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PANSTADIA & ARENA MANAGEMENT

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Fiserv Forum

Multipurpose venues

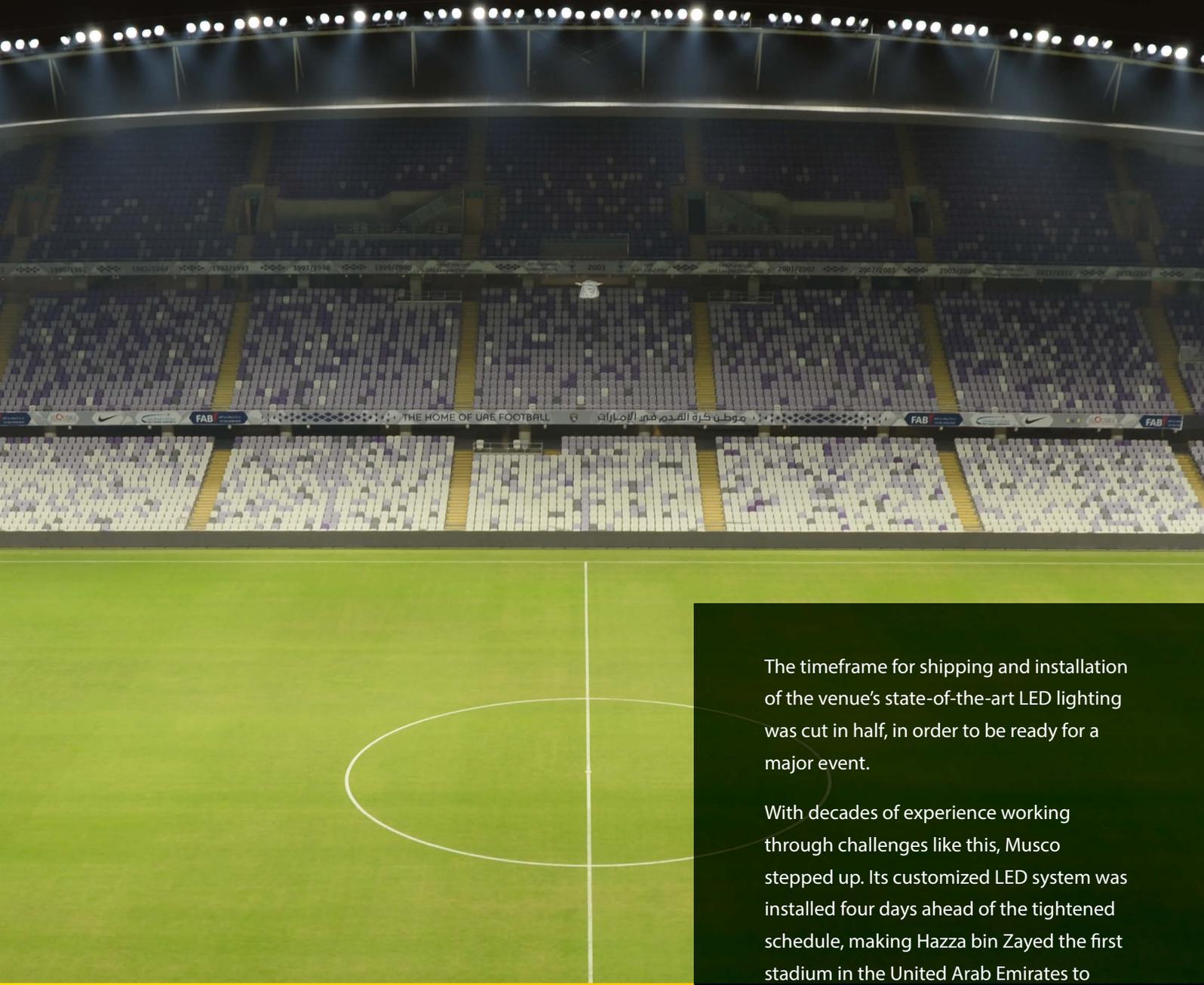
Turf talk

Baseball booms



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– Mr. Rashid Abdullah
Investment and Commercial Director, Hazza bin Zayed Stadium

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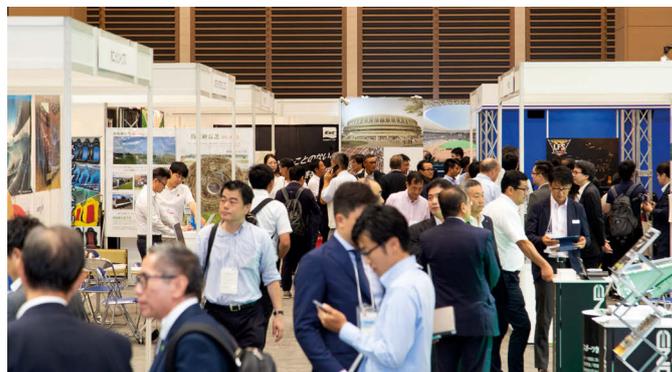
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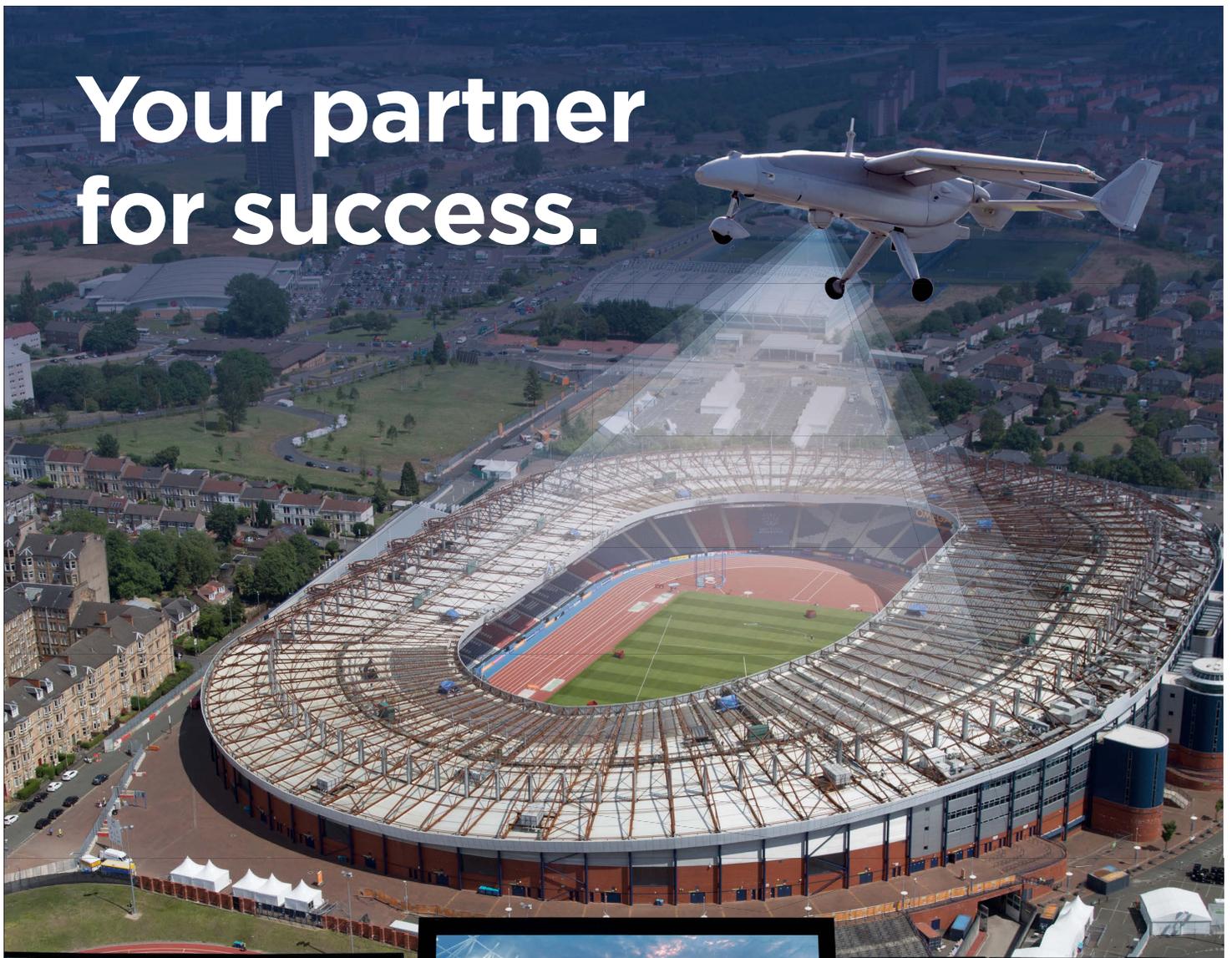
Football fans enjoyed the World Cup on Brighton beach this summer thanks to NEXO's continued teamwork with The Luna Cinema.

ADVERTISERS' INDEX/NEXT ISSUE 110



UGA Sanford Stadium looking to west end expansion

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Another summer has come and gone and a whole host of entertaining sport has taken place, including a stunning **FIFA World Cup** in Russia and the action packed **Asian Games** in Indonesia.

The World Cup was heralded as one of the best ever and the 12 stunning stadia that hosted matches formed a perfect backdrop for the tournament.

All eyes will now be on the legacy of the venues and efforts to stop them becoming 'White Elephants.'

Russian President Vladimir Putin has proposed turning them into multipurpose entertainment destinations, with restaurants, cafes and shopping malls to increase revenues.

This needs to be a feature of venues around the world and in this issue we take a look at some of the best examples of this, including the **Mercedes-Benz Arena** in Shanghai, which hosts a huge array of different events every year.

Venues need to attract a wide variety of shows to cater for diverse audiences and keep visitors coming through their doors.

We also take an in-depth look at the **Fiserv Forum**, home of the **NBA's Milwaukee Bucks**, as well as the enduring popularity of baseball in a round-up of Minor League and collegiate projects.

Turf talk is also on the agenda as we quiz a panel of experts on the latest developments in pitch care and technology.

Meanwhile, our Stadia & Arena Japan conference continues to go from strength to strength and it was great to see so many delegates at the recent event in Osaka. Watch this space for more details on where the event will be going next.

Please keep me up to date with all your latest stadia and arena developments and thanks for reading!



John Sheehan
Editor
PanStadia & Arena Management Magazine

in association with



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NEW SHOWCASE FOR NBA'S MILWAUKEE BUCKS

The newly opened \$524 million Fiserv Forum is helping revitalise a long-derelict 30-acre district at the city's entrance. Feature writer Steve Traiman provides insight from the company's president and architects.

“When our new arena opened it was like giving birth.”

Milwaukee Bucks President Peter Feigin told *PS&AM*. “It all comes from the top, and big credit goes to Mike Fascitelli, former CEO of Vornado Real Estate, one of our owners who include Wes Edens, Marc Lasry and Jamie Dinan.

“Mike took the lead on all real estate development for the area, and we proved that it was not day to day but minute by minute ... not foot by foot but inch by inch if you really care about it.

“Our goal was a finished product that would be a delight for fans and customers every time they come.”

In late July the Bucks and Brookfield, Wisconsin-based financial services company **Fiserv Inc.** announced a 25-year naming rights deal for the new arena, to be called **Fiserv Forum**.

Feigin said he and the team's other owners were delighted to be a partner with a large local company that has an international presence. “*Their exponential success is insane,*” he noted.

Feigin cut the ribbon at the official grand opening Open House August 26, with more than 50,000 local Bucks fans and Milwaukee area residents getting their first look at the impressive world-class arena.

At the signing of the original 30-year lease deal with the **Wisconsin Center District (WCD)**, Feigin said: “*This agreement is the realisation of a commitment our owners made two years ago to Bucks fans and the entire community to keep the team in Wisconsin and help revitalise downtown Milwaukee.*”

“We're incredibly thankful for all of the hard work that went into this historic public-private partnership from the WCD, elected officials and community

leaders. This is just the beginning of our effort and we can't wait to see the economic impact this will have on our community.”

Fiserv Forum is publicly owned by the WCD and is managed and operated by **Deer District LLC**, an affiliate of the Bucks, who have committed to a 30-year lease with rent payments totaling approximately \$45 million over the term of the lease.

In addition to bearing the responsibility for any cost overruns during construction, Deer District will be responsible for all operating, maintenance and capital repair expenses.

Deer District has also agreed to deposit a cumulative total of \$60 million minimum into a capital improvements fund for the arena over the term of the lease.

In addition to annual lease payments, the arena is expected to generate revenue for both the WCD and state from a \$2 ticket surcharge on all Fiserv Forum public ticketed events, while the city, county and state will all benefit from an estimated \$634 million in income tax revenue over the life of the lease from Bucks players and staff, as well as revenue from visiting **NBA** teams.

The lease also includes a non-relocation agreement between the Bucks and the WCD to help ensure that the team will remain in Milwaukee for the next 30 years.

Fiserv Forum seats 17,500 for basketball and up to 18,000 for concerts. Key amenities include a 7-storey glass entry lobby; VIP entry for 34 VIP suites, six Club Lounges, three party spaces, 33 premium lofts; BMO, Mezzanine and Panorama

Clubs; five Public Bars; four Bucks Pro Shops and one Bucks Authentics Kiosk; enclosed secure player parking and loading dock.

TASTY TREATS

Among notable food and drink partner deals are an agreement with locally-based **Klement Sausage Company** to become the official and exclusive bratwurst, hot dog and sausage of the Bucks and Fiserv Forum.

Klement's products will be sold at each of the main concession stands and at two portable locations, and the company will work with



NBA Milwaukee Bucks mascot welcomes fans to new Fiserv Forum

All images courtesy of Milwaukee Bucks

senior Executive Chef Kenneth Hardiman and food and beverage provider **Levy** to create craft sausages and products exclusive to Fiserv Forum.

Another deal with world famous whiskey brand **Jack Daniel's** includes The Jack Daniel's Bar on the upper concourse with an inaugural year speciality drink, as well as cocktails on tap and other beverages.

Jack Daniel's cocktails also will be featured at various other locations. And

with **Miller Coors**, the Bucks are working on developing speciality brews available only at Fiserv Forum.

The star-studded concert programme tipped off September 4 with 12,000 on hand to see local favourites **The Killers** with the **Violent Femmes**.

Also set are actor/comedian **Kevin Hart**, Sept. 13; **Maroon 5**, Sept. 16; **Justin Timberlake**, Sept. 21; comedian **Jim Gaffigan**, Sept. 22; **Foo Fighters**, Oct. 17; **The Eagles**, Oct. 18; and **UFC**, Dec. 15. Already booked for 2019 is **Elton John: Farewell Yellow Brick Road**, Feb. 19.

VIEW FROM THE TOP

Fiserv Forum will be the centrepiece of a 30-acre retail and entertainment district in the heart of downtown Milwaukee that is expected to include an additional \$500 million worth of private investment.

The Bucks were among the first to invest with a new \$30 million **Froedtert & the Medical College of Wisconsin Sports Science Center** training facility adjacent to the new arena, which was designed by **Populous, Eppstein Uhen Architects** and **HNTB**.

Populous design principal Brad Clark had special praise for Bucks' President Peter Feigin.

He told *PS&AM*, "*Peter was very involved with every aspect of the new arena, and his 'eyes on' approach was very important to our overall success.*"

Feigin added: "*It was an unbelievable opportunity for us as we had almost 30 acres of dormant land – truly brownfields – to redevelop and provide a great entrance to our city. Most important, I want to give credit to Populous who paid homage to our iconic Milwaukee architecture. We wanted our new arena to blend into the landscape – something they did very well.*" >>





Open House crowd inside stunning 7-storey atrium

“To make the most of this opportunity, we visited about 20 stadiums and arenas around the world, with special attention to the three most recent new NBA venues in Brooklyn, Orlando and Sacramento to pick their brains for the best new features.

“Our prime concern was the ‘critical path’ to insure the best navigation of the building for all customers. The ‘open concourse’ concept from Populous was excellent, as it opened up the entire environment from top to bottom. The entire project for us was kind of exciting and fun. From the overall entire design down to details for seating, concessions and state-of-the-art technology – all were designed to provide a first-class experience for every fan.

“Our approach to premium seating was to provide a real expectation of class due to the modest Milwaukee sensibility. There was no question to

our commitment to a gold standard but within the local model. One good example was our very original West End Lofts.

“Our commitment to sustainability goes way beyond protecting the environment. Working closely with top food service provider Levy we started with no plastic straws and compostable food packaging. Kohler had a big part with plumbing on water conservation fixtures. The bottom line is that we took the best sustainability practices from around the world for the arena. We will be applying for LEED Silver Certification, and will know in Q1 2019.”

KEY ARCHITECT COLLABORATION

Design Principal Brad Clark recalled: “The Populous-led design team was selected after a two-interview process in late 2014, the second of which

included presentation of a conceptual design from our team that included Eppstein Uhen and HNTB.

“We got to know Greg Uhen and his team as an excellent locally-based architectural firm. They had built new offices for the new Bucks organisation so they had some good relationships to build on. HNTB also had some important connections with the Bucks and had the added advantage of a Milwaukee office.”

(The excellent project team, put together with owner representative CAA ICON, included Mortenson Construction as general contractor; HNTB as structural engineer with Walter P. Moore, who installed the long-span roof; and M-E Engineers for all MEP services.)

Clark continued: “HNTB was given the key responsibility for detailing the entire exterior envelope - all the various systems pre-weathered zinc cladding, curtain wall and brick veneers. Eppstein Uhen handled some of the significant interior spaces including the totally open concourses, concessions and retail space, and one of the three clubs.

“Populous was responsible for all the sports and entertainment aspects of the arena as well as remaining area interiors which included the stunning seven-storey lobby atrium, the other two clubs, locker rooms and team lounge, among other key features.

“While the main tenants are the Bucks, with 41 regular season plus playoff games, and Marquette University’s Men’s Basketball Golden Eagles, with 18-20 games a season, the arena had to be multi-purpose and flexible. This was one of the prime requirements of the Bucks, which operates the venue for the WCD through their Deer District affiliate. Concerts are a key feature, with the main stage at the west end, and seating up to 18,000. Rigging can handle up to 300,000 pounds, a far cry from the 120,000-pound maximum I remember from arenas built in the ‘90’s.”

DEVELOPMENT PARAMETERS

As for VIP seating in the new arena, Clark noted that the Bucks were very conscious of the internal parameters of the local market and Populous worked closely with that concept – modest compared to other new arenas in larger markets.

There are 34 suites, arrayed on both sidelines; a customisable premium group space on the west end behind the stage; and three party suites. >>

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Bucks President Peter Feigin on new arena floor.
Image credit: Milwaukee Bucks/Jeff Phelps

« The 192-seat capacity West End Lofts are inclusive of a private, common space with fine dining options that opens to the lobby atrium on the city side.

With sustainability another key parameter from both the city and the Bucks, LEED silver certification was the target.

Clark said: *“We used energy-saving features in all the mechanical systems, locally-sourced recycled materials wherever possible including reclaimed wood, LED lighting throughout the arena - in short, a smart, prudent design.*

“The downtown urban site was long vacant, which was a big bonus in construction, although cooling towers from the adjacent BMO Harris Bradley Center had to be relocated. The Park East Corridor area has been a target

for redevelopment for many years, and the arena already has been responsible for some major new building announcements.

“While the site was tight, there were no significant site challenges. Teamwork with the entire project team, headed by Mortenson Construction, was a big success, as we knew it would be from our prior history with them on other major sports venues.”

THE BIGGER PICTURE

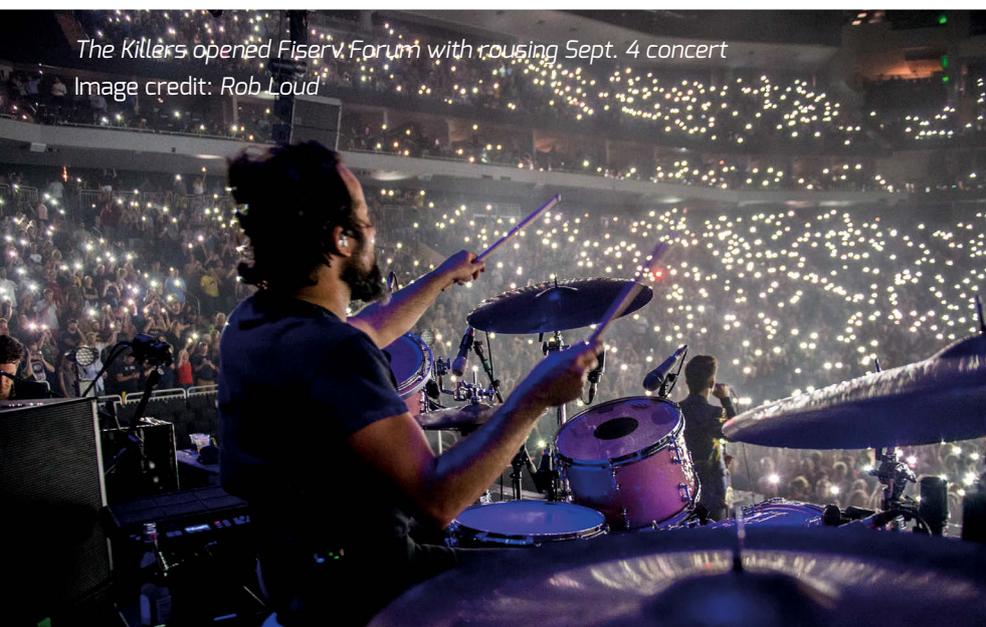
For Milwaukee-based Eppstein Uhen, CEO Greg Uhen told PS&AM: *“For the Bucks’ organisation we had built their offices in a new separate building in a nearby office complex overlooking the new site. We had a similar role with Miller Park for the MLB Milwaukee*

Brewers, working with architectural firms HKS from Dallas and Dan Meis, then with NBBJ. We also did the Bucks new training centre.

“We led the masterplanning effort for the eight city blocks -- about 30 acres. For the arena our role was the majority of inside space. Included was a lot of the concourse-type space, the suites and the Event Club at courtside. The upper concourse is all open, top loading with a lot of glass and windows looking to Downtown. It offers a great mix of food and drink just steps away from some of the best seats in the house.

“Overall it was a great opportunity to take about 30 acres with the arena in the centre. The masterplan will provide demand-generating type uses. We’ve been looking at other blocks and coming up with a plan for daytime and nighttime use, residential and hospitality, appealing to residents of close-by vibrant neighbourhoods. Realising that the arena itself generates a certain sensibility for the market, we’re creating an environment for corporate headquarters and several large new parking structures to generate additional uses.

