NEW FACILITIES IN PROGRESS

ADPRO SPORTS PERFORMANCE AND SCIENCE ADDITION

Description: NFL training facility expansion Major tenant: Buffalo Bills Architect of record: Populous Contractor: ARC Building Partners Est. cost: \$18 million Start date: 2018 Completion date: Spring 2019 Location: Orchard Park, N.Y.

ALLIANZ FIELD

Description: New MLS stadium Major tenant: Minnesota United FC Architect of record: Populous Contractor: Mortenson Construction Est. cost: \$250 million Est. start date: June 2017 Completion date: February 2019 Location: St. Paul, Minn.

AMARILLO BALLPARK

Description: New AA ballpark Major tenant: Amarillo Sod Poodles (San Diego Padres affiliate) Architect of record: Populous Contractor: Western/Hunt Construction joint venture Est. cost: \$45.5 million Start date: February 2018 Completion date: April 2019 Location: Amarillo, Texas

ARENA AT SEATTLE CENTER

Description: New NBA and NHL arena Major tenant: WNBA Seattle Storm; potential NBA and NHL teams Architect of record: Populous Contractor: Skanska-AECOM Hunt joint venture Est. cost: \$700 million Start date: December 2018 Completion date: 2020 Location: Seattle, Wash.

CHASE CENTER

Description: New NBA Arena Major tenant: Golden State Warriors Architect of record: MANICA Contractor: Mortenson: Clark

Est. cost: \$1 billion Start date: April 2017 Completion date: August 2019 Location: San Francisco

CHURCHILL DOWNS

Description: New rooftop club, infield gate and colonnade wall Major tenant: Kentucky Derby Architect of record: Populous Contractor: Calhoun Construction Services Est. cost: \$13 Million Start date: 2018 Completion date: May 2019 Location: Louisville, Ky.

CONTINUED ON PAGE 32

Populous Know-How Drives Offseason Renovation Playbook

Keeping a facility's offerings fresh in between seasons comes with a special set of challenges. At the forefront of these is time. Planning may start well before the final whistle blows, but execution often can't begin until the season comes to an end. Time compounds all of the following challenges faced in a typical renovation:

- Stakeholder buy-in
- Coordination between the cli
- ent, designer and builder
- Protecting the brand

Populous, a global architectural design firm specializing in creating environments and venues that draw communities and people together, has worked on thousands of offseason renovations over the years. The firm has developed the finer points of project design and delivery, including how to thread the needle on time-starved projects. When the window of opportunity is small, experience is huge.

By embracing the role of trusted adviser during offseason renovations

and the responsibility that comes with it, Populous' process started to resemble a design-build delivery. All of the characteristics were there:

- Proactive thinking and taking
- the lead in coordination
 Nurturing relationships with builders and manufacturers who deliver
- Safeguarding the client's brand and reputation

All that was missing was the designbuild contract. After talking with more and more clients, the firm saw a need in the market for a turnkey, design-led approach to targeted offseason renovations. Enter Populous Design Build (populous.com/designbuild).

This new standalone service formalizes many of the firm's best practices. Designer and builder put their heads together from the onset. Other key partners – from manufacturers to furniture procurement agents – plug in early, too.

As designers, Populous employees



The Populous design-build system was critical to helping the Indiana Pacers bring a new look and stronger team branding to Bankers Life Fieldhouse.

are hardwired to take a lead role in coordination. Clients hire Populous to help them create a vision, so who better to be responsible for seeing that vision through to the end? No other firm will fight harder.

Populous' wealth of knowledge goes back decades. That two-way understanding of both the big picture and small details is crucial when up against the clock on a project. It inspires confidence and quick decisions by stakeholders. It also builds trust with build partners.

Experience is key, even on relatively smaller-scale projects like offseason renovations. Facing one? Stay calm and stick to the playbook. One trusted adviser goes a long way in navigating short timelines.

Introducing POPULOUS® DESIGNBUILD

Your trusted point of contact for off-season renovations from design through construction.

populous.com/designbuild

Mortenson Brings Deep Experience to Sports Facility Construction

With its innovative use of technology, its dedicated team of sports experts and its emphasis on a builder approach, Mortenson has made its name as a sports industry leader.

