

CONSTRUCTION & EQUIPMENT



THE COMING WORKFORCE CHALLENGE: FILLING 1M JOBS

Worker shortages are the consequence of a series of policy, education, demographic and economic factors.

In February, 61,000 jobs were added to the construction industry — a significant portion of the 313,000 positions that were added to the overall job market that month.



BY WENDY NOVAK
ABC OF WESTERN
WASHINGTON

This comes as no surprise to those of us in the industry: It has been estimated that there will be a shortage of 1.5 million craft professionals by 2021.

With the added pressure of the baby boomers retiring, one has to wonder how the jobs will be filled. Who is going to repair that leaky pipe, rebuild the roads, replace your air conditioning, hang the drywall, or fix the power line? It is easy to think that it's someone else's problem until we realize just how much this

many vacant positions in the construction industry can affect our daily lives.

Rachel Burris talks more about this in her article at www.nccer.org titled, "Investing in the Future."

A 2015 AGC survey showed 86 percent of responding firms reported having a hard time finding qualified workers and 78 percent predicted that hiring conditions would remain the same or worsen as demand increases. Left unaddressed, these shortages will ultimately undermine the industry's recovery and impact broader economic growth through construction delays.

The shortages are the consequence of a series of policy, education, demographic and economic factors that have decimated the once robust education pipeline for training new construction workers.

As noted in AGC's 2017 Workforce Development Plan: "The lack of sufficient secondary-

school career and technical education training programs across the country means that as the construction industry expands to meet growing demand, an increasing number of firms will have a hard time finding skilled workers. A quarter of firms have passed on projects because of worker shortages."

AGC has developed a workforce development plan to prepare contractors for the next generation of skilled construction workers. It can be found by searching "workforce development plan" at www.agc.org.

Construction careers

Another 2015 survey found that construction workers are the happiest employees of any industry. Why? It is believed that the satisfaction found in bettering communities, the opportunity to obtain the on-the-job training needed to advance as a skilled craft worker, and the continued growth in the industry make con-

struction a great place to build a career.

Today the construction industry employs about 7.5 million workers. Associated Builders and Contractors estimates that we need to hire a staggering 500,000 workers just to fill a backlog of existing jobs. If we add a \$1 trillion infrastructure

bill into the equation, we could have more than 1 million jobs waiting to be filled. The demand for construction workers is high, and firms are looking to hire.

Construction is a career in high demand with opportunities for people from all walks of life.

WORKFORCE — PAGE 7

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SEATTLE BRACES FOR METAL TARIFF FALLOUT

As tariffs further increase local construction costs, developers will either scale back their investments or turn to alternative designs.

When the federal government first announced its intent to impose tariffs on imported steel and aluminum, reaction from AEC industries was swift and to the point.

Most decried the plan. The American Institute of Architects stated: "Any move that increases building costs will jeopardize domestic design and the construction industry, which is responsible for billions in U.S. Gross Domestic Product, jobs growth, and job creation."



BY JULIAN ANDERSON
RIDER LEVETT BUCKNALL

The Associated General Contractors of America's response: "Higher steel and aluminum prices will make the kind of infrastructure work President Trump supports more expensive, forcing federal, state, and local officials to cut back on projects they can fund. And the likely trade wars these new tariffs prompt will diminish demand for private investment in infrastructure, as well as construction demand for manufacturing, shipping, and distribution facilities."

In response to such lobbying, many countries — including South Korea, whose exports comprise a

significant portion of the \$2.5 billion of steel and aluminum that entered the country through the Northwest Seaport Alliance and Sea-Tac Airport last year — were exempted from the fees.

While exemptions for the European Union, Canada and Mexico were extended, it was only for an additional month, and so the need to renegotiate the North American Free Trade Agreement remains urgent.

Looking at the demand side of the equation, there's been a considerable amount of pushback, as well. To date, the Commerce Department has received more than 1,200 applications from American companies that are seeking relief from paying the steel tariffs, and 125 manufacturers have filed to have the surcharge on aluminum waived.

In short, at this point the porous policy has been a boon to bureaucrats, if no one else.

Seattle snapshot

With its red-hot construction market, in large part propelled by the ongoing success of the tech industry, Seattle is certain to feel effects of the tariffs. The city's three big construction sectors — high-rise residential, high-rise office and civic buildings (including schools and convention centers) — are all reliant on steel, be it structural steel or rebar,

and will feel the pinch of the 25 percent tariff.

Buildings featuring curtain walls and storefront assemblies will also be affected by the 10 percent charge on aluminum.

Even before the tariffs were levied, Seattle was an expensive market in which to build. From January 2017 to January 2018, construction costs in the city rose 5.1 percent, almost 1 percentage point above the national average of 4.2 percent. The advent of the tariffs is having a ripple effect on the scene. As they further increase local construction costs, developers will sour on new projects, and either scale back their investments or investigate alternative design strategies.

One telling gauge of the local construction activity is the Rider Levett Bucknall Crane Index, which tallies the number of tall cranes in use at construction sites. According to the most recent index, Seattle has 45 cranes in the sky; a strong number, and the most of the major metropolitan areas on the West Coast. It's the first time the city's crane count has dropped below 50 since 2015. Developers can

interpret this as a cautionary sign, as well.

A trigger for innovation?

Anticipating that the tariffs will spark price increases and/or inventory shortages of the metals, the construction industry is exploring other materials and methods to save money while maintaining growth. These three choices are viable:

- **Concrete.** Since most steel is used in the frame of a building, concrete is a suitable structural (and economic) material alternative. Even if a steel-framed building is in the early stages of design, it can be re-engineered to use concrete.

- **Prefab.** Modular elements, such as bathroom pods, are already gaining traction in student housing and hospitality sectors — buildings that have typically relied on steel. The units are fully assembled at the factory, trucked to the jobsite, and craned into place. While using them requires a longer lead time, they ultimately eliminate the protracted sequence-of-trades process, reduce reliance on a tight labor pool, and quicken

the build-speed of projects. In Seattle, the new Embassy Suites by Hilton is taking advantage of this technology in its 282 guest rooms.

- **Wood.** Mass-timber construction is also getting a closer look as designers and builders investigate alternatives to structural metals. More environmentally friendly than steel, cross-laminated timber and nail-laminated timber can be used in buildings up to around 20 stories. These buildings have a similar life expectancy to concrete-framed structures.

Workers, end-users

In February, the city's employment level for the construction trades was 123,900. With fewer development projects in the pipeline, the current shortage in the labor market is expected to ease up. If the tariff program pushes up the price of steel too much, it will slow down the labor shortage of steel workers but may exacerbate the shortage of concrete workers and carpenters.

METAL TARIFF — PAGE 7

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ON THE COVER

Andersen Construction used a teledipper to excavate the small, tight site for The Emerald condo tower in Seattle. Learn more about the machine on page 9.

PHOTO FROM CITY TRANSFER

DJC TEAM

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Finished hotel units are lined up for transport in Europe.

IMAGES FROM MORTENSON

HERE'S HOW A MODULAR HOTEL STACKS UP IN SEATTLE

Mortenson says modular can alleviate ever-increasing construction costs, labor shortages and congested jobsites.

It doesn't take an industry expert to see that ever-expanding and unprecedented growth in the Seattle and Bellevue markets is unsustainable — something must give.

Mortenson has teamed up with citizenM hotels to make sure safety, quality, cost and schedule are not the “give” by going modular on citizenM's new 264-key hotel in South Lake Union at 210 Westlake Ave. N. As a first for Seattle, the road to stacking modular Lego-like hotel blocks has been quite the journey but should pay off in spades for all stakeholders.



BY PHIL GREANY
MORTENSON

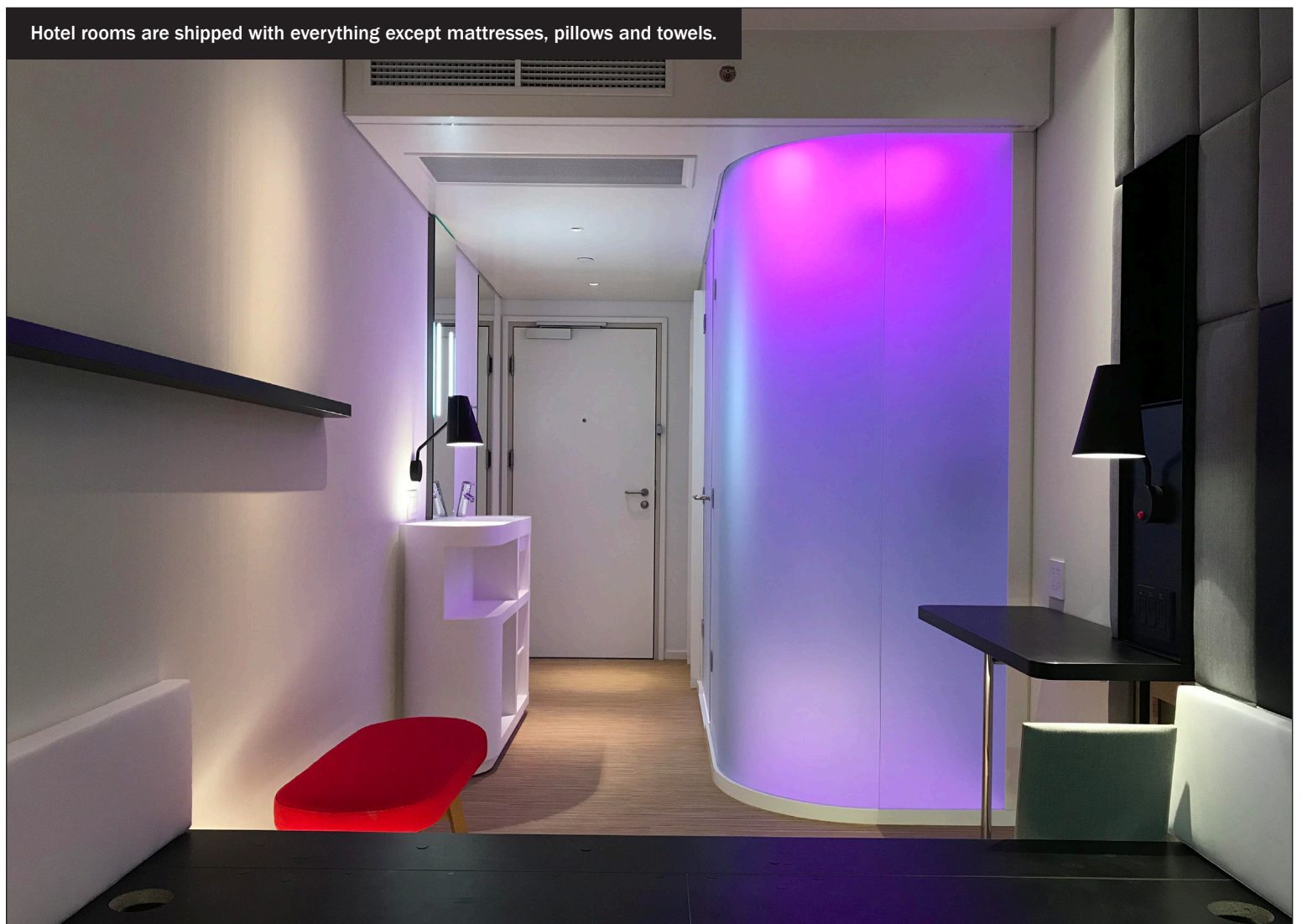
Stagnant industry

The development, design and construction industry struggles to embrace change. The approach often is: “If things are working why disrupt the process?” The tools in our toolkits and how we use them have seen little change over the past 50 years.

