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ON THE COVER
A BMU FIT FOR QUEENS
SAIA 2021 COMMERCIAL COLLABORATIVE PROJECT OF THE YEAR AND 2021 SUSPENDED ACCESS PROJECT OF THE YEAR
By Kit M. Carroll

FEATURES
PERMANENT INSTALLATION 101
A GLOSSARY FROM THE PERMANENT INSTALLATION COUNCIL
By Brian Andrews and Lucas Oliver

PARTNERSHIP RESULTS IN COST-SAVING DESIGN
SAFE AND EFFICIENT ACCESS FOR MULTIPLE CONTRACTORS
By Dolores Díaz

BELL TOWER ACCESS INSPIRES UNIQUE DESIGN
SAIA 2021 MAST DRIVEN HOISTS AND PLATFORMS PROJECT OF THE YEAR AWARD
By Matt Morgan

TAKE CARE OF YOUR PEOPLE
SAIA 2021 ANNUAL CONVENTION & EXPOSITION RECAP
By Cathee Johnson Phillips

COLUMNS
EDITOR’S COMMENTS
IT’S BEEN A PLEASURE
Cathee Johnson Phillips

PRESIDENT’S DESK
LOOKING AHEAD
By Michael Paladino

COMMENTARY
LOADED QUESTIONS
By David H. Glabe, P.E

INDUSTRY NEWS

AD INDEX
COMMERCIAL AND INDUSTRIAL SCAFFOLDING
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DSS offers the industry’s widest variety of complete scaffolding systems and accessory parts compatible with major US and European manufactured scaffold systems. Our scaffold systems, shoring and formworks products and accessories are engineered for safety & rigorously tested to meet or exceed all industry standards.
It was great working with you all!
I do want to give a special shout-out to Dave Glabe, P.E., who never missed an issue in providing the thought-provoking and informative column Technically Speaking. Just in the years that I was editor, that came to 36 columns! I also want to give special thanks to the SAIA Council leaders who provided articles that addressed both basic and cutting-edge issues related to their councils, year after year.

In fact, this issue features an article from the Permanent Installation Council, an article that you’ll want to keep on hand. This issue also highlights several award-winning projects, and I hope you find the time to read it from cover to cover.

Anyway, I hate long goodbyes, so I’ll get on with it. On behalf of Ken Bowman, the publisher, Kelly Coleman, director of Marketing and Sales, Aaron Phillips, the art director, and myself, thank you so much! As the magazine enters a new phase under the KHL Group, we wish you only the best! It has been a pleasure.

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The Scaffold & Access Industry Association (SAIA) 2021 Annual Convention & Exposition was a great success as more than 330 members and friends came together in Cleveland, Ohio. The new Ambassador Committee did a first-rate job welcoming 63 first-time attendees, and the sessions were well attended. The exhibit hall had a great turn out, with only positive feedback from exhibitors and attendees. It was wonderful to see everyone back and working together at our first in-person convention since the pandemic began.

The next opportunity to get together – and the first event of 2022 – will be the World of Concrete, January 18-21 in Las Vegas. The SAIA is offering Competent Person Training (CPT) in Suspended Scaffold, and you can visit us online to register for the course. We will have a booth in the Central Hall and host a reception for current and prospective members. Stay tuned for more information or visit us at booth C3259 during the show for details.

The month of May will see us coming together for the 2022 Committee Week, which is slated for May 1-5 at The Peabody in Memphis, Tennessee. Registration will open this month, and several sponsorships are available for purchase. For more information and to register, visit the SAIA website.

Also in January, the KHL Group will be taking over the magazine, as the SAIA expands its reach internationally. I have appreciated working with Networx, and they are truly a part of our team. I’m confident, however, that in 2022, SAIA members and friends will be able to adapt to any industry changes the year brings, both predicted and unexpected. Working together, we can be an effective voice for safety in our industry, through thick and through thin.

The year 2022 will be a special one for the SAIA – the Annual Convention & Exposition will be our 50th Anniversary event. Please make plans to join us August 21-24 in Boston, Massachusetts. As part of the celebration, we are working to bring back the SAIA Golf Tournament during the convention. Sponsorships and exhibits are open for purchase; visit us online for more information.

We are seeking stories and photos from the past 50 years; please send them to the staff. We want to highlight SAIA’s history and how far we have come as an association and industry in the magazine.

As the association approaches its 50th anniversary, the pandemic has taught us, if we didn’t already know, that you never know what a new year will bring. I’m confident, however, that in 2022, SAIA members and friends will be able to adapt to any industry changes the year brings, both predicted and unexpected. Working together, we can be an effective voice for safety in our industry, through thick and through thin.

I wish you all a happy holiday season! Cheers to progress in 2022!

I’m confident, however, that in 2022, SAIA members and friends will be able to adapt to any industry changes the year brings, both predicted and unexpected. Working together, we can be an effective voice for safety in our industry, through thick and through thin.

WELCOME TO OUR NEW MEMBERS

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<tr>
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<td><a href="http://www.rennon.net/">http://www.rennon.net/</a></td>
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<td>President-Elect, Layher, Inc.</td>
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<td>Vice President Fraco Products, Ltd.</td>
</tr>
<tr>
<td>Frank Frietsch</td>
<td>Treasurer Layher, Inc.</td>
</tr>
<tr>
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<td>Secretary Mdm Scaffolding Services, Inc.</td>
</tr>
<tr>
<td>James Gordon</td>
<td>Member-at-Large Klimer Platforms, Inc.</td>
</tr>
<tr>
<td>Chris Moody</td>
<td>Board Appointee Direct Scaffold Supply (DSS)</td>
</tr>
<tr>
<td>Michael Bredl</td>
<td>Board Appointee Universal Manufacturing Corp.</td>
</tr>
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Why do scaffolds remain standing after a load is applied? How can anyone determine the strength of a scaffold? Those are loaded questions, no pun intended. Scaffolding is fascinating equipment. Think about it. A scaffold erector takes a bunch of components, fits them together, and places a platform on it, and then someone else stands on it. Obviously, anyone can see that it works. But how do you determine how well it works or how do you explain why it is working? Ask an engineer. So, here are a few questions that have been asked and, of course, answers.

How do engineers determine the strength of a material? The strength is determined by research, testing, and evaluation.

