



# **Making the Case for Industrialized Prefabrication in the AEC Industry**





# Contents

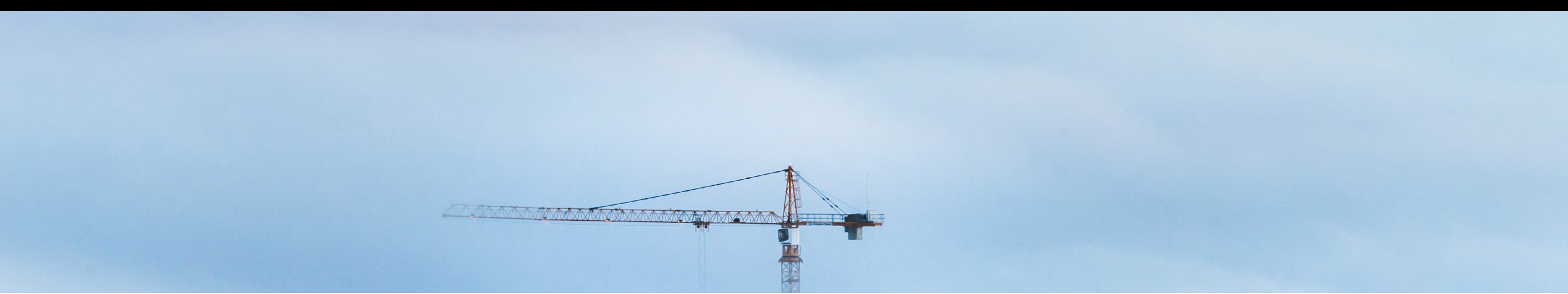
Making the Case for Industrialized Prefabrication in the AEC Industry	3
What is Industrialized Prefabrication?	4
The Benefits of Prefabrication	5
The Future of Prefabrication	6
Getting Started with Prefabrication	9
Conclusion	10

## Making the Case for Industrialized Prefabrication in the AEC Industry

In our modern world, technology has changed the way we complete most tasks, and construction projects are no exception. The AEC industry faces a number of challenges including delays, cost overruns, waste, a labor shortage, and quality control issues. These problems not only hinder progress but also undermine the industry’s sustainability efforts. In recent years, there has been a growing consensus that a fundamental shift in construction practices is necessary to address these issues effectively. One of the most promising solutions that has gained considerable traction is prefabrication.

This white paper will take a deep dive into prefabrication, including its benefits, implications for the future, and how businesses can incorporate prefabrication into their operations.





# What is Industrialized Prefabrication?

Industrialized prefabrication is a construction method that involves manufacturing building components or modules in a controlled factory setting and then assembling them on-site. These pre-made components, such as walls, floors, and even entire building modules, are produced with a high degree of precision and quality control.

The concept of prefabrication is not new and can be traced back to ancient civilizations. However, industrialized prefabrication as we know it today gained prominence with the rise of mass production techniques and modern materials. Advanced materials, computer-aided design (CAD), Building Information Modeling (BIM), and automation have revolutionized the manufacturing of building components. This integration of technology allows for greater precision and efficiency in the manufacturing process.

The key characteristics of industrialized prefabrication include:

**Factory Production:** Components are manufactured in a factory, ensuring consistent quality and minimizing the impact of outside forces such as adverse weather conditions.

**Precise Design:** Industrialized prefabrication often involves advanced digital modeling and design, enabling a high level of precision.

**Transport Efficiency:** Prefabricated components are transported to the construction site, reducing the need for on-site material storage and waste.

**Quick Assembly:** On-site assembly of pre-made components is faster than traditional construction methods, significantly reducing construction time.

# The Benefits of Prefabrication

Top benefits of prefabrication include:

## Building Faster

One of the most significant advantages of industrialized prefabrication is the speed of construction. By manufacturing components in parallel with site [preparation, project timelines can be reduced by 20 to 50 percent](#). With components manufactured off-site and ready for assembly, projects are completed in a fraction of the time compared to traditional construction methods, reducing labor costs in addition to saving time.

## Reducing Waste

With precise measurements and assembly in a controlled environment, excess materials and on-site construction waste are significantly reduced. This not only benefits the environment but also minimizes disposal costs.

## Lowering Risk

Traditional on-site construction is susceptible to various risks, such as labor shortages, accidents, and weather-related delays. Industrialized prefabrication

mitigates these risks and reduces the likelihood of errors, as most work is done in a controlled factory setting which limits on-site activities and exposure to external factors.

## Improved Quality Control

Prefabrication allows for consistency and rigorous quality control measures during the manufacturing process. This results in higher-quality components that meet or exceed industry standards, ultimately improving the quality and thus longevity of structures.