Manufacturing lean techniques were driven by vision and necessity to solve a series of problems: from Henry Ford, who in 1910 assembled his rolling production line to reduce cost and increase production to supply affordable cars to the masses, to Toyota, who developed the Toyota Production System in the 1960s and 70s to reduce the upfront cost of inventory and allow for more variety through just-in-time production.

Lean principals and just-in-time production are now considered the model for manufacturing and

Hotel rooms are shipped with everything except mattresses, pillows and towels.



have become widely adopted and improved upon by some of the world's largest manufacturers, including Boeing, Paccar, IBM, Apple, Dell and General Electric.

Stars align

Vision and necessity have

come together on the citizenM South Lake Union hotel project to help propel us, our industry and our city into a new chapter of the development and delivery model.

We have a necessity: With the ever-increasing cost of construction, lack of skilled labor and construction congestion shutting

down lanes and clogging our streets, we cannot be as successful with the “business as usual” approach.

We have the vision: As owner and operator of its hotels, citizenM long ago understood the value of modular construction, especially that quality and speed-to-market equals early

revenue. With 10 hotels in Europe and eight in deployment or under construction in the U.S., modular design and delivery is something citizenM sees as a key ingredient to success. Combined with the experience and leadership of Mortenson, Gensler and Arup, the stars have aligned to gain

some traction and push our stagnant industry forward.

International lesson

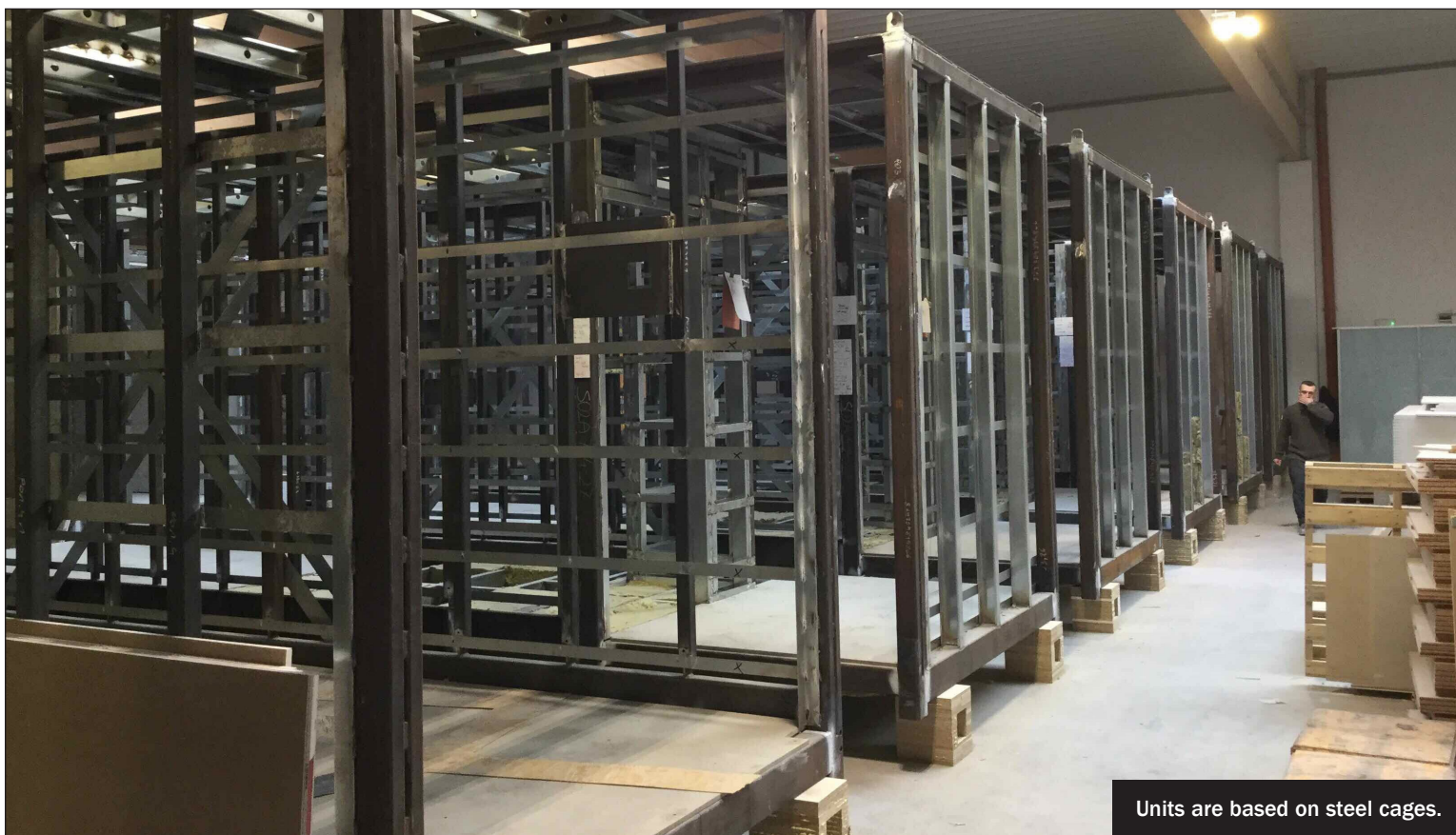
Modular design and construction has been widely adopted in Europe, Asia and Australia for all the reasons we are now looking at. It also solves the specific regional issues we are facing in skilled labor shortages, capacity/backlog of the local subcontractors and suppliers and the logistical nightmare created on our streets, with projects on what seems like every block.

With modules manufactured in a controlled environment, not only have we mitigated these issues, but we have enhanced the delivery of the product.

You get what you put in

The team — including Polcom Modular for modular manufacturing — has spent a year and a half planning for modular delivery. The approach and commitments we have established to function as one team has been a journey for us all and I can say it has been a bit uncomfortable at times.

That is exactly what Menno Hilberts, project director with citizenM, was looking for in a team. A team that is not afraid to break out of its comfort zones. From his experience in the delivery of citizenM's modular hotels in Europe, he knows it means



Units are based on steel cages.

getting past the traditional way of working and thinking. Instead, we are all responsible for everything.

Where we stand

Currently all 264 modular hotel units are in production with full-time inspectors in the factory.

Hotel units will leave finished — down to the toilet paper holder. The only items to be post-factory installed will be mattresses, pillows and towels.

Modular units will also be fully protected from the elements with an air and water barrier that will remain through the installa-

tion process.

The entire hotel will be shipped via one private vessel from Europe to Seattle, a four-week journey that includes a brief stop at the Panama Canal.

Stay tuned

Stacking of our hotel Lego

blocks will begin in late August. The widespread adoption of modular development, design and construction is well underway in the Pacific Northwest.

Phil Greany is an executive with Mortenson and leads its commercial, hospitality and multifamily businesses.



Each unit is outfitted with an air and water barrier before it leaves the factory floor.

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WE'VE GOT GREEN BUILDINGS, HOW ABOUT GREEN COMMUNITIES?

If we networked our buildings and reused resources amongst them, it could lower operating costs for owners and tenants.

Our industry just concluded the 2018 Living Future unConference where a global community of change-makers converged to turn ideas into action. This is the Northwest's marquee event where we discuss what's next for sustainability in the design and construction industry.



BY STACY SMEDLEY
SKANSKA USA

A veteran of this industry for 15 years, I remember nervously drawing my first stair detail and the excitement as a freshly graduated intern working on a LEED for Homes pilot project, when it was a new certification path.

From that LEED for Homes cottage housing development to the Bertschi School Living Building Challenge project with Skanska, my career opportunities span design and construction of deep green buildings of various scales and types. However, something has nagged at me in this space where buildings and sustainability intersect. How do we shift

Bertschi School's Science Wing was the first primary school facility certified as a Living Building in the Lower 48 states.



PHOTO BY BENJAMIN BENSCHNEIDER

our approach from designing and constructing deep green buildings to creating entire deep

green campuses, communities and cities?

The green building movement

historically has largely been just that — a green building movement. At the onset of every green building certification system, progressive code update or system innovation, there is a keen focus on implementation at the single building level, and this does make some sense. There has to be the first adopter, the

prototype and the case study to demonstrate that a certain certification or innovation is possible at a building level.

This resulted in an array of what I call "green demonstration projects" internationally — beautiful stand-alone green buildings of various scopes, on campuses and in our cities and



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communities, that people can tour, experience and learn from. We have examples of this here in Seattle, with projects like the Bullitt Center that is a certified Living Building and a demonstration of several innovative technologies and systems that allow a building to operate at net-zero or positive efficiencies, as well as be constructed of healthy, resilient materials in an urban setting.

With this progress, my troublesome question still exists, and is becoming more nagging as more of these stand-alone built case studies are completed. When do we move from building sustainably, in silos, to building sustainably at the community, campus and city scales where innovations, efficiencies and lessons learned are shared across buildings, owners and project teams?

There are examples of others pushing to forge the path that allows this type of thinking and collaboration. Trends like green rating systems adding campus and community level certification paths are an indication that the design and construction communities are thinking and asking about this. USGBC's LEED for Neighborhood Development and LEED for Campus and ILFI's Living Community Challenge allow for larger scale projects with multiple buildings to approach sustainability more holistically and share green choices around site location, shared water and energy efficiencies and healthy

material choices.

At Skanska, we are searching for how to apply these things beyond a particular owner or larger project's boundaries. We can't just go from individual building silos to larger scale project silos. There should be a way at the jurisdictional and code-making levels to begin to frame what's possible for communities and cities, so we can allow avenues for knowledge, resource and budget sharing across projects, design and construction teams and owners when a district-scale solution is the most sustainable outcome.

There are instances of owners, cities and communities beginning to explore this. Those of us in the design and construction industries need to support these efforts by advocating for solutions beyond the individual building scale on projects that lend themselves to LEED ND, LEED Campus or the Living Community Challenge. We need to be at the table for discussions looking beyond the site boundaries in our communities and cities, to demonstrate that we are open to collaboration and sharing between us, to achieve the most sustainable outcomes.

A city thinking long-term can observe and forecast the opportunity we're missing. If we networked our buildings and reused resources amongst them, it will lower overall demand and, ideally, operating costs for building owners and tenants. We can invest in district solutions now

to know that we will be able to sustain growth and be more resilient.

I don't yet have the mind-blowing solutions, but Skanska recognizes it's time to work with communities to find ways to incentivize and facilitate district-level implementation and take

our commitment to green ratings systems such as LEED and Living Building Challenge, and sustainability to the next level.

