VOL. 36, NO. 1 | WINTER 2018

SUPERSTRUCTURE

MUSEUM OF THE BIBLE

Delivered in Record Time

INSIDE THIS ISSUE

CLARK CONSTRUCTION

FROM THE CEO

What makes you passionate? What drives you to succeed? How do you think big?

Here at Clark, we've been thinking big for a long time. With 112 years behind us, we are continuously evolving. I joined Clark 20 years ago, and it is really exciting to see how far we've come and how far we'll go. Along with a deep bench of industry knowledge and experience, our people and culture are replete with an entrepreneurial spirit that shapes all that we do.

Within these pages, you'll see that "thinking big" means a lot of things. At the Museum of the Bible, it was taking collaboration with the client, design team, and trade partners to a new level to deliver a world-class, state-of-the-art museum in half the time. At The Wharf, it was creating a new Washington, DC neighborhood for the local community. For our design-build transportation projects, it's driving forward to bring faster, tailored solutions to our clients. For Fernando Arias, our new Director of Sustainability, it's building long-term, systemic resiliency strategies that provide value to our clients while improving human health and wellness. For Kris Manning, our Vice President of Safety, it's being passionate about planning for safety and a commitment to creating a climate of safety—a climate that you can feel—on our projects.

At A. James Clark Hall at the University of Maryland, thinking big also meant looking back and honoring our history. The new research and education facility will serve as the new home for the Fischell Department in the school of engineering, which is named after Mr. Clark. It is fitting that this building, also bearing Mr. Clark's name, will serve to inspire the next generation of engineers to think big.

I am proud of our teams' focus on brilliant execution. We get it done. That pride in execution is what drives innovation, because for us, innovation isn't just new, shiny technology; it's creating smart solutions to improve how we deliver value to our clients. That kind of innovation is an inextricable part of our culture and how we approach what we do every day.

2017 was a great year. It was a year full of energy, excitement, and accomplishments. While 2017 was fantastic, we are thinking big. We are looking forward to what's on the horizon for our company, our industry, and our people, not just in 2018, but beyond.

ROBERT D. MOSER, JR.
PRESIDENT AND CEO

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CLARK CONSTRUCTION

SUPERSTRUCTURE

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FEATURES

Photo by: Alan Karchmer

Museum of the Bible Delivered in Record Time

The Museum of the Bible is the latest addition to Clark's multibillion-dollar portfolio of monumental work in the United States. The team set a new standard for the construction of a cultural facility by ensuring that collaboration and open communication guided every step of the process.

Riding the Design-Build Highway

Major infrastructure upgrades and expansions are showing that transportation design-build projects are here to stay.

DEPARTMENTS

ON THE COVER

To create a one-of-a-kind cultural space, Clark surgically retrofitted and restored a refrigerated warehouse originally built in 1922.

Photo by: Alan Karchmer

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Rendering courtesy of Gehry Partners

Clark Selected to Build Eisenhower Memorial

The Eisenhower Memorial Commission and the General Services Administration have selected Clark Construction to build the National Dwight D. Eisenhower Memorial in Washington, DC. Gehry Partners and AECOM are the project designers.

Clark will transform a four-acre site into the first national presidential memorial of the 21st century, which will recognize Eisenhower's contributions to our nation as the 34th President and the Supreme Commander of the Allied Forces in World War II. Located south of the National Mall, the memorial will feature extensive landscaping and hardscaping with large monumental-grade elements including statuaries and inscribed stone blocks. The site also will showcase a 450-foot-long woven metal tapestry connected by a cable net system and supported by a series of 80-foot-tall, monumental-scale columns. Providing a dramatic backdrop to the memorial, the tapestry will feature an image of a peacetime scene of the Normandy coastline. In addition to the memorial, the team will construct a building which will house office space, a bookstore, public restrooms, and support facilities for the memorial's operation and maintenance.

Clark subsidiaries Clark Concrete and C3M are a part of the project team and will perform cast-in-place concrete and electrical work, respectively. Construction started in October, and substantial completion is slated for September 2019. ■

New Contracts

Across the country and in a variety of markets, Clark Construction Group and our subsidiaries have recently been selected to deliver a number of new projects. Our new work this quarter includes:

Rendering courtesy of SmithGroupJJR

COMMERCIAL

45 L Street

Construction of an 11-story cast-in-place concrete office building as part of the third and final phase of Trammell Crow Company's Sentinel Square development

Location: Washington, DC
Company: Clark Construction Group
Client: MetLife Investment Management
Developer: Trammell Crow Company
Architect: SmithGroupJJR
Completion: Fall 2019

RESIDENTIAL

750 North Glebe

Construction of a mixed-use complex featuring three distinct residential spaces, 62,000 square feet of ground-level retail, and a three-level parking garage

Location: Arlington, VA
Company: Clark Construction Group
Client: Saul Centers
Architect: WDG Architecture
Contract Amount: $164 million
Completion: Spring 2020

GOVERNMENT

San Francisco Police Department Traffic Company and Forensic Services Division Facility

Construction of a 90,000-square-foot crime lab and motorcycle police facility to further the city's continuing efforts for disaster readiness

Location: San Francisco, CA
Company: Clark Construction Group
Client: City of San Francisco Department of Public Works
Architect: HOK
Contract Amount: $100 million
Completion: Winter 2021

MASS TRANSIT

CTA Broadway Substation Upgrades

Restoration of the substation's envelope and interiors, replacement of traction power equipment with new gear, and construction of a new cable bridge to the CTA rail line tracks

Location: Chicago, IL
Company: Clark Construction Group
Client: Chicago Transit Authority (CTA)
Architect: TY Lin International
Contract Amount: $14 million
Completion: Spring 2019

Rendering courtesy of WDG Architecture

The sound barrier panels were removed and stored on a custom storage rack until they were ready for placement.

Atkinson Team Develops Innovative Sound Barrier Relocation Approach

The I-405/SR 167 Interchange HOV Direct Connector design-build project includes a direct flyover bridge to join the northbound and southbound SR 167 high occupancy toll (HOT) lanes with the I-405 high occupancy vehicle (HOV) lanes—and an interesting challenge to relocate and reuse a wall.

The Washington State Department of Transportation (WSDOT) had an existing 1,400-foot-long sound barrier that had recently been installed along the I-405. As the sound barrier was a relatively new addition, WSDOT expressed the desire to minimize waste and reuse the 150 wall panels for the I-405/SR 167 project. Atkinson's project team developed an innovative approach to achieve the client's request and conserve materials, funds, and time.

Reusing the existing sound barrier panels presented Atkinson with three challenges:

1. Overhead transmission lines onsite would prevent the team from using a crane. How would they move the panels safely?
2. The panels would break if laid down flat. How would the team prevent any damage to the 25,000-pound panels while in storage between locations?
3. The topography for the panels' new locations was different from the original location's terrain. How would the team adjust the panels so they align perfectly in their new placement?