What do engineers evaluate when analyzing a beam or plank? Simply stated, engineers look at shear, bending, and deflection. Shear is like a karate chop, bending is, well bending, and deflection is how much it sags. Using a plank as an example, shear is more important, or in engineering terms, the controlling factor near the supports, bending is the controlling factor in the middle of the span, and deflection controls when it is a critical factor. For a plank, deflection is limited by statute, a fancy way of saying controlled by the Occupational Safety and Health Administration (OSHA) regulations, and the bending and shear is also limited by statute.

What’s math got to do with it? Everything. While every beam, or plank, could be tested to see what it will hold, wouldn’t it be nice if you could use a calculator, a slide rule, or even your fingers to determine the capacity? That’s what the math does—it allows us to determine strength mathematically. The really smart folks figure out the formulae, through research, testing, and evaluation, and the rest of us use those formulae in everyday applications.

Is there a formula for calculating the load on a scaffold leg? Yes, there is. It takes into consideration the weight of the scaffold equipment, the weight of the plank, the weight of the people on the scaffold, and the weight of the materials and equipment being supported by the scaffold. It looks like this: Load = scaffold equipment + bodies + stuff + tools + other stuff. Of course, that is just the start. Once you get the answer to that formula, you then need to apply safety factors, allocate the load to the appropriate leg or legs, compare it with what the scaffold can support, and adjust the answer for any other applicable factors. You also must determine if the individual components, such as the plank, trusses/putlogs, clamps, ledgers, and tubes, will hold the load. In other words, there is no simple quick and dirty way to determine the load accurately.

Would a 200-pound person overload a scaffold plank when it is rated for a duty rating such as 25 pounds per square foot (psf), particularly when that person is standing in one square foot? This is a frequently asked question. It’s all about average loading, that is the total load spread out over the entire area. For example, for a plank 12 inches wide and 10 feet long, the total area is 1 foot x 10 foot = 10 square feet. If it is rated at 25 psf, then the total load that you can place on the plank is 25 psf x 10 sf = 250 pounds. Your 200-pound person would max out the plank. Of course, the plank has to be strong enough to transfer the load to the supports; you couldn’t use a plank that was only a quarter-inch thick since it couldn’t transfer the load. But a plank that is 1-and-1/2-inches thick could, if it was scaffold grade, which brings us back to an earlier question of knowing how strong the wood is. We rely on those smart folks who figured it out and gave us
the values to use. Better yet, you don’t have to calculate anything if you use the plank load charts. Someone did the heavy work for you.

**How do I determine if I am overloading a scaffold plank if I have a heavy load setting on one end of the plank?** Use charts and the deflection limit. If the chart says the maximum load is 500 pounds for a certain span, then you can put no more than that amount anywhere on the plank. It is assumed you will spread it out over 12 inches or more. OSHA specifies that plank cannot deflect any more than one sixtieth of the span when loaded; for 10 feet, that would be two inches. That is another check as to whether you are overloading the plank, assuming you are using scaffold grade plank.

**Does it matter whether I place a load on the top level or the lowest level of a scaffold?** Not really. It’s the bottom frame that is critical. Therefore, all that frame knows is that there is a load, it doesn’t care where it comes from. Obviously, there are stability issues and load transfer issues to think about, but as for vertical load, it matters not if it’s on top or bottom.

**When using a well wheel – a pulley on a cantilevered arm – to hoist materials, how do I determine the maximum load that can get hoisted?** Ask the manufacturer/supplier what the allowable capacity is for the well wheel. Or do something stupid like load it up until it starts bending and stop hoisting. Also, don’t forget that whatever you hook the well wheel to has to be at least as strong as the well wheel.

**Does it matter if the well wheel is attached to a vertical tube or horizontal tube?** Of course, it does. The well wheel will apply a horizontal force on a vertical tube and a vertical force on the horizontal tube. That has to be analyzed using those formulae referred to earlier. There is no snappy simple answer—someone with the technical expertise must analyze it.

When using a well wheel, how do I determine if I will tip the scaffold over since the well wheel is typically outside the scaffold? Well, one way is to put a big load on the well wheel, start hoisting, and see what happens next. I recommend doing this from the ground because you may not like the outcome. Perhaps not! As a rule of thumb, the load you are trying to lift will exert a horizontal force that is equal or higher. Either the scaffold must be large enough to resist that force or the tie to the structure, and anchor, have to resist that force. In other words, a qualified person must design it.

The bottom line here is there is a limit to what you can do with a scaffold without getting someone involved who knows how to resolve issues beyond your capacity. Just because you can assemble the parts and pieces in a way that it looks like a scaffold, doesn’t a scaffold make. There is a reason there are engineers.

**About the Author**
David H. Glabe, P.E., is President of Glabe Consulting Services Inc. and Founder of DH Glabe and Associates. Contact him at dhg@glabeconsulting.com.
A BMU FIT FOR QUEENS

Sky Climber, LLC was awarded the Scaffold & Access Industry Association (SAIA) 2021 Commercial Collaborative Project of the Year and the 2021 Suspended Access Project of the Year for this permanent installation project for Queens Plaza Park in New York. The collaborating company was Safeway Atlantic, LLC.

By Kit M. Carroll
Queens Plaza Park is a new residential tower in the Long Island City neighborhood of Queens, New York. Now the second-tallest building in Queens, the concave form of the tower curves gently toward the historic Long Island City Clock Tower, creating a visual expression of the present embracing the past.

There are many unique features to Queens Plaza Park, including its curving glass facade, its height, roof elements, and exterior features, all of which made the development of its building maintenance unit challenging. However, through teamwork and collaboration, SafwayAtlantic and Sky Climber produced and installed a one-of-a-kind building maintenance unit (BMU) for this tower.

A Tale of Two Towers
The story of this tower begins with another, very different tower. There is much about Queens Plaza Park that is influenced by the historic Long Island City Clock Tower that sits adjacent to it.

Built in 1927 by the Manhattan Company, the neo-Gothic clock tower loomed over Queens for 60 years as the borough’s tallest commercial building at 14 stories. The building has been landmarked and is undergoing renovations to rebuild the iconic clock mechanisms and reopen as a commercial space.