More of us need to be vocally asking it, not just thinking it to ourselves. That's how change happens, and there is such an opportunity for us to use our

collective knowledge, passion and expertise to make our cities and communities more sustainable. The building-by-building approach isn't going to cut it in the long run.

Stacy Smedley is director of sustainability at Skanska USA.

WORKFORCE

CONTINUED FROM PAGE 2

According to the job search site Indeed, construction careers like preconstruction manager and construction superintendent rate among the top 10 jobs for 2018 based on great salaries and the growth in job postings.

Construction professionals build schools, hospitals, hotels, stadiums and every-

thing in between. The industry has provided fulfilling and lucrative careers to hardworking Americans for generations, and continues to play an important role in national and local economies. It is also among the few industries where someone can enter as an apprentice or trainee and be paid to

further their career through earn-and-learn programs, all without accruing student loan debt. Skilled trades are a viable alternative to college for young students.

Wendy Novak is president and CEO of ABC of Western Washington.

METAL TARIFF

CONTINUED FROM PAGE 3

In the long run, even condo owners and apartment dwellers may experience a change in lifestyle stemming from the tariffs. Under such conditions, owners and developers can decide to reduce the square footage of residential units to maintain their profit margins — or break even. Squeezing two full units out of what once was allocated for a

single three-bedroom is a proven survival tactic.

The story for Seattle's construction prospects continues to unfold as the tariff situation evolves. For the foreseeable future, things will be in flux — a condition no one in the industry finds comfortable. From suppliers and developers to builders and laborers, stakeholders are grappling not only with

real-time effects, but are trying to plan for the unknown events of the future.

Julian Anderson is president of the North American region of Rider Levett Bucknall, which provides project management, construction cost consulting, and related property and construction advisory services.

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DESIGN-BUILD DONE RIGHT: TIPS FOR SUCCESS

Benefits include improved project quality, as well as time and cost savings.

Successful design-build projects provide a multitude of value to the owner, and ultimately to the end users.

These benefits include improved project quality, as well as time and cost savings. Design-build delivery also allows the contractor to establish a guaranteed budget early in the design phase. As a result, the owner can make changes, request additional value engineering or even add scope to a project before the substantial design is complete.



BY BRETT EARNEST
CLARK
CONSTRUCTION
GROUP

The Spark, Washington State University's new digital classroom building, serves as an example of how design-build can work successfully. The Spark was the product of a design-build competition and delivery that allowed WSU to find the best value design and team for the university's budget.



The Spark has a 250-seat circular learning hall.

The academic innovation hub and revolutionary teaching and learning space creates an environment that energizes and connects students and faculty. The 83,000-square-foot, high-perfor-

mance academic building boasts a 250-seat innovative circular learning hall, faculty innovation studio, hoteling office space, media studio with 3-D printers, cafe, student development stu-

dio and event space.

Employing the best practices outlined below, Clark Construction Group and ZGF Architects delivered the \$43 million design-build project for WSU early and under budget, while incorporating numerous technological and student experience enhancements.

While design-build delivery can be perceived as limiting client access to the architect, the opposite is true if a team is committed to maximizing efficiency and collaboration among stakeholders. Providing full access to the design team ensures faster responses and opens communication at all levels.

PHOTO BY BENJAMIN BENSCHNEIDER

WASHINGTON'S PREMIER RIVERFRONT RESORT DESTINATION



Goals and mission

To attain the best possible outcome, design-build teams should align with the client around attaining the project goals and client's mission from the outset. Prioritizing deep and broad engagement with the client — even during the procurement process in proprietary meetings — helps set a collaborative tone early in the project.

On The Spark, the client, architect and contractor fostered a culture of transparency and trust from the start. While WSU was the client, the needs of the students, faculty and Pullman community became equally important to the team throughout the process, from the planning phase to final inspection.

To enhance team collaboration and expedite critical decision making, Clark co-located with the design team and other key consultants. The team worked towards a 100 percent integrated virtual co-location that included regular design staff rotation on-site, video-enhanced conferencing and collaborative online work sessions facilitating long-distance teamwork.

Co-location yielded a more streamlined decision-making process, which ultimately bene-

Flexibility

Remaining flexible to respond to changing project conditions and needs is equally critical in a design-build project. Design-build provides the flexibility to respond to — and incorporate — a client's evolving needs with tailor-made solutions. The project team, in turn, can drive creative solutions that bring value, which are often hallmarks of a successful design-build project.

The Clark/ZGF team surmounted challenges at each stage of The Spark project, including an already tight budget further reduced by state funding cuts, incorporating updated university construction standards into the design, a restricted site, and rapidly evolving technology market.

After reducing overall project costs by \$5 million at the start of the project, the team later incorporated \$750,000 in building design enhancements and still completed the project \$127,000 under budget.

During the design and validation period, WSU released new construction standards that revised the standards to which the Clark/ZGF contract

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DESIGN-BUILD — PAGE 11

TIGHT SITE, DEEP HOLE? BRING ON THE TELEDIPPER

Andersen Construction is using a telescoping excavator, common in Europe, for The Emerald condo tower.

Andersen Construction is building The Emerald, a 266-unit, 41-story condominium in Seattle's Belltown neighborhood just east of Pike Place Market.

Measuring less than 8,500 square feet, the building footprint is relatively small compared to typical high-rise projects. The sleek design by Hewitt makes the most of its small site by cantilevering over a neighboring building to increase the floorplate starting at level 17.



BY SAM BERNOSKI
ANDERSEN
CONSTRUCTION

One of its most difficult execution challenges is minimal site access in a busy, cramped downtown location. The team is not allowed to impede traffic on Second Avenue, limiting deliveries to only Stewart Street.

The technical and complex shoring system presented additional challenges, including underpinning the adjacent Broadacres Building to the south and installing a Dywidag bracing system to the west.

These combined factors demanded creative problem solving to complete the required 65-foot excavation below street level — which accommodates five floors of underground parking.

During preconstruction, Andersen Construction, City Transfer

THE EMERALD PROJECT TEAM

General contractor:
Andersen Construction

Construction manager:
Daniels Real Estate

Architect:
Hewitt

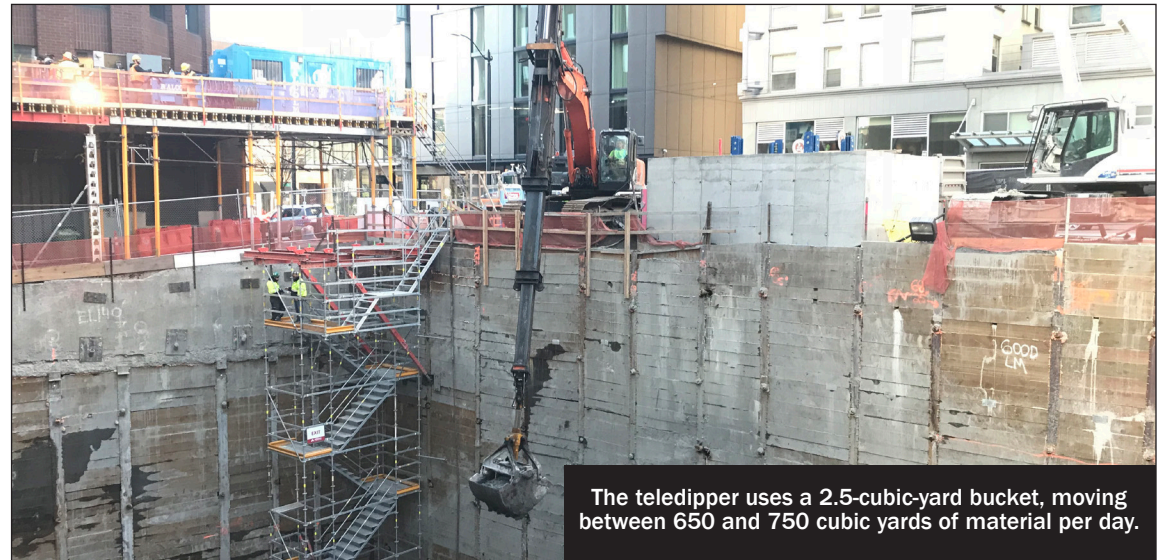
Structural, civil engineer:
KPFF Consulting Engineers

Owner:
Mirador CWZ LLC

and Malcolm Drilling put their collective knowledge to work formulating an excavation plan which would maintain crew production rates and mitigate potential impacts to the overall project schedule. Due to the site's constraints, it was determined that a traditional conveyor system would be ineffective because of the conveyor's large footprint and frequent assembly changes during excavation and shoring.

The teledipper

Projects like The Emerald with small, deep footprints require removing a relatively small volume of material to provide sufficient square footage for shoring and lagging activities to continue productively. During this stage of



The teledipper uses a 2.5-cubic-yard bucket, moving between 650 and 750 cubic yards of material per day.

PHOTOS FROM CITY TRANSFER

construction, shoring became the project's critical path driver. With this in mind, City Transfer's team proposed using a telescoping excavator known as a teledipper.

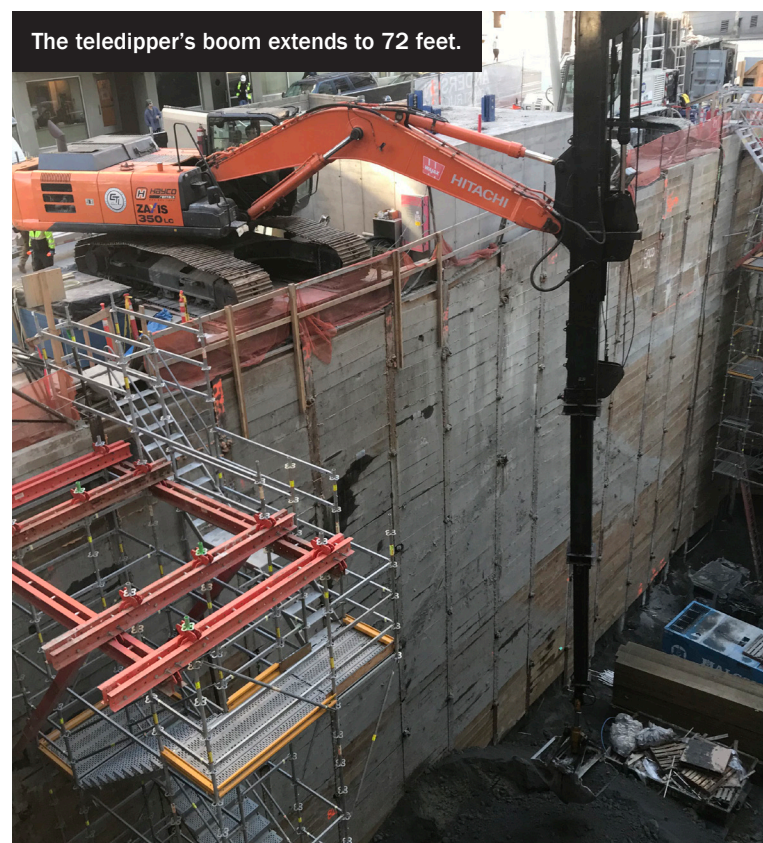
Last year City Transfer visited a transit portal station under construction in Canada to see the teledipper in action and review its functions and feasi-

bility. Already used extensively throughout Europe, the teledipper excelled on a similarly tight and congested work site as The Emerald. This is the first project in which Andersen Construction and City Transfer are using this unique piece of equipment.

