

Reconceptualizing Design-Build for More Efficient Budgeting and Scheduling

Detroit Public Schools used a modified design-build delivery method to maximize financial resources within a compressed delivery schedule.

By Rachel Lynn, PMP, LEED AP BD+C, and Jennifer Zirkle, LEED AP BD+C



In 2009, the city of Detroit proposed a \$500.5 million bond referendum to stem the declining enrollment in Detroit Public Schools (DPS) that mirrored the decades-long decline in the city's population.

Proposal S was passed in November to fund the construction of 8 new schools, the renovation of 10 more, and the improvement of information technology and security infrastructure district-wide. This funding would help the district reshape a shrinking school system while strategically allocating resources to the schools and their communities.

The bond language challenged DPS to maximize the financial resources within a compressed delivery schedule. It also required innovation in the process by which the schools were to be delivered, beginning with project planning and design and continuing through construction.

In collaboration with its program manager, a Detroit-based joint venture of three industry leaders, each with extensive experience in the planning and implementation of large-scale capital improvement projects, the district used a modified design-build delivery method that was established to meet the rigid

budget and schedule constraints and to enhance the accountability of the design and construction professionals contracted to deliver those projects.

To help achieve program goals, DPS challenged the joint-venture team to ensure consistency and continuity across all projects through the development of enhanced specifications and the bridging documents that served as the foundation of the modified design-build delivery method, thereby communicating the district's design intent for programs, systems, and finishes.

Modified Design-Build Delivery Method

In a traditional design-build delivery method, an owner contracts with a single entity to design and construct a facility. Relative to other delivery methods, such as design-bid-build and construction manager at-risk, design-build has provided significant savings in project budgets and schedules, both of which were key elements of the DPS goals as clearly outlined in the bond.

Charged with spending \$500.5 million within three years of the sale of the bonds, DPS opted to proceed using the design-build delivery method despite its rarity in Michigan, particularly on a large-scale, publicly funded project. To ensure

program success, as measured by compliance with the budget and schedule, the program manager took design-build a step further: it expedited the design process by developing project-specific bridging documents detailed to an enhanced level of schematic design that communicated owner intent for building design, spatial layout, and mechanical, electrical, and plumbing systems.

To create the bridging documents, the program manager completed needs assessments at targeted school facilities, consulted with district stakeholders and end users, and collaborated on strategic and efficient allocation of bond funds based on existing conditions and community need. The result was 18 sets of design documents that, together with a set of district-wide design guidelines and specifications, were released to the bidding community during the procurement phase of the bond program for use in preparing a guaranteed maximum price (GMP) for each project.

Accelerating the planning and design phases of the program was critical.

Over the course of seven months, the program manager, in coordination with the district, procured the 16 major renovation and new construction projects detailed in the bond language. As a result, within one year of the passage of Proposal S, more than \$394.6 million—79% of the bond's total value—was under contract, set to be reinvested in Detroit's schools, students, and communities.

Awarded design-build teams assumed responsibility for the bridging documents, advancing the drawings to construction documents, and entering construction in a fraction of the typical time for design-build delivery. Accelerating the planning and design phases of the program was critical not only to maximize bond funding for project costs but also to meet the schedule constraints outlined in the bond provisions.

What Was Achieved?

By using the modified design-build method, several significant outcomes were achieved.

All projects completed to date have been delivered on schedule and within budget under the joint venture's management. The modified design-build method condensed the timetable for completing each project and therefore lowered the costs of retaining the design-build team by overlapping the design and construction periods.

For example, the new \$52 million Martin Luther King Jr. High School was constructed in 14 months, whereas a similar project using traditional design-build or design-bid-build would likely have taken 18–24 months. The

shorter time frame reduces costs in several areas, including design-builder fees, design fees, and general conditions (construction trailers, supplies, security, fencing, and so forth). As most items included within the general conditions are directly related to the time required to complete a construction project, these project costs are lower with a shorter time frame.

The program manager instituted another cost-saving measure: the use of owner alternates when bidding each project. DPS identified certain elements of each project as alternates, rather than as part of the base scope, isolating the cost of desired (though perhaps not required) elements of the program outside of the GMP. This strategy allowed the program manager to evaluate the GMP bids submitted by each design-build team against the respective project budgets and to determine funding availability before the district accepted or rejected the alternates based on price and prioritization.

Examples of owner alternates on the Proposal S bond program projects included expanded athletic fields, complete window system replacement, and enhanced landscaping. The program manager also built in owner allowances for scope—such as furniture, fixtures and equipment, hazardous materials abatement, and moving services—that were common across the major bond program projects.

An unintended benefit for the bond program was the condition of the markets at the time of bidding and construction, both locally and nationally. Locally, the construction community was eager for work, and pricing was driven down by intense competition among the bidding design-build teams on each project.

Although DPS did not use a strictly price-based procurement process, the GMP was nonetheless a key factor in determining awards to the bidding design-build teams. For example, the new \$24.8 million Amelia Earhart Elementary and Middle School had 11 bidders, resulting in competitive pricing by both the design-build teams and their subcontractors.

