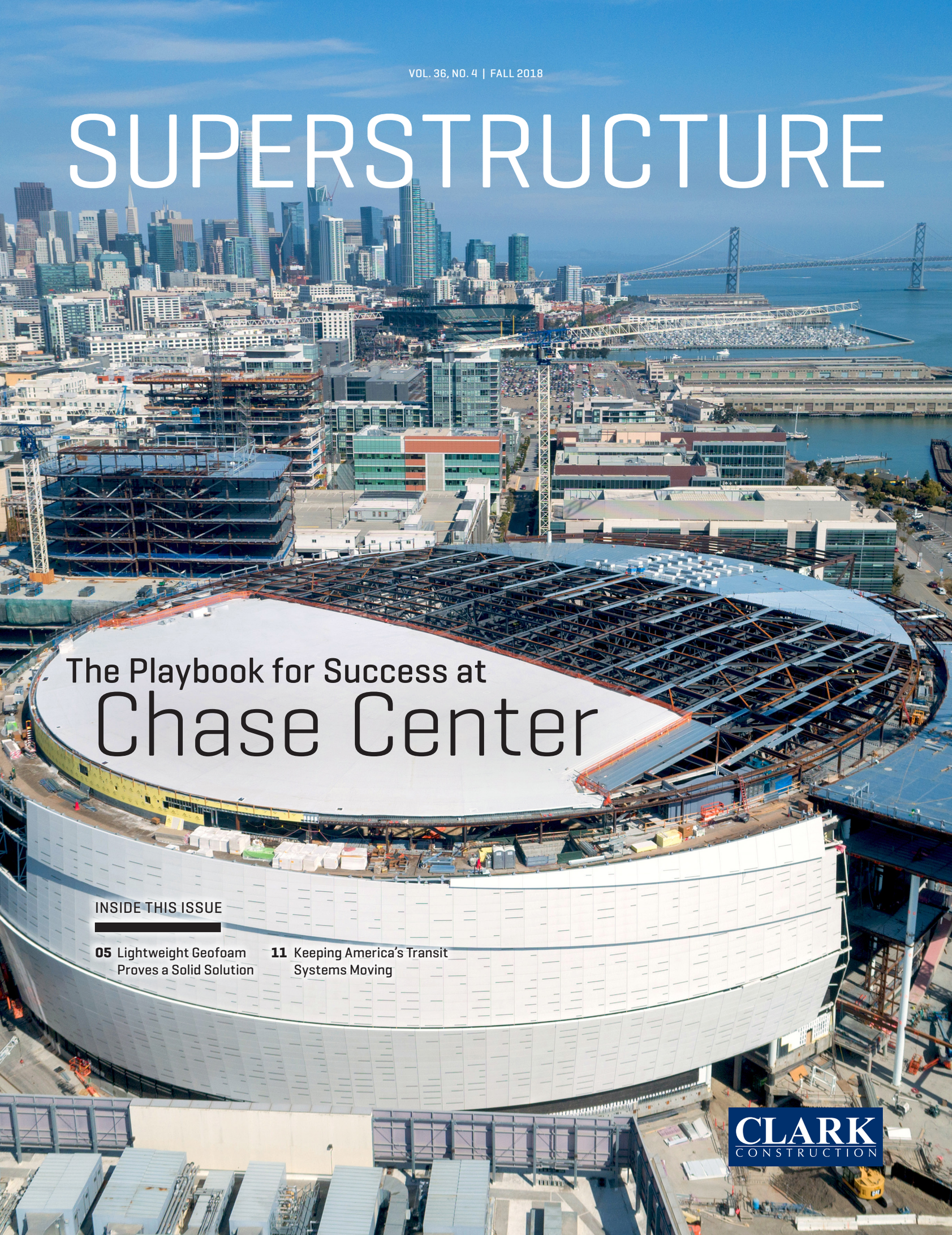
VOL. 36, NO. 4 | FALL 2018

SUPERSTRUCTURE



The Playbook for Success at Chase Center

INSIDE THIS ISSUE

CLARK CONSTRUCTION

FROM THE CEO

FIRST, YOU HAVE TO STEP BACK AND SEE THE BIG PICTURE. Then you have to step forward and make it happen. Around the country, our cities are undergoing incredible transformations. New towers emerge to reshape iconic skylines. New venues open to reorient entire communities. New roads and complex infrastructure drive forward critical change to enhance how we connect to the world around us.

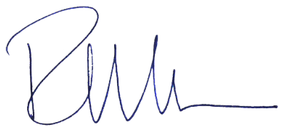
While our communities see these changes happening every day before their eyes, the casual observer might not realize that the most important precursors to these changes happen years before the first shovel breaks ground. As construction becomes increasingly complex, the planning and preconstruction phases of projects are progressively vital to brilliant project execution.

Take the Chase Center, featured in this issue. There are more than 1,250 people onsite delivering $2.3 million of work per day. Walking by the site, it might look like chaos to see so much happening at once. In reality, it's the opposite of chaos. Every day is the deliberate culmination of nearly four years of planning. The team's 200-page schedule details 24,000 construction activities. That meticulous level of detail has led to a project that, two and a half years after breaking ground, is on schedule to the day.

Our teams know what it takes to plan successful projects for our clients. Our C3M team, also featured in this issue, has a deep bench of industry experience and decades of data to support their clients' big picture goals, from improving existing infrastructure to jump-starting citywide mass transit systems. In Washington, Atkinson's teams show that planning isn't just going with the tried-and-true methods. It's strategically evaluating what will bring the most long-term value and being flexible enough to find the best solution.

We want to plan successful foundations for all aspects of our work. The building blocks of success—experience, relationships, passion, and determination—apply to every piece of our projects. Most importantly, a solid foundation allows us to engineer safety into our jobs from the very beginning. It allows our safety professionals like Seth Randall—recently named a Rising Star of Safety by the National Safety Council—to see the big picture and help keep our jobsites safe.

Thoughtful planning and preconstruction means understanding the full scope of work, from concept to completion. Our extensive preconstruction efforts, like that of the new Washington State Convention Center Expansion, build the foundation for all that we do and allow us to move forward effectively. Then, with sure footing on solid ground, we can step back, see the big picture, and bring that picture to life.



ROBERT D. MOSER, JR.
PRESIDENT AND CEO

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CLARK CONSTRUCTION

SUPERSTRUCTURE

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FEATURES

Relentless Planning "Off the Court" is Paying Big Dividends on Site
Clark is working alongside joint venture partner Mortenson Construction to deliver the colossal development in time for the 2019-20 NBA season. As the game clock winds down, the project team is laser-focused on a strong finish.

C3M Power Systems is Delivering the Infrastructure that Keeps America's Transit Systems Moving
In the short time since its inception, C3M has already made a name for itself in the transit market—one that it intends to build.

DEPARTMENTS

ON THE COVER
In September 2018, the Chase Center project team reached a significant construction milestone: completion of structural steel.

Photo courtesy of Golden State Warriors

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Shirley Projects Underway in Virginia

Backlick Road over CSX Railroad Bridge Replacement

Shirley Contracting is paving the way for faster and safer travel in Virginia. In recent months, Shirley has been awarded a number of projects designed to strengthen infrastructure throughout the state.