“Phase one included the entertainment block on Fourth Street that faces the arena main entrance that will be next to a plaza. There are several commitments already for new restaurants and other bars, including Good City Brewing and Punch Bowl Social. Other commitments on both the hospitality and residential side are waiting for completion of the cohesive urban master plan, which should be finished very soon.” >>



The Killers opened Fiserv Forum with rousing Sept. 4 concert
Image credit: Rob Loud



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« LOCAL KNOWLEDGE

Paul Griesemer, HNTB Project Manager, highlighted the firm's involvement, noting for PS&AM: "We saw the project as a way to showcase both our commitment to the city and to the strength of our sports practice with a great high-profile project. Our team committed Tim Cahill, our top design resource and National Design lead, to contribute to and collaborate with this strong team on the finished design -- and then to give the building façades the detailed attention a project of this importance deserved.

"The design pays homage to the strong architectural character of the city

and the natural honest character of its people. The zinc, glass and brick exterior skin provides incredible vistas of the Downtown skyline while also covering the most efficient structural steel frame possible.

"HNTB structural engineers worked in partnership with Mortenson Construction and their steel suppliers to design over 8,000 tons of steel in an intricate web supporting the arena's unique iconic shape.

"Outside the arena, HNTB site and transit planners worked from the very outset with city planners and Eppstein Uhen to plan outside spaces

that will inspire an extended game day experience both before entering the event as well as after.

"They also brought their expertise to traffic planning, including approvals for the closure of Fourth Street and inclusion of the streetcar connection to the project, connecting the entertainment district with the rest of Milwaukee."

Bucks President Feigin summed up: "We know we achieved our successful objective – that every fan and new customer will find the 'first feel' of our new arena beyond surprise and delight." ■

ME ENGINEERS PLAYS KEY MEPT ROLE

ME Engineers provided MEPT systems design for the new Fiserv Forum. This includes the HVAC system design (including bowl air distribution and ice sheet refrigeration design), electrical power and lighting design (including sports lighting), plumbing design, and technology systems design.

ME also provided energy modelling and commissioning services for the project.

Two of the arena's unique features ME contributed to were the ice sheet design and LEED/sustainability goals.

The ice sheet at the new Fiserv Forum is produced with a refrigeration plant using scroll compressors. Because this technology is not common for this application, ME worked very closely with project partner **Johnson Controls International** to confirm requirements.

Part of this effort included optimising the pumping and piping arrangement for the ice floor based upon the exact performance of JCI's scroll compressors.

LEED certification was an important goal, and ME provided energy-saving systems including ultra-efficient equipment specifications, low-flow plumbing fixtures and LED lighting.

ME participated with the design team in a pilot of a new bird collision deterrence LEED credit. For this credit ME prepared documentation for all exterior lighting and controls, and worked with experts to create lighting schedules.

Exterior lighting is reduced overnight with even more reduction during bird migration seasons. The primary concern was limiting uplights that can influence bird migration patterns.

FISERV FORUM

Project Team and Fact File

Location	Milwaukee, Wisconsin
Opening Date	August 26, 2018
Construction Cost	\$ 524 million
Owner	Wisconsin Center District
Operator	Deer District LLC, Milwaukee Bucks affiliate
Capacity	17,500, basketball; up to 18,000, concerts.
Architect	Populous, Eppstein Uhen, HNTB
Owner's Representative	CAA ICON
General Contractor	Mortenson Construction
Structural Engineers	HNTB, Walter P. Moore
Services (MEP) Engineer	ME Engineers
F&B Concessionaire	Levy
Major Tenants	NBA Milwaukee Bucks, NCAA Marquette Golden Eagles

Amenities

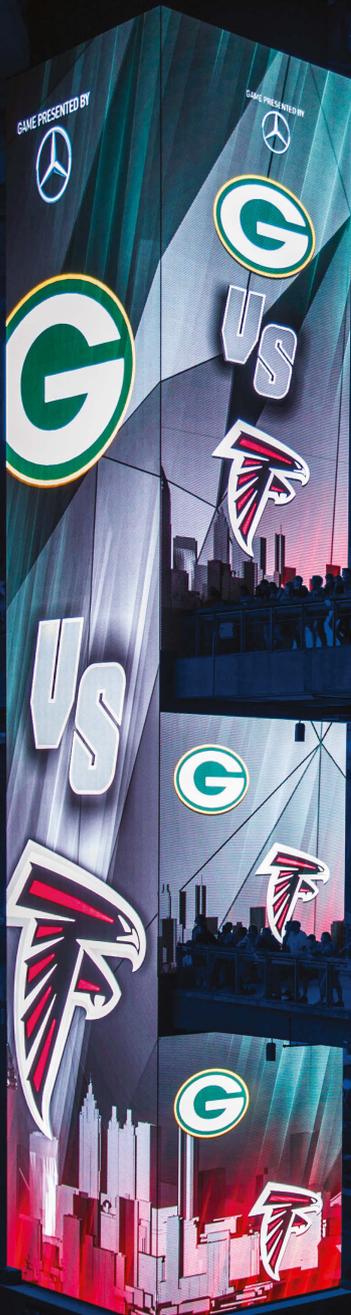
7-storey glass entry lobby; VIP entry for 34 VIP suites, 6 Club Lounges, 3 party spaces; 33 premium lofts; BMO, Mezzanine & Panorama Clubs; 5 Public Bars; 4 Bucks Pro Shops & 1 Bucks Authentics Kiosk; enclosed secure player parking & loading dock.

View of exterior lighting test at Fiserv Forum: Lights are aimed to prevent spilling over to the sky, with some turned off during bird migration seasons.



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VARIETY SHOW

Multipurpose venues around the world are bidding to attract a multitude of different events to keep visitors coming through their doors.

Diversification is the name of the game as stadia and arenas look to attract a huge variety of different audiences to their venues.

Venue managers around the world are booking everything from superstar pop acts to **Monster Jam** motorsport events to pack in guests and keep revenues rolling in.

Matt Holt, VP Commercial Operations, **Arena Americas**, said: *“We have got to make these venues attract audiences 365 days a year. To do that you have got to really enhance the fan*

experience. You have got to connect to the community, you have got to expand your fan base, you have got to connect to non-fan base guests.

“You have got to think along the lines of – if you build it that they will come. If you build it, revenue opportunities will present themselves.”

He said that a downtown venue should be looking to host 200-250 events a year.

“Our business is about keeping your venue alive 365. We want to be able to attract new people any way we can to

bring them in and introduce them to the facility, the sport and utilise the space itself.”

Holt said one way of getting more people into a venue is through the use of ice and installing an ice rink in an open plaza.

“The concept of ice gives you a connection to figure skating, to hockey and it brings in skaters. The idea here is to create a useable space and creation of activity. It also creates 14 revenue points.

“Stadiums are being reinvented, they have to be. They have to be multi-use,



they have to produce more revenue, they have got to be economic drivers. You need to think about using not only your interior space, but also your exterior space."

MERCEDES-BENZ ARENA

The truly multipurpose **Mercedes-Benz Arena** is Shanghai's premier live entertainment venue and the centrepiece of a mixed-use entertainment complex.

With 18,000 seats, 82 luxury suites and various clubs and meeting rooms the Mercedes-Benz Arena offers state-of-the-art technology and amenities for staging the biggest and most popular events in China.

The entertainment complex includes a 700 seat theatre, public ice skating rink, a six screen cinema, and 20,000m² of retail space featuring a variety of shops and restaurants.

Fox Wu, Event Technical Supervisor at the Mercedes-Benz Arena, told PS&AM that the venue attracts a wide variety of different acts.

He said: *"The arena was built from 2007 and opened in 2010 for the World Expo for the opening and closing ceremonies and a lot of concerts were held here. There were two shows held every day for the six months of the Expo in what was then the Shanghai World Expo Cultural Center.*

"It is designed to hold 18,000 people. Mercedes-Benz became the founding partner following the Expo in 2010.

"Now we hold concerts, NBA China games, NHL China games, the Victoria's Secret fashion show, WWE and UFC. We also host family shows like Cirque du Soleil and Walking with Dinosaurs. It really is a multipurpose arena."

Wu said the arena could be transformed with **Star Events'** new venue reduction system to make it more suitable for various different events.

"The system is designed to cover the whole of the upper bowl when a promoter does not want to use all the available seating. A giant curtain screens off the whole of the upper bowl and we're left with around 13,000 seats.

"In the upper bowl we have 28 sections and the reduction system uses 28 curtains to cover the whole of the upper bowl. This

new system is much lighter than our old one. We disassembled the old one last year and installed the new Star Events system at the beginning of this year. It took us about four months to install because we had to work around the show event schedule.

"It should be able to be done in two or three hours. For stage concerts at the east end of the arena we use 12 curtains to cover the back of the stage."

QUICK CHANGE

Wu said the changeover from one event to another at the venue, which hosts around 100 events a year, could be done quickly.

"Last year the changeover from ice rink to concert mode took us five hours. We removed all the dashboards and ice and we were ready to set up for the concert the next morning.

"Because the calendar is very full, the changeover between all the different events can be challenging. The shows all have different production companies which need to bring in their equipment and the rigging has to be changed.

"The schedule is very tight and this presents the biggest challenge. It is more than likely that we will have two different shows a week."

Wu stressed the importance of being able to host a wide variety of different events.

"It is very important to be a multipurpose venue. Other venues in China aren't like this. This is operated by AEG with OPG who have the resources to bring in big events. It is important to have a mix of events as well as concerts. We need to have family shows, fashion shows and sports shows which can attract different types of audiences. It helps to bring in revenues from different types of visitors."

Mercedes-Benz Arena has 82 club suites as well as a large VIP lounge.

The arena also has its own ice making system for **NHL** games and for **Stars on Ice**.

The Dota-2 e-Sports international tournament will also be hosted at the arena for the first time in China next year.

"We need to update a lot of equipment because much of it has been installed >>>



“for around eight years now. We need to upgrade it and make sure it works properly,” Wu added.

MERCEDES-BENZ STADIUM

Sticking with the Mercedes-Benz name, a by-word for quality, the new stadium in Atlanta is another venue that has been designed to host a range of events including **Atlanta Falcons’ NFL** matches, soccer and concerts.

Mercedes-Benz Stadium is designed with functionality and flexibility in mind. The seating capacity can be expanded to up to 75,000 to play host to a potential future **Super Bowl** or **FIFA World Cup**, or to up to 83,000 for other events such as the **NCAA Final Four**.

Alternatively, by utilising an innovative mechanised curtaining system for the stadium’s mid and upper bowls, capacity for events like family shows, concerts and **Atlanta United (MLS)** games can be reduced to optimise the appropriate event setting.

Scott Jenkins, General Manager of Mercedes-Benz Stadium, told *PS&AM*: “It’s a magnificent building. Architecturally it’s striking. It’s a beautiful stadium. It’s a great fan experience. Atlanta United fans and our Falcons fans love the building and we’ve had lots of big college football games, great concerts and the college football championship game we hosted last January.

“Coming into the second year of the building we’ve got the Super Bowl to look forward to and after that the men’s Final Four basketball championships. So there’s a great line up of events.

“When you walk into the building you can’t help but be wowed, whether it’s by the artwork you see, the giant Falcon sculpture as you enter, or the giant halo board that’s the world’s largest scoreboard at 58ft high and 1,100ft around.”

The stadium also boasts a one-of-a-kind eight petal retractable roof which can open or close in around eight minutes.

COMMUNITY HUB

Jenkins said Mercedes-Benz Stadium is at the heart of the community in downtown Atlanta.

“It’s very much a community hub if you will. The building doesn’t sleep as we’ve got Molly B’s restaurant, the store and private events or major events always going on.

“And one thing that’s really exciting, if you look just to the north where the Georgia Dome sat we’re just about to finish the construction of what we call the Home Depot backyard. It’s going to be a community resource, a park that we can activate for kids’ events, community events and then use it to tailgate on major event days. So that’s meant to be programmed pretty much every day and be an asset to the community.”

Technology and the fan experience are at the very heart of the stadium, Jenins said.

“We’ve got great technology in here. We have some 4,000 miles of optical fibre pulled in the building and over 1,700 wireless access points. You’ll get great Wi-Fi anywhere in the building.

“We’ve also got a great art programme. As well as the world’s largest metal bird sculpture we’ve got the stunning giant soccer ball in the Home Depot backyard and about 100 pieces of art throughout the building. As you walk around there are really cool things to see.

“We’re really focused on the fan experience and every step of the way we really put ourselves in the fans’ shoes to say how do we make this the best stadium and best entertainment experience possible.

“It’s simple things like the width of the seats.

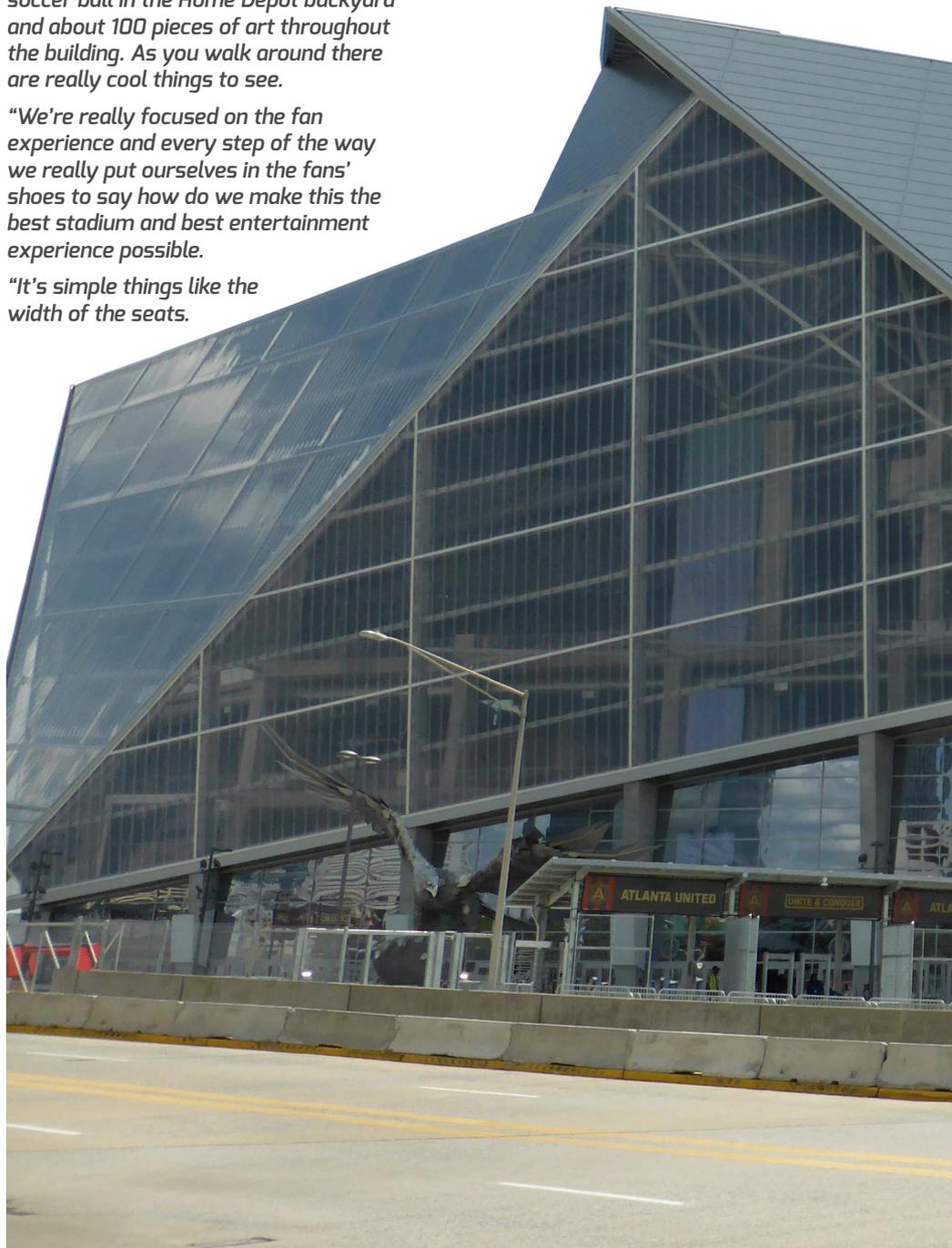
On average they’re about two inches wider than average. It takes a huge investment to do that but it’s the right thing to do. We increased the amount of restrooms and we have about 65% more points of sale for food and beverage than at the Georgia Dome.”

STATE FARM ARENA

Down the road in Atlanta, the newly named **State Farm Arena** (formerly **Phillips Arena**), has also embraced the multipurpose concept.

HB Brantley, Managing Sports Principal, **Russell S.P.A.C.E Venues Group** said the **Atlanta Hawks State Farm Arena** renovation project was aimed at enhancing the fan experience.

He said: “We have looked at diversifying the experience by creating a 360 degree experience, based on community input and on what we thought fans and the city and users would want.



“We have price points for making sure that everybody could utilise all levels of the facility. To get people away from their TV screens, we have created a destination that will draw people to the arena, whether it be for a basketball game, a concert or whatever.”

Brett Stefansson, Executive Vice President and General Manager, State Farm Arena, explained how the venue is being transformed to make it into a truly multifunctional destination.

He said: *“The arena opened back in 1999 and the architect at the time thought it was a great idea to build what was essentially a giant wall of suites on one side of the building with premium seats down below that. It was innovative at the time but doesn’t really fit with what today’s fans want from their experience.”*

Steffansson said the ownership team looked into knocking the venue down and building a new one, but that it made a lot more financial sense to go through a three-phase renovation project.

He added: *“Phase One was a complete shut-down last summer and we did about \$20 million worth of work. Phase Two was during the past season when we did another \$20 million worth of work. We’re currently in Phase 3, which is \$100 million worth of work and we’re currently shut down for the entire summer. We shut down in April and the building will come back over to us on October 16.”*

“The overall project is a \$200 million renovation involving gutting the entire building and building it back up. It’s a focus on technology, food & beverage and re-imagining the fan experience.”

He said the new venue would boast 2,500 premium seats divided into seven different offerings, including a Swag Shop where fans could get a shave, wash and groom while watching an NBA game and Zac Brown’s Social Club.

He added: *“We’ve with Top Golf, so be the first NBA facility to*

also partnered we’ll

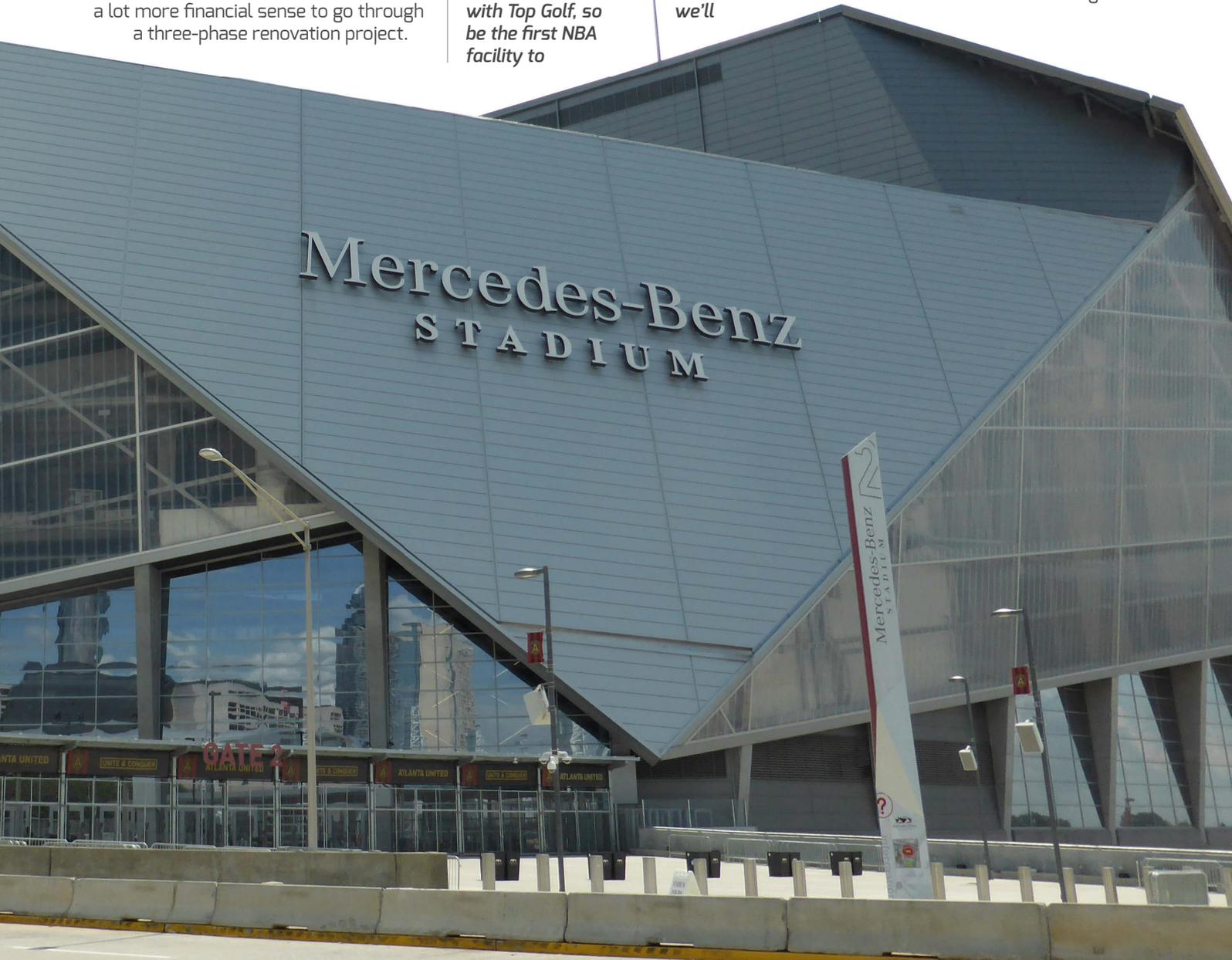
offer a Top Golf simulator experience to fans in a couple of the party suites.”

The redeveloped arena will include new amenities on every level of the building, 360-degree connected concourses at all levels, improved sightlines and state-of-the-art video throughout the building.

Originally constructed as a multi-purpose facility and opened in 1999, State Farm Arena annually ranks among the most-programmed venues in the country, after **Madison Square Garden** and **Barclays Center** in New York City and **Staples Center** in Los Angeles.