Nationally, the project budgets took advantage of lower construction and material costs resulting from the economic climate and decreased building activity within the time frame.

The program has already placed 9,000 students in a new or renovated school. That number will increase to more than 13,000 by fall 2012, providing more than 25% of the district's total enrollment an upgraded facility in which to learn. In addition, *all* DPS facilities will have upgraded security and information technology infrastructure by the program's end through the bond program's \$17 million district-wide initiative. Those enhancements include new security cameras, cutting-edge screening equipment, and wireless Internet access.

The first students moved into their enhanced facilities in fall 2010, only 10 months after passage of Proposal S.

Renovations were completed at three pre-K–8 schools—Marcus Garvey Academy, John R. King Academic and Performing Arts Academy, and Fitzgerald Bethune Academy—during the 2010 summer break. The scope of the renovations included upgraded interior finishes; improvements to the mechanical, electrical, and plumbing systems; and new showcase spaces, like the black box theater at John R. King Academic and Performing Arts Academy and the gymnasium addition at Fitzgerald Bethune Academy.

All projects completed to date have been delivered on schedule and within budget under the joint venture’s management.

In fall 2011, three newly constructed schools were delivered: the \$54.8 million Martin Luther King Jr. High School, the \$23.3 million Samuel L. Gompers Elementary Middle School, and the \$24.8 million Amelia Earhart Elementary Middle School. DPS also opened five major renovation projects, a combination of both existing high schools and elementary middle schools.

A final renovation project at Northwestern High School was completed during the 2011–12 winter break before the opening of four additional new schools in fall

2012: the \$55.1 million Samuel C. Mumford High School, the \$52.4 million East English Village Preparatory Academy, the \$25.1 million Munger PreK–8 School, and the \$24.8 million Mackenzie PreK–8 School.

Program Manager’s Value to the Program

The joint venture’s unique program management structure, composed of industry leaders in planning, design, and construction, was created to meet the district’s stated goals for the bond program and was crucial to implementing a program of this scale within the budget and time parameters established by the bond.

On initiation of the bond program, few components of the necessary implementation infrastructure—from procedures to standardized procurement documentation and contracts—were in place. Consequently, the program manager’s immediate action was required to develop each element in coordination with the district. The program manager also worked closely with DPS to build capacity among the district staff involved in the bond program and to prepare them for the challenges of implementing a program of this scale.

Following the development and dissemination of the bridging documents during the planning and design phases of the program, program management personnel provided continuous support throughout the design period and managed the design-build teams during

What happens while planning for retirement?

Life.

CPI helps administrators and educators successfully navigate the path to retirement and beyond.



WIN THE RETIREMENT GAME

Call today to learn more: 800.279.9916 ext. 764

Scan with your mobile



device to visit us at www.cpiqpc.com.

△CPI Qualified Plan Consultants, Inc.

People driven. Outcome focused. CPI is a member of CUNA Mutual Group based in Madison, Wisconsin. Visit us at www.cpiqpc.com.

construction on behalf of the district, thus ensuring adherence to the owner requirements on each project.

The program manager played a key role in educating the design and construction communities on the design-build delivery method, which had not been widely used in Michigan until the bond program's initiation, and in helping the design-build teams navigate the finer points of the delivery method within a compressed delivery schedule. In addition, the comprehensive program-wide budget and schedule management helped the district meet the rigid performance metrics of Proposal S and the project-specific management activities.

The program manager played a key role in educating the design and construction communities on the design-build delivery method.

Beyond design and construction management, the program manager provided critical support to the district in achieving the ancillary goals of the bond program: (1) meeting district targets for including Detroit residents and Detroit-headquartered businesses, (2) implementing a project labor agreement between DPS and the trade unions, and (3) maintaining a high level of engagement with community residents and other project stakeholders.

One of the program's notable successes has been the inclusion of district students in the capital improvements. A paid summer internship program provided on-site experience to students interested in design and construction and allowed them to invest themselves in the district's transformation.

Win-Win for All

Given the sunset provision attached to the construction bonds, DPS would have had great difficulty completing the ambitious scope of Proposal S without the using the modified design-build method executed in collaboration with its program management team.

The process achieved schedule goals and enabled the district to implement additional improvement projects beyond those originally planned in the bond measure through careful budget management by the Detroit-based joint-venture management organization. Project spending was maximized, administrative costs were minimized, and more than 90% of the bond's value was ultimately committed to project costs.

Rachel Lynn, PMP, LEED AP BD+C, is a project manager at Brailsford & Dunlavey, Detroit, Michigan. Email: rlynn@programmanagers.com

Jennifer Zirkle, LEED AP BD+C, is a project manager at Brailsford & Dunlavey, Detroit, Michigan. Email: jzirkle@programmanagers.com

The Power of Collaboration

True partners work together, side by side, building on each other's strengths.

ASBO International's Corporate Partners look forward to working with you to achieve more.

www.asbointl.org/CorporatePartners

STRATEGIC PARTNERS













EVENT PARTNERS