When the New York City Landmarks Preservation Commission (LPC) granted official landmark designation to the Clock Tower, it allowed construction around it. When Handel Architects LLC designed the 755-foot residential tower called Queens Plaza Park, the resulting shape was concave, curving partially around the Clock Tower to create a closeness between the two buildings, while being deferential to the historic Clock Tower.

All About the Glass
During discussions for maintenance solutions with the Durst Organization, the developer and owner, and the Hunter Roberts Construction Group, the construction manager, Sky Climber, LLC and SafwayAtlantic focused on ways to provide complete access to the entire glass façade. And as with any building of this height, these maintenance strategies are pre-planned into the construction process.

The curtain wall features special windows designed to maximize sunlight while reducing glare and heat, improving energy efficiency and thus assisting in the goal of reaching LEED Platinum certification. Additionally, the south-facing curved side of the tower features glass with electrochromic properties.

Sky Climber, LLC
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The Sky Climber brand represents a multi-national family of companies brought together to meet a variety of safe access needs across several business verticals. Sky Climber, LLC, headquartered in Delaware, Ohio, is the industry leader in designing, manufacturing, and distributing suspended access equipment used in industrial/commercial construction and maintenance applications. Learn more at https://skyclimber.com/home/.
glazing to further mitigate solar heat gain and glare through adaptive tinting. The maintenance plan and subsequent BMU design needed to include features to facilitate future glass replacement of individual glass panels, even at the building’s furthest corners.

Planning and Manufacturing
In addition to requirements relating to the glass on Queens Plaza Park tower, the SafwayAtlantic and Sky Climber team considered several key factors when designing this system, including the total drop height, roof structures, and obstructions on the façade such as boiler flues.

Throughout 2019, the project requirements and several potential design solutions were reviewed. Durst was very involved in the design process and participated in buildability reviews and maintainability discussions. By the time façade work on the tower began that fall, a design was finalized, and Sky Climber began manufacturing the building maintenance unit in its Spain factory near Madrid. Durst and SafwayAtlantic staff visited Sky Climber’s Spain Permanent Installation manufacturing facility in November 2019 for a factory inspection and review. Together, the team implemented changes to the building and the machine to improve user-friendliness and reduce year-over-year maintenance costs.

The resulting machine is based on a Sky Climber T5 design but with several features that make it perfectly suited for Queens Plaza Park. Although telescoping BMU’s typically extend 40 to 100 feet, this unit measures nearly 139 feet long at maximum extension with a 112-foot reach comprised of a five-piece telescoping jib.
The entire unit rotates 360-degrees from its stationary base, and the turning head rotates 180 degrees to allow for positioning of the suspended platform. A telescoping mast moves the vertical mast up and down to either use the machine or hide it in the parked position. A motor access catwalk allows access to the jib motors for maintenance. The cross bar for the auxiliary hoist is designed so that loads can be hung from three different positions to ensure coverage of all building sections.

In total, this BMU has a vertical run of 785 feet on four conductor-core wire ropes. It is equipped with a telephone, anemometer, auxiliary hoist, and water tanks. The suspended access platform carries a load rating of 750 pounds.

Due to crane capacity the BMU had to be lifted in pieces, and nested telescoping jib sections were then assembled on the roof.

Photo credit: Safway Atlantic

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and the auxiliary hoist load, for future glazing and maintenance work, is rated at 1500 pounds. The total dead weight of the entire machine is roughly 150,000 pounds.

Continuous stabilization of the platform to the building is achieved with “torpedoes” connected to track set in the façade. Mullion track torpedoes can be considered standard equipment, but in this case they were outfitted with special sensors that allow the platform to avoid colliding with protruding elements on the tower’s exterior surfaces. At just under 56 feet long in its stored position, this machine tucks away cleanly when not in use.

**Installation**

The finished machine shipped to New York in January 2020, and Queens Plaza Park topped out six months later in June. Due to the capacity of the crane on site, the BMU had to be picked in pieces. This meant that nesting of the telescoping sections of the jib had to happen on site on the roof. This procedure required a delicate touch from the crane operator and the installation crew.

Temporary draw cables were threaded through each telescoping section before nesting to enable the installation of the suspension and auxiliary hoist wire ropes. This prevented personnel from having to crawl inside each section to pull the wire ropes during the commissioning phase of the install.

SafwayAtlantic teams completed installation of the building maintenance unit and all other system elements by September 2020.

**Challenges and Innovation**

Sky Climber and SafwayAtlantic teams faced a few challenges on this project. BMU machines for buildings of this size often circle the rooftop on a track or rail system to allow maximum access to every vertical surface of the edifice. However, other...
roof structures such as the stair bulkhead, temporary generators, air handling units, and water storage tanks made a track system problematic. Additionally, the geometry of the roof would still have required a track-mounted machine to have a considerable outreach and a much taller mast. This mast would have needed a pit to descend into in the parked position. Instead, the team opted for a stationary machine that could simply reach further. Placed on top of the stair bulkhead, this beefed-up design eliminated the need for a track system and required less overall roof space.

Another challenge in this project was a result of the unique shape of the building which could introduce air vortices and currents that would affect the platform. An intermittently stabilized platform would have a tendency to move around more in the wind, resulting in a lower wind-speed operating threshold. This would have limited the number of operational days per year for the BMU. To address this the team introduced the torpedo and track system to tie the platform back to building. Using the system of track built into the façade, crews could help mitigate wind anomalies and keep the platform in place during use.

The BMU can be seen atop Queens Plaza Park from a neighboring rooftop.

Photo credit: Sky Climber
Another challenge on this project involved a high-temperature exhaust pipe that exits the side of the building down on a lower floor. This created an incredibly rare, but possible, chance that workers on the BMU platform could be exposed to high-temperature toxic emissions during an emergency. To address this, special sensors were added to the torpedoes attached to the platform. These sensors automatically stop the machine before it reaches the flue. The workers then engage a horizontal guide track which helps the platform maneuver around and reposition below the flue, keeping workers safely away from exhaust gasses on the outside of the building.

Lastly, like so many others in 2020, the teams faced the challenge of the coronavirus pandemic. For the construction industry in general, the direct impacts of the pandemic varied according to region and project. While the BMU system was manufactured and shipped ahead of the outbreak, Durst’s construction schedule for Queens Plaza Park slipped by several months as global supply chains slowed. While the contracted pick and install window was originally set for February 7th to April 10th, the building itself did not top out until June. When it did, SafwayAtlantic teams were ready and waiting to install the BMU system as per the revised schedule from the developer.