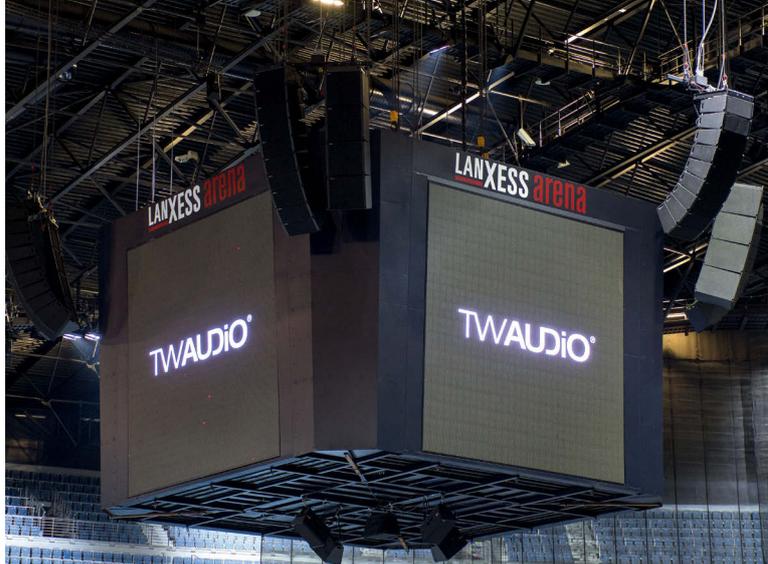
State Farm Arena hosts approximately 170 events per year, including most of the biggest musical acts, family shows including circus and ice shows, and

Atlanta Hawks home games. ■



A DAY WITH TW AUDIO

TW AUDIO attracted a global guest-list to the Lanxess Arena in Cologne, Germany to showcase its products.



Cologne's renowned **Lanxess Arena** hosted a global gathering of pro audio luminaries on August 28th, when **TW AUDIO** took over the prestigious venue for A Day with VERA20.

Offering a mixture of training seminars and full demonstrations, the event drew more than 60 distributors, dealers and VIP customers from all over the world.

Famous as the home of the **Kölner Haie** ice hockey team, the 18,500 capacity Lanxess Arena is the largest ice hockey arena outside of the United States.

The main star of the day was TW AUDIO's powerful VERA20 double 10-inch mid-sized line array.

The day's programme was divided into five separate sessions, with attendees' personalised badges detailing an individualised agenda for the small break-out groups.

"We felt that our visitors would benefit most from a series of educational seminars covering the use of simulation, measurement and system management software, and also a close up look at our rigging systems – all related to our new VERA20 line array," explained TW AUDIO's Managing Director, Bernhard Wüstner.

"In this way we believe they will gain the best understanding of how to specify VERA20, predict its performance,

optimise its setup, and safely rig a system for any project."

The five sessions, conducted throughout the day in German and English, included SMAART training with Thomas Vestergaard and Michael Häck; EASE Focus training with Tobias Goldmann; an Armonia session with Michael Gwozdz and Wasgan Wolski, and an EasyRig™ rigging seminar with Stefan Ullrich and Yannick Faas.

Maksym Zhabotynskyi of Ukrainian TW AUDIO partner **Technology Group** found the Arena tour to be particularly revealing.

GLOBAL APPEAL

TW AUDIO's Spanish distributor, Ansel Calleja of Soinoa Pro, praised the organisation of the training sessions.

"We've always had magnificent support from TW AUDIO, and these seminars were sufficiently in-depth to get people's attention. The rigging guys showed how efficient VERA20 is with a very clear and confident presentation," he enthused.

Travelling to the Lanxess Arena from New Delhi was TW AUDIO India's Krishna Singh. *"I liked that every workshop was connected by the same product, the VERA20 line array,"* he said. *"We learned about it from the start to the*

end. It was also a useful gateway into the other products, and as our market is fast moving we're going for smaller form factors and more efficiency, which is exactly what TW AUDIO is delivering."

Kimmo Merikivi from Finland's **Seastone** was among many to realise the benefits of the technical training. *"In my opinion the rigging is one of the best features of TW AUDIO systems,"* he observed. *"Most of it can be done by only one person. As for the sound demo, this is the first time I've heard the VERA20 in a big space and when you consider that the amplifier choices include Powersoft or Lab.gruppen, this system represents good value for money. TW AUDIO have already achieved a lot since the company was founded and I think the best days are yet to come."*

A special treat for everybody came in the form of a special access-all-areas tour, giving the attendees a bird's eye view from the 36 meter high scoreboard catwalk of the Arena to the permanently installed VERA36 system.

Bernhard Wüstner commented at the end of the day: *"With only eight weeks to organise everything for this event, it was a challenge, but it shows the commitment of our distributors, customers and rental partners that they attended in such impressive numbers."* ■

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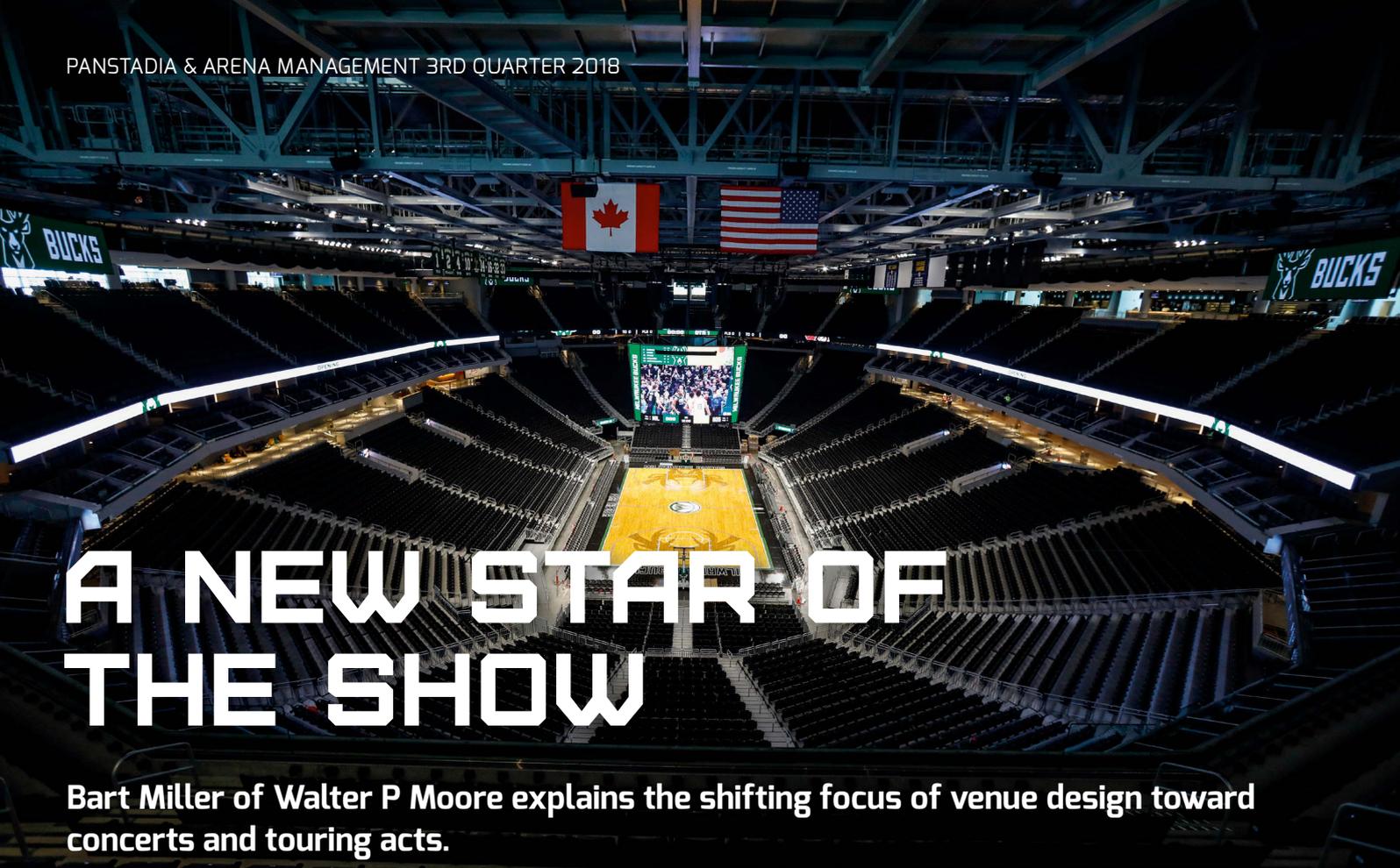
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A NEW STAR OF THE SHOW

Bart Miller of Walter P Moore explains the shifting focus of venue design toward concerts and touring acts.

Professional sports facilities, more than ever, are being influenced by developers and entertainment agencies and conceived as multi-purpose venues anchoring multi-use developments and entertainment districts.

To be financially viable, every new facility must be purposefully designed to attract and accommodate top performers and massive crowds, not just on game days, but throughout the year and across a wide range of events and attractions.

Fiserv Forum, the new 17,500-seat home of the **National Basketball Association's Milwaukee Bucks** and **Marquette University's Golden Eagles**, is the latest multi-purpose facility destined to set a new standard for versatility in the industry.

Having debuted in August 2018, Fiserv Forum is a state-of-the-art concert and entertainment venue as well as a basketball arena.

While the facility's most recognisable feature is an iconic, undulating roof structure that transitions seamlessly into a dynamic, curving north façade, interior innovations are what really set it apart.

"We are seeing a clear trend toward increased attention to concerts and touring acts," says Brad Clark, Lead Designer for **Populous**, architect for the arena.

"From the beginning, the Bucks' vision for this facility was that it had to be more than just a basketball facility. This is a year-round community asset that has to work for virtually every event type, concerts in particular."

A truly multi-purpose venue must respond not only to a variety of event demands, but also to emerging trends.

The fact that today's gameday experience is changing is well documented. Designers of sports facilities are constantly being challenged to innovate as quickly as the needs of today's sports fans evolve.

What may be less apparent is that today's entertainment experience is changing as well, which is impacting both the technology and infrastructure required in each facility.

FOCUS ON PERFORMERS

Fiserv Forum was designed with a specific focus on the experience of the performers, convenience and access for stage crews, and on proportioning the seating bowl to maximise and enhance end-stage performance viewing.

Designers of long-span roofs can no longer simply plan for a one-size-fits-all, distributed show rigging allowance; instead, they must consider a myriad of theatrical lighting and sound requirements, current and future trends in rigging methods and preferences,

and the importance of rapid transitions between successive events.

Concerts are immersive and dynamic and are asking more of arena roof structures with each new tour by applying heavier and more numerous loads, often that move, distributed over much larger areas than ever before.

High-performing, high-capacity rigging grids that provide additional rigging locations and better access, support a wide variety of loading configurations, and enable a show to be loaded and unloaded quickly are critical to ensuring that a venue can transition smoothly from one event to the next.

Fiserv Forum boasts an expansive show rigging grid covering nearly 45,000ft² and providing a load capacity of over 450,000 lbs.

The roof is also configured to allow the immense, 82,000-lb centre scoreboard to be recessed completely into the depth of the structure during concerts to eliminate sightline obstructions and maximise the viewing experience.

"With the long-span experts at Walter P Moore, we designed a rigging grid that is more robust in capacity and coverage than any arena we have designed," Clark explains. *"Rigging, sports lighting, bowl mechanical — it's a small city up there. We only get one chance to get it right and we nailed it here." ■*

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PREMIER PITCHES

PS&AM quizzed a group of experts about the latest developments in playing surface management and technologies. The panel consists of Kevin Hansen, Sports Fields and Grounds Manager, NRG Stadium and Houston Texans Training Facility; Tim Van Loo, CSFM, Manager of Athletics Turf and Grounds, Iowa State University; George Mullan, CEO SIS Pitches; Rob Moors, Export Manager at Schmitz Foam Products.

How long do you expect an artificial field or a hybrid surface to last compared to how long until a renovation needs to be done on a natural grass field?



We replaced our artificial indoor football field after 10 years. I would expect that under normal conditions an artificial grass will last 6-10 years. My natural grass stadium field was installed in 1996 and was renovated in 2008. So, the first field here lasted 12 years. I currently have a 10-year old surface that we have no plans to replace anytime soon. In all honesty, we are trying to manage it in a way where it never needs to be renovated.



It all depends on the amount of traffic the field gets and what kind of environment it is in. Usually you see synthetic fields lasting 6-10 years, whereas natural grass fields can last longer or shorter than that. There are far too many factors that go into both field systems to get an exact renovation or replacement time period.



A synthetic turf field top layer will last on average about eight years and even longer if the system contains a shock pad. A sub-base with a shock pad will last over 25 years.

A natural turf field has to be repaired and renovated every few years. The average for a total renewal of a natural field would be 12 years.



In general, an artificial pitch should last on average eight years and a hybrid pitch would have a similar life span. A natural grass pitch will struggle to last eight years. However, the key determinant is the hours of play on the surface and the maintenance. If a hybrid pitch is used intensively in the winter, then because it is still 95% grass it will suffer damage. An artificial pitch provides the most hours of usage.



SISGrass hybrid pitch at Luzhniki Stadium in Russia



Kevin Hansen



Tim Van Loo



George Mullan



Rob Moors

Do you think there will be a shift in professional sports more towards one kind of these surfaces in the future?



We are already seeing a shift in professional soccer towards natural grass. Most international soccer teams only play on natural grass. Whether that shift will move into the NFL, I can't say at the moment. I think there will always be a place for both field systems.



My own view is that hybrid pitches will continue to grow and that artificial pitches will be used for training facilities

or in schools which do not have many pitches. The three surfaces all serve a market need and it is understanding the customer needs that allows one to recommend a surface. However, in stadiums I see hybrid pitches dominating and in particular against artificial pitches.



Yes, we see a clear shift towards more synthetic turf fields. This is for most sports and we see this shift happening worldwide, but at different rates. First the developed countries, then the developing countries - about 15% more synthetic fields every year (source: AMI Report Artificial Grass The Global Market 2018).



I truly believe that there will be a shift in professional sports back towards natural. Many players prefer it and at that level there is usually a professional groundsman to manage it properly.

What are the real costs associated with all three types of fields?



The exact cost of installing and maintenance is very different in different parts of the world because of big differences in labour costs and local materials. In general, based on my knowledge and experience, you could say that a natural field install in Europe costs about €200,000. Hybrid would be about €400,000 and synthetic about €300,000. Playing hours per year for a natural grass field are about 500 hours. For Hybrid this is about 800 hours and synthetic 1,600 hours. The average maintenance cost per year in Western Europe for natural turf is about €15,000, for hybrid €10,000 and synthetic turf about €5,000. Again, these costs are averages and depending on the location.



Artificial is fairly cut and dry. \$1 million (rough estimate) for a new field and half that cost for a replacement. There are also labour costs associated with the care of these fields. Depending on the situation I would estimate \$5,000-20,000/year. I can't comment on a hybrid system since I have never worked with one. As for a natural grass (sand based) install I am guessing \$500,000-750,000 thousand initially. I spend about \$30,000-35,000 a year to maintain our stadium. When they renovated my stadium in 2008 it was a \$75,000 job. At the end of the day, for my situation, natural grass is much cheaper!



The costs will vary depending on the requirements of the field, how many hours of play, climate and maintenance. In general, a natural grass pitch will be a lower cost than a hybrid or artificial pitch. However, both the hybrid and artificial pitch will deliver more hours of play than a natural grass pitch. Before deciding on which surface, it is >>>

« important to understand the requirements. There is no point building a natural grass pitch if you want to play 1,000 hours a year, if there is no budget for maintenance then all the surfaces will fail.

Hybrid pitches require similar maintenance to natural grass pitches but require a more intensive summer renovation and this needs to be accounted for in the maintenance costs each year. An artificial pitch is not maintenance free despite the claims of some companies, maintenance is essential.



With artificial turf it is the initial cost of buying and installing the field. For natural grass the cost comes with the continued maintenance through the year.

How does climate change influence the choice for natural, hybrid or synthetic turf fields?



Climate will affect the choice of grass for natural or hybrid fields between warm season grasses and cool season grasses, natural grass and hybrid systems will be more susceptible to climate than artificial turf. However, artificial is not immune to the effects of climate, in particular snow.



The weather is always a challenge, no matter if the climate is changing or not. Extreme weather can always cause problems. That said, with increased heat in most parts of the world, the cooling properties of natural grass will help the climate!



Climate change (heatwaves, drought, floods) has an important impact. There is more demand for synthetic fields because of floods, water shortage, heatwaves (like recently in Europe). Synthetic turf systems with a drain and shock pad can deal with most of these issues much better than natural grass or hybrid fields. Also, the increasing cost of water usage is becoming a major factor in the choice for more synthetic grass fields.



I'm not sure that climate change has influenced this market. It may in the future but I haven't encountered this yet. Grass can be grown in almost any climate.

Why do most athletes prefer natural grass?



Some athletes prefer natural grass because they like the way it feels, or in soccer they like the way the ball reacts off

the natural grass over synthetic. There is also the ongoing debate of synthetic fields causing more injuries. How accurate this is has yet to be proven but many athletes feel this way.



In field hockey and American football, most athletes prefer synthetic turf, because it is more consistent, especially in combination with a shock pad. In European football the professional players and the older amateur players prefer natural grass because they grew up playing on natural. It is what they know best and are used to. But in the USA where soccer and football is played from a young age on synthetic, they prefer synthetic grass fields, even when they keep playing as adults.



In most cases it's softer and more forgiving. Athletes are far less likely to have a major lower leg injury due to the transfer of energy that can happen within a natural grass system.



A well maintained natural grass pitch with good levels is an excellent playing surface. However, these surfaces are generally only found at the top end of the sport where the maintenance is well funded and experienced ground staff are available. This is not the case in many grass fields, hence artificial is used. »



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*SiSGrass hybrid pitch at
Lambeau Field, USA*

« **How do you maintain a safe playing surface with events such as concerts, dirt events, and graduations?**



It can be tough. Scheduling and proper work beforehand can save you after the event. Some events force a field replacement, but many if scheduled accordingly can give the field manager time to repair any damage caused by the outside event.



Maintaining a safe playing surface is our number one job as a sports turf manager. With events like these it is essential to have a good flooring system and a plan on how to get your field back in playing condition after the flooring is removed. For synthetic fields it consists of aggressive grooming to help loosen up the rubber that becomes compacted from the weight of the event. The Clegg hammer and an infill depth gauge are two instruments that I use to ensure that my field will be safe for a game.



Firstly, there needs to be an understanding from both the promoter and the owner of the field what the field can withstand. In our experience clear communication and exact planning is required to facilitate events on fields. The pitch should be covered for the minimum amount of time possible and this should be written into the contract.



You will have to cover the playing surface in order to protect the grass. There are several covering systems for this. Of course, the damage to the field will be much less when it is synthetic than on a natural grass field.

What are the challenges of the painting and removal process on natural, hybrid and artificial surface multi-use stadiums?



If you use the correct materials and have an experienced company or ground staff apply the materials there are not many issues. Use the wrong materials or have an

inexperienced company carry out the works, then there are serious consequences.



The biggest challenge we face on our synthetic field is the tight turnovers we have from one event to another. In many cases we are washing out paint right after a game so we can come back in the morning to paint for another game. This takes planning and lots of hard work to make sure everything goes according to plan.



It used to be a challenge, especially to paint and remove on synthetic grass pitches, but with the new paints on the market this is now possible for the three types of turf systems.

Meaning that this is not of influence for having a preference for one or the other anymore.



Removal of paint is becoming easier on an artificial surface. It's still very labour intensive, »



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« but it is becoming better. On hybrid and natural, in most cases you just mow the paint off within a week or two. A quick changeover would likely require logos that are similar in size so they can just paint over the first logo.

Can a shock pad for synthetic turf systems also be used in a hybrid or natural grass system, and what would then be its function?



Yes, it can although it would be a very new development. There have been tests done by important institutes with shock pads under hybrid and natural grass systems. The root zone attachment in the pad will be much stronger, the water flow can be controlled and regulated in the drain and shock pad, and there is a more consistent shock absorption. For several years now there have been systems with natural grass on shock pads for high end natural grass playgrounds (to reach a higher critical fall height). This technology is now being tested for sports fields, and we

expect to see this implemented in a few years.



I don't believe so, but why would you need one? Our natural grass systems are typically half the hardness of an artificial field when we test it with a Clegg hammer.



I have not seen this carried out in our markets and I would question what benefit could be achieved against the costs. A shock pad would create another layer within the natural grass profile which I suspect would hinder the agronomic performance of the field.



I don't see an advantage of using a shock pad with natural grass and I don't think it is even possible. Most natural grass fields are precisely built to move moisture through the profile. Implementing some sort of shock pad would inhibit the movement of water through the profile. In most cases shock pads are used under synthetic fields to

help soften it. Natural grass fields, if managed correctly, are already soft.

Has the use of prefab shock pads and e-layers influenced the ratio of natural versus synthetic turf systems?



Yes, it has. We see a clear increase of fields with a shock pad (source: AMI Report Artificial Grass The Global Market 2018). It makes the fields safer, drain better, less maintenance needed, etc. The use of shock pads is clearly improving the performance of synthetic fields, helping to grow the market share of synthetic versus natural.



E-layers and shock pads prolong the life of the artificial carpets, so I would suspect they have encouraged the use of artificial surfaces globally.



No, it hasn't influenced the ratio. It is just a way to make synthetic fields softer. ■

BUILDING SPORTS SURFACES

SMG has the capability to lay and renovate elastic sports surfaces for all types of venues.

SMG manufactures customised construction machines for the professional installation of jointless, permanent elastic sports surfaces.

The company's mixing, paving as well as structural spraying machines are specifically designed for the implementation of In-situ applications in indoor and outdoor areas. Projects ranging from standardised children's playgrounds up to an IAAF-certified athletic stadium are possible.

All conventional granulates, liquid components and binders used in the installation of synthetic sports surfaces can be processed by SMG machines.

They install elastic layers made from rubber granulate and stones as well as basic surface material made of rubber or EPDM granulates, mixed with PU binder.

EPDM granulates are processed to single-layer or multi-layer, flat or structured synthetic sports surfaces.

Structural spray coatings, or so-called sandwich systems, can be realised.

The paving machines are manufactured with a standard working width from 1.1 up to 3.5 metres.

SMG mixers being adjusted to the pavers are available with a mixing performance from 50 kg up to nearly 400 kg per minute.

Thus, this professional mixing equipment is suitable for the precise mixing of multi-component liquid systems.

SMG offers spraying machines and granulate blowers for structured surfaces as well as machines for grinding and milling of worn out surfaces for renovation purposes.