The Shirley team was awarded a $25-million design-build contract for Route 28, Phase 3—its second Public-Private Partnership (P3) project with Prince William County. Shirley and project engineer Dewberry will widen 1.3 miles of roadway, converting the existing four-lane facility to a six-lane divided section that includes structural improvements to the bridge over Broad Run. Design is currently underway; completion is scheduled for the spring of 2022.

Shirley is also partnering with the Virginia Department of Transportation (VDOT) on four highway and bridge construction projects. The Shirley team has mobilized on a $5.8-million bridge replacement project as part of the agency's Atlantic Gateway suite of projects focused on the I-95 corridor between Washington, DC and Fredericksburg, VA. The project team is replacing the existing bridge that carries Backlick Road over the CSX Railroad with a slightly higher bridge that increases vertical clearance for the rail lines. The bridge is scheduled to reopen to traffic in December 2018, with final completion slated for 2019.

Shirley is also underway on the agency's $19.5-million design-build Warrenton Southern Interchange project. Dewberry is the project engineer. The project includes design and construction of a grade-separated interchange at US 15/17/29 and US Business 15/17/29. The Shirley-led team utilized the Alternative Technical Concepts process to provide VDOT with an innovative design-build solution. Design is nearly complete, and construction is anticipated to start in the fall of 2018. Completion is scheduled for the fall of 2020.

Following the successful completion of the I-64 Segment I project in December 2017, VDOT awarded Shirley and Dewberry a $178-million design-build contract for the I-64 Capacity Improvements Segment III project. The scope of work includes widening more than eight miles of I-64, adding one new lane and one new shoulder, reconstruction of the existing pavement, constructing two new bridges over Queen's Creek, and repairing and widening four existing bridges. The project is anticipated to be completed in the fall of 2020.

The Shirley/Dewberry team was also awarded VDOT's $252-million Route 7 Corridor Improvements project in Fairfax County. The design-build team will widen 6.8 miles on Route 7 from four to six lanes from Reston Avenue to Jarrett Valley Drive. The team will construct a new bridge and a pedestrian underpass, and perform intersection improvements. Design is underway and construction is slated to begin in the spring of 2019; final completion is scheduled for the summer of 2023. ■

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:

TRANSPORTATION

I-15/Limonite Avenue Interchange
Reconstruction of the existing tight diamond interchange to a partial cloverleaf interchange with spread diamond ramps, loop entrance ramps, and a new bridge
Location: Eastvale, CA
Company: Atkinson Construction
Client: County of Riverside Transportation Department
Engineer: Dokken Engineering
Completion: Winter 2020

I-5/Portland Avenue to Port of Tacoma Road, Southbound HOV
Widening and reconstruction of I-5 to accommodate HOV lanes in both directions, as well as one additional northbound general-purpose lane
Location: Tacoma, WA
Company: Atkinson Construction
Client: Washington State Department of Transportation
Delivery Method: Design-Build
Completion: Fall 2022

Cow Camp Road, Phase 2
Construction of a new road, including grading, roadway, retaining walls, sidewalks, and curb and gutters, as well as a 1,350-linear-foot, cast-in-place box girder bridge
Location: Rancho Mission Viejo, CA
Company: Atkinson Construction
Client: Rancho Mission Viejo Development
Engineer: Michael Baker International
Completion: Winter 2020

Rendering courtesy of NBBJ

RESIDENTIAL

Square 696
Construction of a 14-story, multi-family residential tower with elaborate amenity spaces and a landscaped roof
Location: Washington, DC
Company: Clark Construction Group
Client: Tishman Speyer
Architect: Handel Architects
Completion: Spring 2022

MASS TRANSIT

PAAC Automatic Trip Stop Replacement
Replacement of automatic trip stop system components on the Port Authority of Allegheny County (PAAC) light rail system, and on board the entire fleet of light rail vehicles
Location: Pittsburgh, PA
Company: C3M Power Systems
Client: Ansaldo STS and the Port Authority of Allegheny County
Delivery Method: Design-Build
Completion: 2021

AVIATION

Plane Train Tunnel West Extension
Construction of a 700-foot tunnel extension of the existing Plane Train automated people mover system at Hartsfield-Jackson Atlanta International Airport
Location: Atlanta, GA
Company: Clark-Atkinson-Technique, A Joint Venture
Client: City of Atlanta
Architect: McMillen Jacobs Associates
Completion: 2022

SFO International Terminal Building Renovation, Phase 1
Renovation of the International Terminal Building at San Francisco International Airport to improve passenger processing capabilities, expand concessions, and enhance public areas
Location: San Francisco, CA
Company: Clark Construction Group
Client: City and County of San Francisco
Architect: SOM/TSAO/Kuth Ranieri, JV
Delivery Method: Progressive Design-Build
Completion: Spring 2021

Rendering courtesy of SOM/TSAO/Kuth Ranieri, JV

GOVERNMENT

New Sacramento Criminal Courthouse
Construction of a 543,300-square-foot, 17-story county trial court facility comprised of 53 courtrooms
Location: Sacramento, CA
Company: Clark Construction Group
Client: Judicial Council of California
Architect: NBBJ
Completion: Spring 2023

EDUCATION

University of Washington Seismic Improvements
Renovations to seismically upgrade 25 historic campus buildings based on investigation of current conditions
Location: Seattle, WA
Company: Clark Construction Group
Client: University of Washington
Architect: Schacht Aslani
Delivery Method: Design-Build
Completion: 2023

MONUMENTAL

Artifact Move Coordination Services at the National Air and Space Museum
Deinstallation and subsequent move of the Smithsonian's collection of artifacts and aircraft from the west half of the museum to the Udvar-Hazy Dulles Collections Center
Location: Washington, DC
Company: Clark Construction Group
Client: Smithsonian Institution

The Building Blocks of Construction

It was a bit of an odd sight. If you were to look at Renton, WA's SR 167/I-405 Direct Connector in June, you would have seen a wall of white cubes nestled along the roadway. While they may look like enormous sugar cubes or marshmallows, these giant blocks weren't for giant cups of tea or hot chocolate. It's actually a geofoam system that is critical to building a bridge approach ramp.

Atkinson's Direct Connector project includes a new flyover ramp that will connect the I-405 HOV lanes to the SR 167 HOT lanes. As part of the project, the team needed to construct approach ramps on SR 167 and I-405. Here's a look at the challenge they faced and the solution the team developed:

WHAT WERE THE CHALLENGES?

1 On the SR 167 side of the ramp, the site had soft underlying soil. Traditional compacted fill material for the ramp would be far too heavy for the underlying soil condition. It would settle or sink over time under the weight of the fill that would make up the ramp. In the event of a major earthquake, it would be significantly worse.

2 There is minimal space between the construction site and the traveling public. If timber piles were utilized to stabilize the underlying soil, the team would have difficulty driving the 40-foot-long piles between two freeways while maintaining a safe distance from traffic.

3 Driving 3,000 timber piles would be noisy, and the work would have to happen at night due to access and safety considerations. The team didn't want to bring more noise pollution to the area than necessary.

