation on future projects with other partners due to their greater cross-compatibility across the AECO industry.

For companies that have already adopted the PAS 1192-2 standard, or BIM Level 2, this misconception can also take the form of not seeing the current impact from it or the benefits of going further and adopting the ISO 19650 standard. However, the use of an increasingly outdated standard shares the same issues with using internal or local-only standards.

By contrast, when companies adopt the latest international standards, this enables them to work seamlessly with any other company anywhere in the world that operates within the same framework.

The common language and frameworks provided by project standards enhances cooperation, communication and coordination between team members within organisations and between partner organisations on a project. The resulting reduction of errors early in the project's lifecycle clearly saves time and money over the design and construction process, and even into the operations and decommissioning phases. Adherence to standards also leads to higher quality throughout.

Workforces can often adopt standards on a project and apply them to future projects with minimal additional training. Adopting BIM and ISO 19650 also fosters continuous improvement, future-proofing businesses for evolving industry demands and ensuring alignment with global standards.

> *Internal standards might seem sufficient for isolated use, but they lack the interoperability needed in today's complex, interconnected environments. Frameworks like the ISO 19650 series offer the adaptability and scalability required to navigate cross-organisational collaboration. These standards also mitigate ambiguity by providing clear guidelines, which is particularly important in uncertain or dynamic ecosystems."*
>
> **Kendall Wilson,**
> Senior Manager – Digital Twin
> **Modon Real Estate**

Misconception 3

My supply chain is immature and not capable of transitioning to ISO 19650, therefore I cannot change

The truth: While BIM standards are widely adopted, adoption is typically inconsistent across the contracting supply chain, leading to the perception that the ecosystem is not ready for a wider rollout. Cultural resistance across the wider ecosystem can also contribute to the perception that the process of implementing BIM standards more widely throughout the supply chain may be too complex or logistically problematic to be worth carrying out.

Project owners may also be concerned that by insisting on the implementation of a given BIM standard that they could reduce their options for potential partners within the contracting supply chain.

Yet this misses what is perhaps the preeminent purpose of standards, which is to ensure that every participant in the contracting supply chain has the access they need to accurate and up-to-date project information. Conformity to BIM standardisation ensures that the entire supply chain is providing the right services and materials and is appraised of any changes to quantities or specifications as soon as they are made. The outcome of this is less wasted time and materials, better business practices and more sustainable projects.

At the same time, any company process change – especially one involving the adoption of new technology – requires education and training. Enablement should be a collaborative effort between the project stakeholders and led by the owner to ensure the supply chain is skilled to deliver the right information requirement.

Inclusion in training programmes can also help subcontractors feel more comfortable and invested in what may feel at first like a challenging new way of working. While the costs of educating and training supply chain partners might be borne by other parties in a project, the savings, efficiencies and growing maturity of the ecosystem will ultimately be felt across the board.

> *By integrating smaller contractors into our workflows, offering structured training and setting clear expectations through detailed BEPs, we help raise the level of competence within the supply chain, ensuring better alignment with BIM standards over time."*
>
> **Mina Nessim,**
> Head of Engineering & BIM
> **Binladin Contracting Group**

Misconception 4

There is no point in training my staff on ISO 19650. They are going to leave me if I improve their capabilities

The truth: It's true that it takes time and money to train to proficiency in BIM standards, such as ISO 19650, including the opportunity cost of having employees in a classroom when they could be on-site. However, companies that hold the myopic view of staff attrition when trained, without considering the upside of the training programme on factors such as employee satisfaction and engagement, stand to lose more than just business.

Choosing to invest in a BIM standards upskilling programme will lead to a better trained, loyal workforce that will enhance the company's reputation in the eyes of new talent. In fact, according to a SHRM report, more than 80% of HR managers surveyed said training was beneficial for employee attraction and retention. Another bonus is the more employees are trained in both BIM and the standards associated with it, the greater the employee buy-in to the standards.

On the business side, knowing that a company is willing to train and invest in its workforce also undeniably positions it at the forefront of the market for new and existing clients who are looking to work with competent stakeholders trained in ISO 19650 best practice.

In a fast-evolving and competitive construction market, learning and development programmes to upskill to the latest standards – if considered a company priority – are just as crucial for staff retention as they are for the business.

> *Training a transient workforce provides significant value and is essential for maintaining consistent project quality and long-term success. Even though workers may not stay with the organisation indefinitely, equipping them with the necessary skills ensures that they can contribute effectively during their time on the project. Well-trained personnel reduce the risk of errors, improve collaboration and ensure smoother project delivery, regardless of workforce turnover."*
>
> **Mina Nessim,**
> Head of Engineering & BIM
> **Binladin Contracting Group**

> *Short-term workers often contribute to critical project phases. Their understanding of ISO 19650 ensures alignment with standards and minimises disruptions."*
>
> **Tala Damra,**
> Managing Director
> **IVY**

Acting together: ISO 19650 adoption

The progression of standards over the last decade from BS to PAS to ISO 19650 should already demonstrate the validation of ISO 19650 through extensive testing by industry leaders.