Known for its firm commitment to on time and on budget projects, Mortenson's trademark in the industry is a strong completion. "Done Means Done," as Mortenson veterans like to say.

"We turned over the keys to Fiserv Forum two months ahead of schedule," said Derek Cunz, senior vice president of Mortenson's Sports + Entertainment Group. "That gave the Milwaukee Bucks time for a smooth transition. They were able to have plenty of soft openinas and aet their customer service touch points perfect. Staff was fully trained, shelves fully Sports + Entertainment Group. "To us, that means creating better tools for our industry and then using them to drive production. We formed our Digital Integration Group four years ago because we saw the need to treat technology infrastructure the same way we do bricks and mortar — as an integral part of the building's design and structure."

By accounting for technology infrastructure early in a project, Gerken said, Mortenson can ensure higher quality at a lower cost to clients.



Mortenson turned over the keys to Fiserv Forum, the Milwaukee Bucks new home court, two months ahead of schedule, giving the team time to prepare for its grand opening.

Mortenson has led technology innovation in construction for more than 20 years. The firm uses 3D modeling to virtually build every facility before breaking ground, which saves owners from costly changes later. Modeling ensures everyone from architects to owners to subcontractors are working from a single plan and that everyone can track changes at the same time.

Mortenson is busy constructing Minnesota United FC's Allianz Field, a new MLS stadium in St. Paul, and developing the surrounding mixed-use district. Right on the heels of its completion, Mortenson will break ground on a new MLS stadium in Nashville in late 2019.

"We're seeing 'MLS stadium 2.0' or even '3.0'," said Gerken, "Soccer retains its loud, raucous atmosphere, but the architecture and fan experience are much improved."

Next generation soccer at Allianz Field means more club amenities and more premium seating with 16 loge boxes, 22 suites and 1,200 club seats.

"Allianz Field will change the way people experience soccer," said Gerken. "We're building an open concourse with grab-and-go and food hall-like concepts to handle soccer's rush at half-time. The supporters section remains its fervent safe standing bleachers, and there is a brew pub with craft beers."

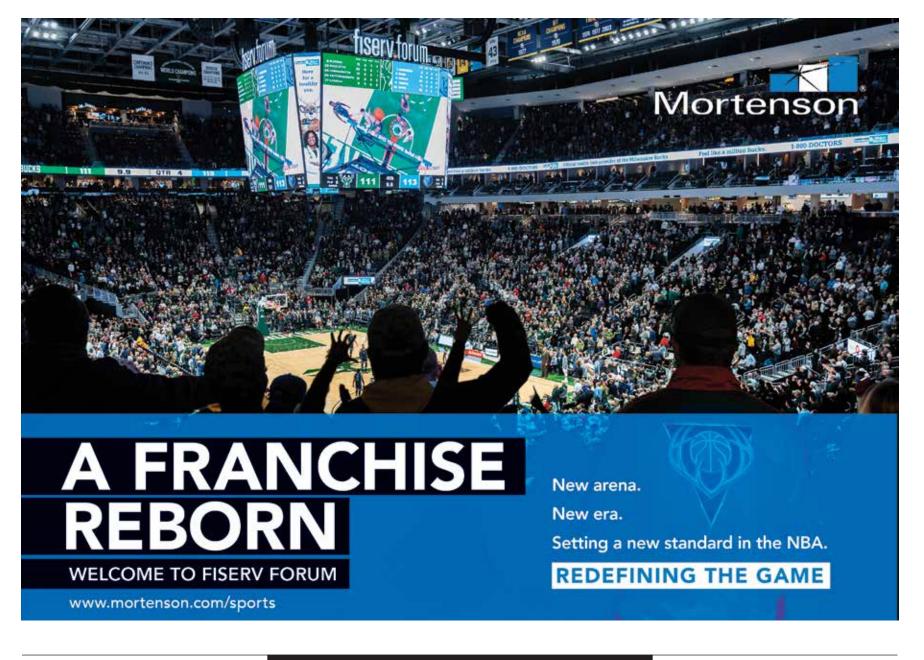
The Golden State Warriors' longawaited Chase Center is scheduled for completion in Fall 2019. Mortenson has been involved since the Mission Bay site was selected more than three years ago.