HOW IS GEOFOAM THE SOLUTION?

1 Geofoam weighs a fraction of what normal soil weighs. Each standard block weighs 248 pounds. With 2,700 blocks comprising the soil replacement, that equates to 700,000 pounds. It sounds like a lot, but it's actually quite light. If the team had used compacted fill, the structure would have weighed up to 100 times more. The team excavated a few feet of the pre-existing soil to add 30 feet of geofoam on top. The resulting structure is seismically stable.

2 The team didn't need to transport timber piles across the freeways. Geofoam provided a safer solution with minimal impact to freeway traffic. As an added bonus, because the team didn't need to execute a ground improvement process, geofoam saved the project time, too!

3 Atkinson's geofoam approach eliminated any additional noise. This minimized the project's disruption to its neighbors.

Once the geofoam was in place, Atkinson's team tied reinforcing steel on top of the foam structure between the ramp walls and poured concrete over the steel to create the approach ramp. The SR 167/I-405 Direct Connector is scheduled to complete in May 2019. ■

Above: Atkinson's team used a solution for the ramp that was as light as a feather—or, more accurately, as light as 700,000 pounds. The team used 2,700 geofoam blocks to replace soft underlying soil. Each standard block weighs 248 pounds.

Left: A member of the project team lifts a geofoam block into place.

Photos by: Harry Griffin

Combating Complacency with Stop-Talk-Accept Protocol

Being suspended from a jobsite for three days for a safety violation can stir a lot of emotions. Being grateful is usually not top on the list. But for Nick Guptill, a journeyman sprinkler fitter on Clark's Chase Center project in San Francisco, that is exactly how he felt.

Construction on the Chase Center, a sports and entertainment venue that will serve as the new home of the Golden State Warriors, includes an 18,000-seat arena, two office buildings, mixed-use space, and underground parking. Completion is scheduled for the start of the 2019-20 NBA season, and structural work at the site is at a fever pitch.

With as many as 1,250 workers on site on any given day, maintaining safe work practices is critical. Which is why, when Safety Engineer Spencer Wojcik observed Nick Guptill on a boom lift, with the gate to the lift ajar and the leg straps to his personal restraint system hanging loosely, he took immediate action. In accordance with Clark's Stop-Talk-Accept safety protocol, Wojcik stopped the unsafe work, discussed the failure to meet proper fall protection procedures, and, due to the severity of the violation, issued Guptill a three-day suspension from the job. Guptill, a proponent of safe work practices himself, had simply forgotten to follow proper procedures that day, and understood that his mistake could have resulted in serious injury.

As part of Wojcik's full-time safety responsibilities on the Chase Center, he communicates with laborers on the jobsite daily, working to ensure that safety procedures and protocols are understood by the workforce and implemented in the field. This interaction at Chase Center helped him to gain a better understanding of the true impact of his work and the power of Clark's Stop-Talk-Accept program. After his suspension from the jobsite, Guptill contacted Wojcik with a message of appreciation. "Most guys might be mad about getting a safety violation or having to sit for three days", the sprinkler fitter wrote. "Just wanted to say thank you, for taking your job seriously and doing it with care for others. Thanks for looking out for me and calling me out for what could have been my last mistake. Today I get to go home, kiss my fiancé and kids and tell them I love them." This message affirmed not only the effectiveness of Wojcik's daily work on the job, but the whole purpose of Stop-Talk-Accept—sending people home safely to their loved ones, on every project, every day. ■

Safety Engineer Spencer Wojcik works to ensure that safety procedures and protocols are understood by the workforce and implemented in the field at Chase Center.

STOP-TALK-ACCEPT

Clark's Stop-Talk-Accept program empowers everyone on site to "speak up" when they observe potentially unsafe activity. The program is based on the principle that no one on the project should ever be complacent, no matter their job title or level of experience. Here's how the three components work:

STOP Unsafe Work

Workers have the authority and responsibility to stop work whenever they believe it is being conducted in an unsafe manner or will cause immediate harm to others. Everyone on site, including trade partners and project management, must respect any concerns and take the time to respond.

TALK to Co-Workers

After identifying a hazard and stopping work, communication occurs. Employees are empowered to talk directly with each other about potential hazards. On the ground, this translates to trade partners talking with each other without waiting for Clark employees to act as an intermediary. Crucial to this step, however, is that there can be no threat of confrontation.

ACCEPT Corrections

As part of onsite safety training, all employees learn that with Stop-Talk-Accept they must accept safety corrections from co-workers without resentment. This up-front explanation reinforces that they should expect these corrections from time to time; the program is part of how Clark does business; and the corrections are not personal but someone's genuine concern for your safety and the safety of those around you. Ultimately, the Stop-Talk-Accept program is intended to foster a culture where everyone on site feels comfortable speaking up to make sure their co-workers are safe.

PLAYBOOK FOR SUCCESS

Chase Center Team's Relentless Planning "Off the Court" is Paying Big Dividends on Site

Chase Center is on track for an on-time completion in August 2019. In September 2018, the project team marked a significant construction milestone—completion of structural steel—with a Topping Out celebration.

SAN FRANCISCO'S MISSION BAY NEIGHBORHOOD IS ABUZZ WITH ACTIVITY: nine construction projects are currently underway in the up-and-coming med-tech hub, and the Bay Area's most highly-anticipated development—Chase Center—is at the heart of the action. Designed as an epicenter for sports and entertainment, this 18,000-seat arena will serve as home court to the back-to-back NBA Champions Golden State Warriors and more than 200 additional events annually, including family shows, concerts, conventions, cultural and community events, and more. The iconic venue anchors an 11-acre site that also includes two 11-story office buildings, 29 unique retail locations, 3.2-acres of publicly-accessible plazas and open space, as well as a 900-space, below-grade parking structure.

Clark is working alongside joint venture partner Mortenson Construction to deliver the colossal development in time for the 2019-20 NBA season. As the game clock winds down, the project team is laser-focused on a strong finish and working at an unprecedented speed to guarantee success—a feat that entails 1,250 craftworkers putting in place $2.3 million of work per day. To the casual observer, the flurry of activity on site may appear chaotic, but just the opposite is true—every detail, every operation, and every sequence has been meticulously choreographed to ensure brilliant execution. Central to that effort is an intensely driven team of building professionals and a jobsite culture rooted in safety planning, preparation, collaboration, and innovation. Throw in a robust 4-Dimensional Synchro model, and comprehensive project playbook, and you have the secret sauce behind the project's success to date.

"From its cutting-edge design, to the intricacies of its urban site, to the sequencing and pace of construction, this is one of the most complex operations I've ever been a part of."