Capabilities, limitations

The teledipper's boom extends to 72 feet and uses a 2.5-cubic-yard bucket, moving between 650 and 750 cubic yards of material per day. Meaning? The teledipper has significantly less

TELEDIPPER — PAGE 12



The teledipper's boom extends to 72 feet.

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EQUIPMENT SECTOR'S HEAVY LIFT: REGULATIONS, EMPLOYEES

The industry faces tough regulations and an education-community business disconnect.

Construction in the Pacific Northwest and most U.S. population centers is moving at warp speed. Contractors are building complex and costly projects. Heavy industry and manufacturing are investing aggressively in their facilities to keep up with production and the often-overlooked continual investment to minimize environmental impacts. Marine and agricultural products are in high demand.



BY SARAH
ROTHENBUHLER
BIRCH EQUIPMENT

In contrast, equipment shortages, regulatory issues and labor shortages are slowing business production and increasing costs dramatically.

Supply, cost, service, value

Equipment manufacturers have only recently been able to abandon an on-demand recessionary mindset and are now in full production. Birch, which rents and sells to commercial construction, heavy-industrial, residential, government, manufacturing and agricultural industries, projects 18 to 24 months out for its market needs. This has led to an expansion of its Pacific Northwest equipment fleet, now

valued at over \$40 million.

Birch has designed proprietary software to support contractors and those managing scheduled maintenance and seasonal equipment needs so they can plan not just with pricing gear but with booking the rentals. This summer and fall will see record-breaking demands for equipment so those able to project quantities and start dates are best to get their equipment needs booked.

Costs to purchase, maintain and deliver equipment have quietly increased the past few years, and the next 24-36 months will show significant increases.

Since the 2007 recession, general construction equipment sitting idle had been in surplus, creating commonplace market folly to send out costly pieces of equipment for loss-leader pricing — i.e. capital cost of \$120,000 renting for \$1,100-\$1,700/month with an average annual utilization of 40-70 percent. This is not good math, especially considering increasing costs in labor, health insurance, liability insurance, preventative maintenance and repair costs, as well as costs and maintenance complications of Tier IV and other emissions-related regulations.

Regulations

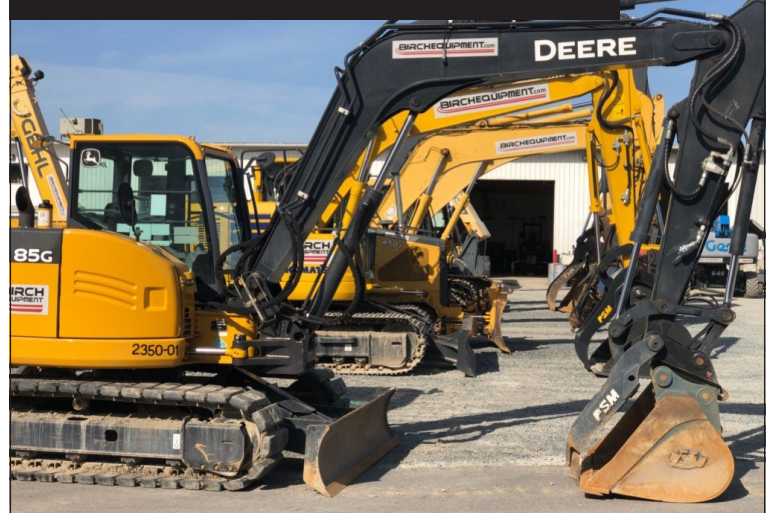
Speaking of regulations, industries across the board have been experiencing workplace shortages for years, and it's interesting this information was not present in mainstream media until recently. One of multiple systemic issues is limiting 16- to 18-year-olds from working at rental facilities and construction sites.

Federal and state laws prohibit minors from working in occupations involving "operation or repair, oiling, cleaning, adjusting or setting up and/or working around heavy equipment." Yet these same teens drive 2 tons of steel 70 miles an hour down our Northwest freeways, many of which were designed and built in the 1950s.

The pendulum has swung too far by preventing the next generation of employees from getting hands-on work experience and tying the hands of employers, especially community businesses offering solid paid internship and training opportunities. Regardless of where a person wants to land in the workforce and whether they attend a tech school, high school or college, hands-on experience is critical to contribute to business production, development and teamwork.

Being in, on and a part of these jobsites and facilities for the past

Birch's equipment fleet is valued at over \$40 million.



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DESIGN-BUILD

CONTINUED FROM PAGE 8

and design were based upon. To meet WSU's new quality, safety and operational requirements, the team held detailed coordination meetings with all stakeholders to revise the design. Because of the process, the team discovered cost-saving opportunities across trades that opened the door for later building enhancements.

The constant review of budgets, transparent cost reporting and detailed allowance management process ensured the delivery of a state-of-the-art building with significant technology upgrades without impacting the schedule or increasing overall construction cost.

Team mentality

Perhaps most importantly, fostering a "one team" mentality is critical to achieving design-build success. Open lines of communication among designers, subcontractors, user groups, and the construction team allows for maximum efficacy of coordination. During design and construction of The Spark, "TEAM" was written on the wall in the

co-location space to signify the complete ownership of all stakeholders at all levels.

The team worked together to address challenges affecting cost and schedule, safety and quality, and The Spark's need for innovative digital technologies. Clark and ZGF reviewed challenges in the field with the client daily and held collaborative work sessions multiple times a week. Project leaders throughout the design and construction process carried a spark of innovation that epitomized their finished product.

The team mentality extended beyond the jobsite, with Clark team members becoming

engaged throughout the local community. For example, the team worked with first responders on an emergency action plan that was later adopted by WSU as the new standard. They also worked with the local Boy Scouts and joined WSU's Butch Cougar mascot program in performing athletic and community service activities on campus.

Design-build success

Early alignment with WSU around project goals, the agility to respond to evolving project conditions and always maintaining a team mentality were all critical to the success of this

design-build project. Adhering to these best practices requires a significant investment in the process. Every design-build partnership is different but committing to fostering a truly collaborative team environment can go a long way towards ensuring project success.

WSU sought a revolutionary teaching and learning space that enables faculty to use the most innovative technology, while also helping students engage deeply in learning. Clark and ZGF worked hand-in-glove to deliver a facility that exceeded the client's vision for functionality, quality and aesthetics, while staying within the budget.

The Spark embodies a holistic understanding of higher education construction and a desire to further WSU's mission and enhance the learning environment for university students and staff alike. The result is an academic building that leaves a lasting mark on the community and has been recognized for building and design excellence by regional and national industry organizations.

Brett Earnest is a vice president with Clark Construction Group in Seattle. Clark has delivered nearly \$20 billion of design-build projects across the country.



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HEAVY LIFT

CONTINUED FROM PAGE 10

25 years, it seems retail parking lots have become more dangerous and environmentally damaging than most commercial and industrial worksites, especially with today's focus on safety, environmental and efficiency standards that these sites maintain.

Additional regulatory delays and costs associated with permitting for building, facility and site development is another area that has gone off track but deserves a separate article ... or book.

Education-business disconnect

Birch, like so many community businesses, lacks the get-rich-quick marketing appeal of the technology industry and would hire 20 people tomorrow if it could.

Having not yet found a pool of energetic and engaged go-getters who have dreamed of working in the equipment rental or construction industry, Birch has developed excellent initial and ongoing training programs and provides solid career-wage jobs with quality benefits and 4/10 work schedules. Birch has never laid off staff or reduced benefits due to the economy; challenging over the past 25 years but this has helped build Birch's 80-plus-person team to an average retention rate of nine years and growing.

Like so many industries, the equipment rental business has

become more sophisticated and requires people with diverse educational and workplace experiences. The construction industry and others have incredible programs and opportunities to connect potential hires with real-life work experience, but it has been difficult to partner with the educational system. It seems people have good intent but are worn out by rules, regulations and liabilities that may have been implemented for good reason but now contradict common sense applications.

Thankfully, where there is noise there seems to be healing, and the pendulum may be swinging back.

The Associated General Contractors of Washington is working with schools to implement program tracks for students interested in the construction industry.

Birch helped launch a youth initiative through the Whatcom Business Alliance that is just starting to connect with area schools to give high school, college and other job-seekers exposure to the vast number of internships, job shadow and job opportunities in Whatcom County.

Birch hopes to do the same in each of its market areas. The opportunity is there and the strong economy and increased labor demand may help encourage common sense into some current regulations. It's exciting to see the possibility of community-minded business and

education coming back together.

Lean management

To combat these and other challenges community businesses face, Birch invests significantly in lean management practices and training programs that include daily and weekly training on its product and services, on-site manufactured training, and interdepartmental cross training. Kaizen-focused continual improvement of processes, systems and operations are helping eliminate wasted motion and increase workplace communication, production and teamwork.

An unanticipated byproduct of this cultural focus has been better management of costs, communication and dedication to internal and external customers. Continuing to invest in employee development, proprietary software, upgraded data processing systems, facility layouts, equipment tracking, training and maintenance should continue to improve efficiency in equipment delivery, service and response times.

This has been a tremendous help through the current market of equipment and labor shortages and regulatory challenges.

Sarah Rothenbuhler is CEO and owner of Birch Equipment, with operations in Washington and Alaska.

TELEDIPPER

CONTINUED FROM PAGE 9

space requirements than a conventional conveyor system, while affording better efficiency than a traditional long-stick excavator or crane-and-skiff method.

Though less productive than a conveyor, which can move up to twice the volume per day, the teledipper's benefits more than compensated by saving precious space onsite and alleviating field congestion amongst excavators, drilling rigs, a mobile crane, and compressors.

The teledipper also offered additional laydown area at street level by removing the conveyor's control shack. This space proved invaluable to other trades for material deliveries and hauling, thus boosting efficiency to the overall project workflow.

Future applications

In downtown developments where space is at a premium, especially in Seattle's current construction frenzy, dense high-rise developments frequently replace mid- and low-rise buildings. Towers with the combination of confined space and deep excavations can benefit from the teledipper's capabilities.

Oftentimes, developers must acquire easements from neighboring property owners to install shoring elements (i.e. soil nails and tiebacks). When these easements are unobtainable, alternative retention methods such as internal braces and/or rakers are often used throughout the excavation phase. These elements, like a conveyor, can be cumbersome to field crews and limit logistical and operational productivity. With the right conditions, the teledipper can help maintain schedule while operating within a braced excavation.

The Emerald is anticipating completion in May 2020. When finished, the 381,571-square-foot tower will house ground floor retail in addition to high-end condos and a wide array of amenities and unobstructed views of the sound to the west and downtown to the south. The 39th floor will be home to an outdoor barbecue and terrace, kitchens and common rooms for residents.

Sam Bernoski is a project manager for Andersen Construction who joined The Emerald team in October 2017.

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ABC'S 2018 EXCELLENCE IN CONSTRUCTION AWARDS

Rafn Co. faced many challenges while renovating 12 floors of an occupied Seattle skyscraper for HomeStreet Bank: limited elevator and building access; restricted work hours; hidden building conditions; and out-of-level ceilings and floors.