RENOVATION PROJECTS

The renovation of sports surfaces through abrasion of the surface layer and subsequent recoating is becoming ever more important as an alternative to a complete new installation.

This is because it cuts down the cost to a great extent and saves a considerable amount of materials.

The original thickness and the technical characteristics of the rubber will remain the same. The RauMatic R400 is a milling machine for milling of the surface coating from elastic PU sports surfaces.

The working width is approx. 400 mm wide and the surface is removed with a speed of approx. 2,600 rpm.

The thickness of material to be abraded is regulated

automatically in the millimetre range through a tactile unit for an evenly flat installation.

Thickness from 1 to 10 mm can be removed in one work operation. Depending on the quality of the substructure, the new surface layer can be applied as required.

The driving seat with clearly arranged control elements allows an easy handling of the machine.

The drive for the machine is provided by an extra powerful and compact water-cooled 4-cylinder diesel engine, producing 100 kW (136 HP). The steering and the feed drive are provided using hydraulics.

SMG offers the biggest product range of unique modern machinery for the installation of synthetic surfaces in the sports industry worldwide for more than 40 years.

As a pioneer in the sector of synthetic sports grounds and artificial turf, SMG has a proven competence and long-term experience around the world and develops and defines the standards.

Customers are not only provided with valuable information for handling, but also with professional guidance in deciding on the right product to do the best possible job. Ask us – we know what is possible.

Since the 1980s, SMG has also been presenting innovations for the maintenance of artificial turf or carpets with granule infilling. Also in 2018, a ground-breaking development will be presented in this sector again. ■



STADIA & ARENA JAPAN GOES FROM STRENGTH TO STRENGTH

The Stadia & Arena Japan 2018/Sports Business Japan 2018 conference and exhibition was a huge success, attracting more than 4,000 visitors over two days.



Delegates packed into this year's **Stadia & Arena Japan** event in Osaka and there was standing room only for the opening keynote session.

Gen Kawai, director at the **Japan Sports Agency (JSA)** told attendees that Japan was looking to build 20 stadia and arenas by 2025.

He said the JSA was looking to help make sport a growth industry in Japan. The industry is worth 5.5 trillion yen (£37 billion) today but the JSA hopes to see this rise to 15 trillion yen by 2025.

The country is due to host the **Rugby World Cup** in 2019 and the **Tokyo Olympic and Paralympic Games** in 2020.

Saburo Kawabuchi, president of the **Japan Top Leagues Alliance**, called on authorities to build bigger and better stadia and arenas around the country.

A plethora of high-profile speakers gave presentations throughout the duration of the two-day event.

Three key speakers – Mick Wright, executive director for event delivery, Rugby World Cup 2019 Organising

Committee; Ross Aitken, Rugby World Cup 2019 venues and cities director, World Rugby; and Takano Tsutomu, director of venue management, JR 2019 – presented the latest on the 12 venues across Japan and the implications for the host cities as they prepare for the world's third largest sports event (after the Summer Olympics and the Football World Cup).

Shaun Dawson, chief executive Lee Valley Regional Park Authority gave a presentation on the legacy of Lee Valley watersports centre from the **London 2012 Olympics**.

Cox Architecture, KPMG and **Mott MacDonald** also hosted a masterclass which attracted more than 50 high-level participants.

Meanwhile, panellists from across the globe discussed topics ranging from playing surfaces to venue design, operation and management and fan engagement.

Event director Neil Levett said: *"It was fantastic to see such a huge crowd at the conference and exhibition."*

"The number and calibre of attendees continues to grow from our first event in Japan in 2016. The B-League is holding a club meeting here, and with a delegation from RWC 2019 and the J-League stadia committee here as well, it demonstrates how the conference and exhibition has grown to become the must-attend event for the sports business in Japan."

The day before the main event more than 150 delegates were taken on tours of the **Ookini Basketball Arena**, Maishima, and the **Panasonic Stadium**, Suita, home of the **J-League's Gamba Osaka**.

Panasonic Stadium holds 40,000 spectators and is used as a showcase for the latest Panasonic fan-engagement technology.

Fans are just metres from the pitch at the stadium which has a roof covering all the stands and an innovative ventilation system to help keep the pitch in good condition.

Watch this space for details of next year's Stadia & Arena Events and Sports Business Japan events. ■



JAPAN
30-31st Aug 2018



Saburo Kawabuchi
President
JAPAN TOP LEAGUES ALLIANCE



Motoi Oyama
Co-President
Japan Society of Sports Industry



Gen Kawai
Director
Japan Sports Agency



Mick Wright
Executive Director
Rugby World Cup 2019 Organising Committee



Ross Atkin
Venues and Cities Director
Rugby World Cup Limited



Shaun Dawson
Chief Executive
Lee Valley Regional Park Authority

COX, KPMG AND MOTT MACDONALD MASTERCLASS



2 VENUE TOURS



EXHIBITION



RECEPTION



SPORTS VENUES GO THEIR OWN WAY FOR CONTENT CREATION

The advent of increasingly affordable production solutions mean that more and more sports venues and clubs are looking to create their own high-level content. SVG Europe Contributing Editor David Davies takes a look at the trend and makes a few recommendations for venues looking to invest in their own production facilities.

For broadcast markets ranging from news to music, the introduction of more affordable broadcast production solutions has had a transformative effect on content creation.

As well as the traditional mainstream broadcast companies, it has allowed a new generation of streaming services and even semi- or non-professional users to shoot, edit and publish a diverse array of content.

But it is arguably upon sports venues and clubs that this latest generation of technology has had the most concentrated impact.

Thanks to the huge audiences that the main disciplines can attract, sports has historically been an early adopter of new broadcast technologies.

But it also helps that sports fans are among the keenest consumers of content, always seeking out analysis, interviews and other material that can augment – and provide elaboration upon – the action taking place on the pitch. Hence there is a very obvious imperative for clubs and venues to play a role in

satisfying this appetite, and to start producing their own content.

Of course, the extent to which they are able to do so will depend upon the rights agreements they have with broadcasters.

In some cases – particularly the higher leagues – these may completely preclude them from covering on-pitch action.

Instead, they will be obliged to think creatively about material that can enhance the pre- and post-match experience, such as player interviews and mini-documentaries.

For other clubs, it may be possible to combine limited live action with other forms of content.

A NEW ERA

Enabled by streaming, 4G and now 5G services – which, for instance, give sports lovers the opportunity to soak up pre-match material as they travel to the game – this new era of content has obliged broadcast manufacturers

to bring a fresh generation of more cost-conscious production solutions to market.

Perhaps sensing early on which way the wind was blowing thanks to developments in the always-vibrant US sports college business, vendors have not been slow to respond, with a sustained wave of more entry level-oriented production switchers, control panels, combined production systems and cameras launching over the last couple of years.

NewTek, **Blackmagic Design** and **Sony Professional** have been among the trailblazers in this regard, but in truth it's now easier to identify a manufacturer who hasn't at least sought to establish »



◀ some form of presence in this area of the market.

The requirements of a given club or venue are likely to vary dramatically – for lower league clubs who are producing relatively straightforward interview material to screen on match days, a couple of cameras and a software-only production system may be perfectly sufficient.

For those with more generous budgets and/or greater ambitions, a full-scale production gallery with high-end cameras and separate audio production area could be in order.

But whatever the scope of the project, there are some universal considerations that should be addressed before going ahead...

1) **Do you have sufficient capacity for production today – and tomorrow?** The system that you have earmarked may be adequate for standard HD production

today – but what about future output in 4K, HDR, etc? Expectations of production quality are intensifying, and it could be that HD-only output doesn't cut it in a few years' time.

2) **Can you support low latency live streaming?** Depending on whether or not you are able to live-stream on-pitch action, then you may have an obligation to support minimal latency live streaming. Remember, that even a few seconds of buffering can be enough to prompt sports fans to look elsewhere.

3) **Have you thought about storage and asset management?** All of this content you are creating will need to be stored securely and then managed in such a way that assets are easily searched and located in the future – not least because one of the most exciting opportunities in this new era is for clubs and venues to build archives that can be made available on a subscription basis.

4) **Are the solutions you have chosen familiar to all?** One of the issues that can occur with the specification of, in particular, less high-end production solutions is that they may not be so familiar to visiting freelancers. Therefore, it makes sense to canvas opinion from a wide range of potential system users.

5) **Have you scheduled and budgeted adequately for training?** Even short courses of a day or two can make all the difference in helping staff to get the most out of production solutions, opening their eyes to features that they may not otherwise have considered.

There are certainly plenty of pitfalls to be negotiated when acquiring in-house production infrastructures, but the potential rewards of even smaller-scale investments mean that it's difficult to envisage many venues and clubs not having at least a basic production capacity in a few years' time. ■

'NEW ERA' OF MEDIA PRODUCTION TO BE REFLECTED AT NEXT TWO SVG EUROPE SUMMITS:

Due to technologies such as IP, 4K, HDR and remote production, the broadcast production landscape is arguably evolving more rapidly than at any time in recent memory. This remarkable pace of change – and the impact it is having on the entire media ecosystem – will be examined in-depth at the next two SVG Europe-organised technology summits.

On 31 October SVG Europe will join forces with **Dolby** once more for the third annual Next Generation Audio (NGA) summit, taking place at Dolby's premises in Soho Square, London. Object-based and immersive audio technologies are quite literally bringing another dimension to broadcast audio production, paving the way to a much more all-encompassing at-home experience of live events. After two summits that focused on the theory of NGA, this latest event will examine in-depth a number of recent spots-based immersive audio projects.



Then at FutureSport – which will take place at Old Trafford, Manchester, on 29 November – a series of presentations and panel sessions will explore the key technology innovations and major work challenges that will shape the future of sports production across Europe in 2019. Specific

topics will include the challenges involved in introducing HDR, the ongoing move towards IP-based workflows for sports production, and the phenomenal potential of eSports.

For information on how to register for these events, and details of other forthcoming SVG Europe summits, please visit www.svg-europe.org.

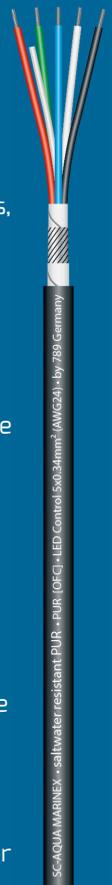
Using the right kind of cabling solution is a critical component of any modern day broadcasting package at a sports venue and one company leading this field is **SOMMER CABLE** based in Straubenhardt/Germany.

Founded in 1999, it is now one of the leading suppliers of professional high-quality cable and connection technology with a focus on the audio, video, broadcast, studio and media technology sectors.

The company recently introduced the AQUA MARINEX cable which has a wide range of application possibilities for sports venues and major sporting events where transversely watertight cables offer the best solution such as transversely watertight LED cables – as they are commonly used with football transmissions, e. g. for cascading ad banners – and the corresponding connectors may lie continuously in puddles.

The same is true of winter events where the environment is rough, with condensed and melt water occurring. These cables are also ideal for an installation in circuits, horse or dog racetracks (the cables are easy to clean) or in a sandy and dusty environment with a risk of moisture condensation due to high temperature differences. The cables were originally designed for permanent underwater installation and are therefore built to withstand high water pressure situations.

Owing to their UV resistance and transverse watertightness, these cables are also of interest to the catering industry, which would prefer permanent installations for outdoor use as they are very often required in Germany, e. g. at the carnival, for Christmas markets or sport events.



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Installation & Conference



Broadcast Solutions



Professional Studio



Event Technology



SOMMER CABLE based in Straubenhardt/Germany was founded in 1999 and is now one of the leading suppliers of professional high-quality cable and connection technology with a focus on the audio, video, broadcast, studio and media technology sectors. The product range including the in-house brands HICON, CARDINAL DVM and SYSBOXX covers cable bulkware, connectors, connection cables, individually adaptable distribution systems and electronics.

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A FOUNDATION FOR GREAT EVENTS

PS&AM caught up with Arena's Willy Irish to find out more about the company's specialist scaffolding capabilities.



Arena UK and Europe is renowned for its turnkey event services within the sport industry. These are often impressively large multi-storey hospitality structures with beautifully appointed interiors or temporary grandstands.

Not so obvious are the tens of thousands of metres of scaffolding Arena install.

Event scaffolding has evolved to become a highly specialised capability within Arena, with managing director Willy Irish overseeing often complex projects.

Irish brings 26 years of experience expanding Arena's scaffolding work around the world.

He said: *"Today's events are becoming increasingly sophisticated and we are always in discussions with organisers and broadcasters looking to push boundaries to improve their offering for their audiences."*

"We are now being asked to build structures, with more ambitious designs, in remote locations to get guests and cameras into more interesting places and closer to the action. Nowhere is this truer than when we're working on golf courses."

"There are a wide range of structures we can deliver and, as with most of life, if we've had good consultation and planning with our clients we can make sure a project is more cost effective, sustainable and delivers best results. The key thinking happens way before

the event build starts, although that does see us doing site surveys in some pretty extreme wet and winter snowy conditions, as was the case in Sweden this year!

"Our best results come when we're first on site and last off. Ideally, we visit the site and conduct a survey with event organisers and broadcasters to understand what the client wants and agree where it's possible to site different things. Later, we liaise with temporary structures and grandstand providers to understand what type of structures will be used for the event."

The advance nature of Arena's work is exemplified by the **2018 Ryder Cup**, with the company arriving on course in Paris during April to start the installation of over 12,500m² of scaffolding.

This was used for a wide range of applications including sub-structures, temporary bridges, screen supports, walkways, steps, timber walls and cladding for the late September event. Other scaffolding teams are also delivering the same quality of services on projects in Korea, Malaysia and Singapore simultaneously.

Edward Kitson, Match Director of The 2018 Ryder Cup said: *"This is only the second time the Ryder Cup has been hosted in mainland Europe, rather than the United Kingdom. It is reassuring to know that we have Arena on board to underpin the delivery of a spectacular tournament."*

Arena's team are experienced at adapting to local cultures and working regulations and working on The Ryder Cup meant adapting working hours to conform to French regulations and adapting time-lines accordingly.

Irish added: *"Our build and derig team are no strangers to working at golf courses, which continue to be open to members playing golf as they build. This means working within clearly designated areas, being ever respectful from noise and vehicle movement perspectives, while also being mindful of wayward golf shots!"*

"This August we delivered the Nordea Masters in Sweden. We were faced with the challenge of building on particularly uneven ground, on a remote course where access was limited. This first year was challenging, but a great example of how planning improved efficiency, as it meant that we could centralise the installation of event scaffolding for a wide range of uses."

"It's great when the whole event is delivered by our sister companies, but from my perspective it's all about our scaffolding. At the Ryder Cup we supply the scaffolding foundations and then they will have tents and seats on from GL, screen supports will carry giant screens from CT, our platforms will carry the host broadcaster's cameras and of course the organiser's own facilities and branding. We might be supporting the whole of the event infrastructure and branding but we're happy to be invisible." ■

STATE-OF-THE-ART IN-STADIUM COMMUNICATIONS

Game-day communications are essential to making the show a success, as Clear-Com explains.



Today's stadium operations are many and complex and need a high degree of communications to keep coordination and timing to standards that match audience, artist and viewers' high expectations. Clear-Com has the tools to manage all the moving parts needed to stage a sporting event, half time show and the adjacent supporting activities.

CONTROL ROOM

There is a tremendous amount of production activity on game night. The Control Room routes field camera video and microphone audio to the scoreboard and the many audience displays in the corridors, food zones and corporate booths.

Stats are entered as graphics and park-wide audio and announcements are made. For many such stadiums, Clear-Com provides an Eclipse-HX matrix with up to 240 ports, so all the communication and specific audio feeds can be routed to announcers, stats staff, security, ticketing, cameras, roving audio and field technicians, talent field managers, talent and even pyrotechnics (yes, the end-of-game firework technicians need cues!).

The video board and audio control rooms use rack mounted intercom panels. Field operators, announcers and talent use a variety of intercom devices.

Feeds to the TV Remote trucks in the compound also come from the control room so they can share content and communications.

FIELD STAFF

Camera positions and roving videographers need direction from the control room. Fixed positions use wired belt packs and roving cameras use wireless belt packs like FreeSpeak II, a Clear-Com digital roaming system.

Both systems use high audio performance, over-ear headsets which give staff comfortable hands-free duplex communications freeing them to follow the game or stage performance.

The remote users hear intercom chatter mixed with pre-fade announcements but are occasionally interrupted to be coordinated by the director.

IFB, Interrupted Foldback, is used extensively to provide direct in ear communication to talent. Field talent are heavy users of the production IFB system as they are cued for interviews with sports stars or coaches.

Because they need to move anywhere within the stadium, UHF IFB receivers are used for greater range and simple operation. Production intercom is distributed to IFB transmitters via LQ, Clear-Com intercom over IP interface boxes, which are placed at various positions around the stadium.



Remote scoreboard technical staff will use key panels connected to the control room. This is typically over the stadium's IT system using IP. Clear-Com provides 12, 24 and 32 key V-Series panels with native IP connectivity for placement in stadia or field side for temporary half time set-up.

ADJACENT USERS

Communications with the security manager, ticketing and facility managers can be executed with intercom apps on smartphones.

Clear-Com provides the Agent-IC app for Apple™ or Android™ phones - the app provides closed circuit secure intercom to the control room over the stadium's private Wi-Fi or cellular wireless systems.

For all the complexities of a stadium show or event, Clear-Com provides the state-of-the-art tools and expertise to make sure the show goes on. ■

SCREEN SAVIOURS

Venues are improving the fan experience and boosting revenues with high resolution displays, as Daktronics explains.

In the world of live events, venues are battling the at-home experience with the evolution of technology bringing video and data to your fingertips.

The cost of concessions are dropping in some prominent stadiums to add more appeal to visiting the stadium on game day. Lucky for these venues, the evolution of technology can also work in their favour.

LED displays offer the opportunity to engage and entertain audiences at every turn.

The emergence of narrow pixel pitches that bring pixels closer together, less than 3 millimeters between pixels, for higher resolution imagery can connect with fans at closer viewing distances.

This technology has come to concourses, club areas and restaurants throughout live event venues to keep audiences engaged and informed while away from their seats.

And it can also be an additional source of revenue as press conference backdrops where multiple advertisers can subtly rotate behind an interviewee.

Starting in the concourses, venues such as SAP Center in San Jose, California, USA, are integrating these fine pixel pitch LED displays to further brand their events and share additional advertising and emergency messaging.

The facility installed a total of 17 displays featuring 2.5-millimeter line spacing and measuring 3.5ft (1.1m) tall and ranging from 12ft (3.6m) to 66ft (20.1m) wide.

These displays are integrated into the game-day experience complimenting other LED technology throughout the building while adding more engagement to events, including hockey games for the **San Jose Sharks**, main tenants of the facility.

ON TARGET

Moving to the specialty spaces including clubs and restaurants, venues such as **Target Field** in Minneapolis, Minnesota, USA, are maximising narrow pixel pitch technology to engage audiences in those locations.

Behind the bar area in Target Field's Bat and Barrell restaurant, a unique three-display configuration of 2.5-millimeter LED screens provides fans with live video and statistics of the game while they step away from the live action.

On the opposite wall, a 4-millimeter LED display shares similar information and video for fans sitting at tables in the area.

The venue is also showing live feeds of other baseball games taking place before and after the game as people dwell in those areas to continue their entertainment experience.

The technology isn't only maximising the fan experience, it's also making an impact on revenue generation for the venue.

Inside **Mercedes-Benz Stadium** in Atlanta, Georgia, USA, a press conference backdrop is used to subtly rotate sponsors' logos.

After **Atlanta United FC** matches, coaches and players are interviewed with the 2.5-millimeter display in the background. The display measures approximately 8ft (2.4m) high by 14ft (4.2m) wide and shows the team and venues sponsors' logos prominently where television cameras catch their symbols to share to a broader audience.

The extra broadcast component of press conference backdrops is highly sought after by advertisers and boosts revenue for facilities.

Since the **NFL's Atlanta Falcons** also play at the venue, digital screens add more value by allowing sponsors to easily be switched depending on which team is playing.

As the narrow pixel pitch technology becomes more prominent in the marketplace, more and more venues are finding new applications to introduce the product to help improve their fan experience and help drive additional revenue.

The imagination of venues owners combined with realistic expectations of the technology are setting a new standard of engaging technology at live events. ■



CRYSTAL CLEAR AT KL SPORTS CITY

18 hangs of six Kara each provide coverage for the outer ring, including the first and second tiers of seating.

L-Acoustics loudspeaker systems have been installed in Kuala Lumpur's National Stadium and Axiata Arena to heighten the fan experience.

Last summer saw the completion of the first phase of the transformation of Malaysia's **Bukit Jalil National Sports Complex** into one of Asia's top sporting venues, **KL Sports City**.

This ambitious project included the installation of an **L-Acoustics** loudspeaker system into the 85,000-seater **National Stadium**, now considered the biggest stadium in Malaysia and Southeast Asia, which needed to be ready in time for the **29th SEA Games** and **9th ASEAN Para Games**.

Sennheiser Electronics Asia, L-Acoustics certified distributor for Malaysia and provider of the system, was first introduced to the KL Sports City concept in 2015. Shortly after, the company was invited to tender for the project, which had to satisfy exacting requirements for coverage and sound quality, while also adhering to strict limitations on structural weight loadings.

"Sennheiser supported system integrator A.F.S. Engineering (Malaysia) by supplying a proposal and design for the tender bid that was based on L-Acoustics products," explained David Cooper, sales manager, Asia, for L-Acoustics. *"By working closely with L Acoustics' application engineer Julien Laval during the process, they*

made sure they adhered to the weight restrictions while providing optimum SPL and intelligibility."

Using L-Acoustics Soundvision 3D acoustical simulation software, the team devised a lightweight system by using a combination of L-Acoustics Kara, Kiva II and ARCS WiFo loudspeaker cabinets for the National Stadium.

The extensive system comprises 18 hangs of six Kara each providing coverage for the outer ring, including the first and second tiers of seating.

The inner ring, comprising the third tier and uppermost bowl, are catered for with a total of 256 Kiva II, configured as 32 hangs of eight each.

Under balconies on levels one and two are serviced by 136 5XT, whilst four hangs of four Kara each cover the field of play. The entire system is driven by a total of 77 LA4X amplified controllers.

AXIATA ARENA

A separate system was installed in the **Axiata Arena**, a 13,000-seat flexible indoor space located to the rear of the National Stadium, comprising 36 Kara, 32 ARCS Focus and 22 ARCS Wide constant curvature line source cabinets, along with 12 SB18 subs to cover the upper balcony, driven by 32 LA4X amplified controllers.

