



CASE STUDY

BJC HEALTHCARE PHASE III PODS & HEADWALLS

Driving Performance Through Prefabrication

Faced with limited site access, complex logistics, and the need to maintain schedule across a 660,000-square-foot hospital expansion, icon Mechanical implemented a fully coordinated off-site prefabrication strategy for restroom pods and headwalls.

The scope included prefabricated patient restrooms complete with headwalls containing multi-trade racks equipped with plumbing, electrical, HVAC, and critical gas components.



St. Louis, MO

MARKET

Healthcare

CAPACITY

660,000 SF
16 Stories
280 Patient Rooms

DELIVERY

Design Build

OWNER

BJC HealthCare,
Washington University
School of Medicine

GENERAL CONTRACTOR

McCarthy



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EXECUTIVE SUMMARY

icon Mechanical (icon) served as the lead mechanical engineering subcontractor for the restroom pod modularization scope on BJC HealthCare's Campus Renewal Phase III project. The modularization effort involved a collaborative partnership between icon, TD4, TJ Wies, and Guarantee Electrical. Approximately 251 patient rooms were part of the project for the 660,000 square foot healthcare tower.

icon kept safety, compliance, and quality at the forefront throughout the project. icon's team-based approach—linking engineering, VDC detailing, fabrication, and installation—helped ensure that all facets were efficient and aligned with scope.

INTRODUCTION

Off-site prefabrication of restroom pods and headwalls has revolutionized construction timelines for hospitals, creating timely efficiency of critical components to patient care. Previously, restroom pods and headwalls were constructed on site and took considerably more time to complete. As a leader in prefabrication innovation, icon has been at the forefront of this revolutionary modularization technique.

For the BJC Phase III project, icon successfully executed the most expansive prefabricated pod and headwall program in its company history.

Successful execution required cohesive coordination of workflows and manpower. The complexity of the project and its many moving parts demanded constant coordination, clear communication, and disciplined logistics to maintain schedule and alignment.



icon Objectives

- Schedule Acceleration
- Reduced Space Usage
- Safety Compliance Throughout Process



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METHODOLOGY & DESIGN APPROACH

Safety “Reigns Supreme”

Safety and quality were integrated in the strategic planning with the solution of off-site fabrication for the pods and headwalls. By manufacturing off-site as opposed to stick-built fabrication, there was no compromise with safety. Assembly was conducted in open space in a repetitive, uniform manner, which maintained consistent organization and order throughout the process.

Cutting-Edge Design Tools

icon utilized cutting-edge design tools, such as Revit, to design systems and components for the pods and headwalls. Building Information Modeling (BIM) also played an integral role in the detailing, fabricating, and checking for clashes to minimize errors and reduce material costs for the project.

icon collaborated with other trades to utilize the latest plumbing fixture technology to minimize water use, as part of icon’s efforts to deliver sustainable, environmentally-friendly projects. This collaboration involved installation of high-efficiency fixtures that reduce water usage including low-flow toilets and showerheads, drastically reducing water consumption while still maintaining performance.

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Analysis of Initial Design

icon established a path to success before the project began through strategic planning and team alignment, identifying strategies to maintain budget and mitigate risk for on-time delivery. This forward-thinking approach was applied during the design phase, with systems developed for off-site fabrication to align materials, components, and installation.

Project Management led the team with advisement and guidance of a workflow process comparable to an assembly line for building cars, each part moving systematically through workstations, with labor assembling parts in a fixed sequence enabling high volume and high efficiency.

Initial design played a critical role in the system. The restroom pods and headwalls were designed to bolt into place with single point connections, saving time on the project. Utilizing the manufacturing mentality, wall and ceiling utilities were installed in prior to putting walls and ceilings together to minimize overhead work which is safer and more efficient as well as providing an assembly line installation versus the stick-built approach, making a cleaner, clearer workflow for all trade partners and final production.

CHALLENGE

Coordinating Workflows and Manpower for Off-Site Pre-Assembly

The project demanded precise coordination of workflows, manpower, and logistics for off-site pre-assembly within highly constrained site conditions. With a major thoroughfare on one side and the hospital's main entrance on the other, no staging area was available, complicating material handling and installation sequencing.

Integrating prefabricated pods and headwalls into an active hospital environment required careful planning to avoid disruptions, delays, and rework. Without a structured workflow system, risks such as improper sequencing, double handling, and reduced productivity threatened both schedule and quality.

icon SOLUTION

Strategic Planning and Prefabrication-Driven Execution

icon addressed these challenges through a structured, multi-phase approach grounded in "Beginning with the End in Mind." Early coordination meetings aligned scope, budget, design, and schedule, enabling proactive risk mitigation.

To overcome site limitations, the team adopted a prefabrication strategy, assembling pods and headwalls off-site to reduce congestion and improve efficiency. Trailers were pre-loaded in sequence at the Earth City, MO facility and staged indoors to ensure accurate delivery, eliminating double handling and minimizing unloading time. More than 200 units were transported, each wrapped for protection. Installation followed an automotive-style assembly process, using repetitive workflows.

The project management team's ability to anticipate logistics and maintain organization ensured seamless execution, high productivity, and successful delivery.



251 Bathrooms
(48 ICU/182 Acute/21 Acute ADA)

224 Headwalls
(prebuilt w/ Med Gas & Electric)



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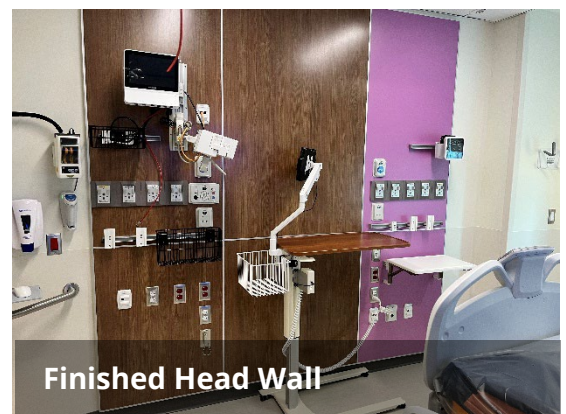
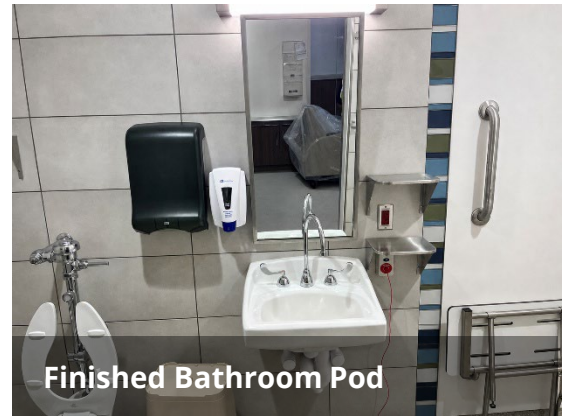
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COMMUNITY IMPACT

Job Creation / Local Economy Boost

The community impact of this project was far-reaching:

- icon's off-site prefabrication solutions reduced congestion in one of St. Louis' busiest thoroughfares. By eliminating additional labor on site, icon minimized parking issues and demand.
- icon mentored and supported a small minority contractor in a large project setting.
- The project created opportunities for local companies and skilled trades to participate while supporting economic growth through increased work volume and visibility.





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