Rafn yesterday won the Eagle of Excellence, the top construction award from the Associated Builders and Contractors of Western Washington, for overcoming those and other obstacles on that project. It was the seventh year in a row that Rafn has taken the top honor at the ABC Excellence in Construction Awards.

Nine projects won top awards in various categories and five others were given merit awards at a banquet held in Bellevue at Meydenbauer Center. Synergy Construction came in second overall, winning the Pyramid Award for its Twin Lakes Landing low-income housing project in Marysville.

The judges this year were John Schaufelberger of the University of Washington, J. Carter Woollen of Woollen|Studio, Bobby Thomsen of CollinsWoerman, Daniel A. Swaab of Mithun, Van Collins of ACEC Washington and Benjamin Minnick of the Seattle Daily Journal of Commerce.

TENANT IMPROVEMENT/RENOVATION \$4 MILLION-\$10 MILLION

**HomeStreet Bank
corporate offices**
Rafn Co.

Architect: MG2
Owner: HomeStreet Bank

Rafn proved itself again this year through its attention to four pillars — excellence, design, integrity and safety — and won the Eagle of Excellence Award for its HomeStreet Bank tenant improvement.

Rafn overcame limiting and often cumbersome conditions at Two Union Square in downtown Seattle, including coordinating with the building's contractor and clients, which were in close proximity. This multi-phase tenant improvement spanned 26 months and covered 87,850 square feet.

Rafn installed a custom marble countertop on the reception desk, and reconfigured private offices, open offices, bathrooms, and conference and break rooms.

One of Rafn's challenges was working with limited access to the site, in Seattle's third largest skyscraper. With construction spanning over 12 floors, along with limited elevator and building access, Rafn had to plan ahead — often three to four weeks — in order to move materials and tradespeople in and out.

The size and weight of the materials that needed to be moved in and out of relatively small elevators posed another challenge.

Timing was also a limiting factor, requiring flexible schedules often well into the night and early hours of morning. The building has a strict poli-

Rafn had limited access to remodel HomeStreet Bank's space at Two Union Square.



PHOTO FROM ABC OF WESTERN WASHINGTON

cy requiring that construction materials not enter or leave the building between 7 a.m. and 6 p.m. This, paired with limited elevator access, meant that tradespeople often had to wait 15–20 minutes every day just to reach their particular job.

Restrictions on the permeation and presence of noise, dust and smells also required much of the work to be done after 6 p.m. to avoid disturbing tenants.

Hidden conditions such as crowded ceiling spaces made routing and installing new systems challenging due to the fact that crews had to fix previous work and find ways to install lighting components that wouldn't interfere with sprinkler systems. During this process they also found the need to retrofit outdated sprinkler connections, which were not up to code.

The building's ceilings and

floors were not level or flat, requiring custom installation of each wall panel while working with special building requirements that didn't permit alterations to the existing ceiling grid.

Of the 15,267 labor hours recorded on this project, there were zero OSHA-recordable injuries that required days away from work, nor were there any cases requiring job transfer or restriction.

2018 ABC EXCELLENCE IN CONSTRUCTION AWARD WINNERS

Eagle of Excellence • Tenant Improvement/Renovation (\$4 million-\$10 million)

HomeStreet Bank corporate offices
Rafn Co.

Pyramid Award • Other Construction (\$10 million-\$25 million)

Twin Lakes Landing
Synergy Construction

Commercial Construction (\$10 million-\$25 million)

Lillehammer Apartments
Redhawk Group

Commercial Construction (\$5 million-\$10 million)

Raceway Heated Storage
Donovan Brothers

Commercial Construction (less than \$5 million)

HomeStreet Bank Tacoma
Rafn Co.

Healthcare (less than \$10 million)

Seattle Recovery Place
Donovan Brothers

Multifamily Construction (\$25 million-\$100 million)

The Eddy at Green Lake Village
Rafn Co.

Mechanical/Industrial (less than \$5 million)

Project Frosty design-build
Air Systems Engineering

Specialty Construction Commercial (less than \$5 million)

G2 exterior
SKIS Painting

MERIT AWARDS

Industrial (\$5 million-\$15 million)

Commencement Bay Corrugated
Donovan Brothers

Infrastructure (up to \$100 million)

Burien Cold Storage (sitework and MSE wall)
Donovan Brothers

Institutional (less than \$5 million)

New Life Church Kent
Donovan Brothers

Tenant Improvement/Renovation (less than \$4 million)

Moorea Seal
Donovan Brothers

Tenant Improvement/Renovation (\$4 million-\$10 million)

Westend interior/exterior renovations
Synergy Construction

OTHER CONSTRUCTION \$10 MILLION-\$25 MILLION

Twin Lakes Landing Synergy Construction

Architect: HKP Architects

Engineer: Lund Opsahl

Owner: Housing Hope

ABC members: Ahlers & Cressman; Propel Insurance; Safety Matters; Dexter + Chaney; Schmitz and Associates; Construction Industry Training Council

Synergy Construction was awarded the Pyramid Award — second best overall — for its work on the Twin Lakes Landing housing facility in Marysville. This 50-unit housing complex is home to low-income families, many of which were previously homeless.

The scope of this project involved pre-fabricated and multifamily construction that spanned over 11 months and covered 47,000 square feet.

Synergy pioneered a full modular delivery method that dramatically decreased on-site risks and the time it takes to construct and deliver affordable housing. It accomplished this by building the modular units in a temperature-controlled facility in Boise, Idaho.

Once units were completed with drywall,

Synergy used modular components to make the 50-unit Twin Lakes Landing apartments.



PHOTO FROM ABC OF WESTERN WASHINGTON

COMMERCIAL CONSTRUCTION LESS THAN \$5 MILLION

HomeStreet Bank Tacoma Rafn Co.

Architect: MG2

Engineer: DCI Engineers

Owner: HomeStreet Bank

Rafn Co. built this 8,800-square-foot HomeStreet Bank in Tacoma with structural steel, engineered metal I joists, wood and metal stud framing, Allura fiber cement siding, stone masonry, accent steel and aluminum sunshades.

While construction took about 8.5 months to complete, the scope of work involved about seven months of preconstruction services that included estimation of building sizes and configuration, and value-engineering to reduce cost. The foreman's proactive scheduling approach of looking for opportunities to move ahead when possible, and taking advantage of limited good weather days, allowed Rafn to complete the project nearly four weeks ahead of schedule.

Rafn encountered a few challenges during its work. First, it was discovered that the site required extensive cleanup, such as removal of five underground fuel tanks and surrounding contaminated soil, even though the site was given a Department of Ecology "no further action" required letter before excavation had begun.

The site also had no utility services, which meant that Rafn had to bring in stormwater and communications lines, as well as gas service.

Complex and highly inflexible construction components made tolerances extremely tight, making this project unforgiving when it came to adjustments. Double- and triple-checking dimensions was a must. This also made fitting duct work through the RedBuilt wood bar ceiling posts difficult.

Of the 7,107.5 hours worked on this project, there were zero OSHA-recordable cases of injury that required days away from work, nor were there any instances that required job transfer or restriction.

Rafn unexpectedly had to remove five underground fuel tanks.

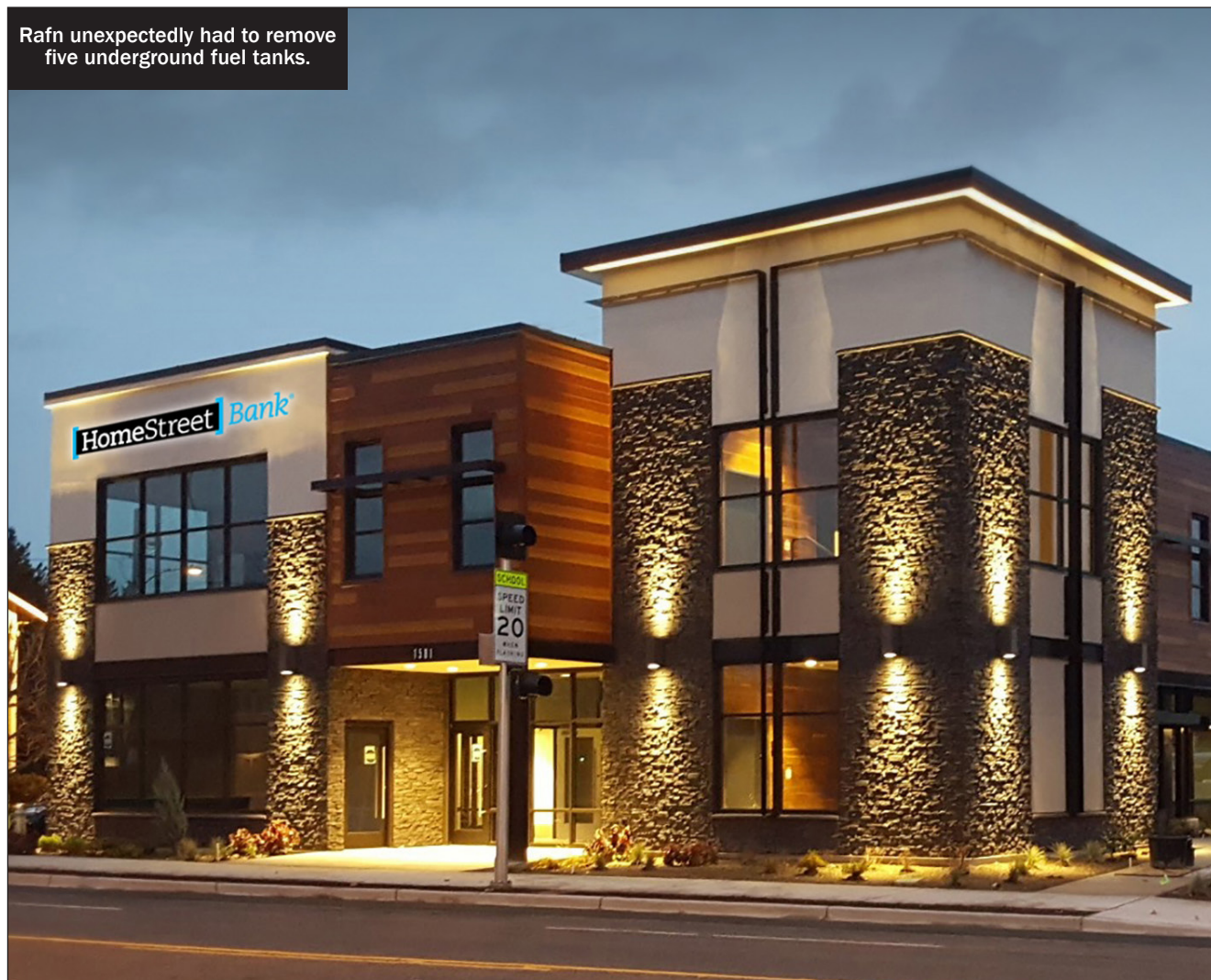
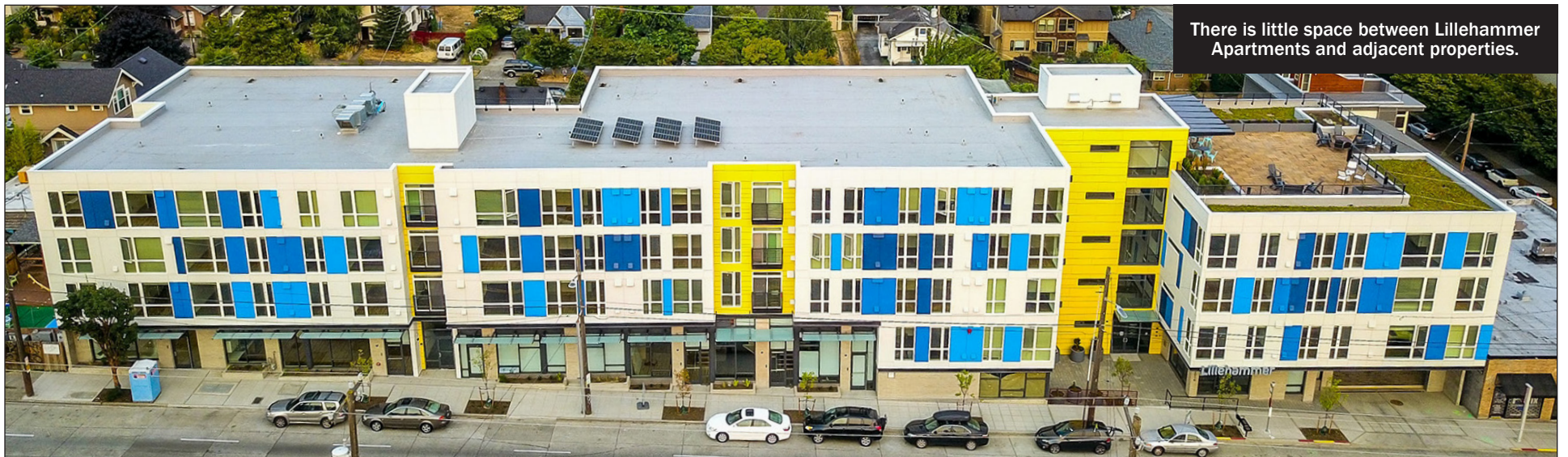