"We have 1,300 craft workers on site right now," Cunz said. "It's been fun building so close to Silicon Valley. We've been able to leverage new, interesting tools, such as drones to do our quality control and to laser-scan the building."

Mortenson's innovative "lean construction" techniques mean using data capture and machine learning to schedule and track materials from the production room floor to shipping to installation from the many sources in its supply chain.

"The site in Mission Bay is extremely tight. There's nowhere to store any material," said Cunz. "Our construction management team is able to use model-based data to ensure that as materials arrive, they're immediately put into place. We're curb to curb on construction. Mortenson is able to do that because of our long-term, ongoing commitment to industrializing the construction industry. We've helped set the standards that the rest of the industry will follow."

Next up? Oh, just a tiny one. Mortenson has been tapped to build the new \$1.9 billion stadium in Las Vegas for the Raiders and UNLV. The 65,000-seat domed facility will open in July 2020.



NEW FACILITIES IN PROGRESS

CONTINUED FROM PAGE 30 COORS FIELD

Description: Baseball stadium renovations Major tenant: Colorado Rockies Architect of record: Populous Contractor: Mortenson Est. cost: \$8.5 million Start date: October 2017 Completion date: April 2019 Location: Denver, Colo.

DICKIES ARENA

Description: Rodeo; multipurpose facility Major tenant: Fort Worth Stock Show and Rodeo Architect of record: HKS Architects; David M. Schwarz Contractor: The Beck Group Est. cost: \$540 million Start date: February 2017 Completion date: November 2019 Location: Fort Worth, Texas

DUNEDIN STADIUM

Description: MLB spring training facility renovation Major tenant: Toronto Blue Jays Architect of record: Populous Contractor: Gilbane/Turner Construction joint venture Est. cost: \$81 million Start date: April 2019 Completion date: 2020 Location: Dunedin, Fla.

GATEWAY CENTER AT COLLEGE PARK

Description: Basketball arena Major tenant: Atlanta Hawks G-League team Architect of record: TVS Design; Rosser Contractor: NA Est. cost: \$45 million Start date: February 2018 Completion date: Fall 2019 Location: College Park, Ga.

LAS VEGAS BALLPARK

Description: New AAA ballpark

Major tenant: Las Vegas 51s Architect of record: HOK Contractor: Hunt/PENTA Est. cost: \$150 million Start date: February 2018 Completion date: Spring 2019 Location: Summerlin, Nev.

LAS VEGAS STADIUM

Description: New NFL stadium Major tenant: Las Vegas Raiders Architect of record: MANICA; HNTB Contractor: Mortenson; McCarthy Est. cost: \$1.8 billion Start date: November 2017 Completion date: July 2020 Location: Las Vegas, Nev.

SMA Keeps Sports Venue Executives at the Top of their Game

The busiest people in the sports industry may be the folks running sports stadiums on game day. In February, they will get a chance to catch their breath and kick off their shoes at the Margaritaville Beach Resort in Hollywood, Fla.

The Stadium Managers Association's annual meeting gives facility executives, vendors and sponsors a chance to catch up on new standards for the industry, make new contacts and spend time building relationships. Stadium managers include operators from the NFL, Major League Baseball, MLS, the NCAA and NASCAR.

The weeklong conference kicks off on Super Bowl Sunday, Feb. 3, with stadium managers gathered by the pool to watch the game and, more importantly, to watch how their colleague at the new Mercedes-Benz Stadium in Atlanta handles the world's biggest sporting event. Their colleague will call into the conference the next day for Monday morning quarterbacking of



The Stadium Managers Association's annual meeting features engaging speakers and information sharing among the top executives at some of the premier sports facilities in the world.

how the game played out — from a venue-management perspective.

"It's important to meet our colleagues, our vendors, our service providers in a social setting," said current SMA President Troy Brown. Brown is also vice president of stadium operations for the Cleveland Browns. "When you've chatted with someone for an hour, you build trust. And in a few months, when you need engineering services or concrete work, you can call on that relationship you've established."

In addition to networking, stadium managers come to the conference to

stay on top of trends and learn best practices for facilities. Safety and security are always top of mind for stadium executives, which makes them eager for the annual report from Homeland Security.

"Our sole goal is to have 65,000 people arrive on a game day, have fun and leave as safely as they arrived," said Brown.

