Introduction to Prefabrication

For Electrical, Mechanical and Datacom Applications

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THE COMMERCIAL CONSTRUCTION MARKET IS VERY COMPETITIVE. BUSINESSES AND WORKERS NEED TO FIND NEW POINTS OF DIFFERENTIATION.

CURRENT TRENDS

The construction market is incredibly competitive. Skilled installers and inexpensive materials are constantly raising customer expectations and lowering project bids. With so much pressure, contractors need to find new ways to differentiate and win.

Additionally, as the market becomes more saturated, the prices for construction services are also reduced. As contractors compete, they attempt to out-bid each other for projects by lowering prices. This cuts down on the contractor's profit margin and reduces the amount of money remaining at the end of the project, leaving companies vulnerable to unforseen circumstances during the job. Contractors need to find new ways to grow profit margins while maintaining a high standard for safety and quality.

In order to survive and thrive in the current market, it is crucial that contractors learn and employ new methods designed to maximize efficiency on the job site.

WHAT IS PREFABRICATION?

The term "prefabrication" can take on many meanings in construction. In general, it refers to parts arriving at a job site preassembled. Historically, complex assemblies were built at the location where they were installed. This demanded that installers had constant access to the job site to progress a project.

With prefabrication, assembly work is completed in a "prefab" shop completely devoted to the production and storage of components. Moving these tasks off-site allows contractors to mass produce assemblies used across similar projects, allowing on-site installers to focus exclusively on mounting the finished product. In some cases, the primary assembly can be completed on-site, either on the floor of the job site or an alternative location. The use of a prefabrication shop typically yields the most advantages, but each situation has unique benefits to the installer.

The process yields countless benefits, but requires a completely new approach to the entire process of purchasing, creating, and installing assemblies. Similarly, the hardware used during the mounting of the finished piece can be very different from the hardware that contractors are accustomed to. Unlike the traditional hardware that is mostly standard across brands, companies are now emerging with new and unique ways to allow contractors to prefabricate.

Despite a few perceived drawbacks, contractors are starting to recognize that prefabricating pieces allows for better time management, safer installation, and cost savings throughout a a project, regardless of its size.

Time-related Benefits of Prefabrication

TIME SAVINGS IS THE MOST COMMON BENEFIT OF PREFABRICATION. MOVING A MAJORITY OF ASSEMBLY OFF-SITE GIVES CONTRACTORS:

MORE LEAD TIME

Contractors can prepare for projects sooner and spend less time on the job site. Installers also do not need to wait for access to the site to begin working because they can prepare the necessary pieces in advance at the prefab shop. Once the site opens, they can quickly install the assemblies produced months earlier.

LESS DOWNTIME

Workers can be more effective because they can work in the prefabrication shop when they are not out on service calls. In an industry traditionally involving an inconsistent schedule, workers are able to fill the gaps in their schedules by working on projects in the shop.

SCHEDULE FLEXIBILITY

Job sites usually have a very strict schedule during which specific trades can work. When one installation crew is working, it may be difficult or dangerous for a different installation crew to work at the same time. Similarly, there may be outside circumstances that limit when workers can access the site. For example, some cities have ordinances that limit noise during night hours. Some buildings remain partially open during construction and cannot have heavy traffic during work hours. Whatever the situation, it is easier if most of the work can be done off-site. Prefabrication shops can run at any time of the day or around the clock if necessary, allowing quick turnaround and giving the contractor more control over the project schedule.

Case Study

Denver, Colorado

St. Joseph Hospital completed 2.5 months ahead of schedule an 18% reduction in total project length.[1]

In addition to completing a job more quickly while providing labor savings, prefabrication allows for easier scheduling of installation crews.

Prefabrication makes schedule compression possible by as much as 18%.[1]

Perceived Drawbacks of Prefabrication

ALTHOUGH TREMENDOUSLY BENEFICIAL IN THE LONG TERM, THE SWITCH TO PREFABRICATION CAN BE INITIALLY DIFFICULT. IT MAY DEMAND:

OFF-SITE SPACE

Most prefabrication is done away from the construction site. Prefab may require shop space from contractors for assembly and storage of completed components. Many prefabrication projects need an entire facility devoted to completing and inspecting pieces that will be used on the final job site. For many contractors, shop space is limited.

PRODUCT KNOWLEDGE

Although the function of parts needed for prefabrication are the same, the way they are installed can differ and demand additional training. Installers typically use repeated or familiar installation methods, so they may lack the time or motivation to learn new ones. Different processes can dissuade an installer from trying a new method.

EXPENSIVE PARTS

To effectively complete a prefab project, special parts are needed for quick and easy installation. These parts are designed to be easier to install and often have different features than products for traditional installation methods. Compared to commodity products in a price-conscious market, prefabricated parts are usually more expensive. Although the labor saving more than compensates for the increase in product price, purchasing agents may not directly recognize the financial benefits of purchasing premium products that reduce the cost of the overall project.

Other Benefits of Prefabrication

WORKING IN A CONTROLLED SETTING REDUCES MANY OF THE RISKS THAT CAN HAVE A NEGATIVE IMPACT ON THE SAFETY OR EFFECTIVENESS OF A CONTRACTOR'S WORK. PREFABRICATION CAN IMPROVE:

PROFIT MARGIN

Prefabrication reduces time spent on the job site during installation, allowing contractors higher profit on jobs and the ability to take more work throughout the year. In most projects, labor is the largest part of the final cost. Materials, in comparison, are much smaller. Thus, reducing labor costs is the easiest way to increase profit margin.

SCRAP

On the job site, pieces are often discarded if they are not immediately useful. When prefabricated components are assembled in a shop, they produce significantly less waste. When prefabricating, unusable cuts and spare parts can easily be stored and held for future projects. Reduction of waste results in a reduction of cost and offers another way for contractors to save money.

SAFETY

Traditional methods often require installers to spend extended amounts of time on lifts, which can compromise quality of work and greatly increase the possibility of work site injury. With prefabrication, contractors do not need to work among other crews, spend long amounts of time on lifts or ladders, or worry about the impact of adverse weather. All of the equipment necessary for proper assembly can be kept in the shop and used when needed. Components can be assembled in places that are comfortable and conveninet to contractors, rather than less than ideal spaces available at the construction site.

QUALITY

Once the component is completed, it can be easily inspected and installed in one piece, eliminating the need to rework projects and reducing possibility of installation error.

41% of projects experienced a decrease in project budget by 6% or more due to the use of prefab.[4]

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