PHOTO FROM ABC OF WESTERN WASHINGTON



There is little space between Lillehammer Apartments and adjacent properties.

PHOTO FROM ABC OF WESTERN WASHINGTON

COMMERCIAL CONSTRUCTION \$10 MILLION-\$25 MILLION

Lillehammer Apartments Redhawk Group

Architect: Caron Architecture
Engineer: Frank Co.
Owner: Gramor Development
ABC members: Ketchikan Dry-wall; Premier Builders; General Storefronts; RC Painting & Sons; HUB International NW;

Oles Morrison Rinker Baker

Lillehammer Apartments is a new building containing 89 housing units, five live/work units and two commercial/office spaces. It is less than two miles from the Ballard Avenue Landmark District in Seattle.

The scope involved construction of a 70,000-square-foot

building with bright yellows and blues that hark back to the neighborhood's Scandinavian roots. It took about 18 months to finish.

In addition to dealing with the increasingly common challenge of working with neighbors who were unhappy with the presence of apartments in a traditionally single-family neighborhood, Redhawk Group also dealt with

a narrow margin between the building's property and adjacent properties, as well as other general space limitations and minor traffic interruptions.

Redhawk was able to overcome these challenges by coordinating with neighbors, keeping the site clean and tidy, planning ahead for limited delivery schedules, and coming up with a creative use of scaffolding to

move materials to higher floors without the aid of a crane, which would have required room that was not available.

Of the 39,487 labor hours recorded for the project, there were zero OSHA-recordable cases of injury that required days away from work, nor were there any instances that required job transfer or restriction.

COMMERCIAL CONSTRUCTION \$5 MILLION-\$10 MILLION

Raceway Heated Storage Donovan Brothers

Architect: The Ronhovde Architects
Engineer: Barghausen Consulting Engineers
Owner: Highlands at Cedar Downs LLC
ABC members: Parker Smith & Feek; Evergreen Refrigeration; Kirby Electric

Raceway Heated Storage is a four-building self-storage complex in Auburn featuring a replica of Herbie the Love Bug car atop the manager's office, as well as a checked flag-patterned tower.

This 108,885-square-foot, 17-month project involved construction of four storage buildings, a manager/sales office and a retention pond.

A combination of one of the wettest winters on record, the six-acre site's slope, and soil composed of glacial till and silty sand made conditions unsuitable for work to begin. This required importing a large amount of soil to the site, along with the installation of quarry spall roadways, and substantial erosion control measures.

Another challenge Donovan Brothers faced was significant changes to the original design



Designs were changed during construction, resulting in one building increasing in height to four stories.

PHOTO FROM ABC OF WESTERN WASHINGTON

after discovering that the property's easement required that all storage buildings shrink by 10 feet. This forced the client to increase the height of one of the buildings from two stories to

four stories in order to make up for lost rental space prompted by the easement.

To ensure timely completion, Donovan phased the project and changed the order in which

it constructed the buildings so that the building with the height change was constructed last.

Of the 11,150 labor hours recorded for this project, there

were zero OSHA-recordable cases of injury that required days away from work, nor were there any instances that required job transfer or restriction.



Air Systems Engineering installed the heating system, large exhaust fans, control wiring and gas piping.

PHOTO FROM ABC OF WESTERN WASHINGTON

MECHANICAL/INDUSTRIAL LESS THAN \$5 MILLION

Project Frosty design-build

Air Systems Engineering

Architect: ATI Architects + Engineers

Engineer: Air Systems Engineering

General contractor: Gray Construction

Owner: Mitsui-Soko USA

ABC members: Cornell Heating and Plumbing; Evergreen Concrete Cutting

Project Frosty is a concrete tilt-up, metal roof deck storage facility in Fredrickson, Pierce County, designed for the special require-

ments of the aerospace industry.

The building has 70,000 square feet of refrigerated space and 130,000 square feet of ambient temperature warehouse space. It took 14 months to build.

Some of the unique attributes of this project involved the coordinated installation of the heating system, large exhaust fans, and miles of control wiring and gas piping that were custom installed. One of these custom methods involved pre-assembling all 17 louver dampers, each 8 feet square, nearly 30 feet up the wall of the building. Air Systems Engineering accomplished this with a custom jig

mounted to a forklift that was then placed into the openings while install crews waited in nearby man lifts, ready to set

and attach the units.

Of the 2,224.5 hours worked on this project, there were zero OSHA-recordable cases of injury

that required days away from work, nor were there any instances that required job transfer or restriction.



A former tuberculosis hospital was converted into an opioid treatment center.

PHOTO FROM ABC OF WESTERN WASHINGTON

HEALTHCARE LESS THAN \$10 MILLION

Seattle Recovery Place Donovan Brothers

Architect: The Keimig Associates

Engineer: Davido Consulting Group

Owner: Valley Cities Counseling & Consultation

ABC members: Parker Smith & Feek; Evergreen Concrete Cutting; Kirby Electric; Wrecking Ball Demolition; Pivetta Brothers Construction

Donovan Brothers converted a former tuberculosis hospital and nursing home from the mid-1960s into Seattle Recovery Place, a treatment center for opioid addiction in Seattle's Beacon Hill neighborhood.

Significant renovations on the 25,928-square-foot building took seven months to complete. Workers installed new PVC roofing, a storefront system, kitchen equipment and floors. There also were new

design-build plumbing, mechanical and electrical systems, as well as interior and exterior paint. The existing elevator was refurbished.

Asbestos and lead-based paint was found in ceiling tiles, hallways, common areas and domestic line fittings — requiring 10 days of abatement before demolition could begin. Another 12 days were needed to fix voids found under the old concrete building slab, requiring engineering review and core samples before crews could fill the voids with grout.

The new center has 26 patient rooms with over 70 beds, indoor and outdoor community spaces, exam rooms, workout facilities, kitchens and laundry facilities.

Of the 7,192 hours worked on this project, there were zero OSHA-recordable cases of injury that required days away from work, nor were there any instances that required job transfer or restriction.

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MULTIFAMILY CONSTRUCTION \$25 MILLION-\$100 MILLION

The Eddy at Green Lake Village Rafn Co.

Architect: Baylis Architects

Engineer: Coughlin Porter Lundeen

Owner: Vitamilk South LLC

ABC members: Evergreen Refrigeration; Rainbow Federal; Village Framers Corp.

The Eddy at Greenlake Village sits at the corner of Northeast 71st Street and Fifth Avenue Northeast in Seattle. It has 130 market-rate apartments over street-level retail and two underground parking levels.

Rafn Co. built the 163,464-square-foot Eddy in 22 months with five floors of wood frame construction over concrete.

Resident amenities include a lounge, clubroom, business space with conference room, indoor bicycle storage, a pet wash, rooftop deck, and an outdoor pet run on the fourth floor. A through-block pedestrian connection links 70th and 71st streets.

Retail is anchored by a 14,600-square-foot Bartell Drugs with a craft beer growler station and an old-school soda fountain.

Rafn used 3-D modeling to plan around site constraints, including power lines that couldn't be moved and a bus line on one side of the building that restricted deliveries. Rafn also used 3-D modeling to review excavation impacts and help the client visualize various interior wall heights within the units.

Challenges included a high water table, which required additional shoring and extensive dewatering to construct the parking garage. Rafn was able to save the client future maintenance costs by changing the water detention method from a pumped system to a gravity system.

Another issue was contaminated soil that needed to be removed during excavation. Also, adjacent structures were built all the way up to the property line, restricting access and the ability of subcontractors to move equipment around safely.

Of the 35,987.5 hours worked on this project, there were zero cases which required days away from work.



Adjacent structures were built up to the property line, restricting access and the ability to move equipment.

PHOTO FROM ABC OF WESTERN WASHINGTON

SPECIALTY CONSTRUCTION COMMERCIAL LESS THAN \$5 MILLION

Georgetown Squared exterior SKIS Painting

Architect, engineer: BEE Consulting

Owner: SDC Creative LLC

SKIS Painting worked on the exterior of the Georgetown Squared building in Seattle.

This specialty construction project covered 280,000 square feet and took about four months to complete. The original scope involved pressure washing all exterior surfaces, and prepping and painting all existing painted surfaces except for the loading dock area. However, as the project progressed, the scope grew to include repainting the attached sky-bridge, as well as a complete assessment and subsequent refurbishment of expansion joints.

In addition to coordinating safe access to the building around pedestrian and vehicle traffic, SKIS faced inclement weather, inconsistent substrates and issues with the building envelope.

Achieving a consistent appearance and providing a watertight surface meant re-caulking all the expansion joints, even though the removal of the old caulking would damage the existing EFIS system. The added scope required SKIS to score each caulking joint to release pressure, clean the surface, bridge the gap with bond breaker tape, and then apply sealant.

Due to poor conditions with the existing substrate, up to three coats of paint were added in some areas to even out sheen differences.

