NAVIGA ANEW

Whether ingrained in tradition or striving for integration, project delivery methods — each with its own timetable and cost offerings — deliver a quality product, as expected. Some markets, however, are breaking away from what they know to try a different approach, while others are finding more room to grow within their preferred delivery choices.

hen searching for a specific product or service, the criteria are pretty straightforward: What reputable company can quickly deliver a quality product at the most competitive price? In the consumer world, Amazon is a prime example of exceptional service. And when the delivery process runs as expected, or better, customer satisfaction drives repeat business.

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The construction industry isn't much different. Rather than searching for the newest gadget on Amazon, the search is for capital delivery that fulfills promises. Globally, infrastructure improvement is a common, critical concern. As those capital projects continue to mount, so does the need and demand for professionally tailored, timely service.

While cost and schedule remain key factors in choosing the right project delivery method, speed to market and team integration also are prominently influencing the decision-making process. To get it all, some markets, with age-old routines, observed how others found greater success, then started rethinking their approaches to project delivery. **>**

COLLABORATING IN COMMERCIAL SPACES

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The engineer-procure-construct (EPC) method also known as design-build (DB) in some markets has been around for decades, mostly within the oil, gas, chemicals and energy sectors. Encouraging early and constant collaboration between the owner and qualified design and construction team, this all-in project delivery method offers one point of accountability, cost certainty and quick delivery.

These all-encompassing benefits and success stories are enticing other markets to change project delivery direction and trust in a more efficient approach. A traditional choice for many years, design-bid-build (DBB) allowed an owner to retain control of each project phase. However, this longer, less cohesive three-phase process often isn't conducive to meeting today's project delivery demands. That's why the commercial markets are turning to DB.

"By bringing design into construction and construction into design, DB is breaking down the paradigms of the industry because very few projects are truly integrated, especially in aviation and commercial facilities," says Greg Carlson, a vice president in the Construction/Design-Build Group at Burns & McDonnell. The historic Braniff Airways Operation and Maintenance Building at Dallas Love Field, for example, needed a little extra love. To modernize the 1958 facility while retaining its historic architecture, an integrated DB team from Burns & McDonnell worked closely with the Texas Historical Commission to seamlessly blend historical preservation requests with Federal Aviation Administration (FAA) requirements.

"For this project, the DB approach allowed the ownership group to sole-source the design and construction to one company and thus one contract," says Nate Purdy, project manager in the Construction/Design-Build Group. "As a result, the designers, engineers and construction team worked closely to solidify the overall plan. Incorporating remaining details and specifications within the subcontracts upfront ultimately saved time, money and the possibility of conflicting information."

The revitalized facility will operate as a mixed-use property, including hangar bays with supporting shop space and fixed-base operations facilities. But that's not all. The scope also included aircraft ramp restoration and modifications to 40,420 square yards of aviation aprons and taxilanes — which the unified DB team addressed with in-house resources — to meet additional requirements and minimize the risk of foreign object damage to aircraft.

FROM DESIGN THROUGH FINAL COMPLETION, DESIGN-BUILD PROJECTS ARE DELIVERED:





Overhaul of Braniff Airways Operation and Maintenance Building

PROPELLING INTEGRATION IN AVIATION

After realizing the multiple benefits associated with an integrated approach, the aviation industry, traditionally loyal to DBB, has changed course, embracing this collaborative delivery method.

Fuel consortiums are responsible for providing and managing the physical assets needed to receive and store fuel purchased by airlines, then deliver that fuel to airlines via hydrant systems or fuel trucks. As the demand for fuel increases — due to more commercial and cargo flights — airlines need increased capacity for their fuel systems at the airport.

"We have been designing aviation fueling systems since the 1950s, but within the past 15 years, we have been upgrading them with a DB approach," says Matt Cox, who manages construction and financial operations for the commercial fueling team at Burns & McDonnell. "Our clients recognize this delivery model provides the ability to accelerate schedule, control costs and take responsibility for the coordination among trades and the fuel facility operator, eliminating risks for the airlines while creating value at the same time."