The second hot topic for executives is incorporating technology and analytics into venues.

"Stadiums now have designated analytics teams tracking, for example, who comes in the gates, at what time, which particular gate, how long it takes them to get in, how long each fan stands in line," said Brown. "How can we use that data to make game day more convenient for the fan? More fun? How can we shorten those lines? Can we use the data to tailor special offers to fans? It's good for all of us to compare notes because these issues are paramount to everyone."



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We gratefully acknowledge the following sponsors for their support and look forward to welcoming them at our 45th Annual Seminar in Hollywood Beach, FL February 3-7, 2019. For details and registration, visit www.StadiumManagers.org

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For Daktronics, Innovation is the Key to Success in Sports

When two South Dakota State University engineering professors noticed that many of their graduates were moving out of state to find work, they decided to change that. Working from a garage in downtown Brookings, Aelred Kurtenbach and Duane Sander started a company in 1968 with no product. Three years later, they developed the patented Matside® wrestling scoreboard, their first sports product.

Fifty years later, Daktronics is the global powerhouse for the digital display industry. The company has outgrown the garage and now has thousands of employees innovating, designing, manufacturing, operating and installing its market-leading products, primarily from Brookings, S.D.

From its beginnings creating scoreboards — still a major product for Daktronics — the company has taken the lead in innovating the world's largest, most high-resolution video displays. Daktronics has expanded its reach into complementary products and services, such as its line of Sportsound ™ audio systems. Daktronics offers software and trains clients to make the most of their displays. The company even offers Creative Services[™] to operate displays for clients, who range from sports to business to the transportation industry.

And Daktronics is always pushing



The prominence of the scoreboard at the Colorado Rockies' Coors Field is typical of the dynamic Daktronics installations seen throughout the sports landscape.

forward, researching and creating ever better digital technology.

The pro sports industry is rapidly adopting Daktronics' newest innovation, narrow pixel pitch (NPP), in every area in their venues that require upclose viewing. NPP involves narrowing pixels — of course — to create a high-resolution screen that gives the naked eye the most crisp, vibrant image possible, even in an area with glare from natural light. This LED video technology brings thousands of colors across the light spectrum to life.

"Club spaces, atriums, concourses, even outdoor gathering spaces are great locations for NPP," said Jay Parker, vice president of live events and spectaculars. "NPP, which is LED technology, is becoming a strong alternative to traditional LCD technology in any location that requires up close viewing. LED technology also has a longer life span, which results in significant long-term savings for clients."

LED video technology is also ideal because it can be configured to any shape with no image distortion. Designers can wrap a circular column in an atrium, for example. A video wall involving multiple screens can be replaced with a single LED screen, with no mullions to break up the images. Clients keep the option of using the screen to display a single image or switching up to multiple videos onscreen at once.

Daktronics works hard to build whatever its clients can imagine. For the Colorado Rockies, Daktronics figured out how to add a fully functioning jagged mountain-scape to the top of the baseball team's video board.

"Our clients see their video displays serving as architectural elements for their facilities," said Parker. "We're being brought into the process at earlier stages to help with the design. At the end of the day, we're an engineering company, and our job is to try to always answer 'yes' when a client says, 'Is it possible to ...?"

Clients are finding new ways, beyond the seating bowl, to use Daktronics displays to generate revenue, working them into entrances, concourses and outside gathering spots.

"We do from streets to seats," said Parker. "How can we use our displays to create a better fan experience? More entertainment in the parking lots for tailgating? Halls of Fame offer endless opportunities for leveraging LED displays. The Viking ship at U.S. Bank Stadium, using a video display as its sail, is an iconic touchpoint, a way for the Vikings to connect their brand and their history to fans. Our goal is to move beyond the flat rectangle."

Forbes has named Daktronics, with its hundreds of thousands of products installed worldwide, as one of "America's Most Trustworthy Companies," every year since 2012.



Retractable Mound System Generates Additional Revenue

As venue and stadium operators look to expand their offerings and utilization, creating a multipurpose venue is critical. The manual removal of a pitcher's mound to create a flat surface can be very costly and labor intensive. With manual conversion, scheduling can become an issue during overlapping seasons.