Atkinson's project team tackled these challenges with innovative engineering and construction planning. During the design-build procurement phase, the team engineered a solution to remove the old panels, store them, and safely place them in their new location. Because the overhead transmission lines prevented the team from using a crane, the team came up with a solution to utilize the boom on a large excavator to safely "walk" the panels from their old location to the new location 100 feet up the roadside terrain.

In order to protect and store the panels until they were ready for placement, the Atkinson team built a custom storage rack. To engineer the new wall for proper placement of the panels at the new elevation, the team rearranged the panels like puzzle pieces to fit precisely into the new topography; the team moved the panels into a stepped footing design to ensure each part of the wall was the correct height. Atkinson's approach eliminated the impact that designing, fabricating, and trucking new sound barrier panels would have on the schedule.

Throughout the development and implementation of the solution, safety and efficiency were priorities. The I-405/SR 167 project team originally committed to complete the wall relocation within 18 weeks. Due to the team's innovative thinking and execution, they safely and successfully completed the operation in only six weeks. ■

Promoting Safety Through Planning and Personal Connections

What does it take to send the thousands of men and women who work on Clark jobsites home safely at the end of each day? If you ask Kris Manning, Clark's new Vice President of Safety, it requires a relentless focus on two things: planning and people. Clark's commitment to safety begins before the project team starts work in the field, with safety solutions engineered into a construction plan so that when a team steps onto a jobsite, it is already a safer place to work. During construction, Kris firmly believes that prioritizing people through relationship building, communication, and training is critical to ensuring a safe workplace from a project's groundbreaking through completion.

Planning for a safe project starts before a single member of the project team dons a hardhat. During the preconstruction phase, a project team examines every part of the project from a safety perspective to engineer potential hazards out of the job. "We use lessons learned and data analytics from similar past projects to determine which conditions are most likely to put a team member at risk for injury," Kris explains. With these tools, the team develops solutions for project-specific safety conditions. "We may find an opportunity for the concrete team to install anchors for fall protection when pouring a ceiling slab," Kris notes, "which will help protect the HVAC and painting trade partners who come afterward to work in that space." These solutions are then incorporated into the submittal, purchasing, and fabrication processes, and ultimately implemented in the field.

Kris' nearly ten years of self-perform experience with Clark Foundations, Clark Concrete, and Atkinson-Southern California has taught him that, sometimes, developing safer construction methods takes a bit of ingenuity. "Rebar sticking out of a slab on a jobsite poses an impalement risk," Kris explains. "The traditional construction method involves placing safety caps on each of piece of rebar. Clark Concrete eliminated this step by curling over the tops of the rebar, like the shape of a candy cane. This provides an extra level of protection for our jobsite team, without the need for caps." This simple remedy proved to be an effective and efficient solution to a common safety hazard. In this way, proactive planning becomes the first line of defense against site conditions that can put project teams at risk.

The work done during preconstruction lays the foundation for safety during construction. When the project moves to the construction phase, "Our commitment to a climate of safety is felt by every member of the team—from project executives to craftworkers—the moment they step onto the jobsite," Kris explains. To reinforce the importance of safety at every level, superintendents and safety professionals make it a priority to establish personal connections with craftworkers. These relationships spur daily conversations about jobsite conditions and safe work practices.

Proper training is an invaluable part of Clark's commitment to safety, as well. Toolbox talks, formal training sessions, and informal communications on the jobsite educate team members about safe construction methods and how to handle potentially dangerous situations. Clark's training centers on actions that team members can take on a daily basis that ensure a safe work environment and have a lasting impact on the safety and well-being of our workforce.

> *"At the heart of our planning and personal development efforts is a genuine concern for the well-being of the person working next to you."*
>
> *Kris Manning, Vice President of Safety*

Kris, a married father of two, does not underestimate the personal importance of his work. "The safety of our team not only affects our jobsites. It affects spouses, children, friends, and the community," he explains. This impact is a critical motivator as Kris leads the company's safety initiatives. "At the heart of our planning and personal development efforts," Kris reflects, "is a genuine concern for the well-being of the person working next to you." ■

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Photo by: Alan Karchmer

A TESTAMENT TO COLLABORATION

Delivered in Record Time, Museum of the Bible Sets New Benchmark for Construction of Cultural Facilities

MARKED BY GRAND ENTRANCES, EXPANSIVE CORRIDORS, INTRICATE ALCOVES, AND ELABORATE STAIRWAYS, the physical attributes of museums are often as significant as the precious artifacts they house. Due to their complex nature, these architectural marvels traditionally have long delivery timelines—until the Museum of the Bible. The latest addition to Washington, DC's cultural landscape, which opened its doors in November 2017, sets a new benchmark for the design and construction of cultural spaces. While typical museum projects take 10-12 years to complete, the Museum of the Bible team brought this world-class structure to life in less than half that time, without compromising quality or safety.

Clark led construction operations on the $254 million project, working in partnership with designer SmithGroupJJR and Museum leadership to deliver the state-of-the-art structure from concept to completion in just

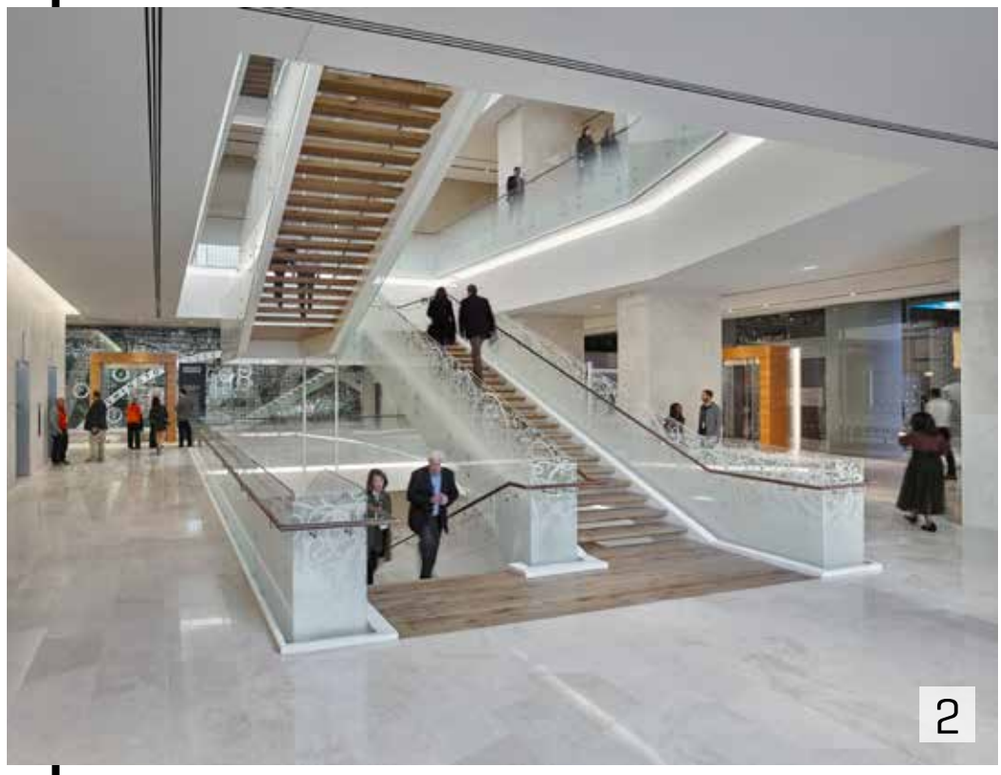
5 years (including 30 months of construction), setting a new industry benchmark for the design and construction of monumental facilities. Collaboration, technical know-how, innovative engineering solutions, and value-added services are hallmarks of the Museum and key factors in the project's expedited delivery.