Vic Watson, Vice President, Clark Construction

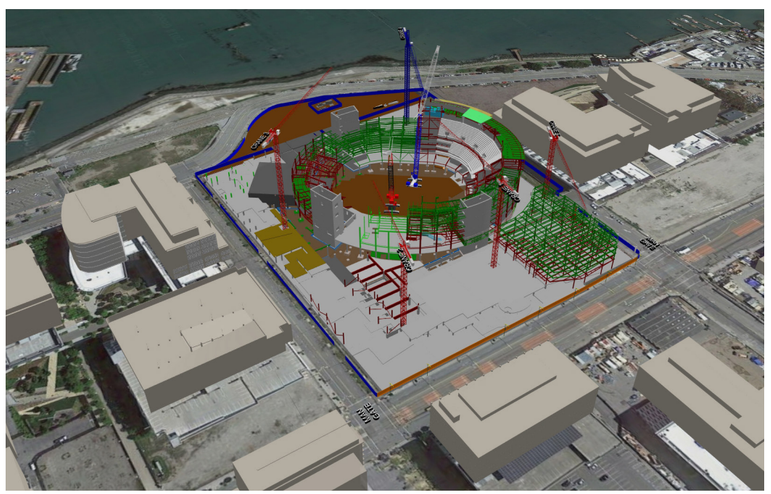
While Chase Center is on track for an on-time completion, the project is anything but typical. "From its cutting-edge design, to the intricacies of its urban site, to the sequencing and pace of construction, this is one of the most complex operations I've ever been a part of," notes Vice President Vic Watson, who has been involved with the job since its infancy. The 11-acre development, which is comprised of five unique structures supported by a shared podium, is bound by the San Francisco Bay to the east, academic housing for the UCSF Medical Center to the west, and active construction projects to the north and south. Adding to the project's challenging site conditions

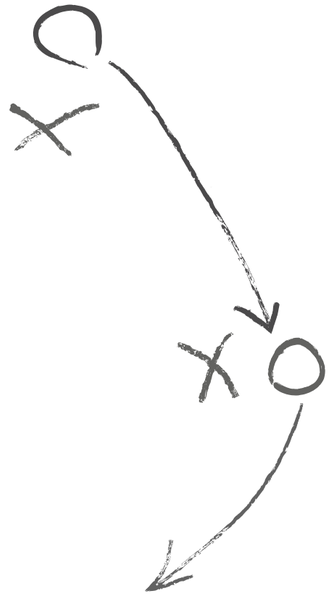
is the land on which it sits—a marshy soil known as "Bay Mud," which is partially comprised of rubble from the 1906 San Francisco earthquake. The arena's sophisticated design, which features little repetition, also enhances its complexity. "With so many variables, we knew this wouldn't be a straightforward approach," recalls Watson when asked about the team's early efforts to plan the job.

To tackle the herculean task, Watson and his colleagues thoughtfully analyzed and planned the Chase Center project for nearly four years—an endeavor that began in the project's pursuit phase and intensified during a two-year preconstruction effort. Those preliminary work sessions were the genesis of several important project management tools, including a 4D model and a project playbook, which have been fundamental to the team's planning efforts.

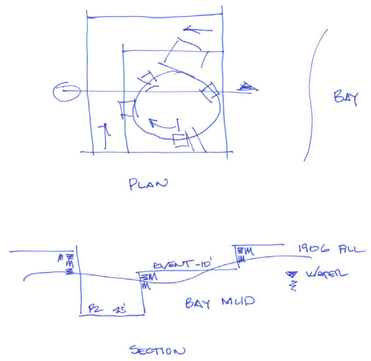
After an extensive evaluation of the project during preconstruction, the Chase Center team determined the only way to move the schedule forward effectively was to break the job into manageable pieces with separate schedules. "We spent a significant amount of time understanding how the various components of the job interconnected," said Brian Nahas, VDC Manager. The team's plan involved unraveling the arena from other structures on site and sequencing construction around its four structural cores: A, B, C, and D. The approach was initially outlined in a simple sketch, which depicted a specialized shoring solution that broke apart the project and detailed the progression of work, starting from the B Core and moving around the arena in a clockwise motion at each level simultaneously. Under this methodology, each quadrant of the arena had its own schedule for concrete and steel, and each level had its own schedule for mechanical, electrical, plumbing, and finish work. The team's approach ensured that all levels of a quadrant were progressing at the same time, in the same direction, a task that required trade partners to provide multiple teams on site to ensure work progressed as planned around the arena bowl. While this approach intensified coordination and sequencing, it also allowed the project to progress unimpeded and at the quickest rate possible.

What started as a simple sketch quickly became an incredibly important tool for communicating the team's approach to trade partners. "We made a point to map out the job very early on so that we could communicate the flow and schedule to trade partners long before we purchased major trades," recalls Watson. "That sketch was the start of countless conversations. I think I drew it 1,000 times early on so that everyone could understand the sequence of work, and the shoring solution we needed to put in place to build the job in the most efficient way possible."





To amplify planning efforts, the Chase Center team partnered with Stanford University on another tech-related initiative, a pilot drone deployment. Twice a month, drones survey and take pictures of the jobsite to record work completed and check quality issues. That information is fed into the 4D model and tied to the schedule of activities.



The plan articulated in a sketch four years ago is still the flow of the job today. "We had a really strong strategy at the beginning of the job, and that has never changed. We've just gotten deeper and deeper, and deeper into the details."

Vic Watson, Vice President, Clark Construction

Once the team established the proper workflow, they evolved the sketch into a 4D model, which they used to validate their approach. "With so many of the project components interconnected, we needed to ensure we had the right stagger between the arena, office buildings, gatehouse, and mixed-use elements," notes Nahas. "The model allowed us to verify that our plan was executable and get everyone on board well in advance of construction."

By the time the team awarded contracts to key trades, every critical partner had walked through the sketch and the model. "Our goal was to ensure there were no surprises," adds Watson. "Because of our early leg work, we were confident in our plan and ready to hit the ground running when it came to executing work in the field."