The combined goal was to design, engineer, fabricate, and install a system that provides comprehensive access to the façade of Queens Plaza Park. Together with the owner and the construction manager, SafwayAtlantic and Sky Climber accomplished this goal and delivered a building maintenance system that is truly fit for Queens.

About the Author
Kit M. Carroll is Marketing Manager at Sky Climber, LLC. Contact her at kcarroll@skyclimber.com or (740) 203-3952.
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PERMANENT INSTALLATION 101

This article, submitted by the Scaffold & Access Industry Association (SAIA) Permanent Installation (PI) Council, provides a glossary of PI terminology.

By Brian Andrews and Lucas Oliver

Figure 1. Wall anchor
The Permanent Installation (PI) Council continues to receive phone calls asking for equipment and using the wrong name, even after last year’s article “Davits aren’t Davits.” Therefore, the council is continuing its education with this article on the terminology for the equipment used in PIs.

Permanently installed equipment is designed, purchased, installed, and permanently dedicated to a building to provide suspended access to the building’s façade. The system is required to be tested after it is installed by a qualified professional engineer and inspected every 12 months thereafter, also by a qualified professional engineer. Before using this equipment, consult the manufacturer’s manual for proper use. As some PIs are very complicated, only trained personnel are approved to operate the equipment, and, again, they should consult the manufacturer’s manual before use.

Anchors
An anchor is a point of attachment which supports the loads from personal fall arrest equipment, transportable rigging/support equipment, etc., and transfers the loads to the building/structure. Wall anchors (Figure 1) are secured to the parapet wall or vertical structure of the building. Roof anchors (Figure 2) are attached to the horizontal structure of the building and come up through the roofing material. Flush anchors (Figure 3) are permanently installed in locations where visible anchors are not desired, such as pool decks or other areas with foot traffic. These anchors are normally hidden under pavers or covers to be out of view. Lastly, horizontal lifeline anchors (Figure 4) are installed in areas where railings are not present and a fall prevention system is required.

Davits
A davit is a piece of equipment used for supporting temporarily or permanently suspended access

Figure 2. Roof anchor

Figure 3. Flush anchor

Figure 4. Horizontal lifeline
equipment or material. Davits can be broken down into two categories, ground-rigged and roof-rigged (Figures 5 and 6). A ground-rigged davit is used when the suspended platform is launched from the ground and does not go above the building face or parapet. A roof-rigged davit is used when the platform is launched from the roof, goes above the parapet, and rotates out to descend along the outside face of the building. Ground- and roof-rigged davits have two types of subcategories, bottom- or top-rotating. This is easily identified by where they rotate. Unlike outrigger beam setups, a davit has a single, permanently installed attachment point into the structure which supports its operating moment load called a pedestal (Figures 7 and 8) or socket. For more information about davits, pedestals, and sockets, please see the article in the SA Magazine November/December 2020 issue.

Davit Carriage
A davit carriage (Figure 9) connects a davit, or davits, to a track secured to the building that closely follows the contour of the facade. The davit carriage is either powered or manually pushed along the track. Compared to standard davits that have to be moved from pedestal to pedestal, having everything together and travelling on tracks reduces the amount of time it takes to transport the davits from one location to another. Davit carriages may be used for supporting temporary or permanent powered platforms or for lifting materials.

Ladders and Traveling Gantry
Ladders and travelling gantries are permanently installed equipment on buildings with sloped roofs, specifically for interior and exterior atriums where access is difficult (Figure 10). They are supported or suspended from tracks that follow the façade of the building and are driven manually or via power.

Monorail
A monorail is a railway permanently installed to the buildings structure (Figures 11 and 12).
Monorails closely follow the façade; therefore, they are an ideal solution for suspended access when recessed or overhanging facades, sloped roofs, cantilevered eyebrows, and inside atriums are present. All monorails are designed to be used with a powered or manual trolley system, to allow the platform or work cage to roll along the monorail to the desired location.

Outrigger
An outrigger is a beam or tube that is projected beyond the building’s façade and used to raise and lower temporarily or permanently suspended access equipment or material. Outriggers are traditionally transportable so that they can be moved from one location to another on the building and are secured to stands or anchors permanently installed into the building.

The suspension rope is typically attached to the FRONT of an outrigger beam (Figure 13). However, backfed outriggers (Figure 14) allow the suspension rope to be secured to the REAR portion of the beam and the tip of the rope is fed through the beam and down to the ground. Push-thru outriggers (Figure 15) slide through stands in the wall of the building and project beyond the building’s façade. Once in position, the suspension rope is secured to the REAR portion of the outrigger and the tip of the rope is fed through the tube to the ground. Backfed and push-thru outriggers allow for easier and safer wire-rope installation and removal.

Platform / Cradles / Gondola
Suspended platforms have many names, however, there are three different types of suspended scaffolding platforms. Temporary transportable suspended platforms – platforms that have a hoist or hoists located on the platform and are not dedicated to a building, as they are usually rented – are NOT considered a PI (Figure 16).

A permanent-installed platform, also known as powered platform, is easy to differentiate from the temporary platform as the permanent platform will have metal mesh all around the platform. However, the difficult portion is seeing the difference between permanent platforms. Some are self-powered, meaning that the hoist(s) is located on the platform itself (Figure 17).

Other permanent platforms are roof-powered, meaning that the hoist(s) is located on the rigging equipment, NOT the platform (Figure 18 on the next page). Factors such as the rigging, height of building, etc., dictate which type of permanent platform is required.
Rigging Sleeves
A rigging sleeve, known as a pigeonhole, is a tube permanently secured onto the roof of a building to allow the suspension cable to pass through and provide suspended access to a recessed portion of the building (Figure 19).

Roof Car and BMUs
A roof car (Figure 20) is a machine on the roof used for window washing and exterior building maintenance that can be fixed in place, track mounted, or moved on a concrete runway. It may have a telescoping boom, telescoping mast, luffing boom, or other features. The suspended equipment may be a temporary self-powered platform, a permanent self-powered platform, or a permanent roof-powered platform. A building maintenance unit (BMU) is a roof car with a roof-powered platform (Figure 21). This system can eliminate the need for support equipment, such as davits or outriggers, on lower roofs or balconies.