Adding to the challenge, the specifications for the weight loadings were updated several times during the tender process, which meant the team had to react quickly. *"At one point, we had just a week to submit a new proposal that would satisfy the change in weight restrictions,"* explained Laval.

"Using loudspeakers such as Kiva II and ARCS WiFo that have external amplified controllers is really useful in these situations, because we can provide a lightweight, weather resistant solution that also has an optimised cable path, which provides both scalability and cost effectiveness. Consultants acknowledge the superiority of this approach for stadium applications, but cable lengths are always a concern as there can be issues with signal degradation in lengths that are over 100m, impacting the overall performance of the system.

"However, because L-Acoustics has developed proprietary prediction tools, such as Soundvision, we can ensure the position of the amplified controllers to keep cable runs as short as possible. Being able to share this methodology with consultants and Certified System Integrators really helps to reassure them that the system will do what we need it to do." ■

A FASTER WAY TO SWITCH BETWEEN GAME DAY AND EVENT DAY

Keeping your playing surface in great condition during non-sports events is possible, as Signature Systems Group explains.

With around only 38 matches played by each team per season, it's important to fill out your stadium.

But as stadiums grow in size and expense, it's best to find other ways to use it in the interim without damaging the facility itself or spending an exorbitant sum to restore it before the season.

What can you do to preserve your stadium for each match and still use it for events during the interim?

A green pitch that's safe to play on is important, so be sure to protect it with a rapid deployment protection system when using your facility for other events to keep the pitch pristine and minimise recovery time before your next match.

Portable pitch protection systems are fast to deploy and remove by design. In many cases they must be deployed or removed in less than a day to accommodate new events. In addition, they must:

- ▶ Protect the pitch during events;
- ▶ Use non-conductive tiles to prevent burning;
- ▶ Prevent browning of grass;
- ▶ Setup and teardown quickly;
- ▶ Save on installation and maintenance.

With all the time, money, and planning that's poured into today's stadiums, it would be a waste to ignore them during the off-season. While newer stadiums are being built to host events in between matches, converting an existing stadium into a multipurpose event centre creates a large problem: how well your turf will bounce back after an event.

Beyond all the fan attractions on game day (concessions and WiFi for example),

keeping your pitch green and beautiful is essential. All the preparation for a game won't help if spectators can see damage, wear, or brown grass from other events held prior to the game.

DAMAGE PREVENTION

Fortunately, open-bottom turf protection mats, such as **Signature Systems Group's ArmorDeck™**, mitigate these damages by evenly distributing weight over your pitch. With decreased contact area, less grass is compacted under the burden of pedestrian traffic.

Especially where natural grass is concerned, thermally non-conductive mats are an important consideration. Any surface used to protect the pitch needs to prevent solar heat transfer from concentrating on blades or fibres.

A well-designed protection system keeps natural grass vibrant. Always look for a system that uses translucent plastic and aeration holes. These features will allow water and light to transfer to the pitch without issue, preventing browning of natural grass. Always use a ribbed underside for any protection system when it comes to synthetic playing surfaces (unless necessary for weight supporting

issues of course) so that blades remain untouched, allowing for longer fibre lifespan.

It isn't just protection of the pitch that a quality surface delivers, by saving you time on surface deployment you'll save money as well.

Less time spent deploying means spending less on employees and an increase in flexibility to host additional events. Additional events mean increased income.

By saving on these expenses you'll open up future possibilities for decreased patron costs or increased facility amenities for those same patrons during a match.

ArmorDeck™ does a better job of reducing impact, even when compared to other systems. Whether you use natural grass or synthetic turf, the proprietary design of ArmorDeck™ decreases surface contact and thermal conductivity while still allowing air and water to flow as needed.

Natural grass gets light, air, and water while synthetic fibres avoid being crushed, reducing maintenance and repair costs and leaving you with a beautiful, verdant pitch for every match throughout the year. ■



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“ I go to the Green Sports Alliance Summit because I come back with at least one new, actionable idea every year. ”

Doug Behar
Senior Vice President,
Stadium Operations at New York Yankees



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SAFE PASSAGE

Advances in access technology are ensuring safe access to venues for visitors, while operators can also reap the rewards.

Amid heightened security concerns and with the need to get people in and out of stadia and arenas quickly, new developments in access control are continuing to emerge.

Barcode scanning of tickets allows security staff to quickly check visitors' credentials, while new advances in technology such as biometrics and facial recognition are becoming more prevalent.

SKIDATA has recently teamed up with the **Los Angeles Football Club (LAFC)** to install the world's most technologically-advanced access control entrance platforms in the brand-new **Banc of California Stadium**, located in the heart of Los Angeles.

The company's efficient ticket verification system features the first-ever wireless turnstiles at its main gates and pedestals for premium entries.

Custom-designed for the 22,000-seat Banc of California Stadium, the innovative turnstiles are wireless and moveable, and can be operated in any location, at any time, using a rechargeable lithium battery and Wi-Fi connection.

The agnostic system launched for LAFC's inaugural match earlier this year and provides a seamless and incredibly fast entry for fans and customers, quickly verifying tickets with 24 Flex Gate turnstiles, six premium Pedestals and more than 30 handheld scanners.

Previously installed with a hard-wired version of the turnstiles at **Mercedes-Benz Stadium** in Atlanta and the **Golden 1 Center** in Sacramento, Skidata's neutral platform can verify tickets through RFID and NFC, in addition to barcodes, helping LAFC move forward with its 'mobile-first' ticketing strategy and ensuring acceptance of all emerging and future technologies.

SKIDATA technology also provided up to 800,000 football fans from around the world with quick and safe access to 12 **World Cup** matches at the World Cup stadiums in Moscow this summer.

SKIDATA solutions are currently used in over 200 stadiums around the world.



Tokyo Olympics facial recognition

FACIAL FEATURES

Allen Ganz, Director, Advanced Recognition Systems, NEC Corporation of America, told the Association of Luxury Suite Directors conference in Atlanta how facial recognition technology is gaining traction in a number of areas.

He said: *"Facial recognition is being used across multiple verticals, not just within sport and stadiums but in markets such as airports and theme parks as well."*

"Although the experience within those venues might be different, the points of friction have a commonality. We're really looking at facial recognition as

a unified key across the guest journey to remove friction and also impact the bottom line of the venue.

"Let's start with a stadium. We can allow you just by walking in to be recognised, have your ticket validated but not have to take it out of your pocket, and then access a suite as well. "We have done facial recognition since the beginning of time, that's how we recognise each other. I could take that to an F&B location and I can actually pay with my face. These are not hypothetical concepts."

He said data collected as fans enter a venue could also help inform decisions to help maximise revenues.

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“In addition to facial recognition we’re also collecting analytics. At the front entrance you can estimate the age and gender of patrons coming in to the venue and that can directly impact decisions on F&B,” he said.

And a facial recognition system is set to be deployed for the first time for athletes, officials and media representatives at the **Olympic and Paralympic Games Tokyo 2020**.

NEC Corporation, a Tokyo 2020 Gold Partner, will provide the face recognition system.

The facial images of every accredited person will be collected beforehand and stored in a database; these will be used to verify identities at accreditation check points.

Face recognition technology will drastically increase security levels at the Tokyo 2020 Games.

Tokyo 2020 Executive Director of Security Tsuyoshi Iwashita said: *“The key to Games security is to prevent unauthorised people or items from entering venues. Tokyo 2020 will utilise an automated face recognition system for accredited people, a first for an Olympic or Paralympic Games, to prevent unauthorised access.*

“This latest technology will enable strict identification of accredited people compared with relying solely on the eyes of security staff, and also enables swift entry to venues which will be necessary in the intense heat of summer. I hope this will ensure a safe and secure Olympic and Paralympic Games and help athletes perform at their best.”



NEC Corporation senior vice president Masaaki Suganuma added: *“With our extensive experience and knowledge of biometric identification technologies, NEC is well placed to help ensure the Tokyo 2020 Games can be operated smoothly, safely and securely. NEC is a global leader in such technologies, including identification using facial images, iris scans, fingerprints, palm prints, finger vein, voice and ear acoustics, and has supplied more than 700 systems in over 70 countries and regions.”*

MAJOR LEAGUE BASEBALL

Meanwhile, the concept of biometric ticketing is also being widened in **Major League Baseball (MLB)** in the US.

CLEAR has announced a partnership with MLB and Tickets.com to introduce biometric ticketing at participating ballparks in 2019.

The partnership will develop a first-of-its-kind collaboration of emerging technologies from CLEAR and Tickets.com, ultimately allowing millions of fans to use biometrics to enter ballparks, eliminating the need to present a paper or mobile ticket.

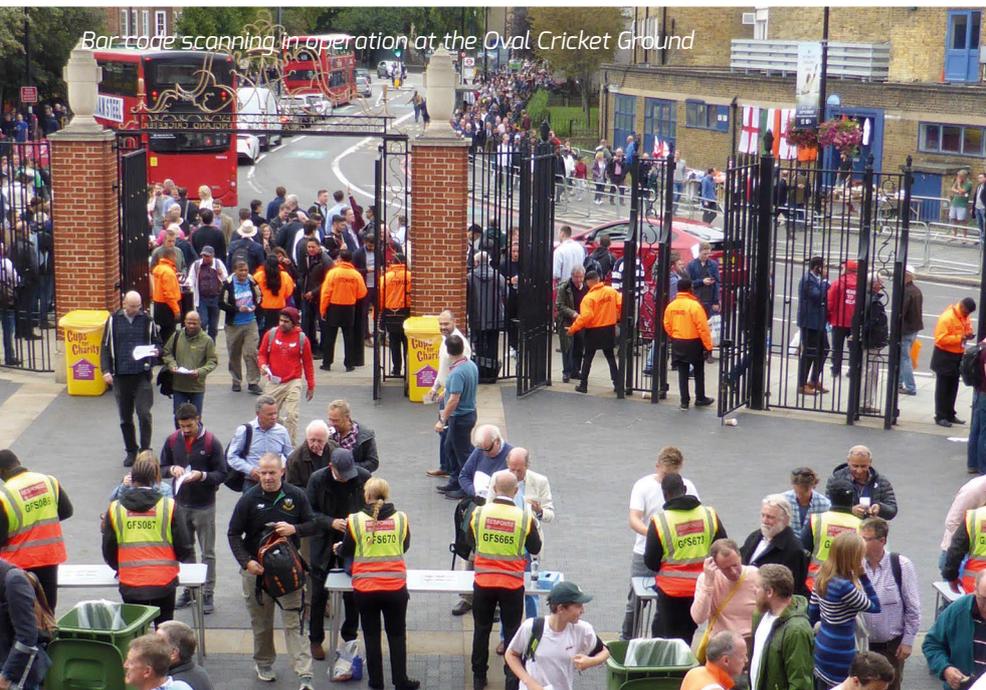
This new partnership will leverage Tickets.com’s API, allowing CLEAR members who link their CLEAR profile with their MLB.com account to gain entry with just the tap of a finger or, in the near future, facial recognition technology.

This new biometric ticketing technology has been piloted at select MLB ballparks this year, with broader roll-out to CLEAR and Tickets.com-enabled ballparks beginning in 2019.

Tickets.com, an MLB wholly owned ticketing technology company, is the primary ticketing partner for 23 MLB Clubs. With this partnership, CLEAR becomes the Official Biometric Identity and Ticketing Partner of Major League Baseball.

CLEAR is also working with MLB to roll out CLEAR Lanes at ballparks hosting MLB Jewel Events, offering fans a faster, more secure entry experience. This year, these events will include MLB All-Star Week ballpark events at Nationals Park, and Postseason games at participating ballparks.

CLEAR’s platform is currently used by nine MLB Clubs, among its 13 professional sports partnerships. CLEAR will also soon unveil new biometric-powered concessions in the state of Washington, enabling fans to pay for food, beer and validate legal age with just the tap of a finger or blink of an eye. ■



Bar code scanning in operation at the Oval Cricket Ground

AXESS ALL AREAS



Christian Heidegger
Axess AG

Axess AG offers new and innovative solutions in people access management for stadia.

Axess AG offers tailor-made ticketing and access management solutions. The systems are installed worldwide in ski areas, exhibition centres, stadia, theme & water parks and also touristic transport. "We customise solutions" is the simple secret of success.

Axess provides individual solutions for ticketing and access management, software products to integrate own business areas and CRM systems for managing customer data. The company is one of the internationally leading manufacturers of ticketing and access management systems.

Talking about future innovations for the stadia market and Axess systems, Christian Heidegger, Director Sales International, said: *"Above all, they impress with the fact that they are easy to operate for the venue owner and therefore reduce expenses and*

automate processes on getting prepared before the game. The system not only simplifies the handling of the entry phase, but also provides insight into the information relevant to the operator at all times. Especially for stadium visitors, Axess systems are easy and intuitive to operate, allowing them access to the stadium with any kind of ticket - RDID tickets, barcode tickets, QR codes, QR on smartphones etc."

In addition to the continuous development of access control software and hardware, Axess is working on a large number of new and innovative solutions for the automation and digitisation of customer's applications.

This year a system for the automated legitimation and accreditation of press representatives was introduced at FC Köln.

Axess offers an online "press/media" portal for this, in which press representatives can create an account and place a legitimation request.

As soon as the association releases the legitimacy, the press representative can independently select his accreditations for the events that have been approved by the association for him.

The accreditations will be sent as PDF and wallet / passbook by e-mail to the representative. The latest innovation in accreditation is currently in development and will enable the stadium management to easily and conveniently distribute work accreditations online.

The solution will reduce distribution management for the operator enormously and on the other hand provide trackability over employees presence in the stadium. ■



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AXESS

LET'S FACE IT: EMERGING TECHNOLOGIES IN ACCESS



SKIDATA sat down with facial recognition expert Anders Malmberg in Salzburg, Austria to discuss the development of access control technology and new trends emerging within the industry.

Anders, why is facial recognition just becoming more available now rather than three or more years ago?

Research on facial recognition goes back to the early 1960's; the first commercial systems emerged around 1997. One example that comes to mind was the 'ZN-Face' system [1] used by Deutsche Bank and airports.

The initial drive for facial recognition technology is driven by defence and crime prevention interests and social media platforms, which further boost the development of algorithms to deliver accurate, fast solutions.

In 2014, Chaochao Lu and Xiaoou Tang at the Chinese University of Hong Kong announced for the first time, a computer system had better accuracy in identifying persons based on facial recognition than human beings.

Several reasons for the booming interest are:

- ▶ Research progress with Artificial Intelligence (AI) providing significant accuracy
- ▶ Availability of facial recognition libraries based on research achievements
- ▶ Increasingly affordable hardware to execute the algorithms

What are the main competencies needed to offer facial recognition solutions?

One of the most crucial parts is the camera component. The system quality might change significantly with different exposures based on lighting conditions.



Wide Dynamic Range (WDR) cameras can compensate for changing exposure conditions and deliver superior results, compared to traditional cameras.

The algorithms applied are crucial for the overall performance provided by computer vision libraries and parameterised for use cases. Algorithms must be efficient in order for response time to not affect the overall access check time.

Most important is the integration with the access system. The overall configuration for enrollment and access check should be automated as closely as possible.

Enlighten us on the design and components of a system.

The first step is to extract faces in an image or video stream: this phase is

called face detection. It is based on common features that apply to a human face, for example the eye region is darker than the cheek bones or the nose bridge region is brighter than the eyes. This results in a list of rectangles where faces have been detected.

For each detected face, the next step is facial landmark detection where facial features like eyebrows, eyes, nose, mouth and jawline are localised. The tilt and rotation of the face are also calculated.

The third step is face normalisation where the exposure (too bright or dark) as well as tilt and angle are streamlined for comparison.

Finally, face recognition is applied. A face is represented by a number derived from the facial landmark detection and compared with numbers calculated from a reference photo. ■

Thanks, Anders! We will be sure to keep our eyes (and other facial features) open for new emerging security technologies in the stadium industry.

Anders currently works on facial recognition at SKIDATA, an international leader in the field of access solutions and their management. SKIDATA places great value in providing solutions that are intuitive, easy to use, and secure. The integrated concepts of SKIDATA solutions help clients optimise performance and maximize profits.

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SEEING IS BELIEVING

The rise of BIM and VR in architecture and engineering is helping create better venues, as Aaron White of Walter P Moore explains.

Architects and engineers have seen a revolution in the way they work with building information modelling (BIM) and virtual reality (VR) tools transforming their jobs over the past few years.

They can now walk around inside buildings before a brick is laid and show clients how a finished project will look.

BIM can be used to create multiple design options and incorporate details from reality capture and geographical information systems.

Aaron White, Principal at **Walter P Moore**, told *PS&AM* how the use of these tools has exploded over the past few years.

He said: *"20 years ago or so ago we worked with line drawings. You'd have 2D representations of a stadium or arena with floorplans, elevations, and cross sections. The linework had no intelligence to it. Now, with the concept of a building information model, you're creating a virtual representation of the building."*



"You can put in all sorts of embedded data. For example, for a steel beam you can put the surface preparation into the model, the paint that may go onto it, or the fireproofing that may go on it. You can literally include hundreds of other bits of information about the beam."

"For an air conditioning system you can select it and find out the manufacturer of it, when it was made, how many tonnes of heat it can remove. So there's all sorts of

additional information that can be put into these models.”

White said BIM had been used in the aviation and petrochemical industries before being adopted by commercial building specialists.

“In the mid 2000s, BIM came into the commercial building industry and has slowly been adopted over the years. We’re obviously seeing rapid adoption now and it’s maturing to the point where the big international firms are now really taking it to the next level in terms of all the information they’re putting in.

“Now there’s a recognition of all the value that comes from inputting data in the model and sharing that information and making sure the information is accurate at all times.”

White said that BIM still has its challenges, particularly in how it is shared.

He said: *“One of the challenges is that a lot of people use it and put in all the information they need for their job only. As a structural engineer, I would put in only the information that I need to create the drawings.*

“But I have the capability to put in a lot more information, so one of the barriers in our industry right now is just the willingness to share all

the information and understand the information and its intended purpose. So there’s risk associated when there is misalignment between the firm creating the models and the downstream users of the models.

“If you’re putting a new project out to tender, you really want to understand how the team are going to be using the BIM and encourage and foster that sharing of information. So it’s a teamwork exercise as well.

“I think the industry is still challenged how to really use the model and engage with it throughout the whole life of a project.

“For example, can the contractor use the engineer’s model for early pricing or a full guaranteed price? Can a subcontractor use it for clash detection or as the basis of fabrication?”

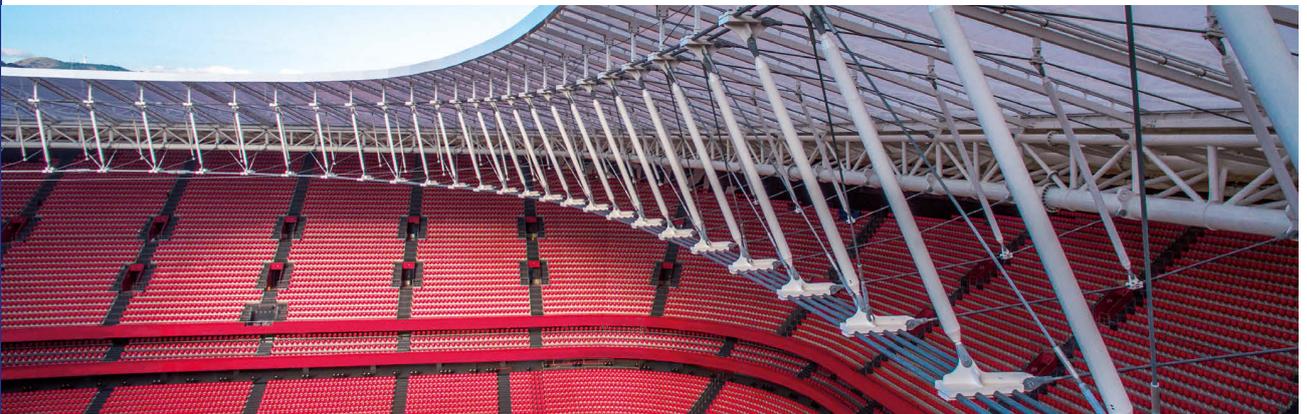
SPORTS PROJECTS

White has worked on a number of high-profile baseball and football stadia as well as collegiate projects.

He said: *“The one that I spent the most time on was the Miami Marlins retractable roof in Miami, Florida that opened in 2012. Subsequent to that, I worked on the Citrus Bowl Stadium in Orlando which is now known as Camping »*



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« *World Stadium* —we're continuing to do renovations at that location. In addition, our team worked on the conceptual design for the Tampa Bay Rays baseball stadium in Ybor City.

"For that project we were in very early and we're exploring lots of totally different configurations for different types of roofs. We're using parametric modelling to evaluate lots of different options and then creating documentation that we're sharing with the contractors. With some of our internal tools that we've generated, we can go very quickly from these kind of parametric line models to showing concepts to the contractors.

"They get a better idea of the complexity of the work involved with the roof and can provide more confident preliminary pricing."

The Rays ballpark will have a fixed roof rather than a retractable roof to counter the extreme heat and frequent thunderstorms in the region.

White added: "The site they're on is a very dense urban site and they just don't have the space to move the roof."

Walter P Moore is also involved with work on the Rams' LA Stadium & Entertainment District in California and the **Texas Rangers' Globe Life Park** that are currently under construction.

White added: "Globe Life Park is a retractable roof baseball stadium. Walter P Moore is designing the entire roof, the track structures and the entire bowl there. So we have a BIM for the entire structure including all of the foundations and all of the bowl structure which is concrete on the lower levels and then transitions to steel. Then of course the steel retractable roof is part of the BIM."

VIRTUAL REALITY

White said that virtual reality played a part in

helping the Rays' owners understand how the ballpark would look and feel before construction began.

He said: "We created some custom virtual reality tools to help with exactly that. On the Rays stadium, when we were looking at different roof schemes, roof cladding options, and different types of fabric and glass, we could show them with the sun in the actual position it would be on say July 1st at a 7 p.m. game or on April 15th for an afternoon game. You can see what the shadows would look like and what it would actually feel like inside the stadium as a batter, or if you were sitting right next to home plate, or from the owner's suite or as somebody in the outfield seats.

"You can do renderings, but with renderings you're always outside of the space, so the power of VR is really that you're immersed in the space. You can turn your head and look around as if you were there. This environment is just about the structure itself - it's really about the entire facility and how it interacts with its environment.