Esto Retractable invented and patented a reliable, cost-efficient retractable mound system to mechanically lower a baseball pitcher's mound without changing the clay. This simple,

RETRACTABLE MOUND SYSTEM

- Mechanically Lowers Mound

Turn-key Installation Process

- See it in action on estoretractable.com

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Call 812.282.3700 schedule a demonstration site visit

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ted Seccet Learne

- Delivers Stadium Flexibility

LEVEL THE

PLAYING FIELD

IN JUST HOURS - NOT DAYS!

quick transition can be implemented in just minutes — not days.

The Esto Retractable mound system uses a single electric motor to drive four industrial screw jacks — simply, safely and reliably. The structural steel walls and moving platform supports the clay pitcher's mound as it is lowered below the playing surface. This allows a baseball venue to host various types of events including soccer, concerts, lacrosse, rugby, civic gatherings, etc. Building a sport-specific stadium in many mid-sized U.S. cities can pose a



The Esto Retractable System allows facility operators to lower a pitcher's mound in seconds, not days, making it practical to host a wider range of events.

major challenge. By implementing this system into existing infrastructure, emerging sports, such as soccer, can easily grow throughout the nation. The company's first model, which was installed at Louisville Slugger Field in 2015 for Louisville City FC, has "worked flawlessly" according to Bats President Gary Ulmer.

With a USL expansion team scheduled to share space beginning in 2019 with El Paso's Triple-A Chihuahuas baseball team, the ability to rapidly transition between different configurations will make the stadium more serviceable. John Leidolf, senior project manager for the Hunt Companies, which owns both teams, estimates that eliminating the materials and manual labor required to rebuild the clay mound will save the venue up to \$7,500 per changeover.

"We just looked at it as a cost/benefit analysis," Leidolf said. "For us, the payback is probably somewhere in the neighborhood of two seasons or less."

Esto Retractable installed a full-size retractable mound system in Louisville, Kentucky to demonstrate its quality and simplicity. Contact Esto Retractable at 812.282.3700 or visit estoretractable. com to schedule a visit to the demonstration site.

The Power of Sports and Arts

Well-known sculptor Erik Blome, owner of Figurative Art Studio, has long been a pioneer in melding sports and art into the dynamic bronze sculptures. When the Blackhawks tapped

Blome to create a 75th anniversary tribute at the United Center, it was the first time a sports team saw the value in incorporating world-class artwork into a venue. For the Blackhawks, the 75th anniversary tribute depicts players from different eras skating out of the wall as a single unified team.

That was followed by a statue of hockey great Wayne Gretzky at STAPLES Center. STAPLES then commissioned a second statue depicting boxer Oscar de la Hoya.

"People at STAPLES Center were hesitant at first," said Blome. "But that changed once the sculptures were in. Fans flocked to see them, even making the trip when there were no events at the arena that day. Those two statues began what is now the well-known Star Plaza."

Blome sees the sculptures for their ability to bond fans to their teams, to serve as touch points, both physical and historical, for fans.

One of Blome's most recent works is

for the Maple Leafs' Legends Row at Toronto's Scotiabank Arena. Blome sculpted a team of 14 dynamic Maple Leaf heroes with each player wearing the uniform and carrying the equipment of his era.

"In this work, it matters who is next to each other and who has his hand on who's shoulder," Blome said. "So when diehard fans look at it, they say, 'oh, that all makes sense — he was roommates with him or these guys were friends.' It pays a tribute to those fans' knowledge and devotion. You have players from different eras interacting with each other. At one layer, you see it as one continuous team. At a second layer, you see that you, too, are part of that team."



Figurative Art Studio's work portraying different eras of Black Hawk stars pays tribute to the team's history.



Trex Commercial Products: Outstanding Quality and Unique Design

When sports facilities designers begin sketching details, they are faced with myriad options for the thousands of elements that will bring a new venue to a single, unified whole.

When it comes to a venue's railing system, there's no question who to call. Trex Commercial Products, formerly

SC Railing, is their go-to source. Trex Commercial's products are

seen throughout the professional sports industry, with clients who have premium venues, such as Fiserv Forum in Milwaukee.

"The design team typically brings us in early on. We collaborate with architects, contractors and owners from the pre-construction and budgeting stage to completion," said Dan Stachel, vice president. "Our goal is to ensure our work enhances the building's intended aesthetics, creates a long-lasting, topquality system and is engineered with value in mind."