Tie-in Guides
Tie-in guides secure the suspended equipment against the building facade to help prevent the equipment from damaging the facade in the event of high winds. One method of tying in the platform is using intermittent stabilization anchors (ISAs). These anchors (Figures 22a and 22b) are permanently installed into the structure approximately every 30 to 50 feet vertically. “Pins” including a stabilizer tie, or lanyard, are then inserted between each ISA and the suspension rope(s) as the suspended platform is descending to stabilize the platform. When ascending the platform, the user simply removes the pin from the ISA and wire rope(s) and continues traveling. Note that this technique can only be used when roof-launching the platform.

Another method of tying in the platform is using a mullion track (Figure 23). This system keeps the equipment in continuous contact with the building as the platform is attached to a track roller bracket that rolls along a vertical track permanently installed into the building.

About the Authors
Brian Andrews is the Vice President of Engineering at Bee Access Products and chair of the Scaffold & Access Industry Association (SAIA) Permanent Installation (PI) Council. Contact him at brian@beeaccess.com. Lucas Oliver is the Regional Sales Manager at Tractel and co-chair of the PI Council. Contact him at lucas.oliver@tractel.com.
The SAIA members have been a source of support, assistance and a place for professionals to network and grow our access industry. I, for one formed my suspended scaffold foundation by interacting, learning and sharing with some of the industry greats.

HAROLD GIDISH - SKY CLIMBER
PARTNERSHIP RESULTS IN COST-SAVING DESIGN

CREATING A DESIGN FOR SAFE AND EFFICIENT ACCESS FOR MULTIPLE CONTRACTORS REQUIRED KEY PARTNERSHIPS AND DIGITAL TOOLS.

BY DOLORES DÍAZ

The air traffic control tower and associated scaffold stands at 250 feet. Towards the base, a double leg with a wedge clamp made use of Allround as shoring to support the heavy load while avoiding the high price of shoring rental.
S unstate Scaffold Services recently teamed with Layher North America to support the construction of an $80 million air traffic control tower at the Southwest Florida International Airport. The ongoing project was made possible via a dedicated scaffolding practice, key partnerships, and digital techniques that accelerated the project schedule and reduced costs.

In June of 2020, AA Stucco & Drywall, Inc., a contractor specializing in interior and exterior framing, reached out to Layher Regional Sales Manager, Obed Bosch, for consultation on a scaffolding design that would facilitate their portion of work on a 200-foot traffic control tower. AA Stucco and Layher worked to produce a design that met the requirements outlined by the general contractor, DeAngelis Diamond.

In the process, it became clear that the scaffolding was an entire job in itself. The project would replace the current airport control tower, doubling its height, and include a 15,000-square-foot operation at the base. At the top, a dome would require a non-traditional scaffolding setup. Early reports estimated that 37 contractors would need to work both inside and outside the structure simultaneously.

**A Proven Partnership**

AA Stucco and Layher agreed that a dedicated scaffolding approach was merited and reached out to Sunstate to work on the job. It would be the latest in a long line of collaborations between Layher and Sunstate.

“You’re not going to get six trades on the job at once otherwise,” Ed Smith, owner of Sunstate and a 30-year veteran of the industry, said to DeAngelis, “unless you

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**Layher, Inc.**

- SAIA Member

Layher International is a world-leading scaffolding manufacturer and scaffolding supplier for the petrochemical, energy, manufacturing, and construction industries and for commercial, infrastructure, industrial, and event applications.
DeAngelis didn’t need convincing. He greenlighted Smith’s pitch for a dedicated scaffolding approach to save time and avoid additional risk associated with multiple constructions.

The Design

Layher scaffold designer Kara Donovan worked on the design. To meet project needs, Layher Allround scaffolding and the Layher Stair Tower Construction Stair 200 came together in a repetitive construction for the first 10 levels. Towards the base, a double leg with a wedge clamp made use of scaffolding as shoring to support the heavy load while avoiding the high price of shoring rental.

For the uppermost portion – where roughly $15 million in computer, navigation, and surveillance technology will eventually be housed – concentric circles formed a 160-foot diameter scaffolding, with a 170-foot circle at the largest point. At the topmost levels, each section was unique.

Layher’s digital design process helped to optimize work while reducing operating costs. First, Layher uploads a client’s 3D digital drawing to a scaffolding application and designs an affixing scaffold. A preliminary drawing is sent to the client to verify field fidelity and viability. Once the design is greenlit, a local engineer reviews and stamps the drawings.

Next, the same suite of design software outputs 1) a materials list that accounts for every component, 2) a 2D drawing, and 3) a 3D digital drawing that
allows builders to verify each component and connection point in the field.
Smith said, “By the time you’re done, you know everything from the total weight to how many truckloads [you need].” Advocates for the process cite a reduction in change orders and the elimination of guess work as additional benefits.
Erectors take the printed drawing into the field, which includes a scan code to the 3D version for quick reference. The 3D plan can be viewed in 360 degrees and magnified or manipulated for detailed view.
“You can spin it, turn it, flip it. If you’re up on the scaffold, you can look and see, ‘okay how many clamps do I need?’,” says Smith.
The scaffold was constructed in the field over the course of six weeks with the use of a crane and motorized hoists.
“I haven’t had to change the initial design,” says Smith.
“If this drawing has a bolt, a nut, and a clamp, so does the scaffold.”

Ahead of Time and Under Budget
Smith estimates that a dedicated scaffolding practice and innovative digital process has reduced scaffolding costs by 50% for the general contractor, with most of the benefits actualized through saving time.
“We’ve had six or seven trades work off this at the same time. That’s what makes scaffolding the most important part of the project,” said Smith.
The project was completed in summer 2021.

About the Author
Dolores Díaz is Senior Writer at Chicago Editing. Contact her at ddiaz@chicagoediting.com.
Companies in construction, along with their estimators, field crews, and engineers, were constantly brought into complex challenges that they were not prepared for during 2020, the year of the pandemic. As the country began to shut down, Mdm Scaffolding Services, Inc. and D.H. Charles Engineering were fortunate to receive calls from one of Mdm’s top general contractors and masonry contractors for a new iconic structure that was coming to downtown Dallas.

