MiTek®

Adopting Innovative Methods in Construction:

The Case for Off-Site Building with Design-Make-Build™

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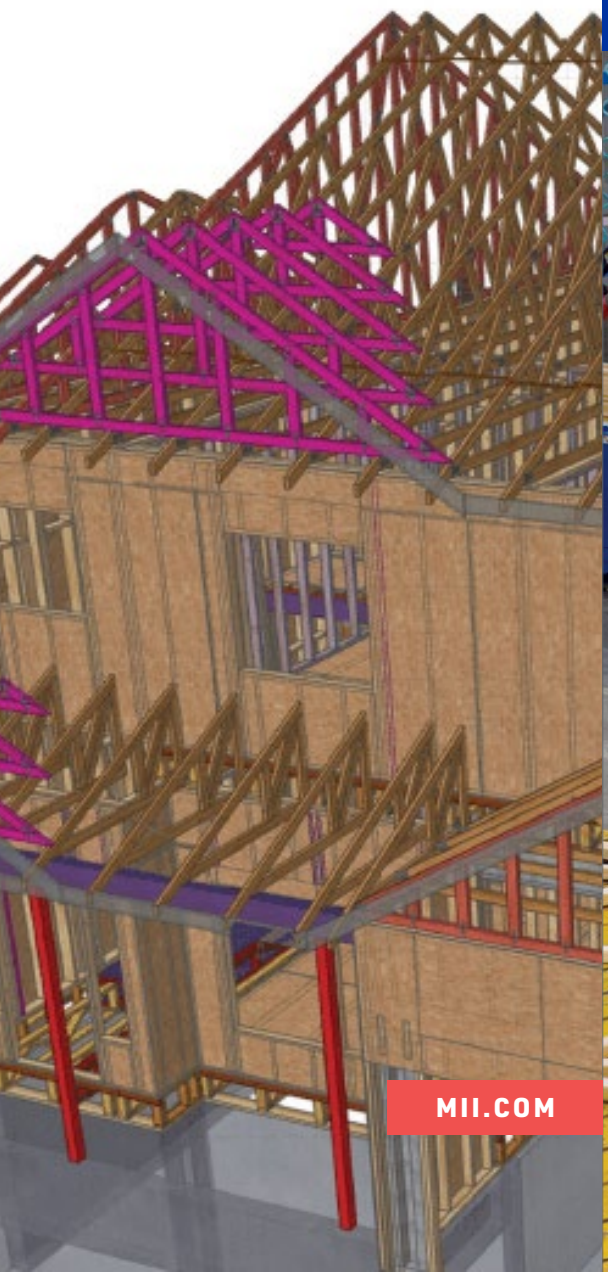

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Adopting Innovative Methods in Construction: The Case for Off-Site Building with Design-Make-Build™

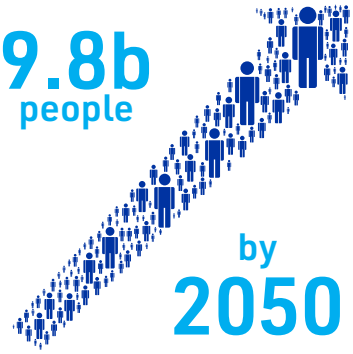
The world population is expected to reach 9.8 billion in 2050. We must build the equivalent of New York City every month to meet global building demand for the next 40 years. How we build has stayed the same for nearly 200 years, and shortages of skilled labor and increasing material costs have made it unsustainable.

With a rapidly growing global population and an increasing need for sustainable and efficient construction, it is crucial to adopt new methods that can support these demands.

GROWING CHALLENGES

The world's population is expected to reach 9.8 billion by 2050[1]. To support global building demand, the equivalent of New York City must be built every month for the next 40 years[2].

However, the way the construction industry builds hasn't changed in nearly 200 years[3], and the current methods are unsustainable.



INCREASED WASTE

The construction industry creates an estimated one-third of the world's waste[4], with building materials accounting for 50 percent of the solid waste.

"Construction waste has increased 342 percent over the past 30 years[5]," said Sheeba Ramaji, Director of Innovation Research at MiTek. "If we don't change, we will destroy Earth."

LABOR SHORTAGE

The shortage of skilled labor is a serious global concern, with nearly one-third of home builders in the US and UK struggling to find labor for framing and mechanical, electrical, and plumbing installation[6]. And 70 percent of 956 contractors surveyed agree there is an insufficient supply of workers or subcontractors[7].

"Additionally, the current design process creates delays, higher costs, and unpredictability," Ramaji said. "Today, the risk-averse construction industry lacks the collaboration, trust, and transparency required to make significant change and adopt off-site construction."

1 Source: United Nations Statistics
2 Source: Architecture 2030 - New Construction
3 Source: Lets Build - Construction Automation
4 Source: BBC Future Planet Sustainability
5 Source: Big Rentz - Waste Statistics
6 Source: MiTek Innovation Research Team
7 Source: AGC Construction Outlook National Survey 2023

SHEEBA RAMAJI
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MiTek®

BUT THERE IS A BETTER WAY.

MiTek's Design-Make-Build™ methodology increases the viability of off-site construction, unlocking builds faster with higher quality, less waste, and fewer resources.

Ramaji says off-site construction provides a faster and more efficient solution, with the potential to frame 1.5 more houses in 15 days and reduce nearly 35 days of on-site construction[8]. Off-site construction improves sustainability by utilizing less on-site material, labor, and energy.

"Instead of stick framing, we should design to build with off-site components. We could build componentized roofs, walls, and floors that install in half the time," Ramaji said.

FRAME **1.5 MORE** HOUSES IN 15 DAYS

REDUCE NEARLY **35 DAYS OF** ON-SITE CONSTRUCTION

COLLABORATION IS KEY

Collaborative design is critical to the success of off-site construction, as it addresses the manufacturing process earlier in the Design phase while optimizing the design for components to leverage the full benefits of off-site.

"Traditionally, the Design partners design in a vacuum," said Ben Tabolt, Principal of BIM and Design Services at MiTek. "Design then sends the plans to Make and says, 'Make it work.' Issues arise because the Design phase lacks collaboration and benefits understood."

Tabolt says the Make and Build phases must inform Design to truly optimize understanding and opportunity.

3D DESIGN FOR COMPONENTS

Harnessing the power of 3D design has revolutionized the way construction projects are designed and executed. The ability to work with a digital model, rather than disconnected drawings, allows for a more collaborative process, and it eliminates the need to manually update every location of a Design change.

"As we get into more 3D, and especially in BIM, we are building virtually in the computer to realize opportunities, identify discrepancies, and, hopefully, do that in the design phase so it doesn't run into the change orders in the field," Tabolt said.

SUMMARY

Componentization leads to higher quality, increased speed, less waste, and fewer resources. Off-site construction through Design-Make-Build solves many industry challenges by offering a more efficient and sustainable approach. Utilizing 3D design and collaborating with the component manufacturer partner earlier in the process achieve the full benefits of off-site building.

8 Source: **Entekra**