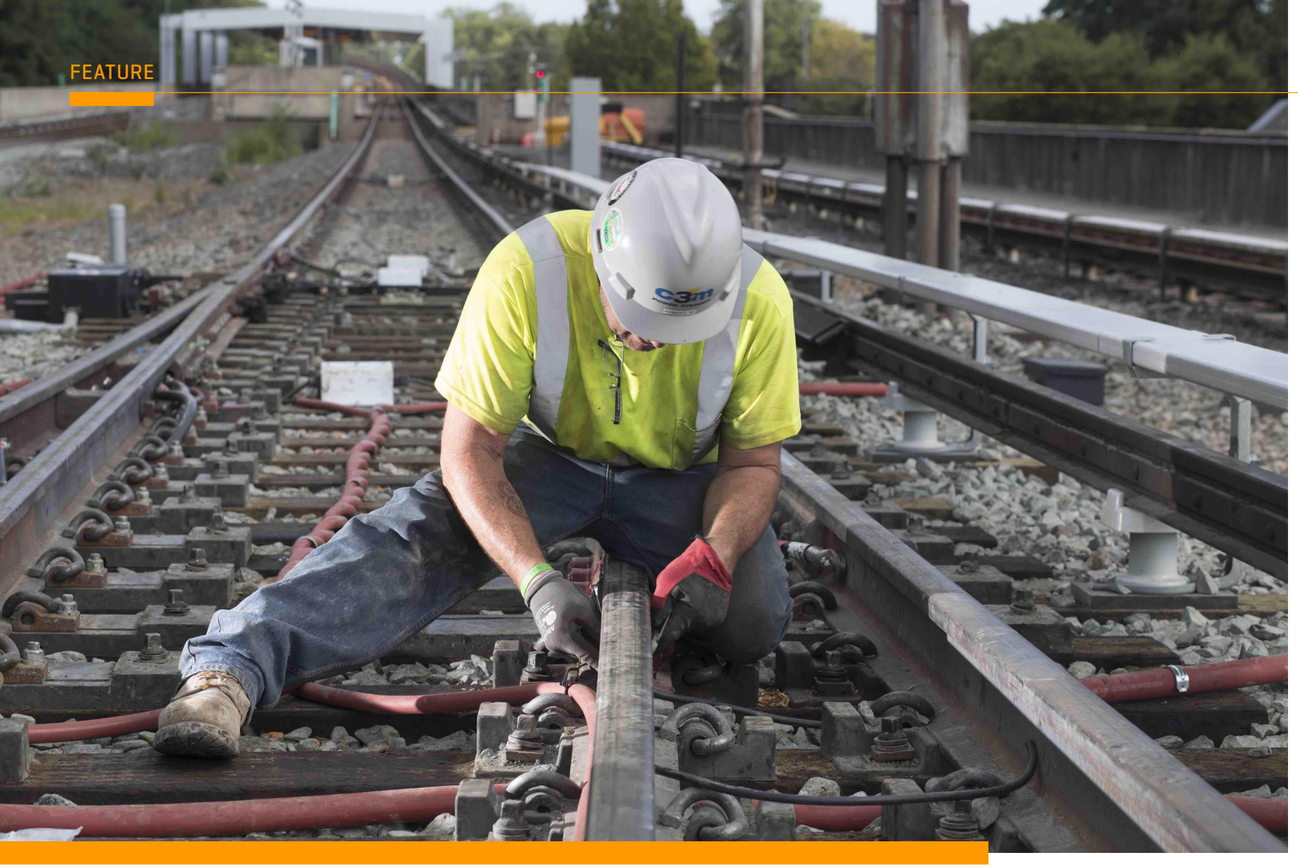
As the team focused on maximizing productivity and ensuring quality and safety on site, the model continued to serve as a platform for collaboration with project partners. Coordination meetings led by Mortenson | Clark often included a cross-section of more than 40 industry professionals, including VDC experts, superintendents, design-assist trades, design managers, detailers, engineers, and architects, all working in the model. "Having key stakeholders from different disciplines working together in the model has yielded tremendous value by helping us not only progress the design but resolve potential roadblocks long before they became problems on site," notes Superintendent Doug Jagoda.

Another tool that is vital to the team's planning effort is a comprehensive project playbook. This 200-page schedule details 24,000 construction activities—every step needed to finish the job and hand over the keys. Similar to the sequencing sketch, the playbook was conceived during the pursuit phase as a lollipop schedule outlining big buckets of workflow. Over the last 19 months, a team of superintendents and scheduling professionals has driven logic into every line of the plan, analyzing and evaluating production rates, timeliness, and schedule disruptions, then modifying the plan to mitigate impacts in order to remain on track. Two and a half years after the playbook originated, the job is on schedule to the day.

While the Chase Center team is leveraging tools like the 4D model and project playbook, it is the people behind those efforts who drive the culture of planning. "We see these tools as a means to heighten safety, collaboration, productivity, and quality, but you have to have the right culture in place to support them, otherwise the job will falter," states Nahas. He adds, "We made a point to establish that culture from day one."

In many ways, construction is like basketball: it takes tremendous practice off the court and a deeply dedicated team—all pulling in the same direction—to realize success at game time. As the Chase Center team enters the second half of the game, their focus on ensuring that every detail is thoughtfully planned and executed remains steadfast. Jim McLamb, project director in charge of Chase Center's construction operations, notes, "We are building a new home for a team that is known for their relentless pursuit of excellence. If we don't apply that same level of passion and intensity to this job, it just wouldn't feel right." ■

Chase Center model coordination meetings involve more than 40 industry professionals, including detailers, designers, superintendents, design-assist trades, VDC experts, and more, all working in the model to further design development, and identify and solve potential problems before they became roadblocks in the field.



C3M POWER SYSTEMS:

Delivering the Infrastructure that Keeps America's Transit Systems Moving

IT'S ALL ABOUT TRUST, WHEN YOU GET DOWN TO IT."

That's Chuck Tomasco speaking, vice president at C3M Power Systems. He sits back in his chair and continues, "I've been in this industry for more than 20 years. Looking at what it takes to work well with people and build successful projects, trust is what truly matters. It's not only market knowledge or the ability to perform the electrical work—those are more like prerequisites. To go above and beyond—it's about building a high level of trust for your team and your client."

C3M, a subsidiary of Clark Construction, is a specialty contractor that's delivering some of the most complex electrical systems for critical infrastructure around the United States. In the short time since its inception, C3M has already made a name for itself in the transit market—one that it intends to build upon for years to come.

Since C3M's founding in 2014, Senior Vice President Mark Ketchel and Vice Presidents Chuck Tomasco and Chuck Hinton have guided the company to a steady, deliberate growth. The C3M leaders formed the company after years of working together while at other electrical contracting firms that performed work across every market sector—from mass transit work for Washington Metropolitan Area Transit Authority (WMATA) and a fueling facility at Dulles International Airport to a wastewater treatment plant for Fairfax County, Virginia. Starting at C3M with 15 employees, they hit the ground running. Four years later, and the company employs more than 150 individuals working on 11 projects in 9 cities across the United States.

> Looking at what it takes to build successful projects, trust is what truly matters. It's not only market knowledge or the ability to perform the electrical work—those are more like prerequisites. To go above and beyond—it's about building a high level of trust for your team and your client."
>
> *Chuck Tomasco, Vice President, C3M Power Systems*

WHAT IT TAKES

C3M's team takes pride in its qualifications, which are often the largest factor in the success of the projects in their market sector. A substantial portion of the firm's portfolio consists of rehabilitating mass transit electrical systems.

"You really need a lot of specialized experience to do this type of work well," says Hinton. "Take traction power systems in the Washington, DC Metro system. This type of work not only requires the qualifications and technical ability to do the work—which is challenging in itself—but you also have to expect and be prepared to overcome the inherent unpredictability associated with working on an active railroad. When you combine Clark and C3M's history in the system, our experience with the work goes back to the original installation in the 1970s."

What does that mean? Years of data and expertise back up the company's understanding of the types of work they perform, which reflects not only in a stellar reputation and execution of work but also a preconstruction strategy that delivers accurate results. Ketchel, Tomasco, and Hinton are hands-on managers—they roll up their sleeves to make sure that each project proceeds as planned.

MAKING A MARK IN THE TRANSIT SECTOR

C3M Power Systems puts their years of experience to work to address increasingly critical mass transit solutions in cities across the United States. In 2016, C3M completed the first contract it was awarded—the Cincinnati Bell Connector. Following the project's success, C3M tackled the QLINE Streetcar in Detroit, which was completed in 2017, and the Oklahoma City Modern Streetcar, which is expected to open for business in December 2018. All three projects required state-of-the-art Overhead Catenary Systems (OCS) to transmit electrical power to the streetcars, and each project presented its own unique challenge. The QLINE is the first streetcar system to feature vehicle charging stations and provided more miles of off-wire track than any other streetcar in the country. For the Oklahoma City streetcar,

This page: C3M recently started work on their largest contract to date: a $52-million contract to upgrade electrical equipment in WMATA stations across Maryland, Virginia, and Washington, DC.