The Trammell Crow Development company was adding to their Old Parkland office campus by constructing a new bell tower to house the fourth largest bell in North America. The bell is 9 feet in diameter, weighs over 30,000 pounds, and is named Horatio. It is now housed 220 feet high in a structure that stands 40 feet by 40 feet and over 280-feet tall, located at the main entrance of the campus.
The Bidding Phase
During the bidding phase Mdm was called on by multiple masonry contractors to help design exterior access from the base of the tower around the perimeter all the way up to access the dome and the spire. The structure alone is a fairly simple design with the largest length of only 40 feet, but Mdm was being asked to help the masons hit a very aggressive schedule. The scope of work called for 75 days for installing stone to the entire exterior and providing access for the waterproofing, electrical, masonry, and roofing contractors to access the tower, dome, and spire safely. Each mason had their ideas of how they wanted to attack the structure, but whoever came up with the most creative design was winning this project. One of Mdm's top masonry customers is a large Fraco user and knew about the ability to “double stack” their products, by providing a single mast unit that allowed crews to work on multiple decks at the same time – but that still wasn’t the total solution.

Mdm reached out to key members of the Scaffold & Access Industry Association (SAIA) and worked closely with D.H. Charles Engineering, Mastclimbers LLC, and Fraco to see what had been done in the past. They also discussed current ideas that might be possible. Mdm reviewed multiple different projects around the nation and overseas and came up with a three-tier concept design that would allow all four sides of the structure to be worked on at three different levels. The concept involved a structure that the Mdm team called a “chair stand.” At the time, they believed that this had never been done before and weren’t sure if it would work mathematically.

Chair Stands
Mdm approached D.H. Charles with cantilevered mast climber projects that were successfully done before and their new concept. The chair stands would be located at two different elevations and each mast climber would be based on top of them and anchored into the structure. The main approach was to use typical components and not have to fabricate custom components, which would keep overall costs and timing down.

Rising to the task, D.H. Charles used typical components to develop a conceptual design based on the current estimated loads for each mast-climber location. Based on their work, Mdm provided the customer and general contractor hybrid 3D designs that included 16 Fraco ACT8 mast climbers, eight chair stands, 40 bridge overhang brackets, and a full dome wrap utilizing Ringlock scaffolding.

The Engineering Process
From the bidding phase, both Mdm and their masonry customer were awarded the project, and the long engineering process began with the most crucial part of the project, the chair stands. The chair stands were the ultimate reason why the mason was able to win the project and meet the aggressive schedule.

D.H. Charles engineered the chair stands to use Dayton Superior soldier beams with steel rods and plates secured to the structure. Each chair stand was designed to handle 43,000-pound loads being passed through the individual masts of the mast climbers. D.H. Charles utilized typical bridge overhang brackets that provided 8 to 10 feet of overall coverage below

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Mdm Scaffolding Services, Inc.
• SAIA Member

Mdm Scaffolding Services, Inc. is a full-service provider of specialized scaffolding services, access, shoring, and personnel-material hoisting solutions to the commercial, industrial, and aircraft industries since 1993. Learn more at www.mdmscaffolding.com.
each of the two raised levels of mast climbers. This overhead protection (OHP) made it possible for three different elevations to be worked at a single time. The OHP deck also doubled as a safe landing for personnel and some materials as it had guard rails on all four sides of the tower.

Considering how complex the conceptual designs were, the actual back and forth between the Engineer of Record (EOR) and D.H. Charles was very smooth. The structure was designed so stout that it was a much simpler review process than anyone anticipated. The Mdm team believed that using the cantilevered chair stands along with double-stacked units was the first design of its kind.

**Time-Saving Design**

The dome access added another complex aspect to the project that required D.H. Charles and another engineering firm to work together. Mdm worked with both the general contractor and the mason to modify the initial dome scaffold design and reduce the overall transition time from the dome scaffold to the mason scaffold. The initial plan was based on Mdm’s budget design in which the dome scaffold would be installed first and then removed. Then a new masonry-style access would be installed to do the remaining brick and stone installation. Mdm came up with a new concept design that allowed the masonry style scaffold to be installed first and the dome access scaffold second.

Mdm called on D.H. Charles and Fraco to see if their new concept was even feasible and if both firms would be willing to take on the new design. D.H. Charles agreed to provide engineering and stamp for the scaffolding, point loads, and the distribution of the point loads based on the
equipment guidelines. Fraco provided a professional engineer consultant who signed off on the loads being distributed over the Fraco decking, which would allow Mdm to base all their equipment off the decks and so cut the equipment needed and the durations in half. Mdm installed all the cantilevered bases and decking and their mast climbers at the third level below the dome. Then they locked out the mast climbers just below the bottom of the dome and tied them in. Once this was completed, Mdm flew all their equipment up on top of the mast climber decks. The equipment included components for an approximately 30-to-40-feet-high scaffold to provide a four-sided, full scaffold wrap with multiple deck levels for dome and spire access.

Installing the masonry equipment and basing off the existing decks eliminated any down time on the mason’s part, and the project gained some three to four weeks on the schedule. The scaffolding being cut in half reduced the install by about a week and reduced the overall dismantle down to four days. Once the final piece of Ringlock was removed, the mason was immediately able to begin flying in their large stone pieces for the archways. The mason finished their portion of the exterior schedule with a two-to-three-week cushion on the general contractor’s schedule.

Early Collaboration
Old Parkland Bell Tower access was a one-of-a-kind mast and scaffold design that consisted of a stacked mast configuration to maximize masonry efficiency, cantilevered shoring to allow for such mast configuration, and a 30-foot cantilevered modular scaffold built on top of the masts. Significant coordination was required by Mdm, the mason, D.H. Charles Engineering, the EOR, and the third-party mast engineer to determine what was required. This project is a great reference for how scaffolding companies are taking new steps to work closer with not only their customers but engineers and general contractors, starting as early as the budget phase.

About the Author
Matt Morgan is Vice President of Mdm Scaffolding Services, Inc. Contact him at mmorgan@mdmscaffolding.com or (817) 329-4994.
SAIA President Michael Paladino and President-Elect Tracy Dutting-Kane opened the exhibition.

Tony Groat and Kevin O’Shea presented on MCWP and MEWP safe use programs.