A recent hydrant system repair and pipeline replacement project for STL Fuel Consortium and Southwest Airlines involved removing, replacing and installing 130 hydrant pits at St. Louis Lambert International Airport. In addition, the project team designed and built more than 1,000 feet of 16-inch hydrant system fuel connection line between concourses A and C without interrupting existing operations.

By using the DB approach, the team could efficiently coordinate efforts with the airport, fueling operator and multiple airlines. This collaborative approach provided firm construction plans and realistic contingency plans for stakeholders much sooner than would have been possible with the traditional DBB method. This level of planning and control was critical in minimizing disruption to air traffic and passengers. **>**



Denton Energy Center

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ENERGIZING ENERGY'S EPC MODEL

Unlike the commercial and aviation space, the energy market has long been an active proponent of an EPC approach. As more owners realize its overall benefits, requests for vertically integrated EPC delivery continue to increase — meaning the search is on for firms that have engineering, procurement and construction capabilities all under one roof.

With an ambitious energy goal — to power its community with 100% renewable energy by 2020 — Denton Municipal Electric needed a low-cost, supplemental power source that could fill gaps left by its renewable generation. To get what it needed, quickly and efficiently, the electric utility turned to Burns & McDonnell and its wholly owned subsidiary, AZCO, to construct a 225-MW natural gas-fired reciprocating engine facility using the vertically integrated EPC approach. The Denton Energy Center, with 12 independently dispatchable 18.8-MW Wärtsilä reciprocating engines, demonstrates what upfront design and construction efforts can accomplish: safe, quality construction on time and under budget.

Given an expedited delivery timeline, the project was completed in less than a year thanks to creative preplanning and innovative execution. Notable details include finalizing permitting and design early to allow the construction team to begin work on-site ASAP, as well as producing custom-made waterproof void boxes to allow construction of the foundation to continue during rainy weather. Delivering the project within its required time frame allowed the client to meet peak summer energy demand. Once clients have decided to build a project, it has to be done quickly and cost-effectively, and if they can hit an 'easy' button by hiring a reputable EPC/DB firm, it's a no-brainer for them.

Greg Carlson



SEE WHAT A COMPREHENSIVE APPROACH CAN BRING TO SOLAR CONSTRUCTION IN MEXICO. burnsmcd.com/SolarEPC

Another noteworthy aspect of this project is its more than 420,000 workers hours on-site without a single recordable incident.

Windla!

The Upper Michigan Energy Resources Corporation (UMERC) shares a similar construction story. A subsidiary of WEC Energy Group, UMERC recently retired its coal-fired power facility, replacing it with two new reciprocating engine power facilities: F.D. Kuester and A.J. Mihm generating stations. These stations in Michigan's Upper Peninsula generate a total of 180 megawatts (MW) of fast-start power from 10 natural gas-fired reciprocating engines.

Design and construction of the two new facilities required the detailed coordination of many moving parts in a short amount of time, within a region known for its harsh climate. Simply put, timing was everything. As the chosen EPC team, Burns & McDonnell and AZCO kept on top of the project's aggressive schedule, driven by the requirement to have the buildings completed before snowfall. Once completed, the Wärtsilä engines could be installed within a regulated environment. Weighing more than 325 tons each, the 18-cylinder engines had to be transported during the summer to prevent damage to roads and bridges, and a few new roads were needed for final transport to the plant sites. During the peak of construction, more than 350 skilled tradespeople worked at the two sites. ≫

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 Programs can be contracted out under many models, which provides flexibility from project to project, but it all comes down to finding a trusted program manager who can handle it all.

Bob Wolfe, program management director at Burns & McDonnell



O MANAGING WATER IN A NEW WAY

The water industry is currently facing what the American National Standards Institute calls "a worldwide problem, as many countries are still transporting the essential component of life through aging piping systems."

Likewise, many of the aging systems that carry and treat wastewater also are past their useful life and in need of significant investment. Choosing the appropriate delivery approach to address such a complex challenge becomes a greater conversation on a grander scale when it comes to delivering related projects or managing and coordinating projects with overlapping geography, interrelated milestones, deliverables and budgets.

