



Building for the Future: The Advantages of Designing for Components

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2021 and 2022 brought massive delays in materials and manufacturing, causing increased costs and ongoing supply chain issues that the building industry still faces today. Finding solutions to adapt to a changing market is more critical than ever.

CURRENT SITUATION

Marc James, Area Vice President for MiTek, recognizes several challenges U.S. builders face today, including the high cost of goods, lack of key materials, and high-interest rates. These challenges make it difficult for first-time homebuyers to enter the market. Additionally, the needs of homeowners have shifted in recent years.

"An open concept has always been popular, but there's a lot of people working from home," James said. "So there's an emphasis on home offices and a separation of space versus a combination of space that was more prevalent a few years ago."

Additionally, the increasing complexity of buildings due to regulatory requirements, such as sustainability and carbon footprint, is adding to the complexity of the construction process.

DESIGN-MAKE-BUILD™

MiTek's Design-Make-Build is the collaborative process of designing for components to be manufactured off-site and then delivered on-site for installation. By bringing all value-chain partners together early in the process and designing the structure using off-site components, builders can overcome challenges and maximize benefits like reducing the overall build schedule, waste, and costs.



MARC JAMES

Area Vice President
at MiTek



STEVE MCFALL

Principal of New
Plan Engineering

OFF-SITE COMPONENTS



FLOOR TRUSSES



WALL PANELS



ROOF TRUSSES



GARAGE DOOR
HEADERS



FASTER BUILDS*



LOWER COSTS



LESS WASTE

**SBCA, 2015, Framing
the American Dream,
Stick-framed vs.
Component-framed
House Comparison*

THE MARKET OPPORTUNITY

Examples of off-site components in homebuilding include roof trusses, wall panels, floor trusses, and garage door headers. These components offer many advantages, such as longer spans, better supply chain control, the ability to build to specification, and more.

To maximize success on the construction site, proper documentation is crucial. The documentation should include information about the type of component to be used and should help those executing the design plan to build it successfully.

Designing and planning for components at the Design phase ensures an understanding of the job site from the start. “The collaborative design and planning process avoids a massive change in the field or on the fly,” James said.



Staged floor trusses and wall panels for efficient on-site building.

BUILDING SPECIFICATIONS + COLLABORATIVE DESIGN

“An integrated systems approach to Design is essential for enabling the industry to advance and leverage the full value off-site components provide,” said Principal of New Plan Engineering, Steve McFall. “Structural and MEP systems have an extensive amount of overlap during the Build phase and efficiencies can be gained by using off-site components that have been thoughtfully designed to make installation simpler.

Specifying the system or off-site component type upfront through a collaborative design and building specifications process ensures the most efficient downstream solution on-site. Prioritizing the cost, schedule, and performance goals during the initial product development stage is essential. Also, considering the job site, materials required, and topography can help make the construction process more successful. Collaborating with the component manufacturer and lumber supplier can help builders take full advantage of the Design-Make-Build process and off-site construction.



SUMMARY

Optimized building starts with a collaborative design process leveraging advanced components, like floors, roofs, and wall systems. Using the building requirements to determine the most efficient off-site construction approach empowers designers to embed off-site methods and solutions into the design phase, helping builders reduce the overall schedule, waste, and costs.