For the client, establishing a high-performing, synergistic team was critical. As such, they selected partners based on their credentials as well as their ability to work as part of a cohesive group. The team's alignment around project goals, commitment to maintaining open lines of communication, working in the best interest of the project, and treating everyone with respect was led from the top down and yielded a solutions-oriented environment, which moved the project forward at record speed.

Clark joined the Museum team while the project was still in conceptual design. The firm's early involvement in the project enabled a close working relationship with Museum designer SmithGroupJJR and lead architect David Greenbaum. Working together from the initial stages to validate designs, evaluate design alternatives, and work through budget, logistical, and engineering challenges created a highly-efficient and collaborative work environment that accelerated decision-making. "Proactive cost estimating was critical during the design process and Clark helped us make adjustments to ensure we had a soft landing when the final bids came in. Together, we analyzed the extent of basement construction, structure retention and modification, central plant options, and even fireproofing alternatives in the schematic design and design development phases. No one enjoys the value engineering process, so instead, we focused on value management. Our collaborative, solutions-oriented approach allowed us to deliver a museum that met the client's progressive vision," said Greenbaum.

A close partnership with the Museum's four exhibit design teams also was a top priority. A special task force comprised of construction, design, technology, and exhibit design team representatives was formed to ensure early collaboration among stakeholders. This approach enabled the team to identify and proactively resolve last-minute coordination

The world-class facility is punctuated by striking, one-of-a-kind features throughout, including a 140-foot-long LED arcade ceiling [1], a 117-foot-tall, suspended monumental atrium stair with etched glass railings [2], and a 250-foot-long barreled curtain wall rooftop galley with striking views of the DC skyline [3].



Photos by: Alan Karchmer

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4

Photo by: Peter Cane

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Photo by: Alan Karchmer

challenges that often plague museum projects. Brian Flegel, Clark's Senior Vice President in charge of the Museum's construction recalled the level of teamwork on the project, saying, "The camaraderie forged in the earliest team meetings drove a level of accountability among every individual that I have not seen before. There were no heroes, only a team deeply vested in ensuring every individual's success...it was amazing!"

One of the most technically-complex projects in Washington, DC, the Museum of the Bible incorporates nearly every facet of construction, including demolition, historic preservation, adaptive reuse, renovation, expansion, and new construction. The project's location in a dense urban core with CSX trains to the south, an active government office building to the east, and a Metrorail line beneath, added additional logistical and safety challenges. The project team tapped into Clark's in-house expertise to address challenges with cost-effective solutions.

Innovative and meticulous schedule management was another crucial component of the team's success. To deliver the project in an expedited 30-month construction duration, the team saved time by deploying elegant engineering solutions, including starting critical foundations work before design documents were finalized. Another unique approach involved dividing the museum into two separate projects: the historic renovation as one, and the demolition and new construction as the other, which enabled turnover of the historic side to exhibit design teams a full year ahead of the grand opening. To further expedite exhibit spaces in the historic structure, the team constructed the building's central plant long before the overall Museum was complete. This tactic provided conditioned air to exhibit spaces at the earliest possible date.

Photo by: Alan Karchmer

The Museum of the Bible is among the most technologically-advanced museums in the world. Through cutting-edge technologies, such as digital docents, immersive theaters [4], interactive exhibits [5] [6], and sprawling LED displays [1], the Museum is revolutionizing the visitor experience and transforming the way museumgoers explore the narrative, history, and impact of the Bible. **S2N Technology Group** played a strategic role in helping the client advance their technology goals, setting the technology standards and low voltage technology budget for the facility. Once construction was underway, they acted as a single point of responsibility for low voltage operations, managing a team of more than ten trade partners and vendors while coordinating with the Museum's exhibit and lighting teams.

Clark's integrated services also helped the team maintain the ambitious construction schedule. During the project's earliest stages, Clark Foundations and Clark Concrete helped set the pace for construction by managing critical early scopes of work. Clark subsidiary S2N Technology Group assisted the client in achieving their vision for a highly-interactive visitor experience. From personalized digital docents to the Arcade's vast LED ceiling to the immersive World Stage Theater, the Museum is fueled by leading-edge technologies. Serving as a single point of coordination between the client, Clark, trade partners, and technical vendors, S2N streamlined management of the Museum's low voltage technology scope and helped save critical time in the final stages of the project.

