

TEAMWORK, PARTNERSHIPS BRING SUCCESS

Granite Construction thrives on complex, expansive projects thanks to its methodical approach to developing teamwork in every delivery format and through joint ventures

by Craig A. Shutt

Since its founding in the early 1900s, Granite Construction has embraced the toughest challenges on the largest projects, from rail systems to freeway spans and waterway crossings. No matter the delivery method or construction issues, Granite's methodical approach has led it to larger, more-complex projects that require innovative approaches and close attention to logistics.

Focusing on logistics has become critical as bridge and infrastructure owners embrace more comprehensive, expansive projects. "We consistently apply diligence, perseverance, attention to detail, and good work habits to ensure high-quality projects and excellent customer service," says Brian Dowd, vice president of business development. "We encourage this effort from the time we begin pursuing a project through construction and closeout."

That focus on quality includes the materials it uses, including precast concrete, notes Tom Boyle, project executive. "Most engineers and contractors understand the advantages precast concrete construction can provide with regard to quality, but Granite looks beyond the precasting facility to the actual construction in the field for ways to incorporate quality into the delivery process. Extensive training and dedicated QC [quality control] professionals help the Granite team deliver quality and minimize costly rework."

The Watsonville, Calif.-based company has especially found success in recent years with alternative delivery methods, including design-build, construction manager/general contractor (CM/GC), and public-private partnerships



The Pennsylvania Rapid Bridge Replacement Project features a consortium of firms in a public-private partnership. This photo shows the West Cruickshank Road Crossing. All Photos: Granite Construction.

(P3s). "Alternate procurement projects allow Granite to add innovation to the design of each project," explains Boyle. "These ideas allow Granite to bring added value to these projects that is recognized by owners as they evaluate proposals." They often score proposals higher that provide reduced long-term maintenance, he notes, as well as those that reduce impacts to traffic, reduce environmental impacts, and provide other benefits.

Rapid Replacement Project

A current example is Pennsylvania Department of Transportation's (PennDOT's) Rapid Bridge Replacement Project, an \$899-million P3 project for which Granite is working in a joint venture with Walsh Construction Co. Plenary Group USA Ltd. and Walsh Investors are providing financing and long-term maintenance. HDR serves as lead designer, Walsh Infrastructure Management will maintain the bridges, and PennDOT will perform routine maintenance.

The 558 geographically dispersed bridges range in length from 40 to 75 ft, mostly in rural regions, according



Precast concrete girder placement for the Ripple Road Crossing over Long Run.

to Joseph McIlhinney, construction manager in the Harrisburg, Pa., office. The work began in May 2015 and contains two phases: construction of early-completion bridges (ECB) followed by remaining eligible bridges (REB). Both phases feature a variety of precast concrete girder types to speed construction. PennDOT handled preliminary design, right-of-way permitting, environmental permitting, and utility relocation for the ECB, while Granite is handling all but right-of-way needs for the REB.

"PennDOT chose the P3 method to accelerate the replacement of the bridges and facilitate efficiencies in design and construction," he says. The result was a 20% savings in costs over the life of the concession period compared to PennDOT handling those duties itself.

Innovation Drives Firm

Granite has provided innovations on a variety of projects. On the Hathaway Bridge design-build project in Panama City, Fla., for instance, Granite used 60-in.-diameter prestressed concrete cylinder piles up to 130 ft long. It

marked the first use of the piles on the east coast. "These large-diameter piles resulted in a more economical substructure design than was developed by other teams for this project," Boyle says.

Each pile was designed with thirty-five, 0.6-in.-diameter, 270-ksi strands and 7 ksi concrete. "Using prestressed cylinder piles eliminated post-tensioning used in spun-cast cylinder piles to join pile segments together," he explains. "This eliminates an area of potential corrosion that occurs with spun-cast piles."

On the Jewfish Creek design-build project near Key Largo, Fla., which was completed in 2008 well before the advent of Florida I-beams, Granite used modified Florida bulb-tee beams that were 72 in. deep for all spans other than at the channel. The beams were designed with a 4½-ft-wide top flange to reduce the formed deck area, a 6½-in.-thick web to provide additional cover for steel, and a typical 2-ft 4-in.-wide bottom flange. "This beam offered a very efficient section for the 102- to 107-ft-long spans."