"On another project they brought in the people who had responsibility for the money, not just the people that were driving the project. In fact they even brought in a player to see what the environment would look like. And you know it just blew them away. It really made the project much more exciting.

"There's definitely a significant difference in the user response that you get when you're in that environment."

White said VR technology had been advancing rapidly over the past couple of years.

"It's not so much just the software and the

hardware around the VR experience but actually the customisation of the software that appears to be advancing quite a bit. Just being in the environment is one thing but then being able to do something as simple as navigating quickly has really moved on.

"Instead of just walking around your environment, you can put on a jetpack or you can be in a lift that will take you up. We also have a tool that you point a laser at a spot and then you immediately 'jump' to that point.

"So if you want to go from home plate in a stadium to being an outfielder you don't have to go through the drudgery of walking the whole way but you can just very quickly jump there—Citrus Bowl Stadium—so that's part of it.

"We're creating tools where you can go up to a wall in the model, see what's inside the wall, cut a section of that wall with a tool and take it out and actually look at the wall section and maybe even mark it up. That can inform the overall design. So those are the big things and then of course there is the ability to walk along with somebody else even if they're not in the same physical space as you."

As well as advances in VR software technology, hardware is also becoming more manageable and headsets lighter.

White added: "That's making it more accessible as well as more portable so that you can bring it to the clients if you want to they don't have to come to your office or have a big complicated set up in their office." ■



A STADIUM FOR HOPE

Kamaishi Recovery Memorial Stadium stands as a beacon of hope for a region devastated by an earthquake and tsunami, as writer Kathryn Wortley discovered.

Japan's only new stadium of the 12 to be used for the **Rugby World Cup 2019** has been unveiled as "a symbol of hope" in Iwate Prefecture's Kamaishi, which was devastated by the Great East Japan Earthquake and Tsunami of 2011.

About 30% of homes, 60% of businesses and 98% of the fishing fleet were destroyed in the disaster, but rugby is helping put the port town on the road to recovery.

Kamaishi has long been known as "Japan's Rugby Town." In the 1980s, former local team **Nippon Steel** won the **All-Japan Rugby Football Championship** seven years in a row and, post-2011, current rugby team **Kamaishi Seawaves** played an instrumental role in relief efforts and inspiring the community through the sport.

More than 6,000 people attended the opening of **Kamaishi Recovery Memorial Stadium** on 19 August to celebrate Kamaishi's role as a Rugby World Cup host city.

The £27 million venue will host two fixtures for the global tournament, which is being held in Asia for the first time.

Some 10,000 temporary seats will be added to the stadium's permanent capacity for 6,000 spectators. As part of sustainability efforts, 600 seats were taken from **Tokyo Dome, Kumamoto**

Stadium and Japan's National Stadium. All

others were made from local cedar sourced from 400 hectares of local forest damaged in a forest fire in 2017.

Water collected from the stadium roof will be fed to two water tanks with a combined storage of 220 tonnes built under the pitch.

It will be used to water the stadium and for emergencies such as further forest fires. Fresh water is required because sea water increases salinity in forested areas, slowing down regrowth following a fire.

The pitch is AirFibr, a hybrid turf technology developed by French firm **Natural Grass**. Though used in high-end facilities, including at **Arsenal** and **Real Madrid** football clubs, the Kamaishi stadium marks its first installation in Japan.

Extra-fine silica sand in the base forms the matrix of the rootzone, which is packed with 150 billion synthetic microfibres. Above, cork granules act as a carbon sink and prevent rot, with natural grass on the top.

The result is a high-resistance playing surface that absorbs shocks,

doesn't have holes after scrums, and supports water supply to the roots to provide a consistent playing surface on all sections throughout the year. Moreover, natural grass enables easy maintenance.

Natural Grass representative Anne-Line Rey said at the opening ceremony. *"This is the first day that players in Japan will experience playing on this kind of pitch, so we hope it will make more people in Japan aware of this technology."*

On a stadium tour, local RWC promotion staff and former Kamaishi Seawaves player Takeshi Nagata said that although AirFibr cost almost £900,000 more than other pitch options, it is expected to provide a saving of £1.3 million over a 10-year period due to its durability and shorter recovery time after use.

Speaking of the new stadium, **World Rugby** Chairman Bill Beaumont said: *"It stands as a testament to the indomitable spirit of the people of Kamaishi and will act as a beacon of hope and inspiration for generations to come, providing an important legacy for the future of this region of Japan that has rugby at its heart."* ■

FEATURE
KAMAISHI
STADIUM



LUXURY LIVING

PS&AM caught up with ALSD Chairman Bill Dorsey to talk about trends in the luxury suite market.

The luxury suite market is evolving with sports fans looking for ever more unique experiences.

Venues are now providing a huge range of different offerings to cater for the demand from visitors for increased flexibility.

Stadia and arenas are adding everything from e-sports lounges to Top Golf suites in a bid to engage with their fans.

Bill Dorsey, Chairman of the **Association of Luxury Suite Directors (ALSD)**, told PS&AM how venues are adapting to keep up with changing demand.

He said: *“On the design side there are two different ways I see it going. One is luxury, where a suite is kitted out and is used like a living room. The other is when the suite becomes an office where the materials are hard edged.*

“We’re going to start to see people use these suites more often and access will be a lot greater. Access on non-game day is becoming a very important part of the offering.

“Corporations can have options. I think we’re going to see more suite branding so that the corporation that owns a particular suite is going to make it feel more like their own and not just a generic part of the stadium.

“So far as design is concerned I don’t think it has changed tremendously, but loge boxes have become very popular with smaller groups of four and then you can go up to a suite of eight, 12 and 24 and you’ll see a lot more suite sharing.

“A lot of design is going to be built around flexibility. You’ll be able to remove a wall if you have a big event. You’ll have the ability to go into the next suite. That happens in a few places right now.”

Dorsey said that in the most luxurious suites and the owner’s boxes on two floors there could be a personal space upstairs with a downstairs area set aside for entertaining.

He added: *“The kitchen areas have typically been moved to the centre instead of the back of these boxes because so much socialising goes on in kitchens. Also, you don’t see restrooms in suites the way you used to. There’s various reasons for this but it opens up areas and it’s just down to the general cost of the plumbing and things like that.”*

Dorsey said the design of suites is more and more being turned over to professionals, including architects and interior designers and taken out of the hands of owners.

He added: *“The one thing I like a lot is that we’re starting to see larger refrigerators in these venues, no longer the smaller ones. The per-caps, the amount of money people spend, is usually higher when there are larger ones because they don’t have to restock items and people don’t have to wait for things to come in.*



The Infiniti Club at Suntrust Park



Below the Chop at SunTrust Park

“All inclusive pricing is becoming more and more prevalent on the food and beverage side and we’re seeing a lot more all-inclusive areas.”

Dorsey also said there is a strong trend towards regionality in food at venues.

“So, in Los Angeles there’s more of a Mexican cuisine culture while in the southern states this is trending more to the New Orleans type of food.”

“The one thing I will say on food is I think there’s an increase in branding for restaurants. A lot of these companies are using it almost like an advertisement or marketing tool.”

TECHNOLOGY

Advances in technology will also shape the way the luxury suite market adapts in the future.

Dorsey said: *“On the technology side you’re seeing a combination of high tech and low tech. Low tech is personal service - being there. Luxury is tied to service more than it is to cost. People still want to talk to a human being. However, technology is making inroads, especially with millennials and younger people who are comfortable with it.”*

“In the US, you’re seeing a lot of artificial intelligence where people can make orders through Google or Amazon. You’re also starting to see concierge apps coming in to venues.”

“There’s a company called Wavework which has a 24/7 concierge app which is tied with the team. They’re starting to

make some inroads. This is going to be the trend in the future where if you need anything or have any questions you can just go into that app and the team can respond. You won’t have to necessarily call somebody and talk to them.”

Dorsey said robots for food and beverage orders are also starting to make their way into the luxury suite market.

He added: *“Food and Beverage ordering systems have been around for a while with the use of surface pads to order. In some places they are becoming popular. There are some teams that are starting to build out things like fantasy sports lounges for e-sports and they are starting to make their way into some of these buildings. I think that is in the future but I think you’re going to see a lot of this stuff over the next five to 10 years.”*

“I’ve even been told that there’s some 3-D technology coming out where you might be able to get the feel of being in a suite offsite. There might be a bar that makes it appear that you’re in the actual suite watching the game. The technology is so good that it looks like you’re there.”

SUNTRUST PARK

Bill Walsh, Vice President Strategy and Development, **Tampa Bay Rays** told delegates at the ALSD conference in Atlanta that flexibility was the key to attracting new fans and retaining existing ones.

He said: *“As we think about developing premium plans and premium product, fans want flexibility to be able to at eight top or four top tables and have a lunch experience, or just for one person to sit right behind the dugout or right behind home plate and have interaction with coaches, players, chefs. This is the type of flexibility that our fans are increasingly wanting.”*

SunTrust Park, home of the **MLB’s Atlanta Braves**, is at the forefront of this new wave, with a range of different premium offerings covering 4,000 seats in the 41,500 seat ballpark.

The **Infiniti Club** is the entry point for luxury packages offered at SunTrust Park and includes 24 suites, 1,200 club seats and 88 terrace tables.

The next level of hospitality comes in the form of the **Delta Sky360 Club** which has amenities such as a sports bar, a restaurant and a lounge for 1,500 members.

The wide, padded leather seats directly behind home plate feature easy access to an exclusive air-conditioned Club with first-class amenities.

The **SunTrust Club** is the top level hospitality offering which is open to Chairman’s and Executive seat holders.

With just 160 seats closer to home plate than the pitcher’s mound, the SunTrust Club is the most exclusive seating environment in SunTrust Park. ■

WORLD CUP WINNERS

A memorable World Cup was staged in Russia this summer with stadia and pitches across the country winning plaudits.

This year's **World Cup** in Russia was high on energy, incident and excitement as 32 teams from across the globe battled it out to land football's ultimate prize.

The tournament took place in 12 stadiums across 11 Russian cities from 14 June to 15 July, with France running out as the eventual champions.

There were any number of surprises with England and Croatia in particular outperforming expectations.

Matches were played at the **Luzhniki** and **Spartak Stadiums** in Moscow, the **Volgograd Arena**, **Nizhny Novgorod Stadium**, **Ekaterinburg Arena**, **Samara Arena**, **Kazan Arena**, **Saint Petersburg Stadium**, **Mordovia Arena**, **Sochi Arena**, **Rostov Arena**, **Kaliningrad Stadium** and the **Fisht Stadium**, Sochi.

BBC TV football commentator Steve Wilson told *PS&AM* that it was one of the best World Cups he had worked on.



Kaliningrad Stadium



Samara Arena

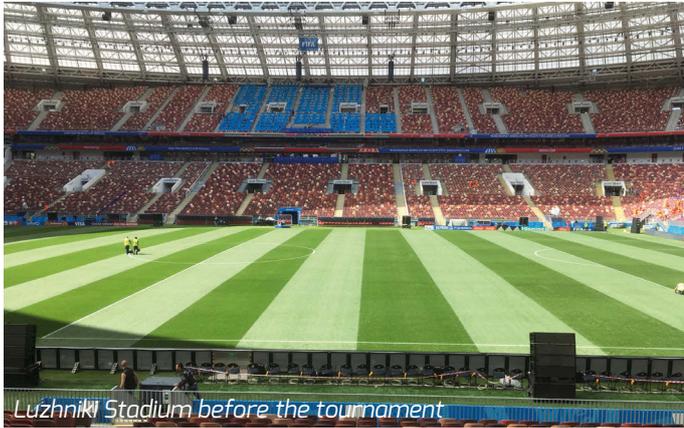
He said: *"It was a brilliant PR event for Russia really. I think everyone I know went there not quite sure what to expect and came back thinking it was fantastic."*

"I think that probably goes for supporters as well. I met fans in St. Petersburg who didn't come out until the very end of the tournament and really regretted they hadn't been there longer."

"Getting into the stadiums all worked well and they were absolutely top notch. I would say that every stadium we went to there was superb. There wasn't really anything they hadn't thought of. And they'd also mustered tens of thousands of smiling volunteers."

Wilson, who has been to six World Cups, but did not attend France 98, said the tournament was on a par with Germany 2006.





Luzhniki Stadium before the tournament



Luzhniki Stadium during the final match

FEATURE
RUSSIA
WORLD CUP

"In terms of infrastructure and stadiums it was really close to Germany. All the stadiums were excellent. There was all the usual pre-World Cup talk that they would never be ready and all that stuff that always happens. But nowhere did I think something hadn't quite been finished, which you got a sense of in South Africa.

"The only thing you would say that probably gave Germany an edge is that it's a lot smaller!"

Wilson visited seven of the 12 host stadiums in Russia and said that one of his favourites was Nizhny Novgorod.

He said: *"It's a beautiful stadium with a blue and white weave in the roof and the game we did there was Argentina, so the roof of the stadium looked like it was lit up for Argentina. It was almost exactly the same colours. I loved that stadium. I thought it was really fantastic. It reminded me from the outside of the Mane Garrincha Stadium in Brasilia Which is about twice as big."*

LUZHNIKI STADIUM

The showpiece arena of the World Cup, the Luzhniki Stadium in Moscow hosted the opening match and the final of the tournament as well as the opening and closing ceremonies.

The stadium was totally refurbished for the tournament: the athletics track was removed and the stands moved closer to the pitch.

A viewing platform was set up on the venue's upper tier and offered a stunning view of the heart of the capital.

The main stadium for Russia 2018 was originally built to host the first nationwide summer Spartakiad in 1956.

Since then, Luzhniki Stadium has hosted a multitude of major sporting and cultural events, including the 1980 **Summer Olympics**.

The stadium has hosted more than 3,000 football matches. It is the venue for most of the matches played by the

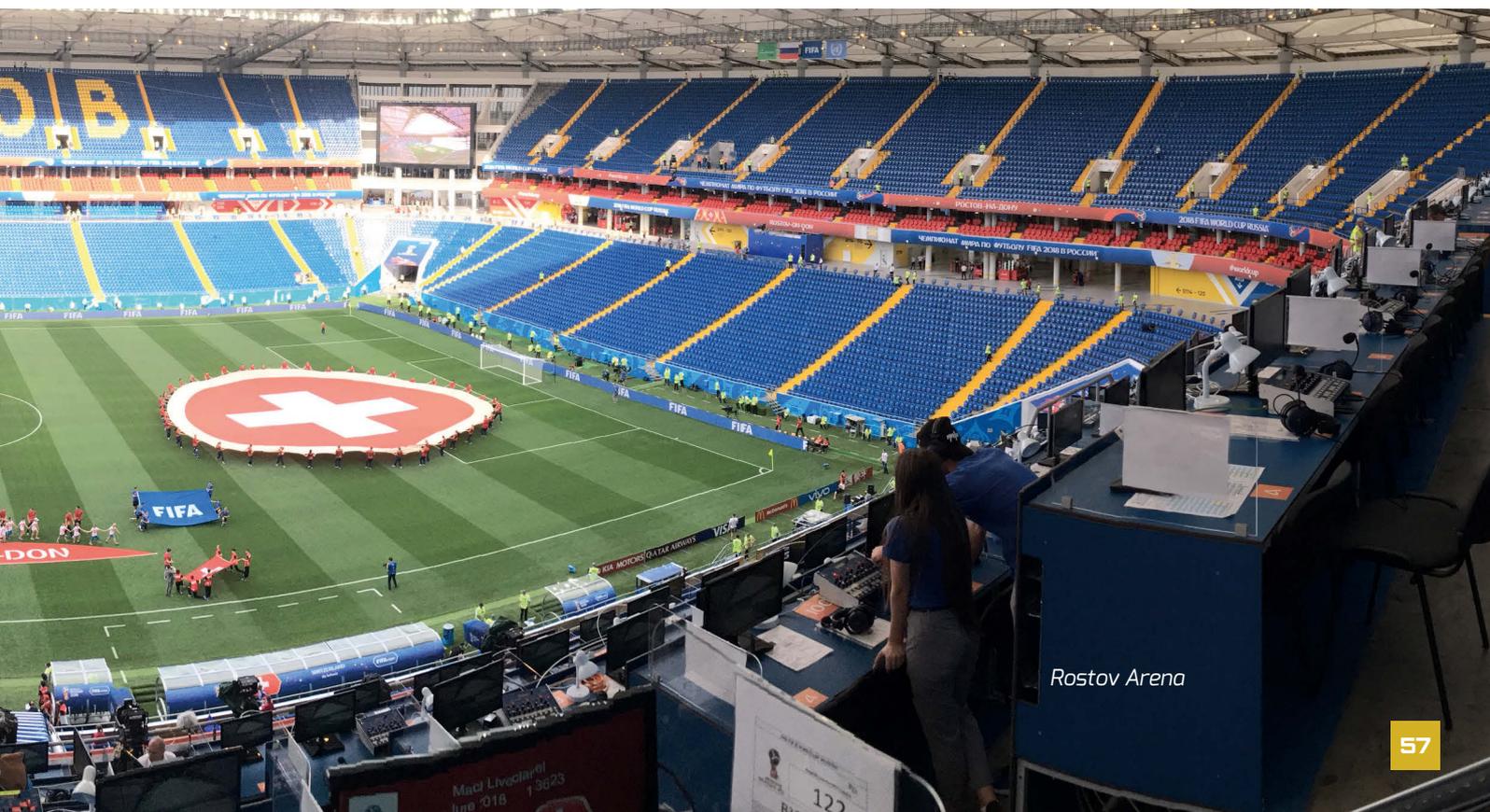
Russian national football team, and at various times it has also served as the home stadium for Moscow's **Spartak**, **CSKA** and **Torpedo** clubs.

Work to rebuild Luzhniki Stadium for Russia 2018 began in 2013.

Wilson said: *"I had been to Luzhniki before when England played there in qualifying for Euro 2008 and lost and it was the worst commentary position I'd ever had in my life. We were commentating from on the bend. It was from a camera platform for the Olympics. The goals were miles away.*

"They have done an incredible job to actually to turn it into what it is now. It must have been done after the World Athletics Championships.

"You would never know that the old stands were effectively behind what is there now. They've done a fantastic job but they've also obviously kept the façade so you get this sense of the history of the place." >>



Rostov Arena

◀ PITCH PERFECT

Wilson said all of the pitches for the tournament had been in excellent condition with the slight exception of Sochi.

George Mullan, CEO of **SIS Pitches**, who were responsible for six of the pitches for the tournament, told *PS&AM*: *"I think the key to any tournament is not to have any comments on your pitches and for the six pitches we had, we didn't come across any negative feedback at all. That's great. SIS Pitches maintained the Luzhniki stadium and the training pitches at the stadium for the tournament.*

"We designed and built the Luzhniki pitches in late 2016 and early 2017 so that they were ready for the Confederations Cup in summer 2017.

"We've been in Russia for about five years now and the key is having Russians talking to Russians. The pitch standards, which they call Russian Norms, are quite different to what we're used to, so I think the key is having Russian staff."

Mullan said logistics were another challenge with sand and gravel having to be trucked thousands of miles.

"An average pitch has about 400 truck journeys so that's a lot of mileage. Logistically there are always big issues with the distances in Russia. The second

really big issue is the quality of the sand in particular.

"We had to sieve every ton of sand. We put a metal frame on the back of a trailer with a mesh and poured 4,000 tons of sand through the mesh with a digger to remove rocks and stones. You then get a clean sand, so that's the level of detail you've got to go into when you're working overseas.

"It probably adds an extra week of work because you really want to get the quality right. People focus on the top of the pitch, they focus on the grass but if what's underneath isn't built correctly, the top doesn't work."

Mullan said the amount of time the pitch was in use during the tournament was another challenge.

"At Luzhniki in four and a half weeks we had 84 hours of the pitch being used, which is the equivalent of a full Premiership season.

"It was used for rehearsals for the opening and closing ceremonies, for the actual ceremonies, for training sessions and games."

Mullan said the biggest issue around a World Cup Final stadium pitch is that it hosts the most games and training sessions, as well as the commercial activities taking place on it.

He added: *"There's competing forces because obviously the major companies want to advertise their products and to launch products on the pitch. At the same time you have to deal with football managers who want to win a game and have different demands.*

"The demands on the pitch were huge and that's where the hybrid system came in. The SISGrass system is 95% natural grass and 5% fibre and it performed beyond our expectations.

"People think about a pitch for the World Cup being used to play football on, but actually less than half of the 84 hours were for football."

Mullan said it was also difficult fitting in pitch maintenance and mowing with all the activities going on.

The most advanced combined pitch technologies – SISGrass and SISAir – were used for the first time on the World Cup Final pitch.

Developed only three years ago by SIS Pitches, SISGrass has been installed in 80 pitches worldwide, including a pitch in Japan for the 2019 Rugby World Cup, and at **Lambeau Field USA** for the **NFL's Green Bay Packers**. ■

For **Edelweiss Audio** – also known as **Funktion-One Russia - Volgograd Arena's** debut at the **2018 FIFA World Cup** marked the culmination of a two-year project to custom craft the perfect sound system for the 45,000 capacity venue.

Led by Technical Director Andrei Kremenchugskiy, Edelweiss Audio worked closely with Funktion-One in the UK to produce a system that would not only satisfy FIFA's exacting stipulations for public address intelligibility and level but also enhance match days through its immersive, full-range musical reproduction capabilities.

The team began by producing modelling and simulations in EASE – anticipating potential challenges and identifying the optimum loudspeaker configurations.

Their solution combines Funktion-One's Evo Series with the manufacturer's renowned bass technology - a design comprising 638 Funktion-One loudspeakers in total.

Loudspeakers are accurately arrayed in 24 C-shape clusters along the stadium's sides and 12 Y-shape clusters in the corners, delivering strong directivity control in both the horizontal and the vertical planes.

Each array features Evo 65H loudspeakers with 50-degree horizontal dispersion for the closer seats and Evo 75H loudspeakers with narrower dispersion and resulting higher intensity for the further seats. To help spread the load on the suspended roof, alternate clusters are supplemented with either two F215 Mk2 midbass or a single F221 bass enclosure. Under-balcony coverage is provided by Funktion-One's highly intelligible and compact FB1 and F101 loudspeakers.



FUNKTION-ONE®

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High-Intensity
Controlled Directivity
Class-Leading Intelligibility



The Evolution Series provides the highest levels of performance and flexibility for world-class sports stadia.

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VOLGOGRAD ARENA RUSSIA - WORLD CUP VENUE 2018

MICROCLIMATE MODELLING

The work of wind engineers has widened over the past 20 years, with more and more emphasis now placed upon understanding, resolving and optimising the microclimate within a stadium, as Dr Robin Stanfield of BMT explains.