This page: Senior Project Manager Kivins Beecher oversees C3M's work at MD 355 Crossing. The C3M team onsite is part of a cross section of Clark civil groups working to design and construct a safe pedestrian tunnel in Bethesda, MD.

Opposite page: The C3M project team installed the rail systems for the Cincinnati Streetcar project, a 3.6-mile loop connecting key communities in the city's urban core.

the team energized their first traction power substation just 10 months after Notice to Proceed by leveraging relationships and precise schedule coordination with trade partners and city agencies. Combined, these three streetcar projects provide improved public transportation to more than one million local residents.

The team continues to partner with WMATA as the organization upgrades the Metro system across Maryland, Virginia, and Washington, DC. C3M recently began work on its largest contract to date—a $59-million systems upgrade project that will allow the transit system to accommodate 8-car trains on their Blue Line through electrical upgrades at 7 tie breaker stations and 25 traction power substations.

C3M's prolific experience with mass transit electrical systems enables their teams to execute creative solutions, optimizing safety and efficiency. On WMATA's Orange and Blue Line Rehabilitation project, the team implemented a custom-built system on the D10 aerial portion of the project. The D10 aerial's specified plan dictated 75% of work be performed at night when the trains were not running. The slim gap between operational and non-operational hours meant that C3M was only able to work actively on the tracks two to four hours per night, a fraction of a typical eight-hour shift. Foreman Wayne Kirkpatrick designed 21 custom junction boxes that significantly improved how much work could be done during active rail operations. It allowed much of the work to be done during the day and permitted productive work to be done during the full eight-hour nightshift. As a result, the D10 aerial completed months ahead of schedule.

"One thing I'm pretty proud of," says Tomasco, "is that when there's a problem, clients know that they can call us, and we'll solve it."

> You need a lot of specialized experience to do this type of work well. Take traction power systems in the Washington, DC Metro system. When you combine Clark and C3M's history in the system, our experience with the work goes back to the original installation in the 1970s."
>
> *Chuck Hinton, Vice President, C3M Power Systems*

ONWARD AND UPWARD

Because of C3M's ability to develop and evaluate innovative solutions throughout the design process and implement them successfully during the construction phase, the company is excelling in design-build projects that bring the best value to the owner. C3M is currently part of the MD 355 Crossing project where a cross section of Clark civil groups have come together to design and construct a safe underground route between Walter Reed National Military Medical Center and the National Institutes of Health in Bethesda, MD.

With projects in cities across the country, the C3M team is currently focused on upcoming mass transit projects that bring much-needed infrastructure upgrades to the public. In late 2018, the team will begin a $28-million contract to install traction power, overhead contact, train control, and Light Rail Vehicle monitoring systems for Sound Transit Operations and Maintenance Facility: East in Bellevue, WA. C3M is also partnering with the Port Authority of Allegheny County on a design-build project to replace the existing emergency braking system with a modern radio-frequency identification (RFID) tag-based braking system. The project, located in Pittsburgh, PA, will be completed in 2021.

"We're excited for the future," comments Tomasco. "We're strategically thinking about what's best for our people, and where we can foster steady, healthy growth. We're proud of our reputation—that we can fill our client's needs with great service and quality. That we're proactive problem solvers working in the best interest of the client. If you want to build trust, you not only have to be honest and ethical, but you also must be great at what you do. We have both." ■

> [C3M goes] above and beyond to help WMATA get our work done according to specification, with outstanding workmanship, and ahead of schedule."
>
> *Joseph Fowler, Assistant Director of the Office of Capital Planning and Program Management, WMATA*

Municipalities and transportation agencies across the country rely on C3M to perform the construction, rehabilitation, and maintenance of electrical systems to bring their connectivity, economic development, public works, and transportation visions to life. Here's a sampling of their portfolio across the country:

Hector Colina (second from left) and his children Jenifer, Daniella, and Nick.

SPOTLIGHT ON:

ANCO IRON & CONSTRUCTION

A Family-Run Business Seizes Opportunity to Grow and Help Shape San Francisco's Landscape

Preparing small businesses to take hold of the next big opportunity is one of the primary goals of Clark's Strategic Partnership Program. San Francisco small business owners Hector and Nick Colina graduated from the program in 2017 and are applying many of the lessons they learned during the class on their biggest project to date—the highly-anticipated Chase Center.

Formed in San Francisco in 1969 by brothers William and Tony Colina, the company, which performs commercial and residential steel fabrication and installation, has been passed down through generations and is now headed by William's son Hector Colina, and supported by Hector's children Nick, Jenifer, and Daniella.

"This is a third-generation minority business," says Nick Colina, Anco's Administrator of Operations. "My grandfather came over from Mexico and started it with his brother and began with only a dream."

Run out of a small, unassuming shop in San Francisco's Bayview neighborhood, Anco has worked on some of the city's most notable structures, including the San Francisco War Memorial, Candlestick Park, the Ferry Building, and most recently, Chase Center, the future home of the Golden State Warriors. As the company's largest contract to date at $2.3 million, the new sports and entertainment venue is an opportunity that enabled the firm to grow both literally and figuratively.

While today Anco manages anywhere from 20 to 25 active jobs at one time, this family business had its fair share of difficult times. "It was a shock when my dad and my uncle retired, and I was left holding the key," recalls Hector. For a period, Hector carried the family business alone, weathering a difficult recession and diminishing sales. But when Hector's children joined Anco, the company's fortune changed. In 2013, Nick and his sisters, Daniella and Jenifer, presented their father with a plan to renew Anco.

Their plan worked. "We really just stuck with our values of working hard and being good to people along the way," notes Nick. The Colina's earnest approach to doing business, coupled with a small staff of tenured, hard-working employees, some beneficial small business training, and the right opportunities at the right time, changed Anco's trajectory; annual sales jumped from $250,000 in 2013 to $3 million today.

"Winning the Chase Center contract was an important element of our success," recounts Nick. Anco is a steel contractor and supplier at Chase Center responsible for supplying piles, studs, security rails, rebar, miscellaneous metals, and structural beam fabrication—a role that has kept them involved with the project from its infancy. "We needed a good job with a good client to help us get out of the recession and move to the next level. The Bayview community does not get as much business as it should, but Chase Center joint venture partner Clark is one of the best contractors in terms of including the community and expanding local growth," states Nick.

While Chase Center is Anco's largest contract to date, it was an earlier opportunity with Clark that helped prepare the Colinas for it. Both Nick and Hector are graduates of Clark's Strategic Partnership Program (SPP), a 10-month MBA-style course designed to help small business owners build capacity. Nick points to the relationships Anco gained as one of the most important aspects of the SPP experience. "I still call on Clark executives for references; they've helped with our company profile, coaching on estimates and change orders, and introduced us to other subcontractors that led to new work," says Nick. "Their advice is gold."