Such results make owners open to new ideas, and Granite encourages that. "We prefer alternative delivery options because they're more competitive on key issues," says Chris Deane, design-build project manager in the Everett, Wash., office. "We can create a better product for both owners and users." Kevin Graf, construction engineering manager in the Lewisville, Tex., office, agrees. "I've been involved in only one design-bid-build in the past 10 years. For projects in Texas, we prefer design-build."

Texas Work Booming

Texas construction is definitely booming, Graf notes. "There are a lot of mega jobs underway in Texas because the government is focused on upgrading the infrastructure. P3 projects are helping to move those forward faster, and design-build ensures they are efficiently designed and built."

An example of this booming construction is the \$1.1-billion I-35 Express Project in Dallas and Denton Counties. The design-build project covers 30 miles through eight cities



The Ripple Road Crossing over Long Run is part of the Pennsylvania Rapid Bridge Replacement Project and features precast concrete girders and bridge components. Note the use of a large, rubber-tire hydraulic crane with single-pick diagonal slings to erect the girder from one end.

and two counties and will alleviate congestion in the heavily traveled corridor. Intersections will feature Texas-designed 54-in.-deep (TX54) prestressed concrete girders. "The TX54 is our beam of choice for highway bridges," says Graf. "It offers a good span length without requiring huge cranes."

For a 1-mile-long bridge crossing a lake and an adjacent roadway, a TX70 will be used, weighing 1000 lb/ft. "We could stretch it over marine areas to cut costs on the marine infrastructure and construction time," said Graf.

With the design-build format, Granite could map out the key critical-path areas and create packages of small areas of focus, such as bridge widenings that could be finished quickly using TX28 or TX34 prestressed concrete girders. The project was divided into four geographical segments, with three construction companies (including Archer Western Contractors and The Lane Construction Corp.) working as a joint venture.

Combining Cultures

"The project was too much of a monster to do as one project," Graf says. But all three companies worked on each segment, combining forces to maximize their skill set. "It wasn't a line-item joint venture, so the tricky part was combining three cultures and finding ways to work together as a team. By focusing on the work at hand and establishing strong communication lines, it works out."

There are benefits to such partnerships, he notes. "Everyone has different ways of doing things, so everybody learns



from each other in some ways. If we learn that there are better ways of doing things that we do routinely, we will adopt what works best and keep using those ideas afterward."

Partnerships can involve more than construction companies, notes Boyle. "Larger projects lend themselves to custom equipment, where the investment can pay a return in increased productivity and reduced costs," he explains. "During the proposal phase, we partner with equipment manufacturers and suppliers to explore potential equipment options and enhancements that could provide a competitive advantage."

Granite has long encouraged a feeling of entrepreneurial leadership to mitigate its large size. "We build capability through continuous learning and remaining flexible and open to possibilities," says Dowd. "We encourage decisions to be made at the lowest level possible. Each business-unit leader, whether a regional manager responsible for a business that covers an entire state or a project manager, knows to continually seek the most innovative way to build our construction projects."

Each unit leader is supported by a host of resources, such as the construction services group, which provides engineering, design coordination, or



Pennsylvania Rapid Bridge Replacement Project utilizing spread boxes and epoxy-coated reinforcement.

scheduling expertise. Each year, the firm presents an award and a \$2500 prize to the employee that developed the best innovation. "This not only highlights the innovation throughout the company but gets our employees engaged in thinking about how they might develop innovations."

This annual operations meeting also provides awards to top projects in several categories of specific criteria, such as developing the best technical solutions while meeting high standards for safety, environmental issues, quality, ethics, and productivity.

Joint Ventures Blossom

Granite's joint-venture partnerships develop based on the project's size, risk profile, and expertise needed, says Deane. His recent work on the SR 520 Eastside Transit and HOV [high-occupancy vehicle] Lanes Project in Bellevue, Wash., was completed in conjunction with PCL Construction. The \$306-million size was "on the fence" of a joint-venture size, but the requirements of the project and its location encouraged the partnership.

The work, in an affluent area where the road served as the only access to high-end homes, included widening 2.8 miles of roadway plus replacing

two overpasses and other structures. The team also constructed general-purpose and HOV concrete access ramps along with three lid structures (tunnel like) over the road, with two providing access to new transit stops.

"This job fit well with PCL due to our individual expertise," he says. "It also gave us a smaller project to work on to see how we fit together for future partnering opportunities. We could get to know each other on a smaller scale."