Of the 1,500 hours worked on this project, there were zero OSHA-recordable cases of injury that required days away from work, nor were there any instances that required job transfer or restriction.



Due to poor conditions with the existing substrate, up to three coats of paint were added in some areas to even out sheen differences.

PHOTO FROM ABC OF WESTERN WASHINGTON



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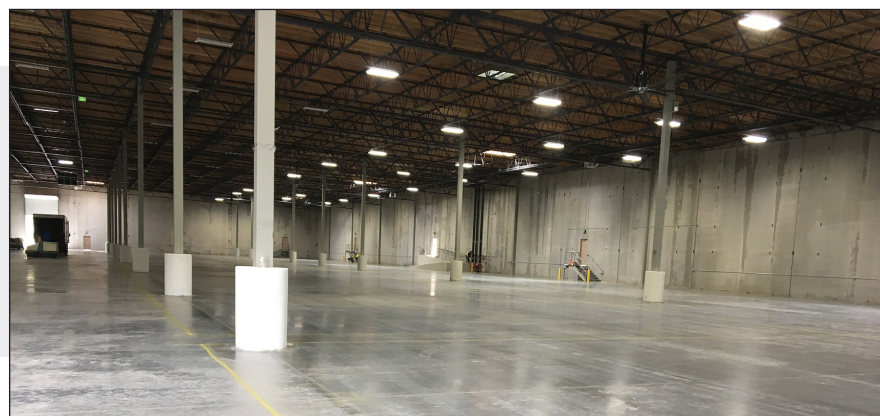
Commencement Bay Corrugated

Contractor: Donovan Brothers

Architect: Tahoma Design Group

Engineer: AHBL

Owner: STB/PCC Joint Venture



INFRASTRUCTURE

UP TO \$100 MILLION

Burien Cold Storage sitework and MSE wall

Contractor: Donovan Brothers

Architect: Pranger Group

Engineer: Barghausen Consulting Engineers

Owner: Bridge Burien LLC



INSTITUTIONAL

LESS THAN \$5 MILLION

New Life Church Kent

Contractor: Donovan Brothers

Architect: AustinCina Architects and Land Planners

Engineer: DPH Engineering

Owner: New Life Church



TENANT IMPROVEMENT/RENOVATION

LESS THAN \$4 MILLION

Moorea Seal

Contractor: Donovan Brothers

Architect: Matthew Zinski AIA

Engineer: Frank Co. Structural Engineering

Owner: Moorea Seal



TENANT IMPROVEMENT/RENOVATION

\$4 MILLION-\$10 MILLION

Westend interior and exterior renovations

Contractor: Synergy Construction

Architect: Environmental Works

Owner: Housing Authority of Snohomish County



SURVEYS

The Population Health Facility will be near the western entrance to the UW's main campus.



RENDERING BY THE MILLER HULL PARTNERSHIP/SITWORKSHOP

LEASE CRUTCHER LEWIS

Specialty: General contracting and design-build for projects across the commercial, corporate, healthcare, life sciences, civic and education sectors

Management: Bart Ricketts, CEO; Jeff Cleator, Seattle president; Berger Dodge, CFO

Founded: 1886

Headquarters: Seattle

2017 revenues: \$658 million

Projected 2018 revenues: \$720 million

Projects: 300,000-square-foot UW Population Health Facility; 58-story building with offices, apartments and retail alongside Rainier Tower for Wright Runstad & Co.; Seattle Children's/Building Cure, a 13-story laboratory in the Denny Triangle

Jeff Cleator, Lease Crutcher Lewis Seattle president, answered questions from the DJC about his company and trends and issues in the industry.

Q: What are the important issues in your industry?

A: We are fortunate to be enjoying a robust market, yet a number of factors could limit continued growth. Traditionally, businesses can reasonably forecast cost adjustments due to predictable supply and demand factors and make their investment decisions accordingly.

Costs due to policy decisions, however, are more difficult to predict. For example, delivery costs have increased due to traffic congestion, material costs are volatile due to fears of tariffs and a trade war, and regulatory costs continue to increase in unpredictable ways.

At some point these cumulative costs could stifle continued economic growth. Additionally, it is becoming increasingly challenging to find qualified labor to sup-

port the strong local construction market, particularly in the trades. We need to do a better job recruiting young people into these rewarding, living-wage jobs.

Q: How are rising land costs in Seattle affecting what gets built?

A: It is a little bit hard to predict. We are seeing some mixed messages. On the one hand, some of our developer customers have said it's too expensive to develop in Seattle and have begun looking for opportunities in other markets. At the same time, there still seems to be plenty of capital flooding into the Seattle market from national and international investors.

Some of the recent programs that allow developers to build more square footage on a site in exchange for providing public benefits feels like a win-win solution that may allow some marginal projects to move forward.

Q: What's an interesting trend, and how does it affect your firm?

A: We continue to be quite interested in all forms of integrated project delivery. The Population Health progressive design-build project we are undertaking with the University of Washington has allowed us to deliver value to the owner that would not be achievable in a traditional project delivery format.

Building information modeling is another area that will benefit from more collaboration between project participants. By integrating design-build trade partners earlier in the process, we are working to eliminate traditional shop drawings and embed that level of detail within the model itself.

We also continue to experiment with augmented reality, virtual reality, drones and other technologies in search of opportunities to improve safety, schedule duration, cost and quality for our clients.

Q: Which sectors are growing and which are slowing locally?

A: All our traditional market sectors continue to be strong, but perhaps a couple areas are beginning to show signs of slowing.

The failure of some recent school bond levies will limit

the pipeline of K-12 school projects. In the commercial market, increasing taxes, regulatory costs and land costs have caused many of our developer clients to adopt a more conservative approach or look for investments outside the Seattle area.

The corporate market sector continues to be one of our stronger markets. We are blessed to be working for great customers such as Boeing, Amazon, Microsoft, Tableau, Starbucks, Oracle and others. Our medical and life sciences business units are seeing steady growth as well.

Q: What's a recent value engineering success you've had?

A: In our mind, value engineering is only successful if integrated into the initial design effort. Too often, a design gets documented then priced. If it exceeds the owner's budget, "value engineering" ensues to cut scope, change details or revise material selections to get the design to fit within the budget. This is an immense effort that adds no value for the owner and causes the designers to repeat work.

Alternatively, we prefer understanding the owner's budget goals from the outset, and working side-by-side with the architect and their consultants to deliver a great design within budget, the first time. Population Health has been a great example where we set budget targets for each component of the project: structure, enclosure, interiors, mechanical, etc. We then created cross-disciplinary "project work teams" to design to budget. Thus far we have been extremely successful, allowing us to reinvest design contingency back into the project.

Q: Have you gotten into new project types recently, or do you plan to?

A: We have found ourselves with a fair amount of civic work currently including the Washington State Convention Center and the Seattle Opera. We appreciate our involvement with these projects and plan to stay present in the civic market sector moving forward. In addition to being challenging and interesting projects, contributing to the betterment of our community is something that feels good to our employee-owners.

SURVEYS



Skanska was recently awarded a \$77.9 million GM/CM contract to build a new high school and middle school in Silverdale.

IMAGE BY INTEGRUS ARCHITECTURE

SKANSKA USA

Specialty: Construction and commercial development

Management: Chris Toher, executive vice president and general manager; Murphy McCullough, executive vice president

Founded: 1946

Headquarters: New York City (U.S.); Stockholm (global)

2017 revenues: \$7.3 billion (U.S.); \$18.8 billion (global)

Projected 2018 revenues: N/A

Projects: 2+U, a 38-story office tower in downtown Seattle; 191,000-square-foot University of Washington Life Sciences Building and 15,000-square-foot research greenhouse in Seattle; 325,000-square-foot Central Kitsap middle and high schools in Silverdale

Chris Toher, executive vice president and general manager of Skanska's Seattle office, said the company is building 30 to 35 projects locally — fewer than in the past.

But that's not for lack of ambition.

"We are doing more large-scale, complicated projects than ever before," he said.

Projects underway include 2+U, a 38-story office tower in downtown Seattle; Nexus, a 41-story condo tower in the Denny Triangle; and the Life Sciences Building on the University of Washington's Seattle campus.

The company's commercial development division has announced plans for a 30-story apartment building in Belltown — its fifth development in the area since the division began operating locally in 2011.

Growth cycle

The boom times don't appear to be letting up. Whereas builders once knew to count on three- to five-year growth cycles, this one just seems to keep going and going.

Toher ticked off a list of Skanska market specialties that all seem to be strong or on an upswing: health care, commercial office, K-12, higher ed and aviation.

Does he see any of these areas growing or sputtering in the near future?

"Every time I think I know the answer to that, I'm proven wrong," he said.

Head tax fallout

One thing that could throw sand in the gears is a proposed "head tax," which the city would levy on certain employers to raise \$75 million a year for housing services. One of those employers, Amazon, sent shock waves through the city when said it will pause its considerable construction plans if it's stuck paying the tax.

"We will be interested to see what happens with the head tax," Toher said. "We'll see what that all means to the market."

A different long-term concern is the aging workforce and shortage of labor.

Toher said the staffing issue "is the single biggest thing we face in this industry."

When crews are stretched thin, they can face longer hours on the jobsite and become more prone to accidents and injuries, something Toher is eager to avoid.

"One thing we're talking about for future projects is scheduling more thoughtfully," he said.

That could mean having conversations with owners early on to reset their expectations about how quickly their projects can be completed.

Expanded recruiting

On the recruiting front, Skanska is looking for white-collar staff outside its usual haunts in university engineering and construction management programs. People new to the field can learn what they need to know on the job if they arrive with great communication skills, curious minds, and a desire to learn and grow, Toher said.

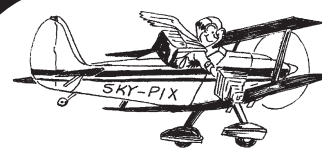
The company is advertising at Seattle University, the UW and WSU business

schools, and in-state liberal arts schools, where it's never recruited before.

Looking ahead, Toher said Skanska is doing more design-build work than ever before — about 25 percent of its volume — and he expects that number to get larger.

He attributes its popularity to the fact it offers one-stop shopping for owners, and it encourages architectural plans that are buildable from the get-go.

"Hopefully, you design (the project) just once," he said.



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SURVEYS

Schuchart is building a 105,000-square-foot performing arts center at Eastside Prep called TALI Hall.



PHOTO FROM SCHUCHART

SCHUCHART

Specialty: Commercial general contractor

Partners: Jennifer Rosado, vice president of administration; George Schuchart, president; Casey Schuchart, vice president of strategy

Founded: 1988

Headquarters: Seattle

2017 revenues: \$100 million

Projected 2018 revenues: \$110 million

Projects: 42,000-square-foot TI for manufacturer Romac Industries in Bothell; 26,000-square-foot office TI for DLA Piper on floors 69 and 70 of the Columbia Center in Seattle; 105,000-square-foot performing arts center for Eastside Preparatory School in Kirkland

Casey Schuchart, vice president of strategy, shared his thoughts about his company and the local construction market.

Q: Your projects range from retail to industrial. What has been strongest lately?