In addition to Hector and Nick's leadership, Anco's growth is also being shepherded by the Colina sisters, Jenifer and Daniella, who are proud to be paving the way for women in the construction industry. "It is gratifying to build up San Francisco and help my family at the same time," says Daniella, who is integral in Anco's office operations.

One of Anco's values is to continue the tradition of assisting other companies that need help, notes Jenifer, who is responsible for the firm's estimating efforts. "I take pride in the idea that we are not just interested in growing our own business, but like Clark has done with us, we try to give other minority businesses opportunities," she says. "I'm really excited that we are third generation. I feel like we can keep it going and build for our next generation." ■

SUMMER ASSOCIATES EMBRACE CLARK'S TRADITION OF GIVING BACK

Despite a Short Stay, Summer Associates Make a Lasting Impact Through Community Service

One of Clark's core values is giving back to the communities where we live and work. Through a variety of initiatives, employees across the Clark organization donate their time and talents to enhance the lives of the people around them who need it most.

It is this commitment to our community that draws college students from across the country to join the Clark team each summer, where they are encouraged to volunteer in their communities.

Here is a sampling of the events our summer associates organized this past summer:

COLLECTING ESSENTIALS IN BETHESDA

Summer associates working in the Preconstruction department at Clark organized an Essentials Drive for Bethesda Cares, an organization whose mission is to combat homelessness in Montgomery County, MD, the county in which Clark's headquarters is based.

"Our team figured this organization was a perfect way to give back to the community where we work every day," said Summer Associate Paige Ferrell. ■

REVAMPING A HOMELESS SHELTER IN MARYLAND

Summer associates from the University of Maryland Capital Regional Medical Center project team organized a group of Clark employees to freshen up a homeless shelter run by the Volunteers of America Chesapeake in Prince George's County. The Clark team helped to landscape the property by trimming bushes and planting shrubs and flowers. The team also painted the shelter's bathroom and hallway. ■

HELPING THE HOMELESS IN SAN DIEGO

San Diego has the fourth largest homeless population in the country. Summer associates in Clark's San Diego office decided to organize a volunteer event at Father Joe's Village, a food kitchen located in downtown San Diego that serves the local homeless population. During the event, a group of Clark employees and summer associates prepared and distributed over 200 meals for those in need. ■

CLARK ANNOUNCES OFFICER PROMOTIONS

Stephanie Calhoun
Vice President, Northern Region

Since joining the company in 2001, Stephanie has delivered a number of signature projects throughout the Northern Region, including the McCormick Place Convention Center West Building, 300 North LaSalle, the Patrick V. McNamara Federal Building Tenant Fit Out, and the Malcolm X College Campus. She currently leads the 145 South Wells project in downtown Chicago.

In addition to her operational expertise, Stephanie has played an integral role in forming the Northern Region's training and development program, implementing structured training and facilitating team engagement. As vice president, Stephanie will continue to provide operational leadership on Chicago projects while also steering the Northern Region's talent development.

Eric Long
Vice President, Mid-Atlantic Region

Eric joined Clark's Finance department in 2004, first working with enterprise budgeting, forecasting, and analysis. He later transitioned to a technical role in the Business Intelligence group focusing on streamlining financial functions and reporting. In 2009, Eric moved to the company's Risk Management department.

Eric is responsible for the management and performance of Clark's insurance and surety programs, including warranty, indemnification, and risk-transfer provisions. He is also responsible for leading day-to-day department operations. He possesses a wide breadth of institutional knowledge and experience and, as vice president, will continue to partner with executive leadership to optimize Clark's risk strategy.

Chuck Watts
Vice President, Clark Concrete

Throughout his 27 years with Clark, Chuck has gained field expertise in a variety of roles. After joining Clark as a carpenter in 1991, Chuck was promoted to general carpenter, and later foreman, at which point Chuck transitioned to Clark's superintendent track.

Chuck has guided field operations on some of Clark Concrete's most complex work in the Mid-Atlantic, including Strathmore Concert Hall, The George Washington University Science and Engineering Hall, U.S. Coast Guard Headquarters, and The Wharf; he currently oversees day-to-day operations on a variety of projects across the region, including the National Dwight D. Eisenhower Memorial, Suburban Hospital Campus Enhancement, and 45 L Street. As vice president, Chuck will also provide leadership in the acquisition of new work.

SETH RANDALL NAMED RISING STAR OF SAFETY

Seth Randall, division safety director for Clark Concrete, has been named a Rising Star of Safety by the National Safety Council. The award recognizes safety professionals under the age of 40 who provide safety leadership in their organization and are dedicated to continuous improvements in safety.

Seth manages a team of nine safety professionals in Clark's largest self-perform division. Under his leadership, Clark Concrete's safety performance has consistently improved, and in 2017 the division achieved a lost time rate of 0.00. Seth is also a leading proponent of greater head protection across the industry. In 2016, Seth spearheaded the company's research efforts and adoption of safety helmets with chin straps, making Clark the first general contractor in the United States to transition all of its workers from traditional hard-hats to safety helmets. ■

Photo by: Dominique Muñoz

USGBC HONORS INNOVATIVE PROJECTS OF THE YEAR

Two of Clark's Mid-Atlantic projects were recently honored with Innovative Project of the Year awards from the U.S. Green Building Council (USGBC). The Alexandria Renew Enterprises Environmental Center, a 100,000-square-foot Nutrient Management Facility and adjacent 60,000-square-foot office building in Virginia, was a winner in the New Construction category. The project is a key component of Alexandria Renew's state-of-the-art Nitrogen Upgrade Program, designed to improve water quality in the Potomac River and Chesapeake Bay watershed.

The Pearl won top honors in the Health and Wellness in the Built Environment category. This 391,000-square-foot luxury residential complex in Silver Spring, MD boasts myriad sustainable features, including a 5,000-square-foot vegetative green roof, solar photovoltaic panels, electric vehicle charging stations, and more than 100 secure bike storage racks. ■

The Pearl, Photo by: Isaac Maiselman

Ventura County Medical Center, Photo by: Lawrence Anderson

HEALTHCARE AND EDUCATION PROJECTS EARN MERIT AWARDS FROM DESIGN-BUILD INSTITUTE OF AMERICA

The Ventura County Medical Center Hospital Replacement Wing and The Spark at Washington State University have earned 2018 National Awards of Merit from the Design-Build Institute of America, which annually recognizes projects that exemplify best practices in design-build delivery nationwide.

The Ventura County Medical Center Hospital Replacement Wing project, one of the largest healthcare design-build efforts in California, was recognized in the Healthcare Facilities category. Using collaborative plan review, the team completed the Replacement Wing in just four years. The project team implemented a hybrid design-build approach to address strict government mandates, a modest budget, seismic response requirements, and ongoing hospital operations. The result was an intensely collaborative, innovative, and fluid team that designed and delivered a critical project on time and on budget.