General view of Arthur Ashe stadium before a roof was added
Image credit: lev radin/shutterstock

Today's stadia are advanced multi-purpose buildings that host a variety of events.

With architectural form becoming ever more complex, and the quality of space now paramount, the engineer is arguably as pivotal as the architect.

Together, these designers are responsible for the allure of the venue, for its function, plus – crucially – for the suitability and comfort of the environment they create.

Of late, with the expectation of optimised 'microclimates', the wind engineer often works hand-in-hand with specialised building physics engineers to deliver sophisticated and integrated support services.

In present day stadium design, the structural performance and the ability of the structure itself to enable the architectural vision remain two fundamental prerequisites.

Beyond this, it is the sports fan, the concertgoer or the business person's complete experience that defines their response to each new iconic venue, and ultimately its success. Often therefore, where stadia require very specific and optimised climatic conditions, the microclimate becomes a focal point of the design process.

Arthur Ashe Stadium in New York City, the main court for the **US Open**, is arguably an example of where this was not the case. Ashe had a reputation for being particularly windy.

The former World No. 1 professional tennis player **Jim Courier** in fact once declared: *"I'm not an architect, so I don't understand the dynamics in play with the design, but I can tell you as a player that the wind in Ashe is the most inconsistent wind of the four major stadiums."*

Perhaps this provided Arthur Ashe with an edge over its rivals, with the unpredictability of the wind keeping things interesting but, as former tournament director Jay Snyder has admitted: *"When the stadium was constructed, wind patterns were not on the agenda."*

Since the turn of the millennium, the work of wind engineers has widened, with more and more emphasis now placed upon understanding, resolving and optimising the microclimate within the structure itself.

One of the key challenges in optimising the microclimate within any stadium is the management of air infiltration into the bowl.

To achieve this, while sophisticated computational modelling tools continue to advance in both capability and speed, reliance solely on these tools might still be considered imprudent.

For rapid and robust modelling of the bluff body aerodynamics of stadia and arenas, boundary layer wind tunnel testing remains a key asset from which data can be used to validate more comprehensive CFD predictions, or from

which data can be combined with other software suites to provide a complete picture of the microclimate.

As an established wind engineering consultancy, **BMT's** experience in research and application of wind engineering techniques to commercial projects dates back more than 50 years.

Structural wind engineering studies for modern stadia tend – as standard practice – to include wind tunnel tests conducted within a boundary layer wind tunnel.

These measure the wind pressure field across exposed surfaces of interest, principally the upper and lower surfaces of the roof, to derive accurate overall structural and local façade wind loads or pressures for complex architecture that cannot be robustly predicted otherwise.

For environmental purposes, it is also routine to conduct wind tunnel testing to measure local wind speeds within occupied areas and, increasingly, to adopt a far more integrated approach by combining physical testing with computational fluid dynamics to provide a near-complete understanding of the eventual microclimate.

The commercial and financial success of today's modern stadia and arenas would not be possible without the support of rather sophisticated multi-disciplinary engineering and there is no doubt that in this context wind engineering has played a vital and central role. ■

SOUND OF SUSTAINABILITY AT JOHAN CRUIJFF ARENA



A d&b audio system installed at Amsterdam's Johan Cruyff Arena has led to significant energy and cost savings.

When the **Johan Cruyff Arena** upgraded its sound system in late 2016 the installation was part of the venue's revolutionary drive to deliver the best audience experience of any stadium worldwide.

And with solar panels and wind turbines already in place, to do so as ecologically as possible.

Now, just over 18 months later, the Arena has gone live with a 3MW energy storage system that will provide back-up power, reducing the use of diesel generators and relieving the energy grid by flattening peaks that occur during concerts.

A feat that adds to the Johan Cruyff Arena being one of the most sustainable stadiums in the world.

With a reputation as something of a Living Lab, the stadium and neighbouring arena are a testing ground for innovation in practice.

It's here that pioneering ideas as well as proven solutions - in fields such as safety, fan experience and sustainability, are put through their paces before finding their way to similar venues worldwide.

WORLD FIRST

True to form, Johan Cruyff Arena was the first soccer stadium in the world to install a fully ArrayProcessed **d&b audiotechnik system** system - a unique technology for controlling the dispersion of loudspeaker arrays by software.

As well as sonically enhancing the experience at every seat, ArrayProcessing also expands the flexibility of the audio system.

"When replacing the sound we want to make maximum use of new technologies in the field of acoustics and durability," confirms Henk van Raan, Chief Innovation Officer at the Arena.

"We recognised the impact high quality, easy listening has on fan experience and with the d&b system we were able to meet all our criteria: address the Arena's atypical acoustics; provide touring productions with a welcome brand, and with ArrayProcessing - which interfaces seamlessly with our existing MediaMatrix system - be flexible enough to suit any event without compromising safety standards."

"At the touch of a button, we can switch to evacuation mode, or reset from sports stadium mode to international concert venue. And if we need lower levels, for example in dedicated media or VIP areas, unique avoidance zones can be defined - a requirement now fixed in the UEFA guidelines."

POWER SAVING

The installation specific 30D amplifiers by d&b drive the system; their enhanced system status monitoring functions make them ideally suited to emergency situations.

"To comply with EVAC regulations the arena's previous sound system was switched on 24/7; this was to ensure an immediate response," explains Olaf Landzaat, Project Manager for audio integrators, Ampco Flashlight. *"But with the d&b amplifiers, the system can be on stand-by when it's not in use. This is because if the evacuation button is hit, the system responds in less than half a second. We also created default programmes so if only part of the stadium is in use, the evacuation system will trigger people to move by zone."*

The 85% reduction in audio power consumption initially expected has turned out to be closer to 90%.

"I would say the system is switched on maybe 10% of the time of the previous system, plus the d&b amplifiers are very much more power efficient," says van Raan. *"That's obviously a big financial saving, and a fantastic ecological result."*

As quality, innovation and sustainability fill the atmosphere at Johan Cruyff Arena, its conscientious approach to entertainment clearly hasn't compromised performance.

"We do get a lot of credit for investing in a sound system that is a good addition to a touring system," confirms van Raan. *"Also during matches the sound quality has improved enormously, not only in terms of intelligibility but also for background music and DJs." ■*

CLEAR-SIGHTED SECURITY



Fans, visitors and employees at das Stadtwerk.Donau-Arena trust video technology from Dallmeier.

With over 150,000 visitors every year, das **Stadtwerk.Donau-Arena** in Regensburg, Germany is one of the premier event locations in the region.

In a multipurpose hall of this size, of course security is of paramount importance. At the same time, however, it is essential to protect the personal privacy of fans, concertgoers and staff in keeping with the strict requirements of the law.

As part of a modernisation project in 2017, the management therefore decided to install a video security solution from the Regensburg-based company **Dallmeier**.

The arena has capacity for up to 7,700 concertgoers and is the home venue for the third-tier league (**Oberliga**) ice hockey team **EV Regensburg** with seating for over 4,800 fans.

Accordingly, great importance is attached to a security strategy in which the fans can enjoy the party atmosphere without worrying about their safety, and players and employees are also protected from danger.

This naturally includes acute danger situations, such as the outbreak of fire, but also the investigation of crimes involving injury to visitors, in the stadium concourses or in the car parks for example.

VIDEO SURVEILLANCE

Most importantly, das Stadtwerk.Donau-Arena wanted a system that would enable a rapid response to isolated incidents while maintaining an uninterrupted overview of the total picture.

The multifocal sensor system of the patented Dallmeier Panomera® technology is designed to provide them with exactly that: If necessary, the operator can focus on a certain area, but capture and recording of all areas of the scene under observation continues simultaneously, without interruption and in the highest resolution.

This means that an incident can be reconstructed subsequently wherever it occurred in a manner that is admissible as evidence, even if the operator was focussing on a different detail of the scene at the time.

This is not possible with conventional PTZ (Pan Tilt Zoom) cameras. The S8 Ultraline series of Panomera® cameras also offer good low-light sensitivity, which is important with the lighting conditions that prevail during events.

The Dallmeier IR (infrared) cameras for car parks and the concourse / ticket office area have also been developed with particular attention to changing

light conditions to ensure 24-hour video coverage.

The combination of the very latest sensor and encoder technology deliver outstanding contrast, brilliant clarity and the highest possible resolution and colour fidelity even under diffuse event lighting.

The venue operators are extremely satisfied with the new systems.

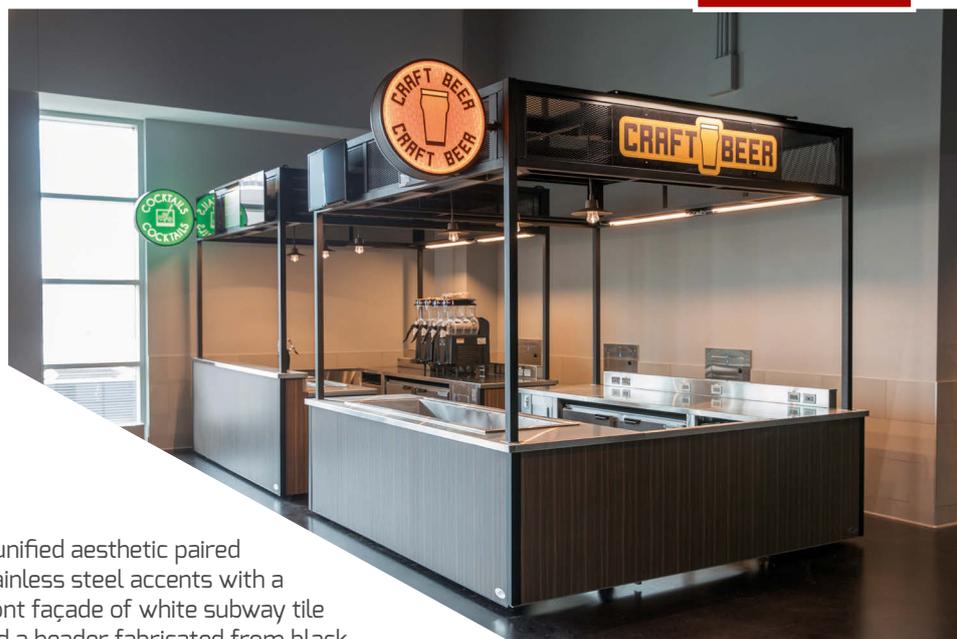
Arena manager Peter Lautenschlager said: *"In an age characterised by both digitalisation and an increasing unpredictability of events, it was clear to us that we need to upgrade our camera and recording technology from analogue to IP systems and deploy modern security equipment.*

"The quality of the images delivered by the new cameras is exceptional. The perfect harmonisation of camera technology and intelligent (live) observation and analysis enables us to receive meaningful image material so that we can act rapidly if intervention is needed. We want happy visitors and fans. With the solution from Dallmeier, we have obtained exactly the right degree of data protection while offering the highest level of security. We are very glad to have chosen the right partner in Dallmeier." ■



TASTY TREATS AT FISERV FORUM

Iowa Rotocast Plastics' permanent and portable food and beverage carts work in harmony at the Milwaukee Bucks' new Fiserv Forum.



Iowa Rotocast Plastics (IRP), a supplier of custom fabricated food and beverage equipment, is experiencing an increasing surge in product demand for portables and kiosks.

This type of equipment is utilised in conjunction with the built-in permanent concessions but allow the venue the flexibility of changing menus and placement.

The newly constructed **Fiserv Forum** in Milwaukee, Wisconsin represents a major project milestone for IRP.

IRP supplied the entirety of the portable food and beverage concessionaire equipment, as well as the kiosks for the Southside Market.

The IRP team worked closely with **CAA ICON** on behalf of **Levy Restaurants** throughout the entire process.

The project timeline was completed ahead of schedule, with the first shipment of portables delivered in late July and the second shipment of **Southside Market** kiosks delivered in early August, well ahead of the Grand Opening event that was held on September 4th.

IRP's crew of technicians assisted in the unpacking, setup, and placement of the portables throughout Fiserv Forum, as is customary for projects of this scope.

At Fiserv Forum the portable equipment is placed throughout the concourse, a strategy used to alleviate congestion at the main concession areas and allow the event patrons the option of making an expedient individualised purchase.

The final design for the portables was congruent for both the food and beverage equipment.

A unified aesthetic paired stainless steel accents with a front façade of white subway tile and a header fabricated from black ACM, topped with CNC die-cut brushed stainless steel ACM signage.

Equipment incorporated within the portables focused on traditional fare like sausages, popcorn, hot roasted nuts, and pretzels, as well as niche offerings like donuts, Mexican cuisine, local ice cream, and deli fare.

Specialty beverage portables included bottled beer, blended frozen drinks, and a coffee cart, which was conveniently placed next to the donut cart.

SOUTHSIDE MARKET

The market kiosks are all placed within the Southside Market, an open concept concession area located on the south upper concourse of Fiserv Forum.

The majority of the Southside kiosks consist of a front and back cart connected with an overhead canopy and a supplemental third cart positioned to create a U-shaped concession area.

Each kiosk is self-contained and designed to sell speciality foods or beverages. Speciality foods, including ethnic fusion cuisines and health-friendly options are on the rise, as venues cater to health-conscious patrons and Millennials, a demographic that has a tendency to splurge more on trendy food and experiences as a whole.

The cuisine offered in Southside Market will include gyros, **Cedar Crest**



ice cream, grilled cheese sandwiches, **Geno's** meatballs, **FreshFin Poké** bowls, and speciality slider sandwiches from the Miniwaukee market kiosk.

Bottled craft beer, cocktails, and frozen drinks will be available for purchase at the beverage kiosks located within Southside Market.

In addition to supplying the portables and kiosks, all portable condiment stations in Fiserv Forum were fabricated by IRP.

The venues that have contracted IRP — such as Fiserv Forum, **US Bank Stadium**, and **Golden 1 Center** — appreciated the option of custom designed condiment carts, since this provides a cohesive look with the other food and beverage equipment while also being built to the highest quality standards. ■

LET'S ALL HAVE A BETTER EVENT EXPERIENCE

Leonardo technology solutions are designed to protect stadia and major events from security threats.

Modern Stadia and Major Events involve various multipurpose activities and take place in wide areas where thousands of people congregate either on a regular basis and on specific occasions or periods.

This poses different challenges and issues for different stakeholders.

Thanks to the long lasting and wide-ranging experience in delivering turnkey technology solutions for Stadia and Major Events, acting as prime contractor as well as system integrator and technology provider, **Leonardo** is an ideal partner to meet both technical issues and emerging needs.

First and foremost, a security and safety issue: to protect people and goods either from common and well-known threats as well as the emerging menaces arising from malicious activities applied to and made through technology.

In addition to this, a new challenge is represented by the visitors growing demand for a better event experience away from home.

An experience which has to be comfortable, entertaining and above all engaging, especially for millennials whose participation is linked to their digital inclusion.

Consequently, the factors leading to the success of an event today are increasing in number and in complexity: this means that the main stakeholders (organisers, public safety and security) are requested to manage a heterogeneous and quickly evolving context, hence their need to be supported in managing the complexity, and not only from a technological point of view: they need a turn-key approach given by a trusted,

competent and privileged partner able to face the different issues.

RAPID DECISION MAKING

Focusing on Safety and Security, leveraging a breadth of expertise across defence, security and civil domain, Leonardo developed a solution providing a global situational awareness to Major Events and Stadia Management for a more complete and rapid decision making process.

This is achieved through the integration of information originated by technical systems inside the venue as well as outside (Last Mile).

Leonardo's capability of integrating proprietary and third party products guarantees the use of the latest technological innovation, while exploiting as much as possible previous investments to facilitate cost reductions. This approach is applied to different domains with a particular focus on physical and cyber security.

Leonardo physical security component involves the use of multiple layers of interdependent systems designed to deny unauthorised access to facilities, equipment and resources and to protect visitors, personnel, and property from damage or harm (TVCC and access control with biometric advanced algorithms, EVAC, smoke detectors).

The cyber security component is aimed at detecting, protecting and responding to the most persistent cyber-attacks.

Leonardo professional and infrastructural services are aimed at increasing the resilience (hardening) of the infrastructures of its customers with respect to cyber-attacks coming from inside or outside the organisation.



The Intelligence component permits clients to prevent, manage and investigate potential threats. This is achieved thanks to systems and services based on the monitoring and analysis of open sources, deep and dark web, for preventing threats against companies, people and goods.

Leonardo also extends integration to event organisers, clubs, public authorities, law enforcement and emergency services to prevent and mitigate critical situations, thanks to inter-operable secure communications.

Indeed Leonardo Professional Communications solutions are aimed at supporting cooperation among different agencies and this is achieved through use of the CSP Perseus integration platform.

Leonardo acts both as a technology provider and system integrator.

We develop in-house technologies (TETRA, DMR, LTE) and network integration infrastructures.

Last but not least, Leonardo consolidated experience in different sectors (safety and security, professional communications, cyber security, but also automation, SCADA, plant designing, system integration) is a distinguishing feature to provide complete solutions encompassing various domains and to respond to the increasing demand for turn-key solutions coming from customers. ■

SEEING THE LIGHT

Five English Premier League Clubs have debuted Musco's TLC for LED Stadium Lighting for the 2018-2019 season.

Five Premier League clubs are enjoying the benefits of new pitch lighting at their home grounds for the 2018/19 season.

The new **Musco Lighting** systems are significantly enhancing visibility, broadcast quality, energy efficiency, and the overall stadium experience for players and spectators.

Cardiff City FC, Southampton FC, and Wolverhampton Wanderers FC are among the clubs to have had new LED lighting installed, continuing a growing trend among **EPL** clubs.

The transition to LED for field-of-play lighting at major stadiums and arenas has become more frequent in recent years, as advances with the technology have made it a cost-effective option.

In that time, stadium owners also have discovered a wide disparity in how well different LED solutions perform. In some cases, clubs that had LED lights installed in just the past few years have already been forced to have them replaced due to problems with glare, unreliable performance, and failing to comply with necessary lighting and light-level specifications.

With the new LED lighting in place, Cardiff City, Southampton, and Wolves are poised to offer an enhanced stadium experience for players and fans.

The system's patented visoring virtually eliminates glare that non-shielded LED fixtures create, and its DMX integration allows individual fixtures to synchronise with music for cutting-edge light shows.

Multi-zone aiming will greatly improve broadcast quality, and the system's reliability and long-term warranty relieves the clubs from worrying about maintenance or paying to maintain the system.

Southampton's Board Member and Director of Legal & Risk Tim Greenwell said: *"We have had a number of challenges in getting our stadium to meet the Premier League's compliance requirements. We engaged with Musco to find a lasting solution to the longstanding problem of lighting at St Mary's.*



"We want to provide our fans with the best possible experience, both at St Mary's or at home, so we wanted to engage the market leaders and we have not been disappointed by the results."

Each of these five most recent EPL clubs to make the switch to LED conducted exhaustive, independent research comparing the performance of different manufacturer solutions, before all of them chose to partner with Musco Lighting.

Musco's Total Light Control – TLC for LED® technology is distinctive in that it's designed as a complete and highly-customised system, manufactured to meet each stadium's exact needs based on their unique architectural and environmental features.

Wolverhampton Wanderers' Head of Operations Steve Sutton said: *"Since Wolves were last in the Premier League the floodlighting requirements have changed significantly, as a result we needed to completely replace ours. Musco were chosen as the preferred supplier following extensive research into their products and capabilities.*

"The system is now fully installed and we are delighted with the end

result, especially given the very tight timeframe they had to work to. We are very excited to now be able to deliver first class lighting with entertainment capability that will enhance the fan experience here at Molineux for years to come."

This brings the number of EPL clubs that have had Musco's LED system installed to 11, in addition to other iconic UK venues such as **Twickenham Stadium, Manchester Arena, and Wimbledon's Centre Court.**

"Every venue is unique and has its own set of lighting, structural and electrical challenges. Our project design and installation teams take great pride in developing site specific solutions centered around Musco's state-of-the-art lighting equipment," says Jeff Rogers, Vice President of Musco.

"We work closely with each stadium operator to assure all the details are covered and the EPL standards for illumination are met from day one. No doubt the fans will be enthused about the improved illumination for broadcast and the new 'Show' features of the LED lighting system." ■

PUTTING THE AUDIO INTO AUDIO-VISUAL FOR FAN ZONES

Football fans enjoyed the World Cup on Brighton beach this summer thanks to NEXO's continued teamwork with The Luna Cinema.

England's unexpected run in the **FIFA World Cup**, combined with an equally unexpected summer of sunshine in the UK, has raised the profile of large-format open-air screenings and broadcast relays.

The innovative and adventurous outdoor cinema specialists **The Luna Cinema** have expanded their offering from feature films to include event and sports broadcasts, and got off to an early start this season with a large presentation of the Royal Wedding in the grounds of Kensington Palace.

The company has completed its first residency on Brighton Beach, creating the Luna Beach Cinema, a 4,000-capacity open-air movie theatre just yards from the sea.

Timed perfectly for the FIFA World Cup and the **Wimbledon** tennis championships, visitors have enjoyed the performance of a new **NEXO GEO M10** line array system, teamed with a new ProLights 10m x 6m LED screen, essential technology for screening in bright sunshine in a residential neighbourhood.

NEXO QUALITY

The Luna Cinema operation has been an enthusiastic user of NEXO audio systems since 2015, purchasing a sizeable inventory of GEO M6 compact line arrays for use with the screens that tour some of the most historic and picturesque venues in

the UK, from Westminster Abbey to Chatsworth House.

This summer, Luna's Technical Director Jamie Plummer and Production Manager Tom Barton chose NEXO's new GEO M10 mid-size array system, with its dedicated subbass cabinets, specifically to service the six-week Luna Beach Cinema event.

"We've had a very successful run with NEXO and their line arrays," explains Barton, *"so we wanted to stay with the brand. Jamie and I took a trip to NEXO HQ in Paris, where it was really helpful to hear the new M10 side-by-side with the GEO M6, which we know so well. Adding the larger line array models gives breadth and depth to our inventory, and they are the perfect complement to our new highest-definition LED video screen."*

This latest investment in NEXO sound reinforcement includes GEO M10 line array modules and MSUB15 subbass cabinets, together with NEXO's brand-new NXAMP4x2 amplifiers.

All equipment has been supplied by Orbital Sound, one of NEXO's main dealers in the UK.

"The GEO M10 is particularly versatile, allowing us the choice of groundstacking or flying systems," continues Barton. *"Flexibility is a priority for us: how the system travels, how it packs down. Set-up of M10 is so easy, we can carry six modules in a flightcase, and just pick them up onto the line array towers. Many of our sites are noise-sensitive, and the GEO M10, with its cardioid subs, allows*

us to manage the LF and avoid complaints from the neighbours."

