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Modular Design & Construction:

A Real-World Solution to the Nation's Housing Shortage

By R.C. Alley, partner at AO

In some parts of the country, particularly California, the COVID-19 pandemic has heightened an already severe housing crisis, accelerating the need to develop more multifamily projects, especially affordable housing and housing for the homeless. Unfortunately, the pandemic has also complicated an already arduous construction process, from slowing down the processing of land use and planning applications to bringing forth new safety protocols and guidelines on construction sites. While not a panacea for all multifamily projects, modular design and construction can help alleviate housing shortages and deliver efficiencies that address some of the biggest challenges facing the multifamily sector today.

Benefits of Modular for Multifamily

The key benefits of modular construction for multifamily projects include efficiency, reduced risk and speed to market, all of which can amount to considerable time and cost savings. Transit-oriented and market-rate developments — particularly affordable and high-density multifamily developments — are well-suited for modular construction, given that modular efficiencies stem from the replication of identical units (called modules) that are built off-site in a controlled, indoor factory. They are then shipped and assembled on the construction site.

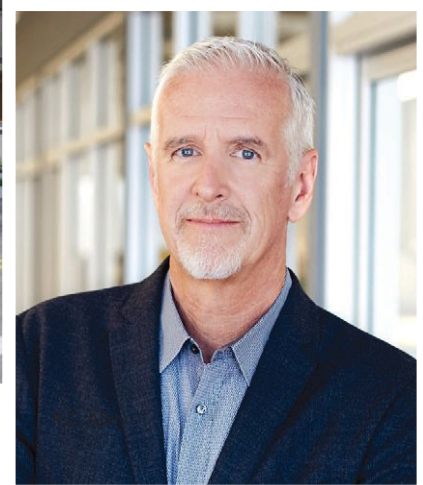
Further, modular has become an increasingly more affordable delivery method; costs continue to skyrocket for conventional construction, which is burdened by the added cost of providing personal protective equipment and additional workplace safety measures due to COVID-19. In this respect, the modular process has been affected to a much less significant degree.

Modular multifamily developers are attracted to the predict-

ability of the modular construction process that is afforded by a more controlled, factory-built environment. With 65% of modular construction completed in factories, risk is reduced in many areas that can be unpredictable with onsite construction, such as weather and workforce disruption. A rise in automation and robotics within modular factories has further enhanced quality control and worker safety. Regarding COVID-19, the factory model provides a more efficient means to implement social distancing measures via assigned workstations and the ability to regulate the movement of materials around workers. Ultimately, the controlled factory environment helps to alleviate construction delays, shorten construction timelines and contribute to worker safety, all of which reduce the risks associated with development.

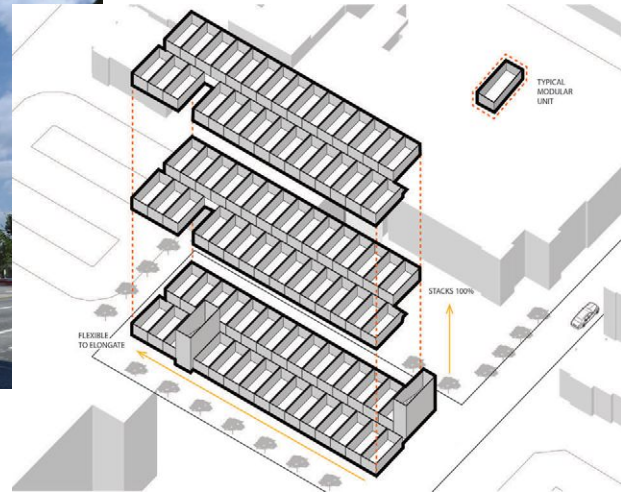
Another key benefit of modular construction is speed to market. While traditional construction is a very linear process, modular allows for various building components to be constructed in parallel. Assisted by automation, modular multifamily projects can be constructed in about half the time of traditional developments.

Another area in which modular is being explored is housing for homeless people. AO, in partnership with Horizon North, is developing a case study for an affordable, temporary modular solution that provides an option between temporary tent-like structures and traditionally built housing. The solution, known as T-Mod, combines the benefits of being a temporary, affordable housing solution that is relatively quick to construct and install, while providing an elevated quality of life for residents and the greater community. This building solution has been successfully implemented for homeless housing in Canada and is a promising option in California, which is home to more than half of the nation's unsheltered homeless population.





Photographs courtesy of AO



Key Factors for Modular Success

Two factors are critical to realizing the full potential of modular construction for multifamily projects: selecting the right team and collaborating at the onset. Not all projects lend themselves to modular construction. Therefore, it is crucial to select the right architect and consultant team who bring the knowledge and discipline to properly assess the project goals, site and other important factors (such as transportation, logistics and time management) to ultimately determine whether it's a good fit for modular construction.

Additionally, the decision to use modular design and construction methods should preferably be made at the onset of the project, as it is much easier to design a project knowing it will be modular than to revise a conventional build to meet the constraints of modular design. Because the timeline is compressed, many decisions that are usually made later in the timeline of traditional construction sites (for example, interior finishes) must be made in the very early stages of planning. The units/interior of the project are being built in the factory at the same time that the building's utilities and foundation are being constructed at the site.

It is important for developers to have a team that will perform the necessary due diligence, advise the developer and guide the process. Navigating modular construction requires a thorough understanding of the product from design through manufacturing and installation. Decisions must be made quickly to allow the process to flow smoothly. This means that the architect and consultant team must think multiple steps ahead, understand the complex schedule, analyze the constraints and possess the technical knowledge to work within the modular protocols in order to successfully guide the process.

Because modular design requires doing much of the planning work and decision-making upfront, the developer, architect and modular manufacturer must work together to understand the project goals, manage expectations, facilitate the decision-making

process, expedite the approvals and permitting process and ensure that the project's technical requirements are met.

A great example of this working process is the partnership between AMG & Associate/The Pacific Companies (developer), AO (architect), Autovol and Prefab Logic Solutions (modular manufacturer). This team has partnered to develop, design and build over a dozen affordable multifamily modular projects throughout California. Based in Nampa, Idaho, Autovol recently opened its state-of-the-art 3D volumetric automated factory and began fabricating the modular units for Virginia Studio in San Jose, California, the first project off the assembly line for the new facility. The AO team collaborated closely with Autovol and Prefab Logic Solutions to develop prototype 3D modular units that could be built efficiently in an automated facility. We believe that the AMG/TPC, AO, Autovol, Prefab Logic Solutions partnership has created a winning formula for modular best practices and as a result, each subsequent project will maximize the potential of multifamily modular construction.

While no longer in its infancy, modular design and construction is still considered an alternative delivery method in the multifamily sector. The current pandemic has exacerbated existing challenges specific to multifamily construction that modular helps address. However, not all projects lend themselves to modular design and construction, and assembling the right team of experts who can collaborate at the onset is key to unlocking the benefits of modular construction.

R.C. Alley is a partner at AO, a California-based architectural services firm with 13 distinct design studios serving the entire commercial real estate spectrum, including multifamily, modular and transit-oriented developments (TODs). For more than 30 years, he has specialized in multifamily and mixed-use architecture, and he is currently overseeing a diverse range of over 20 market-rate, affordable, senior and transit-oriented modular developments. He can be reached at rca@aoarchitects.com Learn more at AO Modular at aoarchitects.com.