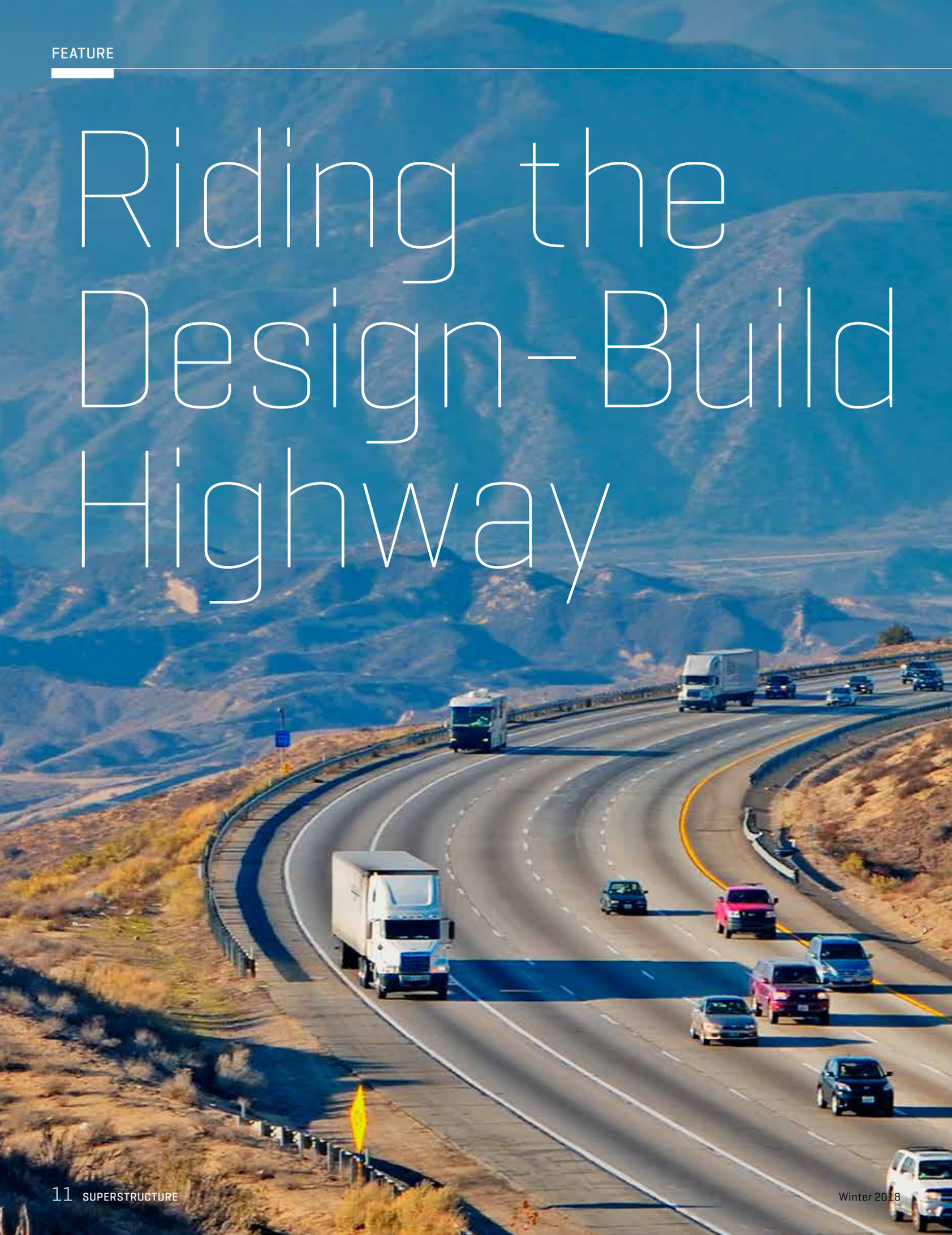
Now open to the world, the Museum of the Bible represents the future of cultural institutions. Not only is it revolutionizing the way visitors experience history, the story of its design and construction is changing the way museums come to life: it is a model of what can be achieved through creative engineering and superior collaboration. ■

TAKING COLLABORATION TO NEW HEIGHTS

The Museum of the Bible team set a new standard for the delivery of a cultural facility by ensuring that collaboration guided every step of the process:

- At each exhibit deliverable, all stakeholders came together to review the documents, facilitating open communication and allowing all voices and opinions to be heard at each critical step in the process.
- Clark, SmithGroupJJR, and the Museum's four exhibit design teams established a special task force early in the project to ensure they were designing and installing the proper infrastructure to eliminate changes that can cause delays during the final stages of museum projects. The raised access flooring system, which provides flexibility for designers and lighting consultants as the Museum's exhibits evolve, was one of the many solutions the team identified.
- With the client's budget firmly in place, Clark and SmithGroupJJR worked collaboratively to incorporate new features and finishes while evaluating ways to adjust other elements of the program. The team's streamlined decision-making process eliminated costly delays and ensured the finished Museum met the client's vision—functionally, aesthetically, and financially
- While no formal partnering agreement was in place, the Museum is often referred to as "an IPD project without an IPD contract." The team's alignment around project goals, and commitment to maintaining open lines of communication, working in the best interest of the project, and treating everyone with respect yielded a positive, solutions-oriented environment.

Riding the Design–Build Highway



WHAT STARTED OUT AS A TWO-LANE ROAD IS NOW A HIGH-SPEED INTERSTATE HIGHWAY. As infrastructure projects grow in number, size, and scope across the United States, this is a story that is repeating itself as states and local jurisdictions work to improve transportation infrastructure for their constituents. And many of them are turning to design-build delivery for their large-scale infrastructure upgrades and expansions.

In 2017, the American Society of Civil Engineers gave infrastructure in the United States a D+, and estimated that U.S. roads and bridges need approximately $2 trillion in improvements (the Federal Highway Administration names a number closer to $836 billion). With high demand from the public to improve transportation infrastructure, the proliferation of the design-build delivery method in road and rail work provides a means for public entities to speed up their improvement projects to bring much-needed upgrades to commuters faster than ever before.

To respond to this demand in the transportation market, Clark and its subsidiaries are providing niche expertise in design-build road construction that allows project teams to go above and beyond for clients with big needs and tight budgets. In particular, Clark's subsidiary Guy F. Atkinson Construction (Atkinson) has been and continues to serve at the forefront of best practice development and partnership with its design-build public clients.

With burgeoning popularity starting in the 2000s, design-build transportation projects are flourishing across the country as project teams form partnerships with public and state entities to deliver cost-optimal infrastructure that performs better and is delivered faster.

In the early 2000s, many firms and clients were beginning to explore the possible advantages of design-build work. Atkinson and other industry leaders worked together with the Washington State Department of Transportation (WSDOT) to develop design-build best practices; after collaborating to consolidate these practices, Atkinson won the state's first competitive design-build project. A decade and ten WSDOT design-build projects later, Atkinson has honed their process and expanded their capabilities for design-build transportation projects.

As design-build is operating at full speed in Washington, California projects are also taking off. In Atkinson's Southern California office, traditional design-bid-build projects are still the standard. But with the I-15/I-215 Devore Interchange, Atkinson demonstrated in California that design-build can work, and work well.

I-15/I-215 DEVORE INTERCHANGE

The Devore Interchange transformed one of the worst grade-related bottlenecks in the country. The project improved safety and reduced traffic congestion by adding one new lane and two miles of truck bypass lanes in each direction, building a new I-15 mainline northbound connector to restore route continuity, and reducing operational deficiencies and functional problems related to weaving trucks.

Completed in April 2017, the project originally was selected as one of ten state-administered design-build pilot projects. Atkinson's design-build proposal received the highest technical score, and included eight approved alternative technical concepts that added a number of project betterments to Caltrans' conceptual design.

By providing project upgrades like northbound route continuity, eliminating sub-standard hook ramps, reducing bridge construction by 20%, and reducing right-of-way acquisitions

by 12 acres, Atkinson provided numerous conceptual improvements with no net additional cost to the owner. Not only that—because of the team's excellent utilization of the design-build method, crews opened the interchange to traffic over a year ahead of the planned schedule.

When asked about the project, Chief Estimator Drew Nelson focused on one crucial aspect of the project's success: communication. "We had the right people on the project putting the right foot forward together. During design, we communicated really well with the owner, which allowed us the flexibility to adapt and tackle challenges head on. We both wanted to succeed together. We brought all of the decision makers to the same room, and it made all the difference."