For these massive infrastructure rebuilds, water and wastewater utilities are looking to portfolio or program management as a method to define which projects get the most bang for their buck, then group them to effectively stretch precious dollars across more projects. As demand has increased for such capital improvement programs, the need has surfaced for a qualified program manager who can control cost and schedules across multiple projects to meet stringent deadlines and budgets and exceed greater public stakeholder expectations. As with any 200-year-old city, Shreveport, Louisiana, has an aged sewer system. Over the course of several years, sanitary sewer overflows from that system caught the attention of state and federal regulating agencies, resulting in a federal consent decree that required immediate action to avoid potential litigation. To meet this impending deadline — as well as a comprehensive compliance schedule — the city hired a new program management team to help it address a growing list of improvement projects with a dwindling budget.

The immediate plan of action called for a lean, flexible project approach that focused on optimizing procurement methods to keep the program moving. Paired with a comprehensive review of the program and consent decree obligations, the team will propose new, cost-effective approaches to achieve greater efficiencies. Ultimately, the city will progress the program so its overall capital portfolio is considered when making decisions. This will inform which projects require immediate attention and provide the most benefits when rebuilding and extending the life of its infrastructure system.

With advancing smart technology applications, Shreveport also will be able to consider how to derive more benefits from the investment already made in its existing infrastructure. Examples include advancing the program with smart manhole technology that can read water depths in real-time and feed hydraulic models used to predict system performance or detect system maintenance needs below ground. Also, applying smart stormwater controls can track storms and provide adaptive control technology that automatically opens or closes retrofitted values on existing stormwater infrastructure to better manage flows above ground.

To properly and holistically manage such a complex, lengthy program requires a software solution that can handle the weight. In conjunction with other data tools, OneTouchPM, a geospatial data aggregation tool developed by Burns & McDonnell, will make its debut in the water industry, enabling project teams to access real-time project data anytime, anywhere, allowing possible issues to be quickly identified. When pairing it with mobile construction monitoring applications, critical information can immediately be delivered to impacted stakeholders, such as field crews, regulators and the general public.

These enhanced data management processes can then be integrated into the city's geographic information system, work order management system and asset management methodologies to help optimize future project selections and stretch the city's dollars even further. ≫

READ UP ON POSSIBLE COMPENSATION STRUCTURES. burnsmcd.com/PriceTagSpecifics

DELIVERING ON THE AGREEMENT

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Obstacles are unavoidable — such as the dwindling number of skilled tradespeople — but a well-rounded firm or skilled industry partner will find the most effective way to provide specific services within the appropriate delivery method.

"It's beneficial to bring in professionals early in the process to lay out advantages, and pluses and minuses associated with different delivery methods," says Chris Baxter, vice president of risk management and quality assurance at Burns & McDonnell. "There should be an open dialogue with someone who understands this."

Laying out specifics ahead of time helps streamline any process, from confidently choosing the right delivery approach to setting the stage for smooth, timely delivery, no matter how challenging the scope might seem. When the process works as or better than expected, future projects could follow.

"We put the right people on the right projects with the background and experience to run and manage projects appropriately," Baxter says. "We don't manage risk by avoiding projects. Any risk we have is a risk our clients have, and it's up to us to successfully deliver on our promise to them with each and every project."

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READ ABOUT HOW THE CONSTRUCTION INDUSTRY IS SOLVING FOR THE CRAFT LABOR SHORTAGE beginning on page 32.

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2019 U.S. CONSTRUCTION OUTLOOK



INCREASE IN SPENDING LEVELS OVER 2018.

PRIMARY GROWTH SEGMENTS IN 2019 ARE EXPECTED TO INCLUDE OFFICE, EDUCATIONAL, PUBLIC SAFETY, TRANSPORTATION, CONSERVATION AND DEVELOPMENT, AND MANUFACTURING – ALL WITH FORECAST GROWTH RATES OF 5% OR MORE.

Source: FMI Corp.