A key part of the planning involved a task force that worked with the community and Washington State Department of Transportation to gain feedback on desired goals and amenities. "It was challenging to fit everything into the budget," he says. "We wanted to meet their needs but also manage expectations."

Working with communities has become a much larger part of the process, and Granite encourages that interaction at every level. "We recognize that the best-run business units and projects are the result of the highest functioning teams," says Dowd. "One very important way to nurture this culture of teamwork is by engaging as a team in the communities in which we work. We encourage and support our employees to engage with local communities."

Granite's 100-plus-year History

Granite Construction's history dates to the 1870s when granite was discovered in Watsonville, Calif. John T. Porter, his son Warren, and Arthur R. Wilson purchased the Logan Quarry and began to supply granite to builders. In 1900, the Granite Rock Co. was incorporated, followed in 1922 by the establishment of the Granite Construction Co., which focused most of its efforts on quarrying.

The firm adapted through the Great Depression and World War II, working on many infrastructure projects for the government. It purchased the Perkins Quarry and American Sand & Gravel in Sacramento, Calif., which laid the groundwork for its growth across the country. In the 1970s, it expanded to take on subway work, working on projects from San Francisco, Calif., to Washington, D.C.

Today, Granite is publicly traded and one of the 25 largest construction companies in the United States. Divided into four business segments (Construction, Large Project Construction, Construction Materials, and Real Estate), it reported revenues of \$2.3 billion in 2014. It has about 1700 salaried employees located in offices nationwide. It also operates a variety of sand and gravel quarries in western states.

Meetings a Must

This responsiveness to stakeholder feedback and attention to detail results from one key activity: meetings. "The key to success and our ability to overcome challenges is to have a lot of meetings," says Deane. On the SR 520 project, a variety of task forces and constructability reviews worked through every detail at each point. "Our plans are robust; we often produce 3- to 4-in.-thick binders of work scope." That can include pre-activity meetings with all qualified people, area-coordinator meetings, weekly and daily conferences for foremen, quality-incident reviews, and others.

Attention to detail is apparent on the Tappan Zee Bridge project currently



Precast concrete deck panels ready for installation on the Tappan Zee Bridge, the 3.1-mile-long, \$3.9-billion bridge in New York. Placement of precast concrete deck panels that are 12 ft long and 11 in. thick, and range in width from 22 to 45 ft.

Granite's Core Values

"You can't talk about Granite's culture without talking about our Code of Conduct and Core Values," says Brian Dowd, vice president of business development. Based on a document produced about 1940 by founder and first president Walter "Pops" Wilkinson, the code is ever present on walls and desks.

Included are key tenets in nine Core Values: Safety, Honesty, Integrity, Fairness, Accountability, Consideration of Others, Pursuit of Excellence, Reliability, and Citizenship. They include statements such as "Boldly contend for that which is right and firmly reject that which is wrong" and "Review each night the entire day's work, considering all mistakes and shortcomings, resolve to improve tomorrow, never making the same mistake twice."



As part of the Pennsylvania Rapid Bridge Replacement Program, membranes were used to enhance performance in concrete substructure abutments.

quality-control and quality-assurance teams.

Many of the challenges involve the basic logistics of such a large project. "The sheer size of the bridge makes it daunting," he says. "The logistics of moving workers and materials to where they are needed on a daily basis is one of the biggest challenges."

The project's first phase is scheduled to open later this year. "We're now well into the construction phase, with only a few design issues left, so we're mostly focused on the technical work groups and construction issues. Every element has its own challenges." The team also is quick to find innovations. "The lessons we learn on an early section are put to immediate use as we move into the next segment."

underway, in which the new 3.1-mile, \$3.9-billion New York bridge is having approximately 7000 precast concrete deck panels installed for the driving surface on the approach spans and the river crossing. The panels had to provide a 100-year service life, which required added attention to embeds, reinforcement, and other detailing. Special concrete mixture proportions were created to ensure the panels resisted corrosion.

"We had rigorous preproduction testing to approve the final design criteria," says Chris Leykam, project manager at Granite's Brooklyn location. Leykam's job is to manage technical work-group meetings and details that arise with issues related to the development of the specifications. Achieving that goal requires meetings with representatives from the client, designers, construction team, and

Encouraging an entrepreneurial spirit while focusing on team building ensures Granite will continue to innovate. "The magic of our culture has been passed from generation to generation," says James H. Roberts, CEO. "As the generations go on, Granite becomes stronger. We invest heavily in people because they are our greatest strength." 