The Devore Interchange was one of the most successful projects of Caltrans' 10 pilot design-build projects. Caltrans calls the project "Design Build Done Right," and awarded the project team silver and gold partnering awards throughout construction. Once complete, the project received the Excellence in Partnering award, the highest level of recognition for partnering on Caltrans projects. In 2017, ENR awarded Devore with Best Highway/Bridge Project of the Year for the Region.

The Devore Interchange project improved safety and reduced traffic congestion by adding one new lane and two miles of truck bypass lanes in each direction.

SHIRLEY CONTRACTING DELIVERS EAST COAST DESIGN-BUILD

Shirley Contracting, a leader in design-build delivery in Virginia, is showing that not all design-build transportation projects are taking shape on the West Coast. Most recently, Shirley Contracting delivered the $122 million I-64 Widening Segment I project, which marked Shirley's 18th design-build project with the Virginia Department of Transportation (VDOT).

The design-build project spanned 5.6 miles of road in Newport News, VA, and its completion has garnered high praise. The project was delivered in only 22 months and within budget, thanks to Shirley's hard work and design-build approach. After breaking ground on Segment I in September 2015, crews worked around the clock to construct an additional 12-foot travel lane and 12-foot shoulder in each direction on I-64, as well as repairing and widening four bridges, demolishing and reconstructing two new bridges, lengthening on- and off-ramps, constructing sound barrier walls, and adding low-maintenance landscaping.

At the ribbon cutting ceremony, Governor Terry McAuliffe commented, "on budget and on time—those are my four favorite words as a governor." Five days after the ribbon cutting ceremony for Segment I, VDOT awarded Shirley the $178 million design-build contract for Segment III of the I-64 Capacity Improvements Project, which will begin in 2018.

I-405/SR 167 Interchange HOV Direct Connector

In Renton, WA, Stuart Moore is the Senior Project Manager on the I-405/SR 167 Interchange HOV Direct Connector. The $116 million design-build project consists of a direct flyover bridge to join the northbound and southbound SR 167 high occupancy toll (HOT) lanes with the I-405 high occupancy vehicle (HOV) lanes. The project also included the complete relocation of a sound barrier, which is detailed further in this issue's innovation section on page 5.

Stuart and his team worked with WSDOT to turn project concepts into concrete plans: whereas the owner's original concept included widening both sides of SR 167 and extensive hillside excavation, Atkinson and project engineer Jacobs Engineering collaborated to come to a final design that lessened environmental impact, waste, and the cost of the project. The project now involves combining two exit ramps on I-405, reducing excavation by 100,000 cubic yards, and reallocating materials onsite to circumvent matter removal. The Atkinson team developed three alternate design concepts to eliminate all widening in the southbound direction and reduce the impact to permitted wetlands by 19,786 square feet. The team's creative problem solving has led to a design that not only eases traffic impact during construction and improves traffic flow afterwards, but also dramatically reduces the quantity of work to shave three months off of the project timeline.

DRIVING FORWARD

Design-build best practices are constantly improving, and the rate of design-build transportation projects show no sign of slowing down. In 2015, the Washington state legislature passed a funding package known as "Connecting Washington" which allocates $16 billion for highway projects, and Sound Transit has a similar funding package dedicating $54 billion to 63 miles of light rail. Other states, including California and Virginia, continue to look to design-build delivery for their largest and most important roadway improvements.

For the road ahead, the Atkinson team is focused on a number of new and ongoing opportunities, including the advance of light rail projects in Washington state. Above all, Atkinson is committed to providing their project teams with nuanced, well-rounded expertise, and maintaining the reputation and relationships that have facilitated such successful projects. ■

Bottom: The I-405/SR 167 project included the relocation of a temporary sound barrier; Top: The project's final design, which combines two exit ramps on I-405, lessens environmental impact and waste and reduces the cost of the project.

Photos by: Dominique Muñoz

EXPANDING HORIZONS: GREENBUILD 2017 AND BEYOND

By Fernando Arias

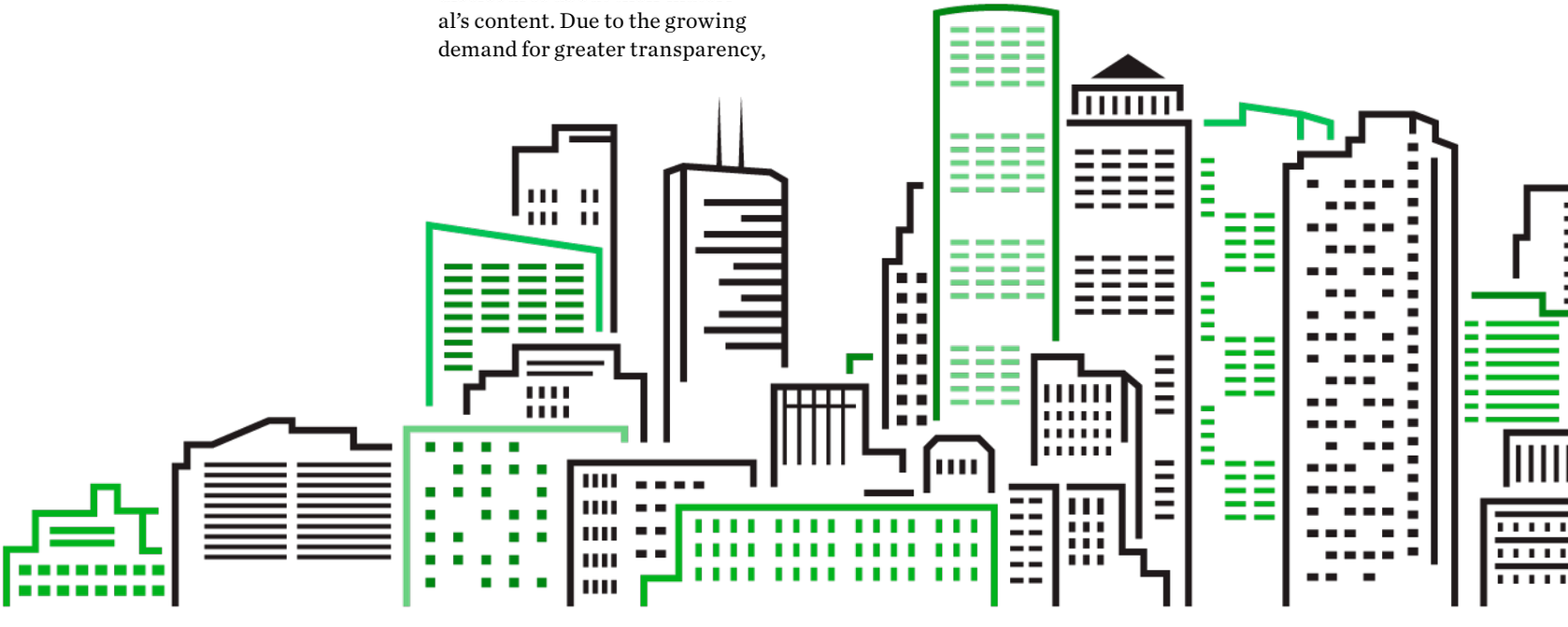
Net zero ready buildings are here. That's a bold statement, right? Though the concept goes by several names, such as zero net energy (ZNE) building, or net zero building, the general goal is to deliver a building with zero net energy consumption. While this might seem like a challenging feat today, we saw at the 2017 Greenbuild in Boston that our industry is constantly pushing best-case innovations closer to reality. On-site energy generation has strengthened its business case with lower costs for solar installations on buildings and battery energy storage, and Greenbuild attendees saw exciting demonstrations from Tesla's Powerwall for residential energy storage.