With its sleek, modern design, the recently opened Fiserv Forum, home to the Milwaukee Bucks and the Marquette Golden Eagles, showcases nearly 12,000 linear feet of Trex Commercial's ornamental railing.

For this project, Trex Commercial Products had two goals in mind. First, to deliver engineered custom decorative railing that enhanced the accessibility,



Trex Commercial's practical and elegant design on the stairwell at Little Caesars Arena is typical of the company's work throughout sports venues.

safety and overall fan experience at the arena; and second, to complement Fiserv's distinctly contemporary architecture.

Fiserv features custom radius-glass railing in the arena's exclusive Sky Mezzanine and Panorama Club, along with glass railing top-mounted to a rolled steel angle with LED lighting, enhancing the ambiance of the VIP space. The Panorama Club's exclusive exterior balcony features three-quarter-inch laminated tempered glass with SentryGuard Plus (SGP) interlayer, allowing fans to enjoy expansive views of the Milwaukee skyline.

Track Rail, featuring half-inch laminated tempered glass with polyvinyl butyral (PVB) interlayer, can also be found in the massive multilevel, lightfilled east atrium, VIP suites and upper concourses, enhancing the sophisticated interior design, while also providing a secure, yet unobtrusive, barrier along the stairs, concourses and overlooks.

LED-lit railing is incorporated into the intermediate rails on awe-inspiring stairways in the east atrium, serving as an important safety function – gently lighting walkways to help patrons get to their destination. Additionally, the arena is furnished with anodized aluminum handrails, liquid-painted cable railings, drink rails, and classic picket railings along with ADA-compliant guardrails.

A skywalk featuring an elegant stainless-steel handrail connects the third level of the parking facility to the new arena, allowing fans to park and walk directly across to the arena's main concourse.

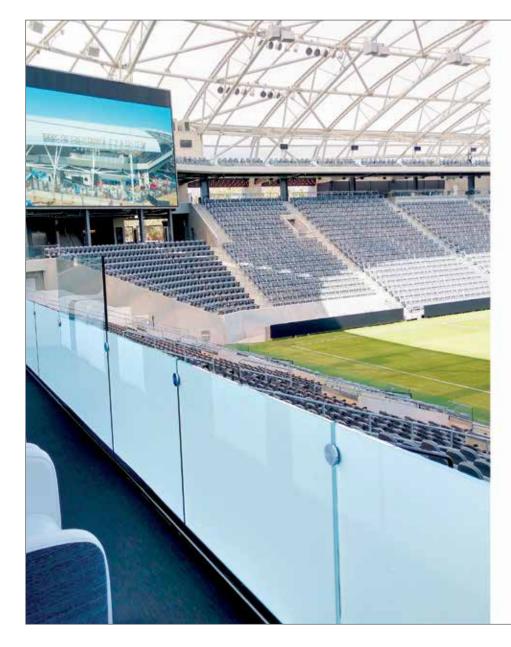
Trex Commercial's current projects include the Rams and Chargers' new Los Angeles Stadium at Hollywood Park; the Golden State Warriors' Chase Center; Minnesota United's Allianz Field and the renovation of the Atlanta Hawks' State Farm Arena. Trex Commercial is also putting the finishing touches on Dickies Arena, the new home of the Fort Worth Stock Show and Rodeo.

The firm began in 1990 as Staging Concepts, manufacturing demountable staging equipment. Over a few years, the company began adding railings to its staging, perfectly matching venues' existing railings.

"Then, in 2005, we had a client say, 'How about you give us a price to build all the railings in the facility?'" said Stachel. "Since then, our growth has exploded, with our team constantly hiring more well-trained engineers. We've provided the railings for the vast majority of pro facilities built since."

In 2017, the company was acquired by Trex, best known for its residential decking material.

Trex Commercial's 200-plus employees, including 45 fully degreed engineers, design and build the company's railing systems at its headquarters and manufacturing facility in Minneapolis.



Superior Performance -On and Off the Field.

Tailor-made railings that complement your project, delivering on aesthetics and strength and contributing to the ultimate fan experience.

With experience providing ornamental railing for premier sports venues, our vast product offering and technical expertise make us the perfect partner for your next project.



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