## Flexibility for Repurposing

Considering that 40-60% of buildings change their original use during their lifecycles, the adaptability of buildings is crucial. Prefabricated components are often designed to be easily disassembled and reconfigured, enabling the repurposing of structures as needs change. Being able to repurpose a building has a major impact when it comes to improving sustainability and increasing cost savings.



## The Future of Prefabrication

The AEC industry accounts for about 40% of global CO2 emissions, so sustainability has been a hot topic in recent years as environmental concerns have grown. All the benefits prefabrication deliver make it not only a more efficient building option, but a more sustainable one too, highlighting its ability to reduce waste, minimize energy usage, and optimize resource utilization. We will see firms increasingly turn to prefabrication as they employ modern tools to construct buildings of the future.

The future of prefabrication is deeply intertwined with technological advancements. Innovations in the 3D printing of building components, BIM, smart materials, and robotics and automation can further enhance the efficiency, cost-effectiveness, and sustainability of prefabrication.

Prefabrication has also played an important role in responding to global crises. It has enabled teams to quickly create affordable housing for refugees and construct healthcare facilities during the pandemic. Its versatility can help fill the immediate building needs of communities while structures can later be repurposed and converted into different types of structures adapting to evolving community needs. The future of prefabrication holds significant opportunities for businesses to diversify their offerings and capture emerging markets.

Key developments in the future of prefabrication include:

**Sustainability:** Continued efforts will focus on reducing the carbon footprint of the AEC industry and increasing the use of sustainable materials in prefabrication.

**Digitalization:** Advancements in BIM, automation, 3D printing, and emerging technologies will have a big impact on delivering more efficient and precise prefabrication.

**Customization:** The flexibility of prefabricated components allows for customizable designs that can later be repurposed to align with changing needs.

**Global Expansion:** Prefabrication will become more common globally, addressing the housing and community needs of growing populations.







## Getting Started with Prefabrication

From faster project completion to cost efficiency to quality assurance, sustainability and more, embracing industrialized prefabrication can significantly benefit your business. As you think about implementing prefabrication, here are some considerations for the different phases of the process:

### Planning

Before embarking on a prefabrication project, construction businesses must clearly outline their goals, resources, and constraints. This includes an assessment of project size, the required level of customization, the availability of skilled labor, and the financial considerations involved in transitioning from traditional building methods to a prefabrication model.

### Preconstruction

Collaboration between architects, engineers, manufacturers, and other stakeholders is crucial during the preconstruction phase. Together teams can work on creating a detailed assembly plan and select the right materials for the project. Building information modeling (BIM) plays a pivotal role in ensuring the seamless integration of prefabricated components with the overall design.

### Manufacturing Phase

The manufacturing phase occurs in a controlled environment, usually a factory or other dedicated facility. Close attention to quality control, safety measures, and logistical planning is essential. Project managers must coordinate closely with suppliers and ensure that manufacturing schedules align with the on-site construction timeline.

### On-site Installation

The final phase involves transporting and assembling prefabricated components on-site. Careful planning and coordination are vital to ensure efficient and safe installation. Project managers should also oversee inspections, quality control checks, and final touch-ups to ensure that the project meets quality standards.

To successfully implement prefabrication in your business, consult with experts who have extensive experience in this construction method. They can guide you through the process, from design and planning to the selection of the right materials and components to streamlined manufacturing and efficient installation.



# Conclusion

Industrialized prefabrication will play an instrumental role in addressing long-standing challenges and in shaping the future of the AEC industry. With its ability to help firms build faster, reduce waste, lower risk, improve quality control, and offer flexibility for repurposing buildings, prefabrication is a game-changer for the sector. By leveraging the advantages of prefabrication, you can deliver better results for your clients and your business. Embracing this shift in the way we build is not just about staying competitive, it's about creating a more sustainable and efficient future for the industry.

\*This white paper is based on material developed by RIB Software, a strategic partner of SoftwareOne and developer of RIB 4.0.

## CONTACT US TODAY

Find out more at

**www.SoftwareOne.com** [change to  
www.softwareone.com/precast](https://www.softwareone.com/precast)

SoftwareOne AG | Headquarters [SoftwareOne, Inc.](#)

T. +41 44 832 41 69 [+1 800 444 9890](tel:+18004449890)

E. [info@SoftwareOne.com](mailto:info@SoftwareOne.com) [change to mtwo.noram@softwareone.com](mailto:change to mtwo.noram@softwareone.com)

Copyright © 2023 by SoftwareOne AG, Riedenmatt 4, CH-6370 Stans. All rights reserved.  
SoftwareOne is a registered trademark of SoftwareOne AG. All other trademarks are the property of their respective owners. SoftwareOne shall not be liable for any error in this document. Liability for damages directly and indirectly associated with the supply or use of this document is excluded as far as legally permissible. © Imagery by: Adobe Stock and Getty Images.