Companies that have integrated BIM standards have reported significant returns on investment through reduced errors, minimised project delays and improved alignment with client expectations. Non-compliant project management, by contrast, can result in both costly re-surveys and challenges in terms of data management, interoperability and the efficient maintenance of the building lifecycle.

As the framework has become an essential approach to managing complex data and ensuring streamlined project delivery, organisations that have already adopted ISO 19650 will also find themselves at a competitive advantage in both local and cross-border markets.

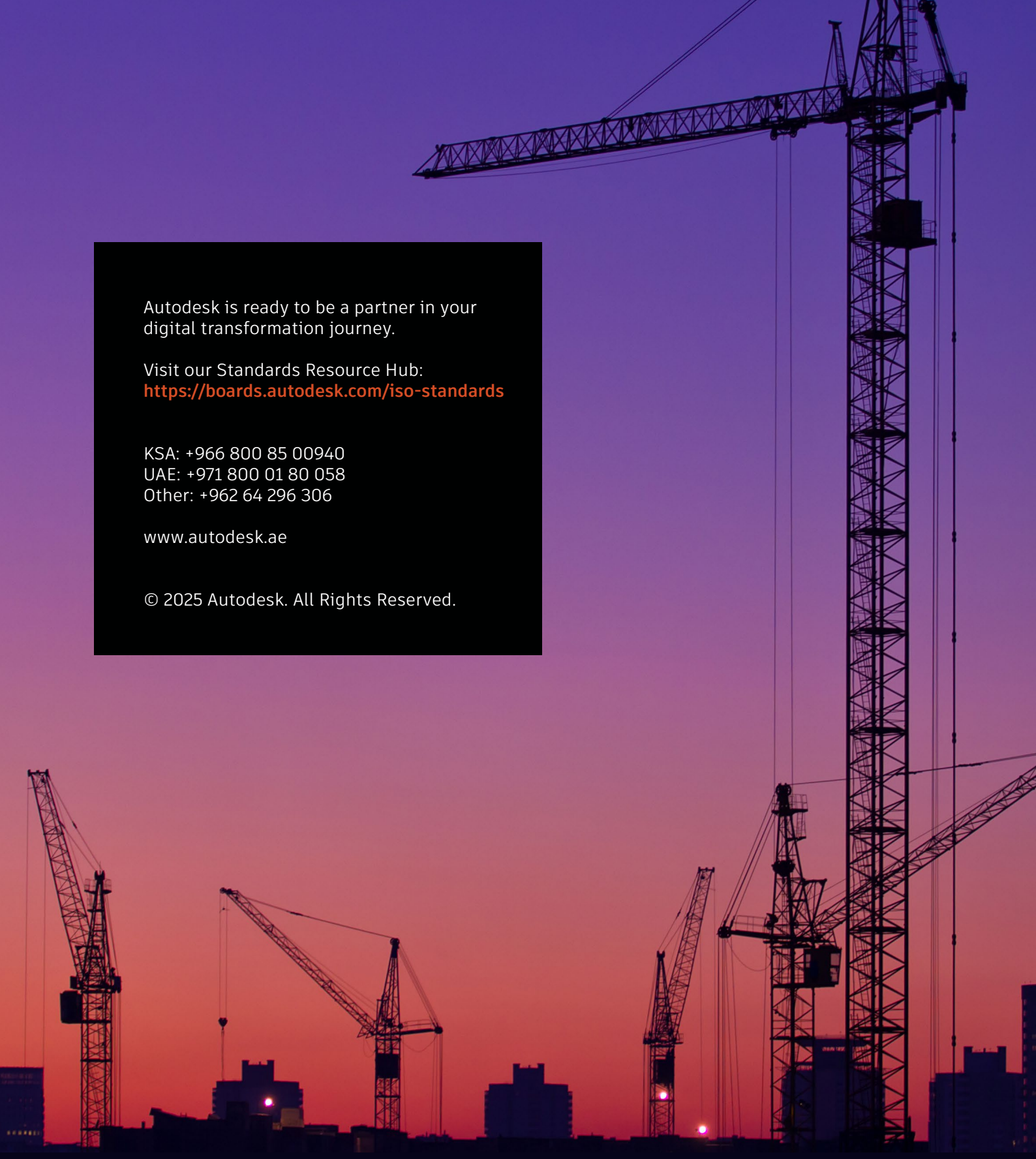
Simply put, in the face of an evolving AECO industry, adoption of ISO 19650 is not merely a trend but a long-term strategy for shared collaboration, resilience and innovation. By investing in standards, organisations will position themselves as not only collaborative, forward-thinking partners, but they will also be well-prepared to meet the complex demands of modern construction.

Supporting your ISO 19650 journey

Autodesk is dedicated to facilitating your adoption of ISO 19650 by offering comprehensive guidance documents and templates for owners, consultants and contractors, and through Autodesk's own design and collaboration platform that supports compliance of ISO 19650.

Visit Autodesk's Standards Resource Hub for materials on how to meet ISO 19650 standards, including our:

- **Asset Information Requirement (AIR) template**
- **Employer's Information Requirement (EIR) template**
- **BIM Execution Plan (BEP) template**
- **BIM Implementation Guide and more**



Autodesk is ready to be a partner in your digital transformation journey.

Visit our Standards Resource Hub:
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