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Mission of the *Academy Journal*

As the official journal of the AIA Academy of Architecture for Health (AAH), this publication explores subjects of interest to AAH members and others involved in the fields of health care architecture, planning, design, and construction. The goal is to promote awareness, educational exchange, and advancement of the overall project delivery process, building products, and medical progress that affects all involved in those fields.

About AAH

AAH is one of 21 knowledge communities of the American Institute of Architects (AIA). AAH collaborates with professionals from all sectors of the health care community including physicians, nurses, hospital administrators, facility planners, engineers, managers, health care educators, industry and government representatives, product manufacturers, health care contractors, specialty subcontractors, allied design professionals, and health care consultants.

AAH currently consists of approximately 6,000 members. Its mission is to improve both the quality of health care design and the design of healthy communities by developing, documenting, and disseminating knowledge; educating design practitioners and other related constituencies; advancing the practice of architecture; and affiliating and advocating with others that share these priorities.

Please visit our website at www.aia.org/aah for more about our activities. Please direct any inquiries to aah@aia.org.

***Academy Journal* editor**

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An Efficient Method for High-Performing Healthcare Facilities

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ABSTRACT

This paper discusses the unique challenges and pressures with which health facilities must cope when accomplishing repair, alteration, and construction projects. It also explores the applicability of the Job Order Contracting construction procurement method for hospital and healthcare systems.

A 2015 study by Arizona State University's Performance Based Studies Research Group set out to analyze the performance and value of the Job Order Contracting (JOC) process. The study measured the performance, satisfaction, and economic impact of JOC compared to other construction procurement methods, and gained the perspective of facility owners and contractors through survey questions. The paper will discuss the results of this study and how the JOC process can and is being used as an efficient and effective construction procurement process for the streamlined repair, renovation, and alteration of hospitals and healthcare facilities.

The paper will further analyze case study examples at three healthcare systems and discuss how the JOC method has been used to procure construction projects at the Jackson Health System, Harris Health System, and NYC Health + Hospitals. The case studies will discuss overall JOC programs, types of projects procured, and benefits associated with the program.

Introduction

Hospitals and healthcare systems are not immune to the challenges of repair, modernization, and renovation projects. Compressed construction timelines and strained budgets add to the pressure of facility alterations to contend with technology updates, patient demands, green and sustainable upgrades, and security improvements. Hospital and healthcare systems continue to make facility adjustments and advancements to meet the needs of patients and seek construction procurement processes that are efficient, effective, and flexible enough to meet their needs. Hospital repair and alteration projects such as exam room renovations, medical equipment upgrades, facility consolidation, HVAC upgrades, or energy retrofits have been successfully accomplished with the JOC construction procurement method. This indefinite delivery, indefinite quantity process accommodates healthcare facilities' construction demands to quickly procure projects. It has also been proven to save time and costs while providing high satisfaction ratings.

Job Order Contracting was created to tackle the demanding requirements, tight timeframes, and stringent complicated competitive bidding requirements at US Army facilities in Europe. JOC aims to simplify and streamline the process of completing straightforward repair and renovation projects. Over the years, JOC has become a preferred method of facility owners to accomplish a large number of repair and renovation projects with a single, competitively bid contract.

As the saying goes "failing to plan is planning to fail." Healthcare construction is no exception to this reality.

Architects, engineers, facility owners, and contractors need to ensure that both the construction plan is solid and that all end users have buy-in. The project's mission needs to be more than just that of the patient, but also that of the nursing staff, doctors, and administrators. By engaging JOC contractors early in the design phase, architects and engineers will be able to gain a unique perspective on the project, helping avoid potential costly mistakes down the road. Often, onsite experience will give contractors knowledge of the ins and outs comparable to that of facility personnel. This represents an opportunity when it comes to developing a project's scope of work. In addition to valuable scope input, JOC contractors can also work side by side with architects and engineers in developing the costs for the project using the pre-priced construction task associated with the JOC contract.