A: Schuchart has maintained a strong presence in the industrial construction sector, possessing nearly 30 years of experience with the Boeing Co. Mirroring national declines in the manufacturing sector beginning in 2014, we also experienced a slowdown in volume of industrial projects.

Q: In your ground-up work, what are some of the biggest challenges?

A: Seattle is in a period of rapid growth and economic success. As large numbers of companies look to establish or grow a presence in the Seattle business market, our ground-up teams are facing several challenges. Today's successful ground-up projects involve earlier collaboration with the client to understand and develop a schedule. Given the constraints in the local workforce and long-lead times for certain materials, we work closely with the owner and design teams to plan and execute critical elements during construction.

To accommodate the region's rapid development, Seattle and neighboring cities are considering zoning changes that facilitate new construction while mitigating emerging issues of traffic congestion, housing affordability and homelessness. Given that these zoning changes are in process, clients are uncertain as to the potential effects on their own development opportunities.

Our ground-up project delivery teams work closely with the authorities which have jurisdiction over the work to understand any potential impacts early on in the preconstruction phase of the project.

Q: Your work for tech companies is growing. What are their unique demands?

A: Our tech clients are looking to maximize collaboration and employee comfort in their build outs. All-gender, single-stall restrooms promote a commitment to diversity and inclusivity. Open office layouts reduce

organizational hierarchy and create opportunities for impromptu interactions. Large self-serve and catering kitchens, cafes, and vending options offer employees a greater range of dining options. Common meeting and all hands areas with flexible seating options, and smaller huddle and breakout areas provide a variety of spaces for employee collaboration. To balance this openness, the offices also offer private phone booths, conference rooms and focus rooms with acoustical treatments and a host of technology tools.

Specific to construction delivery, we are seeing a push for accelerated construction schedules.

Q: Will higher interest rates or worker shortages slow the flow of projects?

A: While it is true that the construction market is facing challenges including labor shortages and the increasing costs of building materials, we do not anticipate a slowdown in the next three years.

Q: Is there a trend in the type of projects you are pursuing?

A: While our project pursuits may not be changing, we are experiencing projects being delivered by way of alternative contracting methods such as integrated project delivery and progressive design-build. We applaud this contracting method shift as it allows us to maximize project value through engaging teams earlier in the process, reducing risk associated with schedule and price escalation.

SURVEYS

WALSH CONSTRUCTION

Specialty: General contractor in health-care, multifamily/senior living, higher education, hospitality, aviation, correctional facilities, office, retail and federal work

Management: Warren Johnson, director of business development (Seattle)

Founded: 1898

Headquarters: Chicago

2017 revenues: \$5 billion

Projected 2018 revenues: \$5.5 billion

Projects: \$24 million Concourse D Annex at Sea-Tac Airport; \$90 million Denny Substation in South Lake Union; \$100 million seismic upgrade at the naval shipyard in Bremerton

Warren Johnson, director of business development in Walsh's Seattle office, answered questions about the industry, his company and where retail development is headed.

Q: Are any sectors outperforming others, and if so why?

A: Nationally we are seeing a lot of work in healthcare, mid- to high-rise multifamily, student housing in college campuses and aviation — a lot of it having to do with

baby boomers and their kids.

Q: What are some core philosophies of your green initiatives?

A: We definitely see a trend in building smart, net zero and green initiative. There is a good example in a project we are doing for the California Military Department. It is a \$135 million design-build project (Walsh Group and Stantec) where our team will deliver a 285,000-square-foot consolidated headquarters complex near Sacramento.

The CHQC is one of the first large scale new zero net energy projects that will be implemented by the state of California after Gov. Jerry Brown's Executive Order B-18-12 to reduce greenhouse gas emissions and improve energy efficiency in California. The project is targeting LEED gold certification and will be constructed to achieve a variety of sustainable goals to reduce environmental impact, optimize performance, lower energy and operating costs, conserve resources, and increase occupant satisfaction and productivity. On-site renewable energy is generated by a photovoltaic array that will serve a dual purpose as parking shade structures.

Q: Are there any signs of economic weakening, and if so how is Walsh preparing?

A: Yes, we track all those economic and political signs, along with foreign capital flow. We feel we are well positioned with a balanced mix of building and heavy-civil sectors in private, public and federal work in our portfolio of projects and clients —

Concourse D Annex at Sea-Tac Airport will have a holdroom building for passengers.



IMAGE BY HOK

usually when the private sector slows down the public and federal sectors are strong. We also see a strong need for public-private partnerships in the coming years to help us fix our aging infrastructure across the U.S. and Canada.

Q: Since Walsh was founded in Chicago, do you have a different business development strategy here?

A: Yes, being headquartered in Chicago and a four-generation family-owned company, we are well connected to the building industry and the community in Chicago. Walsh is everywhere! In Seattle we are fairly new, been here since 2007, so we need to work harder for name recognition and gaining trust in the local community.

Q: With the continued expansion of Amazon, are you seeing any slowdown in retail?

A: Retail is changing so fast, and the development and building process takes so long. Retailers are right-sizing and closing/selling a lot of their national stores and there are very few retail replacements to backfill, so they are looking for other sectors to backfill, like medical, entertainment, multifamily, hotels, office, farming (rural malls turn back into farms) etc. — bigger emphasis on mixed-use. The retail developers and large REITs like Kimco, Simon, GGP are turning into mixed-use developers. Also the large mall adjacent to transit hubs will survive, but will be totally different in the next three to five years.

SYNERGY CONSTRUCTION

Specialty: All sectors of commercial construction

Management: Pam Stewart, CEO; Larry Stewart, president; Justin Stewart, executive vice president

Founded: 1990

Headquarters: Woodinville

2017 revenues: \$55 million

Projected 2018 revenues: \$60 million

Projects: 403 Dexter, 98 residential units in South Lake Union; Drivers Club and Metropolitan Auto Park, an automotive club in Redmond; Cheatham Street Flats, 245 student beds in a modular building in Texas

Justin Stewart, executive vice president of Synergy Construction, answered questions from the DJC about his firm and trends and issues in the industry.

Q: What are the most important issues in your industry?

A: The rapidly rising construction costs and the industry-wide labor shortage are clearly the most widely talked about topics. However, I would say they are symptoms of another significant issue, which is a general lack of innovation compared to other

industries. People are understandably attracted to innovative, forward-moving industries where they have greater opportunities for upward mobility due to growth, and that is simply not the case for most of the construction industry.

Construction costs will continue to rise as long as the economy creates more demand than the current workforce can supply.

Q: What's an interesting trend, and what does it mean for your firm?

A: The one I am most excited about is full volumetric modular construction. While construction costs continue their dramatic rise, by working extensively with leading modular off-site construction providers we now have a single-source contract, fully vertically integrated delivery model that is bringing overall costs back down. This is really making an impact on projects that commit to modular construction early and are optimized for off-site construction.

I believe we will see this continue to grow into a mainstream method of construction and I am happy to lead that charge. Ultimately, this is how I see the industry solving the affordable housing crisis and engaging the younger workforce.

Q: Which sectors are growing

and which are slowing locally?

A: As a GC we are largely at the tail end of that information cycle, but I'm happy to share what we see. Our preconstruction activity continues to be very strong in the multifamily sector, which after years of strength is in completely uncharted territory at this point. Student housing seems to be in a frenzy competing for land. Self-storage and commercial tenant improvements are on a strong upward trend. Industrial demand is strong but there is limited available land, and there is still a lot of action in hospitality.

Sorry to sound too positive, but there isn't a lot of negative information out there from our perspective, despite the tightened commercial lending (lower debt to equity) available in many of the above sectors.

Q: How are rising land costs in Seattle affecting what gets built?

A: In commercial real estate development, everything comes down to simple math. On one side, you have land, soft and hard costs. On the other, you have the expected net operating income: the completed asset's revenue minus the ongoing operating costs including debt service. Any increases to the development cost have to be offset in the net operating income or the project won't get built.



Synergy is building the 98-unit 403 Dexter project in South Lake Union. It was designed by VIA Architecture.

IMAGE COURTESY VIA ARCHITECTURE

So rising land costs are no different than higher construction costs, impact fees and other costs. They require higher rents or increased unit counts/density (or other offsetting factors such as property tax abatement) to make the same development deal work again at a higher cost.

In general, land is priced at the maximum revenue that can be generated from the property, so in strong economies, the "highest use" of the land is typically what gets built or it wouldn't provide an adequate return on investment to get funded in the first place. In contrast, in weaker economies land sellers are more willing to work with creative

developers to get a deal done.

Q: Has your firm gotten into new project types recently, or do you plan to?

A: Our firm has grown to include teams that perform across a range of project types over the last 28 years, including medical, office, retail, multifamily/mixed-use, hospitality and occupied renovation. However, recently we have seen an increase in self-storage, commercial tenant improvement, engineered steel buildings, warehouse renovation/TI and hospitality projects, specifically using full-modular construction methods.

SURVEYS

ABSHER CONSTRUCTION CO.

Specialty: General contractor/construction manager and design-build
Management: Dan Absher, CEO; Lane Tanabe, CFO; Jeff Richards, COO
Founded: 1940
Headquarters: Puyallup
2017 revenues: \$240 million
Projected 2018 revenues: \$330 million
Projects: Sound Transit Link Northgate station, elevated guideway and parking garage; Marriott hotel at the Greater Tacoma Convention Center; Olympic Middle School, Auburn

Absher COO Jeff Richards explains why he's proud of WSU's Elson S. Floyd Cultural Center, and warns of the industry's coming retirement cliff. He also talks about cool new technology his company is using.

Q: Which market sectors have you been most active in?

A: What market haven't we been active in is a better question. We've seen great opportunities across many markets, but have been busiest in transit, education, hospitality and federal.

Q: What new opportunities will Absher pursue in the next few years?

Absher is building an elevated light rail station, guideway and parking garage at Northgate under a \$174 million contract with Sound Transit.



IMAGE FROM SOUND TRANSIT

A: We've really been focused on technology, and our staff is pushing the envelope in VDC — virtual reality and drone use. We are applying these technologies in communication, constructability, scheduling and documentation, to name a few. New ways to use these tools for better project delivery are happening every day.

Another area that we are excited to see gaining speed over the next few years is design-build in the public market. We've had great, collaborative experiences using design-build delivery at the federal and higher-education level, and are starting to see the K-12 market explore design-build, too.

Q: What's an important trend we should be paying more attention to?

A: As an industry, we need to keep addressing the aging workforce. I recently read an article that called it "the retirement cliff."

We need skilled workers ready to fill positions as our current workforce starts retiring. Attracting a more diverse range of young people to careers in construction is another key industry issue that goes right along with this.

Q: What's a recent project you're particularly proud of?

A: I'm really proud of our (Washington State University) Elson S. Floyd Cultural

Center project. To start with, it's a really cool building with a curved roof and no right angles.

On a deeper level, it is making a significant statement about the university's commitment to inclusion and diversity. And, from a contracting perspective, it was a textbook case of how effective design-build can be.

Q: How much of your work involves federal contracts? What's the trend?

A: Federal contracting is one of our core markets and continues to be a steady market for us. It has accounted for roughly 10 percent of our revenue in recent years.

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