The Spark, a winner in the Educational Facilities category, is a high-performance digital classroom building constructed on the campus of Washington State University. The $43-million design-build project is a technology-rich academic hub that accommodates the university's student enrollment growth through state-of-the-art learning space. The project team overcame challenges including a tight budget, updated university construction standards, a restricted site, and rapidly evolving technology market conditions to deliver the project early and under budget. ■

The Spark, Photo by: Benjamin Benschneider

Clark Tower Cranes Rising Across Chicagoland

Over the past 25 years, Clark has established itself as a premier builder in the Windy City, successfully delivering more than $5 billion of work in the Northern Region. Clark is continuing to build on its reputation for delivering exceptional projects for clients in the Chicagoland market, with tower cranes rising for four new projects between this summer and early next year. In June, the Clark team erected a tower crane at 145 South Wells Street. Located inside the loop in downtown Chicago, the 237,000-square-foot, 20-story, core-and-shell commercial office building will include 3,830 square feet of retail space on the first floor and parking on the second floor. Substantial completion is slated for October 2019.

Adjacent to the West Side of Chicago, a tower crane was erected in July at the Albion at Oak Park project. The Clark team is constructing a 340,000-square-foot, 19-story residential building with 265 units in the epicenter of downtown Oak Park. The project is scheduled to complete in December 2019.

Clark is also constructing Albion Evanston, a 16-story mixed-use building that will feature 273 residential units and 6,800 square feet of ground floor retail space. The tower crane was erected in October, and substantial completion is slated for 2019.

In January 2019, a tower crane will be erected on one of the last available pieces of riverside real estate in downtown Chicago: 110 North Wacker. Clark is constructing a 55-story superstructure that will feature 1.35 million square feet of Class A office space. The project is scheduled to complete July 2020. ■

PROJECT MILESTONES

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

UNDERWAY

Washington State Convention Center Expansion
After nearly two years of planning and preconstruction, the expansion to the Washington State Convention Center in downtown Seattle is underway. Clark is delivering the $960-million project in a joint venture with Lease Crutcher Lewis. Clark | Lewis team members joined state, county, city and convention center executives as well as developer and design team representatives to kick off the project with a groundbreaking ceremony in August.

The Wilson and The Elm
In August, Maryland Governor Larry Hogan joined Clark and Carr Properties to celebrate the groundbreaking of The Wilson and The Elm, a mixed-use development project in Bethesda, MD. When complete, the development will total more than one million square feet, made up of an office building with ground floor retail, two residential towers housing 456 units, and a shared above- and below-grade parking facility. The project is scheduled for completion in the first half of 2021.

Hyatt Regency Nashville
The first concrete footings were poured in July at the Hyatt Regency Nashville project. Clark Construction, in a joint venture with Bell & Associates, is constructing a 24-story, 784,000-square-foot hotel that will feature 591 guest rooms and over 65,000 square feet of flexible mixed-use banquet and conference room facilities. The Hyatt is the first parcel of Nashville Yards, a multi-phase, 15-acre mixed-use development project. Clark has also been awarded the preconstruction contract for parcels 2 and 3.

TOPPING OUT

The Boro
The team building The Boro in Tysons, VA topped out both residential towers—the 32-floor A1 tower and the 25-floor A2 tower. Since starting construction in October 2016, the team has placed 95,000 cubic yards of concrete and completed more than two miles of utility work. The project, which has welcomed 3,500 workers on site throughout construction, has achieved 1.5 million work hours without an OSHA lost time incident. When complete, the 1.7-million-square-foot mixed-use complex will boast 680 residential units, below-grade parking, and will be anchored by a Whole Foods Market. Completion is scheduled for October 2019.

Photo by: Harry Griffin

San Ysidro Land Port of Entry, Phase 3
The Atkinson/Clark team celebrated the topping out of the San Ysidro Land Port of Entry, Phase 3 project in August. The project is designed to address the increased travel delays due to traffic volume in the busiest land port in the Western Hemisphere. The Atkinson/Clark team is expanding southbound Interstate 5 from five to ten lanes, adding ten new inspection booths, and constructing a 562-car parking structure for employees. Additionally, the team is expanding the northbound primary vehicle inspection canopy and creating eight additional lanes with 15 northbound inspection booths. Completion is slated for 2019.

SUBSTANTIAL COMPLETION

International Spy Museum
The Clark team celebrated substantial completion of the new 140,000-square-foot museum in late July. The museum sits directly in front of the glass atrium on L'Enfant Plaza in downtown Washington, DC. Clark's scope of work included retrofitting an existing structure and foundation, as well as building a new structure in an active parking garage and retail center. The eight-story museum features three floors of exhibit space, an interactive theater, a gift shop, and educational, office, and event spaces.

COMPLETE

The Dalton

The project team recently celebrated completion of the 256,000-square-foot, 14-story, mixed-use residential building in Alexandria, VA. The building houses 270 apartment units and numerous amenities, including a club room, cyber café, community room, rooftop pool, fitness center, and meeting room. Landscaped courtyard areas flank the building's entrance. The Dalton also includes 1,500 square feet of retail space, which sits on top of two levels of below-grade parking.

1221 Van

Clark recently celebrated the completion of a 336,000-square-foot, mixed-use residential building in Washington, DC's Ballpark District neighborhood. The 13-story building overlooks the field at Nationals Park, and offers views of the Capitol Building and the Washington Monument. 1221 Van features 291 units, two levels of below-grade parking, two levels of retail space, and rooftop amenities.

Lake County Court Tower

Clark's Lake County Court Tower project team, along with county judges, elected officials, and hundreds of community members, gathered for the ribbon-cutting ceremony of the new Lake County Court Tower in downtown Waukegan, IL. The new facility, which opened to the public in August, will help improve the efficiency of the County's justice system. The eight-story, 200,000-square-foot structure features 12 new courtrooms, jury assembly space, administrative offices, and additional space to accommodate future growth.

Photo by: Alexy Saltekoff

Photo by: Jeffrey Sauers

THE WAY WE WERE

Cara Lanigan, now a vice president leading efforts at the Fort Bliss Replacement Hospital project in El Paso, TX, joined Clark as an intern in 1999.

Walking the jobsite with trade partners. Preparing estimates of roofing materials. Developing project close-out plans. It's been nearly twenty years, but several of Clark's leaders can vividly recall their days as college interns.

This summer, Clark welcomed 120 college students from across the country for an intensive construction immersion experience. We updated the moniker from intern to summer associate, and upgraded the program to provide a more immersive experience that conveys what it is like to work at Clark through meaningful, hands-on assignments alongside seasoned professionals.

Vice President Cara Lanigan, who currently manages Clark's efforts on the Fort Bliss Replacement Hospital in El Paso, TX, began her career as an intern in Clark's Mid-Atlantic Region in 1999. Lanigan recalls, "I was able to work in the field, office, and MEP areas of our operation and see these processes and procedures. This experience of being able to see work through a variety of perspectives has served me through my entire career."

Senior Vice President Chip Hastie recalls that one of the most memorable experiences was sharing lunch each day with his project team. "My internship helped me build perspective on the nature and breadth of our business, but most importantly, I learned how special our people are and how much fun we can have delivering for and with our business partners," Hastie reflects. "I knew I wanted to work at Clark when I returned to school after my summer internship," Hastie recalls. "When you're in school, you want find the best opportunity to learn, grow and contribute. At Clark, I felt I had." ■

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The Dalton
Alexandria, VA
Photo by: Alexy Saltekoff

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