With the popularity of Integrated Project Delivery (IPD) on the rise, those looking to get the most out of their design, construction, and commissioning would be wise to use a JOC contractor in the IPD process. Just as the goal of an IPD process is to foster communication and teamwork among all parties to see the project completed faster, so too is the goal of a JOC contract. However, there is one paramount difference: In traditional IPD processes, construction costs are still developed through a budgeting process and are not truly known until the subs or suppliers are contracted. Also, in case of a change order, these are typically still priced the traditional way. Incorporating JOC into your IPD process eliminates those cost concerns because all the pricing will be derived from the pre-

priced task catalog associated with the JOC contract. All construction costs have been defined and assigned well before the planning phase, and costs can be more easily controlled throughout the IPD process. Also, all change orders will be priced from the same task catalog, thus protecting the owner from change order escalation. Using JOC in your IPD process fosters the best collaboration possible while still offering the owner true construction cost protection.

With JOC as the procurement method for a project, everyone is on the same page. What follows throughout the entire construction lifecycle will be true collaboration. Knowing the project has been successfully bid, the contractor can immediately plan to ensure schedules, budgets and personnel requirements are met. Because the contractor's prices are pre-priced, architects and engineers can develop the scope with confidence that costs will not balloon out of control. Architects and engineers now have a direct conduit for identifying construction prices and potential construction issues at the very early stages of planning when adjustments can be made quickly. And if cost overruns do arise, the JOC contractor will be present to assist in keeping costs in line and the project development moving forward. Conversations about how best to design, develop and execute the project can now take place amongst architects, engineers, and contractors. Facility managers will have confidence they are using a contractor who already knows their systems and practices. All parties succeed.

In 2015, the Performance Based Studies Research Group (PBSRG) from Arizona State University's Del E. Webb School of Construction set out to analyze the performance and value of the JOC process. The result was the Job Order Contracting Performance Study which measured the performance, satisfaction, and economic impact of this process. The survey was completed by 47 owner companies and 13 contractors who represent \$5 billion in construction projects. Survey participants included facility owners from hospital and healthcare systems, housing authorities, institutions of higher education, K-12 systems, cities and counties, transit authorities, and more.

The differences between JOC versus design-bid-build and design-build boil down to a single, crucial detail: pre-priced tasks. Although absent in the two traditional procurement methods, this concept is the foundation of JOC. With pre-priced tasks, costs are determined upfront and cannot be altered. This changes the fundamental relationship between contractor and owner (along with design team). With prices established ahead of time, there's no monetary advantage for the contractor not being

totally transparent from the onset. If the contractor notices a design flaw in the plans, there is no lucrative change order that can be executed down the line. This makes the cost for a contractor to bring the flaw to the attention of the designer early on the same as it would be in the middle of construction.

When properly implemented, JOC contracts give substantial cost protection to the owner and design team. Plus, when done correctly, JOC projects cost less than those procured through traditional methods as it is not a "one and done" situation. Often, JOC contracts last four or five years. During that time, the contractor has the ability to spread overhead across many different projects, thus reducing the owner's cost. On the other hand, with design-bid-build and design-build, the contractor is only looking in terms of one project and must make all profits through that single job. There is no other procurement method that delivers this level of construction cost protection to owners, architects, and engineers.

Research has found that only 2.5% of all projects are delivered on time and within the planned cost (PricewaterhouseCoopers, 2009) establishing a great need for faster, better methods of completing repair, modernization, and renovation projects efficiently while staying on deadline and on budget. Inefficiencies costing those in the industry up to \$36 billion per year in lost time and fiscal overages (Lepatner, 2007). Researchers at Arizona State University spent 24 years and more than 1800 tests to identify the source of these issues (Rivera, 2014). They found that a primary cause in low construction project performance is the traditional design-bid-build construction procurement method. Other approaches, including design-build and CM at risk were not found to be a solution to the problem of project inefficiencies and low project satisfaction. The 2015 PBSRG study focuses on JOC, with overwhelmingly positive results in project satisfaction, timeliness, cost savings, flexibility, transparency, and ease of use.

Greater satisfaction

The study found that respondents rated 96% of JOC projects as satisfactory, while almost all (99%) owner participants said they would recommend the JOC method to other facility and infrastructure owners. These high satisfaction marks derive from the time and cost saving benefits from JOC, as well as overall transparency, flexibility and efficiency. Owners were 60% more satisfied with the JOC process compared to design-bid-build or design-build.

Time savings

Job Order Contracting streamlines the bidding process by putting contractors in place to perform a number of projects with a single-competitively bid contract, enabling construction work to begin faster. Contractors who compared the process to design-bid-build and design-build found the JOC process outperforms others on delivering projects on time. Contractors responded that 94% of projects procured using Job Order Contracting are delivered on time, compared to only 63% for design-bid-build and 73% for design-build.