In addition to net zero ready building, the conference presented other exciting ideas, including the proliferation of green building certifications focused on the health and wellness of building occupants. The growth of the LEED® system and its latest version continues to transform the market by requiring manufacturers to make even deeper disclosures about their material's content. Due to the growing demand for greater transparency, the AEC industry is also pushing to design buildings and interiors that not only dramatically reduce carbon emissions, but also improve tenant health and wellness with building certifications like the WELL Building Standard and the newer Fitwel system from the Centers for Disease Control and Prevention (CDC) and the General Services Administration (GSA).

Innovative green building certification systems are coming together to provide tangible benefits for clients via the triple bottom line—social, environmental, and financial—in ways that we haven't seen before. This shift from "check-list" sustainability methods to more nuanced green building strategies allows our interdisciplinary Clark teams to tailor how we approach preconstruction and construction on our projects. From wastewater treatment plants and utility plants to high-rise residential and commercial building projects, different end-users and

THE LOW DOWN ON NET ZERO BUILDINGS

The Department of Energy defines net zero buildings as a building with zero net energy consumption, meaning the total amount of energy used by the building on an annual basis is roughly equal to the amount of renewable energy created on the site. This year's Greenbuild emphasized the concept that a net zero ready building is easier to achieve than ever before through deeply retrofitting existing building systems.



GREEN CERTIFICATIONS: A QUICK GUIDE

LEED v4
USGBC's LEED system is still the flagship of sustainability in the United States. LEED v4 was adopted in October 2016. The increasing rigor of the program is driving market trends to make resilient structures more attainable—and affordable. While USGBC hinted at v4.1, it won't be a complete overhaul, but rather a small reiteration with relatively minor changes.

Fitwel
The Centers for Disease Control and Prevention and the General Services Administration recently partnered to launch Fitwel, which targets building optimization to support occupant health and wellness.

SITES
Designed to develop sustainable landscapes and ecologically resilient communities, SITES does not limit itself to buildings. Potentially eligible projects include national parks, corporate campuses, and urban streetscapes.

WELL Building Standard
Aimed at advancing the well-being of building occupants, this system features a flexible framework and holistic approach to improving employee productivity, engagement, and retention.

Living Building Challenge
This challenge throws down the gauntlet and targets net zero buildings. Buildings are treated like organisms interacting with the environment in a way that gives back more than it takes.

environments necessitate a situational approach to achieve the best outcome. With more tools in the marketplace, we can address our clients' needs across a range of risks and markets.

We also see time and again that introducing sustainable solutions on a project has financial benefits for its owner. Many individuals and organizations now look to work and live in spaces that incorporate health and wellness initiatives. This focus, which often increases tenant and employee retention, has the additional benefit of lowering building life cycle operating costs through energy efficient lighting and higher performing HVAC systems that can be monitored via building management dashboards like the Arc Skoru, which was officially launched in 2016 by the Green Business Certification Inc.

Retrofitting existing buildings and ensuring performance-based operations was also a big trend at Greenbuild—and a testament to the adage reuse, reduce, recycle. This approach can save the owner or facilities operator huge variable costs over the life of the building while also minimizing the building's impact on the environment via controllable emissions and optimum energy use.

As LEED v4 progresses with a forthcoming "v4.1" update, more green systems compete for value, and net zero buildings become marketable, Clark is joining the industry's movement from near-term, check-list approaches toward more long-term, systemic sustainability strategies that also factor the resiliency, health, and wellness of our environments and communities. The new landscape of sustainability is more complex than ever. As it continues to evolve and adapt to continuously escalating environmental risk, Clark, along with our partners and clients, are presented with a tremendous opportunity to take part in the industry's transformation.

It's exciting, and much needed. And the best part? It literally pays off. ■

Fernando Arias *is Clark's new Director of Sustainability. Fernando's extensive experience in environmental policy and his holistic focus on the resilience of buildings, and the health and wellness of occupants provides long-term operational benefits and adds value to our clients' green objectives.*

PROJECT MILESTONES

This quarter, our project teams across the country reached some exciting building milestones:

UNDERWAY

Academic Building Replacement at UC Hastings
Clark officially broke ground on the state-of-the-art academic facility at University of California, Hastings College of the Law. Designed to achieve LEED Platinum certification, the new building is the first step in the university's long-range campus plan to develop a vibrant and interactive academic village in the heart of San Francisco. The new 58,000-square-foot building will enable UC Hastings to provide a more cohesive campus experience by replacing and consolidating student, faculty, and staff spaces currently located in Snodgrass Hall. The scope of work includes classrooms, offices, legal clinics, a conference center, as well as indoor and outdoor student life spaces.

Photo courtesy of University of California, Hastings College of the Law

TOPPING OUT

Photo by: Frank Ruggles

National Museum of the United States Army
Carrying the U.S. Army and POW/MIA flags, a final steel beam lowered into place marked the top out of the National Museum of the United States Army. Passing this critical milestone, the project team, U.S. Army, and The Army Historical Foundation are one step closer to the capstone museum of the Army Museum Enterprise, which will serve as a testament to over 240 years of Army history and traditions. The 188,000-square-foot museum will be comprised of 2 adjoining buildings on a 46-acre site which will feature numerous outdoor memorial and program spaces.

St. Matthew's Redevelopment
Clark Concrete celebrated the topping out of St. Matthew's Redevelopment in Washington, DC. The 320,000 square-foot project is comprised of an 11-story apartment building with two levels of below-grade parking, and a church on the ground level. The church's exterior showcases a curved and battered architectural concrete wall clad with stone. To construct this complex feature, the team created three full-sized mock-ups to achieve the architect's desired finish. Clark Concrete poured the wall in three lifts using a pea-stone concrete mix and PVC pipes to distribute concrete evenly and provide consistent consolidation.

Argonne Materials Design Laboratory
The Argonne Materials Design Laboratory recently topped out at the Argonne National Laboratory. The 110,000-square-foot building is a component of the Department of Energy's Strategic Laboratory Initiative. The Materials Design Laboratory will be the final building to complete Argonne's Energy Quad—a group of four adjoining buildings designed to maximize collaboration, drive discoveries, and accelerate innovation between energy and material scientists. Once complete, the new facility will connect to the Energy Sciences Building and Advanced Protein Characterization Facility, both of which Clark completed in 2013.