SCAFFOLD & ACCESS INDUSTRY ASSOCIATION (SAIA) MEMBERS AND FRIENDS CAME TOGETHER IN CLEVELAND FOR THE 2021 SAIA ANNUAL CONVENTION & EXPOSITION.

BY CATHEE JOHNSON PHILLIPS

TAKE CARE OF YOUR PEOPLE
he 2021 Scaffold & Access Association (SAIA) Convention & Exposition was held August 29 through September 2 with 338 members and friends in attendance. The week began with training sessions and product demonstrations by CrewTracks and Avontus Software Corp, as well as a welcome reception with exhibitors.

The Sessions

SAIA President Michael Paladino, Eagle Scaffolding Services, Inc., welcomed attendees to the convention and recognized the sponsors and exhibitors that made the convention possible. Brian Hillier, Fraco Products, Ltd. and Corinne Dutil, Fraco, served as masters of ceremonies.

The opening session Leadership: Your Greatest Competitive Advantage in Veteran Recruitment and Achieving Greatness in the Marketplace was presented by Sean Patton, a leadership and mindset coach and a former U.S. Army Special Forces Commander. He began the presentation by discussing the differences between the military and civilian work cultures and said that veterans are looking for elite leadership and effective management.

“Leadership and recruitment of veterans are intertwined,” he said. “In order to be competitive you have to take care of your people and treat them as human beings who have goals and not as widgets that get things done.”

Patton explained the difference between leadership and management and how both are needed for a company to thrive. He talked about the two key tasks that a leader could never delegate, creating the proper culture and making decisions. He stressed, however, the importance of bringing others into those processes, for example by using the special ops planning methodology. He offered practical advice on how to communicate well, based on the 5 Bravo Communication Method, and how to develop a veteran recruitment battleplan.

He concluded by saying, “Effective leadership is the greatest competitive edge for your company. If you have good people, you will be successful. A great textbook has never made a great student – only a teacher can do that. A great product can never make a great company – only an effective leader can do that.”

Taking care of business through taking care of people, workers, clients, and the public, was the common theme of all the sessions, which included, in order of presentation:

- Rising to New Heights. Micah Turner, Trekker Group, focused on taking care of the industry as a whole. He said, “We are the special forces of the construction and industrial industry – we are the first ones in and the last ones out. We are a very skilled craft, but we are not treated like one.” He challenged the attendees by presenting ways to achieve a more value-based marketplace in the scaffold and access industry, rather than one that is only market- or cost-driven.

- Scaling New Heights. Stuart Robles, Sales Transformation Group, Inc., discussed how to take care of salespeople and presented five actionable strategies for sales growth. He began by sharing the reasons that sales managers often fail and said, “Sales managers are the most undertrained sector we see.”

- 3 Engineers “Stumbled” into a Bar. Tracy Dutting-Kane, P.E., Layher, Inc., Dave Glabe, P.E., DH Glabe & Associates, and Dale Lindemar, P.E. came together to answer questions submitted by convention attendees. Steve Smith, Edge Scaffolding, facilitated the panel. Over the past year, the engineers had created their own bourbon whiskey and entertained the audience by giving those with their favorite questions a shot of the 3 Engineers bourbon whiskey. Questions covered a variety of topics, from improving interactions between salespeople and engineers to the lack of women in engineering roles.

- Weathering the Storm. Tim Oleszczuk, TKO Miller, returned to the convention for a third year to provide his take on how COVID-19 impacted the access market and discuss the current state and future direction of the market. He also provided an update on recent mergers and acquisitions activity, with an emphasis on the BrandSafway acquisition of the Brace Industrial Group. He said, “The big-
ggest takeaway today is that I see a real change coming to the scaffold industry… what BrandSafway is doing affects everybody in here.” He noted that BrandSafway’s shift to industrial projects may leave the industry “with no true national player for the first time in decades” and speculated on who might fill that gap.

• **Fall Protection: The Greatest Challenge in Compliance and Risk.** This presentation by Thom Kramer, P.E., L.J.B., Inc., encouraged those present to rely less on personal protective equipment (PPE) in preventing injuries and deaths from falls. He reviewed the history of fall protection standards and looked at fatality statistics for the U.S. and the U.K. Among other topics, he discussed leading edge issues and compared self-retracting lanyards with twin-leg lanyards. He said, “There’s no group that understands gravity better than you guys… but put yourselves in the shoes of those who are only using fall protection equipment – the adjacent industries. Our workers are only one mistake away from a fatality. We need to focus on system redundancies and processes first and training second.”

• **User Need to Develop MCWP and MEWP Safe Use Programs.** Kevin O’Shea, Hydro Mobile, Inc., and Tony Great, IPAF North America Regional Manager, shared their expertise on ensuring a safe and productive worksite. O’Shea said, “We can analyze ourselves to death… Sometimes what you are seeing is not actually what is going on. Going all the way back to the prevention is hard work.” They provided detailed information on developing a safe use program, which should begin with a risk assessment and include selecting the proper machine, a detailed list of safe work procedures for each control measure, a rescue plan, training and re-training, equipment inspections, and more.

• **Stump the Experts presented by the SAIA Suspended Scaffold Council.** Har- old Gidish, Sky Climber, LLC, and Jim Boudreau, Tractel, hosted this session.

Brian Andrews, Bee Access Products, Mark Wigginton, P.E., Sky Climber, and Dale Linder, P.E., served as the experts and came out wearing white wigs, which set the tone for a fun session. The hosts asked 10 prepared questions, and the audience teams competed to answer the questions correctly. Recordings of the sessions are available online to members by logging into the SAIA website and going to “Meetings and Events.”

**General Membership Meeting**

President Paladino welcomed everyone to the meeting and introduced the 2020-2022 SAIA Executive Committee.

**Treasurer’s Update**

Treasurer Frank Frietsch, Laywer, reported that the association is on track to meet the current year’s budget and come out with a slight profit, as planned, and that the Board of Directors approved next year’s budget of $2.27 million.

**Headquarters’ Update**

American National Standards Institute (ANSI). SAIA Executive Director DeAnna Martin announced that the ANSI Board of Standards Review has approved final actions on ANSI/SAIA A92.2-2021, A92.20-2021, and A92.22-2021.

Scaffold & Access (SA) Magazine. Martin also announced that the SA Magazine would be published by the KHL Group, effective January 1, 2022.

