

Multi-trade Offsite Prefabrication in Healthcare Construction

What is Multi-trade Prefabrication? In short, the multi-trade prefabrication process allows multiple building components to be constructed in an offsite temperature-controlled environment concurrently alongside the building structure and site work activities. Healthcare projects - with complex but repetitive elements such as vertical and horizontal mechanical/electrical/plumbing (MEP) systems, patient rooms, bathrooms, clinical spaces and building envelope systems - are extremely well suited for multi-trade offsite prefabrication.

Why is it Innovative? Simply put, our process is revamping the hospital delivery process by producing higher quality buildings more quickly, safely and cost effectively. In an industry historically reluctant to change, multi-trade prefabrication is set to replace the centuries-old “stick-built,” onsite construction method. Our utilization of multi-trade prefabrication allows for parallel construction activities to take place and is providing the following benefits to our healthcare clients:

Increased Safety –

- Typical overhead work, including welding, is performed at “bench height”
- Superior lighting and ventilation conditions
- Ample room to move around modules and install ceiling elements
- Reduced tripping hazards with a clean and organized space.

Enhanced Quality –

- Typical onsite construction activities are enhanced with the ability to work in a temperature controlled warehouse
- Dedicated crews of carpenters, plumbers, sheet metal works and electricians gain increased control over production
- 360 degrees of accessibility to MEP components
- Standardization of MEP installations limits conflicts among trades
- Preliminary inspections by local jurisdictions are facilitated, minimizing last-minute changes.

Reduced Schedule and Cost Savings –

- An average of 30 percent schedule savings facilitates earlier move-in dates = owner revenue
- Cost savings through a reduction in general conditions.

Lower Labor Costs –

- Production-line system reduces labor by 75 percent
- Offsite construction minimizes trade bottlenecks, reducing and eliminating overtime and off-hour wages.

Waste Elimination –

- Reduced scrap by ordering components to exact lengths required
- Fewer mistakes, misalignments and deviations with production-line system
- Less waste reduces costs spent on materials, handling, dumpsters and transportation costs.

Overall Facility Improvement –

- Reduced above ceiling “clutter” with prefabricated MEP systems and repetitive locations of valves, terminal boxes and cable trays, provide hospital maintenance staff better efficiency
- Same-handed patient rooms aid hospital staff and increase patient safety.

Multi-trade Prefabrication's Origin and Utilization: Skanska's European operations have been utilizing this method for over 15 years. After extensively studying the process, we pioneered multi-trade prefabrication on the Miami Valley Hospital Southeast Addition project in Dayton, Ohio. Lauded as the “most ambitious U.S. implementation of the strategy” by *ENR Magazine* and the “Leading Edge of Hospital Construction” by *Medical Design and Construction Magazine*, the method is now being used on multiple Skanska projects throughout the U.S. and is moving swiftly to become a standardized practice for all of our healthcare projects.

Multi-trade Prefabrication on the Miami Valley Hospital Southeast Addition: Pioneering the multi-trade prefabrication process detailed above, corridor racks, bathroom pods and patient room headwalls were prefabricated on the Miami Valley Hospital Southeast Addition project.

Reaching new heights with innovation, the project team identified an uncommon source for schedule savings on the temporary bridge component - an airport jet way. Normal construction of the temporary bridge would have taken four to six months, but by utilizing a prefabricated jet way it was complete in three days, saving \$1.12 million.

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Building Information Model (BIM) of the MEP corridor racks



Dedicated MEP crews building the MEP corridor racks at "bench height"



MEP corridor racks lined in the prefabrication warehouse



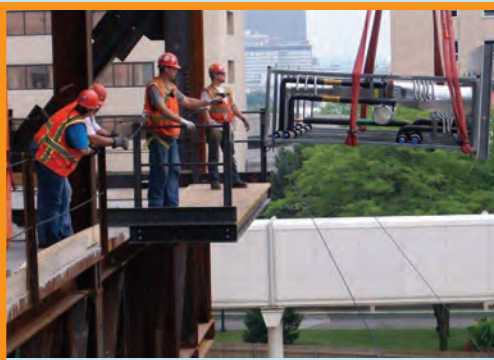
MEP corridor racks being delivered to the jobsite



MEP corridor racks being lifted to the floors



A tower crane lifting the MEP corridor racks



Workers guiding the MEP corridor racks onto the floor



MEP corridor racks being installed



MEP corridor racks BIM model design and final MEP corridor racks installed

Prefabricated Temporary Connector Bridge

December 13



December 14



December 15



December 16