COMPLETE

A. James Clark Hall
The Clark team celebrated the dedication of the University of Maryland's A. James Clark Hall, a 184,000-square-foot facility that will catalyze engineering innovation and bioengineering breakthroughs and serve as a hub for new partnerships and collaborations throughout the Baltimore-Washington region. The new structure provides research and academic space for the Fischell Department of Bioengineering. The new building features atrium space, a two-story flexible open laboratory space, flexible classrooms, optical laser laboratories, imaging laboratories, electromagnetic and radio frequency interference shielded spaces for sensitive equipment, and a vivarium. The building exterior is comprised of curtain wall with aluminum baguette sunshades, masonry, cast stone accents, and metal wall panels.

Photo by: Duane Lempke

The Wharf

A 19-acre waterfront site in Southwest Washington, DC has been transformed into a vibrant mixed-use community, complete with two residential buildings, a Class-A office building, a 278-room 4-star hotel, a yacht club, 2 parks, and a parking garage. The project team constructed a 501-unit apartment building, which features The Anthem, a 6,000-person music venue on the first 5 levels. The 134-unit condo building features a rooftop amenity space with an infinity pool and private penthouse terraces. The 12-story Intercontinental Hotel contains 278 guest rooms, 6,000 square feet of retail, 4,000 square feet of meeting space, and a 5,000-square-foot ballroom. The 225,000-square-foot office building features decorative steel arches that connect to adjacent buildings. To mark the opening of the new waterfront community, hundreds of thousands of people attended a four-day grand opening event, with a concert headlined by the Foo Fighters at The Anthem.

Salesforce Tower

Salesforce Tower is complete and open for business. The monumental Class-A office tower climbs 61 stories and 1,070 feet to take its place in the San Francisco skyline. Constructed by Clark and Joint Venture partner Hathaway Dinwiddie Construction, the city's tallest high-rise features of a uniform steel and glass curtain wall system.With high performance, low-emissivity glass accompanying the spectacular views afforded by floor-to-ceiling windows, the project is designed to achieve LEED Platinum certification.

Why We Give Back

An interview with the women who make up "Builders at Bliss" at Fort Bliss Replacement Hospital:

Gina Chapa Fuentes
Ana Guzman
Liliana Gallegos
Lisa Haisan
Janeth Holguin Cano
Geeta Kudalkar
Cara Lanigan
Sofia Martin
Kayla Morales
Elizabeth Mendoza
Hannah Nicholson
Amanda Rabah
Jessica Rau
Jessica Saenz
Estefania Soto
Fabiola Suarez
Taryn Swopes
Marisela Tellez
Kayla Valdez

OSHA reports that women make up only 9% of the U.S. construction industry. With women accounting for nearly half of their own project team, the women on the Fort Bliss Replacement Hospital project are working to increase that industry statistic. They call themselves "Builders at Bliss" and they are on a mission to inspire and motivate young women to pursue higher education and a future career in STEM fields.

How did Builders at Bliss get started?

Cara Lanigan, Vice President: It started with a potluck with the women on the project. As our team grew, we organized more events. We hosted a meeting to discuss Sheryl Sandberg's book, *Lean In: Women, Work and the Will to Lead*. After that event, we decided we wanted to focus on connecting with our community while providing professional development for the women on our project through networking opportunities.

What types of events have you organized?

Lisa Haisan, Project Engineer: We work with many local schools to host events that encourage young girls to pursue degrees in STEM. Our team comes up with engaging STEM-focused activities to spark their interest in those fields.

Taryn Swopes, Assistant Superintendent: One of our favorite events was building popsicle stick structures with girls at AOY Elementary School. We gave the girls 100 popsicle sticks, a paper plate, and tape, and their objective was to build the tallest structure that could withstand being pushed one foot across the table. We taught them basic knowledge about solid foundations and structures. It was fun to see everyone work together to create a structure based on what we taught them!

Jessica Rau, Project Engineer: Recently we used the holidays to help make science fun! We taught the girls how molecules react to each other and made "snow globes" by combining oil, water, food coloring, and glitter, and then dropping in Alka-Seltzer tablets to activate the ingredients. We all had a blast!

Hannah Nicholson, Engineer: At Young Women's Leadership Academy, we taught girls the importance of networking, and put our skills to the test with a few fun activities. We've also done a few "non-STEM" activities with the academy which have been fun, like Christmas caroling in the local neighborhood. It was nice to interact with the girls in a different setting.

Why do you think it's important to encourage girls to explore STEM?

Ana Guzman, Engineer: For women—young or old—entering the STEM field can be intimidating, and deter many from pursuing a career in the industry. We believe it is part of our job to serve as role models and mentors to young girls so that they are confident and emboldened to explore the world of STEM. It's important to not only encourage young girls to explore careers in STEM, but also to provide hands-on, real-life examples they can interact with and learn from.

Geeta Kudalkar, Project Engineer: It touches our hearts to see how the time we invest in these young women by sharing our stories of successes (and failures!) motivates them to learn more about STEM and potentially pursue a career in the industry! They have so much drive and optimism for the STEM fields and we love that we get to help support that.