Budgetary control & cost savings

Cost savings is a cornerstone of the JOC process, typically resulting from increased efficiencies in four areas: procurement, design, construction and post construction. Owners reported saving, on average, 24% in administrative costs compared to other methods, while contractors reported a 21% total cost savings throughout the project. Regarding the cost savings, owners most commonly mentioned procurement administrative time, project manager support time, design and drawing costs, and decreased documentation demands as main contributing factors to the cost savings. The contractors surveyed felt that acquiring and bidding new projects, a decrease in change orders and decreased time requirements most impacted their cost savings.

Transparency & flexibility

More benefits that are associated with the JOC procurement method are the transparency and flexibility it brings to projects and processes. Owners responded

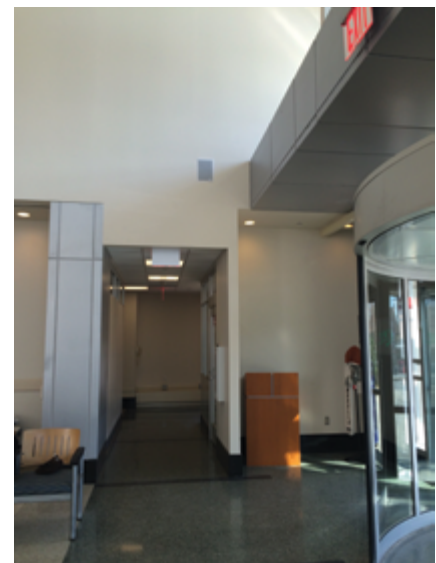
that transparency is on average 30% higher for JOC than traditional construction delivery methods. Owners also believe JOC to be an average of 76% more flexible than other methods.

Case studies

NYC Health + Hospitals operates the public hospitals and clinics in the five boroughs of New York City. With 225,000 admissions, one million ER visits and five million clinic visits by New Yorkers annually, New York City Health + Hospitals sought a streamlined solution to procure straightforward construction, demolition and renovations work at its facilities. In 2010, New York City Health + Hospitals implemented a JOC solution and has completed over \$59 million in construction work through the program. New York City Health + Hospitals has used its JOC program for projects including renovation of clinic examination rooms, HVAC upgrades, electrical efficiency projects, mold and asbestos abatement, and more. Through its JOC solution, projects are managed from initiation to close-out and onsite construction management experts carry out the day-to-day operations, allowing New York City Health + Hospitals to focus on other projects.

Harris Health System is a fully integrated healthcare system that cares for residents of Harris County, Texas. This system includes 23 community health centers, five school-based clinics, a dental center, and dialysis center, mobile health units, a rehabilitation and special hospital and two full-service hospitals. Since they implemented a managed JOC process in 2011, almost \$16 millions of work has been completed through the program. Projects completed include moisture repairs, roof replacements,

FIGURES 1-3



(Left) Before Photo; (Center + Right) Hospital call center after photos
Image credits: Gordian

dental clinic renovations, security upgrades to entrances, X-ray equipment upgrades, treatment room renovations, and more. With JOC, Harris Health System found projects were completed more quickly. The customized task catalog of construction line items includes costs local to Harris Health System, along with their special standards and specifications.

Jackson Health System is a nonprofit academic health system in Miami-Dade County. The health system includes six hospitals and a growing network of primary care clinics, specialty care programs, urgent care centers, behavioral health facilities, skilled nursing facilities, and a corrections health service. They have completed more than \$55 million in construction work through a JOC procurement program since its implementation in 2008. Projects completed through the program include cardiac cath lab expansions, trauma center renovations, roof replacements, oncology infusion lab renovations, and more. Implementation of JOC for Jackson Health System's repair, renovation, and minor construction needs allows them to complete more projects through process efficiency and provides transparency and auditability throughout each stage of the process.

An efficient process

The JOC construction procurement method is an ideal solution for hospital and healthcare facilities that seek a faster way to update and renovate their facilities and infrastructure. Research has shown the JOC process saves time, saves on costs, and provides high satisfaction ratings for those who use it compared to other procurement methods. As hospitals and health centers continue to make improvements and modernizations, the JOC process can help keep them on deadline and on budget.

FIGURE 4



Renovated Vascular Angio Recovery Unit
Image credit: Gordian

FIGURES 5 AND 6



(Left) Patient suite pre-renovation and (right) patient suite post-renovation
Image credits: Gordian

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