**Membership, SAIA**

Membership Manager Brandi Fox reported that 376 members renewed their membership for 2021, resulting in an 86% retention rate. The association gained 28 new members and, as of the meeting, had 404 members in total. They are expecting more new members to join and to reach between 450 and 500 members in total.

**Training, SAIA Outreach Training Manager Daphne Reitz**

reported that a total of 2,099 students had been trained from January through mid-August. Thirty-three students participated in the training sessions offered in conjunction with the convention.

**Alliance Updates**

SAIA Education Foundation (SAIAEF). President Amy Johnson, Skyline Scaffold, said that all was going well for the foundation and encouraged attendees to support funding for program development of safety training and education.

Occupational Safety and Health Administration (OSHA)/SAIA Alliance. SAIA Liaison Kevin O’Shea, Hydro Mobile, Inc., commented that this alliance is one of the better performing alliances from OSHA’s viewpoint. He thanked SAIA Executive Director DeAnna Martin and Associate Director Jackie Brown for their work and support of the alliance.

Scaffold Industry Association of Canada (SIAC) – Ontario Chapter. Chapter President Rick McKinlay, Tractel, said that the primary focus of chap-
SAIA Council and Committee Updates

Council and committee leaders each gave brief updates on current projects. All the councils need volunteers to help with their efforts. Some highlights were:

- The Program Planning Committee noted that next year is the SAIA’s 50th anniversary and asked members to send their ideas for content and any photos they might have to SAIA’s Associate Director Jackie Brown.

President’s Awards Presentation

For many, the highlight of the week was attending the President’s Gala & Awards, sponsored by STVA Scaffold Manufacturing & Sales. During this event, the association recognized the accomplishments and contributions of its members.

SAIA Project Awards

The SAIA Project Awards recognize member companies that have gone above and beyond in contributing to the overall success of a project. The SAIA bestowed six project awards recognizing challenging and successful projects.

SAIA Membership and Training Awards

The William T. Ayres Founders Award, given to an SAIA member who has excelled in the recruitment of new members, was presented to Alan Kline, Lynn Ladder. The Accredited Training Institute (ATI) of the Year Award recognizes the ATI that has trained the most students over the course of a year. James Brown, Echafauds Plus, Inc., who trained 297 students in 2020, is the 2021 recipient.

SAIA Association Awards

The SAIA Association Awards recognize members who have contributed their time, devotion, passion, and expertise to the overall growth, mission, and initiatives of the SAIA. They are nominated by their fellow members and voted on by the entire membership.

The D. Victor Salechey Award was bestowed on Frank Frietsch, Layher. This award recognizes an SAIA member who has achieved at least 15 years of outstanding and exceptional service to the association and has received the Coupling Pin Award in the past. In honor of other outstanding performances this year, the following members were also recognized with association awards:

- Coupling Pin Award – Chris Moody, Direct Scaffold Supply (DSS)
- Hall of Fame Award – Shawn MacDonald, Superior Scaffold
- Outstanding Service Award – Ali Hajighafari, Avontus Software Corp.
- Outstanding Council Chairperson Award – Sam Reese, StepUp Scaffold
- Outstanding Company Contribution Award – Bee Access Products
- Spirit Award – James Boudreau, Tractel
- Unsung Hero Award – Tracy Dutting-Kane, P.E., Layher

SAIA 2021 Project Awards

The Commercial Collaborative Project of the Year and the Mast Driven Hoists and Platforms Project of the Year are featured in this issue.

Commercial Collaborative Project of the Year & Suspended Access Project of the Year

Sky Climber, LLC, A BMU Fit for Queens Collaborating Company:
Safeway Atlantic, LLC

Innovation Award

Forming & Shoring Solutions, Peace River Hydro Dam

Mast Driven Hoists and Platforms Project of the Year

Mdm Scaffolding Services, Inc., Old Parkland-Bell Tower Collaborating Company:
D.H. Charles Engineering, Inc.

Shoring Project of the Year

PCI Scaffold, TMUS B2-B3 Connector

Supported Project of the Year

D.H. Charles Engineering, Inc., Big Creek Bridge Restoration

SAIA 2021

The SAIA’s next meeting is the 2022 Committee Week, scheduled to take place May 1-5 in Memphis, Tennessee. The SAIA 2022 Annual Convention & Exposition and 50th Anniversary Event is slated for August 21 - 24 in Boston, Massachusetts. Visit www.saiaonline.org to learn more the SAIA meetings, training, and membership benefits – and how to take care of your people.
COMMERCIAL CONSTRUCTION RECOVERY SLOWS

In the face of escalating challenges including worker shortages, materials shortages, and rising costs, commercial construction contractors are seeing a slowdown in the pace of their recovery from the pandemic, according to third quarter data from the U.S. Chamber of Commerce Commercial Construction Index.

Almost all contractors, 92%, report some level of difficulty finding skilled workers, but this quarter, 55% indicate high levels of difficulty—a jump of 10 percentage points from the second quarter. The lack of workers has caused 42% of those contractors reporting difficulty finding workers to turn down work, up from 35% in the second quarter.

Also, a record 93% of contractors report they are facing at least one material shortage. Prices are also a worry: An all-time high of 98% of contractors say building product cost fluctuations are having an impact on their business, up 35 points year-over-year.

Contractors’ concerns about supply chains, worker safety, and talent shortages are reflected in the index score, which rose just one point this quarter to 66. Two of the three leading indicator scores—confidence in new business opportunities and backlog—improved slightly, while the score for revenue remained unchanged.

Contractors, however, see improvements over the longer term, with 90% of contractors reporting a moderate to high level of confidence in the market’s ability to provide new business over the next year. Project delays due to the pandemic also continue to improve: 60% are experiencing delays, down from 72% in the second quarter, with an average share of 15% of projects delayed.

Other findings include:

- Steel replaces lumber as most-reported shortage. Reversing a year-long trend, the product which most contractors are experiencing a shortage in is steel, 34%, followed closely by wood/lumber at 31%.
- Steel tariff concerns grow. As steel shortages worsen, 46% of contractors say steel and aluminum tariffs will have a high to very-high degree of impact on their business in the next three years. Visit www.CommercialConstructionIndex.com to access the full report.

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