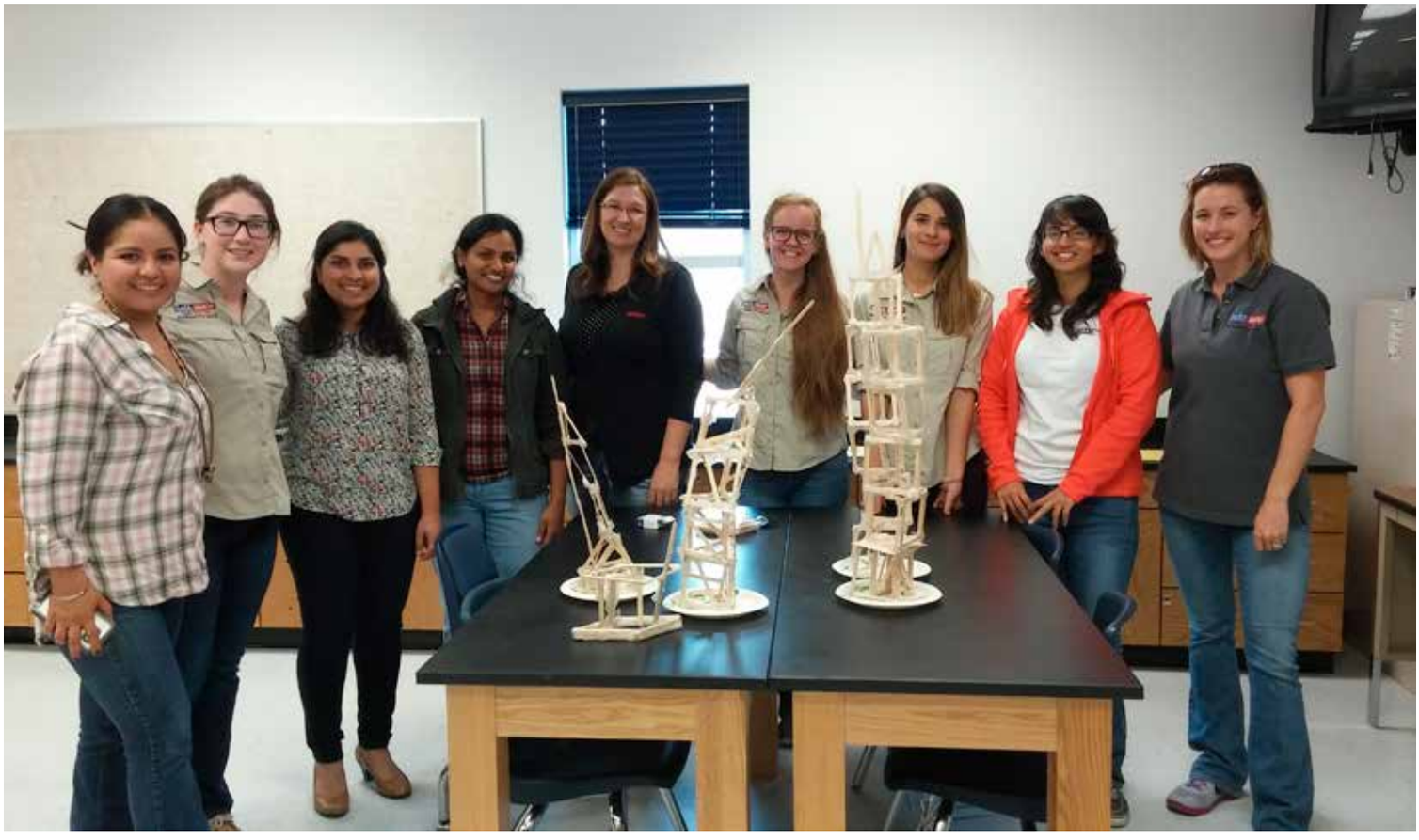
What impact has Builders at Bliss had on your own team?

Sofia Martin, Engineer: Spending time with these girls has developed a sincere appreciation for our careers and work, as well as a passion to continue learning and evolving into better professionals and role models.

Kayla Morales, Assistant Superintendent: Builders at Bliss has made our team aware of the important roles we play not only professionally, but socially, and in our community. Our goals should not be limited to just completing a construction project, but also to give back and contribute to the community around us. Working and interacting with the young girls in the El Paso community has shown us the need and desire for female figure mentors in the STEM industry.

What's the most rewarding part about working with girls through Builders at Bliss?

Amanda Rabah, Project Engineer: Seeing someone at a young age with big goals for the future, and being able to help them reach those goals, is very rewarding. These girls are eager to listen and learn, and hopefully we can make an impact by instilling in them the enthusiasm, motivation, and discipline it takes to reach their goals. ■



CLARK ANNOUNCES OFFICER PROMOTIONS

Jim Calvo
Vice President, National Marketing and Proposal Development

Jim has provided leadership, continuity, and creativity to Clark's Mid-Atlantic Marketing team since joining Clark in 2005. With more than 20 years of experience in the industry, he has played a major role in the company's pursuits, ranging from Nationals Park in Washington, DC to the ECB2 project for the U.S. Army Corps of Engineers in Fort Meade, MD. As Vice President, Jim will collaborate with business unit leaders, marketing directors, and members of the marketing network to lead our marketing and proposal development efforts throughout the country.

Kevin Legge
Vice President
Western Region

Since joining Clark in 2005, Kevin has delivered a number of successful projects in the San Diego area, including the USC Galen Center, UC San Diego Village at Torrey Pines East, the FBI San Diego Field Office, and Marriott Marquis San Diego Marina Meeting Space Expansion. Kevin recently led the successful pursuit of the UC San Diego North Torrey Pines Living and Learning Neighborhood design-build project. As Vice President, Kevin will provide executive leadership throughout the region and on the design and construction of the North Torrey Pines Living and Learning Neighborhood.

Jesse Wadeson
Vice President
Mid-Atlantic Region

Jesse joined Clark in 1999 and, after working on several residential projects in the Mid-Atlantic Region, began working on quality control procedures and initiatives on numerous projects. Throughout his tenure with Clark's quality team, he has contributed to projects across the eastern half of the United States, including the National Museum of African American History and Culture, University of Kansas Central District Development, the Miami Beach Convention Center, Frost Tower, and most recently, The Wharf. Currently, Jesse leads Clark's eastern quality team to ensure that Clark delivers quality on every job.

EMILY JORGENSON NAMED AGC OF DC SAFETY PROFESSIONAL OF THE YEAR

Division Safety Manager Emily Jorgenson was recently named Safety Professional of the Year by the Associated General Contractors (AGC) DC chapter for her work on The Wharf in Southwest Washington, DC. Throughout construction of The Wharf, and during the crucial months leading up to its grand opening, Emily served as an exemplary manager who built a culture of safety based on mutual respect and appreciation.

Vice President Mark Chandler stated, "Emily is a team player. She goes beyond her role to do whatever she can to make the job better and keep things on track. Each and every day, she did whatever it took to make sure all 1300+ craftspeople went home safely to their loved ones." ■

VICE CHAIRMAN BILL CALHOUN EARNS NATIONAL HONORS

Bill Calhoun, Vice Chairman of Clark Construction Group, was recently elected as a member of the National Academy of Construction (NAC). The NAC chose this year's 28 inductees from among 300 industry leaders as a celebration of their career achievements and contributions to the engineering and construction industry. The NAC, established in 1999, is an organization of industry leaders who have made outstanding contributions to the design and engineering industry. Bill also recently received the Glenn L. Martin Medal in recognition of his achievements and service to the A. James Clark School of Engineering at the University of Maryland. The Glenn L. Martin Medal honors individuals who have contributed to the mission and ideals of the A. James Clark School. ■

THE WAY WE WERE

The Wharf, July 2015

The photo above, snapped in July of 2015, shows the 19-acre site of The Wharf just shy of being completely excavated—less than one year after the project broke ground. Our project team built a 2,000-foot-long bulkhead parallel to the Potomac River's edge to hold back the flow of water before removing more than 300,000 cubic yards of dirt from the shoreline to make way for the mega mixed-use project. Clark Foundations drove more than 2,000 piles, sometimes 30 per day, to support the excavation.

Fast forward two years, and this stretch along the Potomac River in Southwest Washington, DC is now a bustling waterfront destination overflowing with restaurants, retailers, residences, businesses, and monumental views. ■

The Wharf, October 2017

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A. James Clark Hall
University of Maryland, College Park

Photo by: James Ewing

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