DAYLIGHT SCREENINGS

The centrepiece of Luna Beach Cinema is another new acquisition, ProLights' next generation OmegaPIX LED video screen, which is 10m wide by 6m high, delivering a high resolution of 3072pix wide by 1280pix high. The screen was supplied by **A.C. Entertainment Technologies Ltd's (AC-ET)** specialist video division.

With the company previously utilising a video solution comprising of HD projectors and a pop-up screen, movies could only be shown after dusk to ensure sufficient image quality in ambient light.

However, wanting to expand into hosting screenings throughout the day, the Luna Cinema decided it was time to invest in a high brightness outdoor LED video wall.

Specifically designed for temporary outdoor daytime events, the range features an IP65 version in the popular 3.9mm pitch and utilises next generation NovaStar A8 graphics receiving cards combined with 18 bit+ ClearView technology to deliver truly stunning picture quality even in bright daylight conditions.

The Luna Cinema's Head of Production Jamie Plummer commented: *"With our state-of-the-art new OmegaPIX LED screen, in our opinion we've just raised the performance bar for open air screenings. The screen's image quality is fantastic. It's bright enough to cope with daylight, has IP65 protection, and is designed for quick and easy assembly."*

Further information:
www.thelunacinema.com ■

Create a **LASTING IMPRESSION**

INNOVATIVE & CUSTOM DESIGNS FOR ANY STADIUM OR ARENA



CHECK US OUT

This custom built margarita kiosk is located at the new Milwaukee Bucks arena at Fiserv Forum in Milwaukee, WI.



IOWA ROTOCAST PLASTICS

DRAW IN THE CROWDS WITH UNIQUE CARTS & KIOSKS

Iowa Rotocast Plastics was the proud supplier of all portables for the new Fiserv Forum in Milwaukee, Wisconsin. IRP is a supplier of fabricated food and beverage portables incorporating any specified preparatory equipment, including grills, woks, draught, refrigeration, warming drawers, and hot and cold wells. All IRP equipment is designed and fabricated in-house and is proudly made in the United States of the highest quality materials.

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STADIUMS ASIA & AUSTRALASIA

AUSTRALIA
Brisbane: Dolphin Oval

Phased redevelopment of the Redcliffe Dolphin Stadium at Kippa-Ring to help Brisbane Bombers' NRL expansion. Multi-stage upgrade for Redcliffe Dolphins rugby league club. 4,000-seat western stand completed June 2016. More stands to follow on eastern and northern ends. Covered seating, upgraded change rooms and a recreation area for schools and junior player camps. Finance: Federal Government AUD\$4m, Moreton Bay Regional Council AUD\$3m.
Capacity 10,000
Brookvale, NSW: Brookvale Oval
Proposed new home of NRL team Manly Sea Eagles to resist urge to move to Allianz Stadium. Community consultation process. Development of land on Pittwater Road for commercial and residential. Owner: Warringah Council.
Capacity 23,000
Cairns: Rectangular Stadium
Study commissioned from Coffey Sport and Leisure. Owner: Cairns Regional Council.
Capacity 20,000
Cost AU\$66m
Canberra Stadium
Crumbling home of the ACT Brumbies and Canberra Raiders. Maintenance costs of AU\$2m per annum. Naming rights in prospect and then new under cover multi-purpose stadium in Civic for Raiders, Brumbies, soccer, concerts, conferences, netball and basketball. Expandable to 45,000 for any future World Cup bid.
Capacity 25,000-35,000
Completion 2020
Darwin: TIO Stadium
Proposal by AFLNT (Chief Executive Tony Frawley) for upgrade of TIO Stadium at Marrara Sporting Complex. Expanded main grandstand, portable stands on the scoreboard side, kitchen and dining facilities, new changerooms and resurfacing. Designs and feasibility study (AU\$50,000) completed for submission to the Federal and Northern Territory Governments
Cost AU\$80m
Fremantle Oval Precinct
Development to maximise community use and commercial exploitation for Fremantle Football Club, South Fremantle Football Club, the Western Australian Department of Sport and Recreation, and the AFL. Masterplan: Coffey Commercial Advisory, Cox Architects, WT Partnership. Commonwealth Games 2018: athletics competition and the opening and closing ceremonies. Capacity will be temporarily increased from 25,000 to 40,000. A new warm-up track will also be constructed. Owner/operator: Stadiums Queensland.
Capacity 40,000
Gold Coast City: Hockey Centre
Upgrade complete ahead of the Gold Coast 2018 Commonwealth Games. Realignment of the synthetic pitches to meet international competition, upgrade and expansion of the clubhouse. Jobs: 50. Architect: MODE Design. Audit Quantity Surveyor: Aquenta Consulting. Construction: Alder Constructions.
Cost AU\$14.5m
Capacity 5,000 (200 legacy)
Completion 2017

Gosford: Central Coast Stadium
Australian Hyundai A-League team the Central Coast Mariners have revealed plans for upgrades to their Central Coast Stadium. The main components of a stage one upgrade to include: dual big screens in the south east and north west corners of the venue; weather/sun protection over the northern grandstand; yellow seats; additional changing rooms; wi-fi compatibility; state of the art sound system; upgrade of the corporate facilities (including a 100-seat function room); retail and café precinct.
Parramatta: Western Sydney Stadium
Work has begun on the new stadium. Lendlease has been named as preferred design and construct contractor to deliver the new venue, on behalf of Infrastructure NSW. The stadium redevelopment project, designed by Populous, will bring Western Sydney a brand new rectangular stadium with all 30,000 seats under roof cover, plus an additional 1,000 person standing area. The new stadium will be able to support a number of different sports. Work to demolish the existing stadium will begin early this year and it is expected to be open to fans in 2019. Possible demolition of Parramatta swimming centre for a stadium forecourt with retail. Better sightlines. VIP and media, 4 x dressing rooms. Incorporation of safe standing zone (1,000) that can be switched to seating. Tenants: Western Sydney Wanderers and Parramatta Eels. Parking: 1,000. Owner: Parramatta City Council. Consultant: PricewaterhouseCoopers.
Capacity 30,000-32,000 (expandable to 35,000)
Cost AU\$300m
Completion March 2019
Melbourne: MCG Sports Link
The Melbourne Cricket Club (MCC) and the Melbourne Cricket Ground (MCG) Trust have presented a billion-dollar plan to the Victorian Government that proposes a link between the MCG and the Melbourne and Olympic Parks. Elevated pedestrian podiums stretching from the MCG to Richmond Station and a new hotel and health club, with later development to include decking of the railway tracks between the MCG and the Melbourne and Olympic Parks decked, with open space created for events in the middle. To compliment the expected redevelopment of the Great Southern Stand.
Richmond: Tigers Stadium
Proposal by Richmond Tigers AFL (CEO Brendon Gale) for new stadium at the club's Punt Road Oval headquarters. Team plays at MCG but could use a lower-capacity, low-cost stadium to make smaller fixtures more viable.
Capacity 40,000
Rockhampton, Queensland: NRL Stadium
Central Queensland Stadium committee set up to consider sites and manage licensing and approvals stages. Project is dependent on the success of the region in getting its own NRL team. Stadium and 1,000-seat convention centre. Jobs: 425 (operational). Developer: Capricorn Enterprises (CEO Mary Carroll). Architect: Populous. Finance: State Government.
Capacity 20,000
Cost AU\$130-150m
Sydney: Allianz Stadium
Naming rights deal is helping fund upgrade to Sydney Football Ground. Proposed level-one deck to connect to the eastern and western stands, forming a continuous upper bowl to provide extra seats at the goal ends. Developer: Sydney and Cricket and Sportsground Trust.
Capacity 60,000 (55,000)
Sydney: Blacktown Olympic Park (BOP)
Proposed upgrade to host a new AFL franchise in western Sydney. 170 metre by 150 metre main oval with a second practice field and ancillary facilities.
Capacity 10,000 (current)

Sydney: ANZ Stadium
Masterplan for upgrade of former Olympic Stadium, now back in NSW Government ownership. Operator: STADIUM Australia Operations Pty Ltd (ANZ Stadium Managing Director Daryl Kerry). Contractor: Laing O'Rourke. Architect: BVN Donovan Hill. Engineer: Arup. Vision includes a retractable roof, reconfiguration of the Stadium's lower seating bowl to improve spectator viewing and playing field dimensions - bringing spectators as close as five metres to the field of play at the northern and southern ends of the Stadium through the installation of moveable grandstands and creating a perfect rectangle for rugby league, rugby union and football; increasing the eastern and western boundaries to provide longer straight-hit boundaries in cricket and a more traditional oval shape for AFL. New and refurbished player and spectator facilities including restaurants, bars, terraces and eateries. Development of the precinct outside the Stadium, which is expected to include new precinct bars, cafes and restaurants for Stadium patrons to enjoy before and after events.
Capacity 80,000
Cost AU\$350m
Completion 2018
Sydney: Liverpool Multipurpose Stadium
Mayor Ned Mannoun's proposal for a new covered roof stadium. Retractable pitch to provide a convention and event centre floor. Possible home for Wests Tigers NRL team. Part of an entertainment and cultural precinct at Woodward Park, 800 metres from Liverpool train station and a kilometre from the M5. Finance: AUD\$400m developer contributions, AUD\$200m from the NSW Government.
Capacity 30,000
Cost AU\$600m
Sydney: Moore Park Stadium
Proposed new stadium at Moore Park for Sydney FC, currently playing at Allianz Stadium.
Capacity 55,000
Sydney: Western Sydney Stadium
Western Sydney's new stadium is 70% complete and will be ready to open in mid-2019. The new venue will be home to the A-League football club Western Sydney Wanderers and NRL rugby league team the Parramatta Eels. Construction began in September 2017 on the site of the old Pirtek Stadium and the next phase of construction will see completion of the Western Grandstand before 30,000 seats are installed and the stadium's two giant video screens are installed. The stadium, designed by Populous, has already seen 26,000 cubic metres of concrete poured into the foundation and more than 3,300 tonnes of steel lifted into place.
Completion 2019
Townsville, North Queensland Stadium
Construction progressing well. The civil earthworks, driven piling and a significant amount of substructure and in-ground hydraulics work is already complete. The 25,000 seat stadium will become the new home of the NRL's North Queensland Cowboys. The stadium features a horseshoe-shaped, cantilever roof inspired by the pandanus plant which is achieved by using folded plates instead of traditional trusses. These plates have been chosen for their ability to resist cyclonic wind loads while also providing flexibility to allow for roof expansion and contraction due to tropical temperature fluctuation. The project, which has been designed by Cox Architecture and is being built by Watpac, is on track for delivery by the start of the 2020 NRL season.
Capacity 25,000
Cost AU\$250m
Completion 2020

CAMBODIA

Phnom Penh: Morodok Techno National Stadium

Centrepiece of the 2023 Cambodia SEA Games, in multi-purpose sports complex on the outskirts of Phnom Penh in Prek Phnov. Complex also houses Olympic swimming pool, outdoor football pitch, running track, tennis courts and dormitories for athletes. Finance: \$100m donation from the Chinese government.

Capacity	60,000
Cost	\$100m
Completion	2021

CHINA

Hebei Province: CFFC Training Centre

China Super League side Hebei China Fortune Football Club (CFFC), has announced plans for a new Populous-designed professional training centre. To be located in Gu'an County of Hebei Province, approximately 50 km south of Beijing, the training base will include 12 FIFA standard football fields, a training hub, medical centre, hotel and apartment, gym and all the support facilities.

Completion 2018

Hong Kong: Kai Tak Sports Park

Proposed stadium at heart of 24 hectare sports hub as part of redevelopment of airport site. Companies interested in supplying goods and services to project can now register their interest on the project website. Three prequalified tenderers were invited by the Home Affairs Bureau on December 29, 2017 to make tender submissions for the contract for the design, construction and operation. The three consortia include an Alibaba Group subsidiary, New World Development and Dragages Hong Kong, a subsidiary of France's Bouygues Construction. The current Design, Build and Operate scheme includes a 50,000-seat, retractable roofed stadium, a public sports ground with seats for at least 5,000 and an indoor arena with 10,000 seats. Government seeking HK\$32 billion (US \$4.1 billion) from the legislature to help build the huge sports park Developer: Home Affairs Bureau. Finance: public.

Capacity	50,000
Cost	HK\$32bn
Completion	2022

Hubei Province: Yichang Sports Centre

Main stadium and other facilities.

Capacity	40,000
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Jiangsu Province: Yancheng Stadium



Main stadium and other sports facilities in Sports Centre configuration. Outdoor tennis (1,000) and swimming (1,500) and indoor arena. Area (site): 218,298m².

Capacity	34,000
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Shaanxi Province: Xianyang Sports Centre

Outdoor stadium Area: 68,695m².

Capacity	40,000
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Suzhou: Multi-purpose stadium

Main stadium, one of five facilities on a single campus – stadium, sports and entertainment arena, an international-standard swimming complex, an athletics track and training centre. Plus retail mall and hotel. Curved roofs of the stadiums give the impression of pavilions in flowing landscape. Stadium roof: single-skin cable network. Well connected to the Metro. Owner: City and District authorities. Developer: Suzhou Industrial Park Sports Industry Development. Architect: von Gerkan, Marg and Partners gmp. Area above ground: 263,310m². Area below ground: 157,730m². Building services, energy planning and LEED green building consultancy services: Mott MacDonald.

Capacity	45,000
Completion	2017

Zhejiang Province: Hangzhou Stadium

Main 'Olympic Stadium' and separate tennis centre (+12,000). Adjoining Hangzhou Olympic Sports Expo Centre will be a large urban complex which is expected to boost economic activity in the areas of commerce, travel, accommodation, entertainment, food, leisure, vacation, shopping and other services.

Capacity	80,000 (stadium), 12,000 (tennis)
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Zhejiang Province: Ningbo Sports Centre

Main stadium, arena and swimming hall. Area: 598,000m².

Capacity	46,000
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GOA

Panaji: Campai Football Stadium

With the original stadium already demolished, the State Government has promised a FIFA-compliant soccer stadium in the next 18 months. The project is being developed in consultation with Collage Design, the infrastructure consultants for the 2017 Under-17 World Cup in India.

Capacity	4,000
Cost	Rs 45 crores
Completion	2018

Thivim Cricket Stadium

For international matches and Indian Premier League (IPL) matches. Area: 100,000m². Owner: Goa Cricket Association (president Chetan Desai). Needs government approval.

Capacity	35,000
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INDIA

Dwarka Cricket Stadium

International cricket stadium to become HQ of Delhi and District Cricket Association (DDCA). DDCA talking to ministry of urban development over the process of identifying and acquiring 10 acres required. To replace The Kotla (38,167).

Capacity	50,000
Cost	Rs 150 crore
Completion	2020

Gujarat, Ahmedabad Cricket Stadium

Building work has begun on the new Ahmedabad Stadium, which will become the biggest cricket stadium in the world. The new Populous-designed stadium, which is being built on the site of the Sardar Patel Gujarat Stadium, will be able to hold 110,000 spectators. The new complex is expected to take about two years to build and facilities include three practice grounds and an indoor cricket academy. The stadium will have 76 corporate boxes, four dressing rooms, a clubhouse and an Olympic-size swimming pool. Once completed, it is also expected to be the home of Indian Premier League side, the Gujarat Lions..

Cost	US\$84m
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Hindustan, Solan, Chail: Cricket stadium

Preparing detailed project report for construction of a cricket stadium (international standards).

Jammu and Kashmir Cricket Stadium

International standard cricket stadium on land donated by government to Kashmir Cricket Association (JKCA). Finance: Board of Control for Cricket in India (BCCI).

Kerala: Stadium programme

Multi-purpose indoor stadium in each of the 14 Districts of the State. Finance: Kerala Government plus renovations and upgrades to existing facilities. Announced as part of the first budget, using money from the Special Infrastructure Fund. Stadium names will be dedicated to sports personalities who have done Kerala proud: Thiruvananthapuram (Thomas Sebastian, football), Kollam (Olympian Suresh Babu, athletics), Pathanamthitta (Blessen Goerge, volleyball), Alappuzha (K. Udayakumar, volleyball), Kottayam (Susan Mable Thomas, athletics), Ernakulam (Olympian O. Chandrasekharan, football), Idukki (K.P. Thomas, athletic coach), Thrissur (I.M. Vijayan, football), Palakkad (K.K. Premachandran, athletics), Malappuram (P. Moideen Kutty, football), Kozhikode (Olympian T. Abdul Rehman, football), Wayanad (C.K. Omkaranathan), Kannur (Jimmy George, volleyball), Kasargod (M.R.C. Krishnan, football). Sports Department also planning a mini stadium in each of the panchayats in the State (Rs. 5 crore each). Renovations of the Jawahar stadium in Kannur and the construction of a new stadium in Adoor (Rs. 10 crore each). Upgrading of sports schools (Rs. 30 crore each to two schools), volleyball academy in Alappuzha named after Kalavoor Gopinath (Rs. 50 lakh) at the new indoor stadium named after K. Udayakumar. Finance: Kerala State Sports Council and Directorate of Sports and Youth Affairs. Budgeting has begun for the Asian Beach Games in the State during 2018.

Cost	Rs 500 crore (US\$74m)
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Lucknow: Ekana International Cricket Stadium

Newly opened international cricket stadium and cricket academy project developed on a public-private-partnership model. Residential and commercial as main part of development. Owner: Lucknow Development Authority (LDA). Consultants: Innovest Advisory Services Pvt, Uttarakhnad Infrastructure Development Company and Infrastructure Development Finance Company Ltd. Area: 60 acres.

Cost	Rs 400 crore
Completion	Q1 2017

Mussoorie: Multipurpose Stadium

Stadium in hill town at altitude of 1,800 metres. Ahead of 38th National Games (2018). Outdoor stadium for hockey, football and 400-metre athletic track, indoor hall for four badminton courts and table-tennis. Basketball and volleyball courts inside the stadium. Area: 3.6 hectares. Construction: Uttarakhnad Peyjal Nigam.

Punjab: Shahbaz Park & Sports Stadium

Main stadium and community sports facilities.

INDONESIA

Borneo: Balikpapan Stadium

New home base of Balikpapan's football team Persiba, which plays in Super League Indonesia.

Capacity	40,000
Completion	2017

Gelora Bung Karno National Stadium

Renovation ahead of 2018 Asian Games. Improved spectator facilities, individual seating.

Cost	Rupiah 500bn (US\$40m)
Completion	July 2017

Jakarta Velodrome

For the 2018 Asian Games, to cycling federation standards and in legacy converted to multi-use. Stakeholder workshops have already kicked off the design process. A modular structure will be used and readily available materials chosen. Roof: membrane. Contractor: ES Global, leading the Design & Build team – Cox Architecture, engineering Mott MacDonald, construction Wika and local architects BKM.

Capacity	3,000
Cost	US\$40m
Completion	June 2018

Jakarta Velodrome



JAPAN

Tokyo: Kasumigaoka National Stadium



Building work now underway on an oval, wood-latticed framework design chosen in new international competition to achieve a more affordable project. Lumber from earthquake hit area. Tiered levels with plants and trees on concourses. Japanese-style interiors. Architect: Kengo Kuma. Construction: Taisei Corporation, Azusa Corporation. The first competition was won by Zaha Hadid Architects, but was ruled out in July 2015. In 2014 around 40,000 Japanese sports fans made the pilgrimage to bid a fond Sayonara to the national stadium. Demolition of the stadium started in July 2014 and completed in May 2015. Construction start delayed by one year. It will not now be used for the 2019 Rugby World Cup, but will host the Opening and Closing Ceremonies, athletics, football and rugby competitions for the 2020 Olympic and Paralympic Games. Debate continues over design and capacity. Ambition to incorporate green technologies. Owner: Japan Sports Council. Area: 290,000m². Architect: Kengo Kuma. General constructor: Taisei Corporation and Azusa Corp.

Capacity	68,000 (expandable to 80,000)
Cost	¥149bn (£932m) (US\$1.3bn)
Completion	November 2019

Ariake Tennis Park

Some permanent, some temporary stadiums. Legacy: temporary parts will be re-used for community and schools sport. Capacity main stadium 10,000, stadium² 5,000, stadium³ 3,000 (legacy 1,000), stadium⁴ 2,500 (legacy 0).

Capacity	20,500, legacy 3,500 (total)
Cost	US\$66.754m

Dream Island Archery Field

Tokyo 2020: archery. Legacy: integrated into the parkland surroundings, to host national and international archery competition events. Owner: Tokyo Metropolitan Government.

Capacity	7,000
Cost	US\$15.84m

Kamaishi: Kamaishi Recovery Memorial Stadium

The only newly built stadium for the Japan Rugby World Cup 2019 has opened in the 2011 tsunami and earthquake devastated city of Kamaishi. The Kamaishi Recovery Memorial Stadium in Iwate Prefecture was opened on 19 August. Built on the former site of the local Elementary and Junior High Schools, construction of the stadium began in April 2017. The Kamaishi Recovery Memorial Stadium will be the only newly built facility of the 12 Rugby World Cup venues. Upon completion, it will have a permanent capacity for 6,000 spectators, with 10,000 additional temporary seats to be added for Rugby World Cup 2019, bringing the total capacity of the stadium to 16,000 for the two Rugby World Cup fixtures it will host.

Completion	2018
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Musashino Forest Sport Centre

Under construction in the Tama district of Western Tokyo. Tokyo 2020: modern pentathlon. Owner: Tokyo Metropolitan Government. Legacy: sports, concerts and other cultural events.

Capacity	8,000, legacy 6,600
Cost	US\$282.857m

Completion	2016
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Sea Forest Waterway

Tokyo 2020: rowing and canoe-kayak (sprint). Legacy: rowing and canoe competition plus leisure. Construction of additional permanent structures required.

Capacity	24,000 (10,000 seated), legacy 2,000
Cost	US\$78.069m

Seaside Park Hockey Stadium



Newly built in Ohi Seaside Park. Tokyo 2020: hockey. Legacy: remodelled as a hockey stadium with 4,000 capacity. Owner: Tokyo Metropolitan Government

Capacity	10,000 (legacy 4,000); stadium 25,000
Cost	US\$28.286m

KOREA

Changwon City: NC Dinos Baseball Park



Roof top gardens stretching the length of the building. 360 open views to the field and circulation around the whole stadium. fixed seating, grass berms and timber terraces. Restaurants, fan retail shop, function room and café have been designed for use outside game day. Design and build: Populous and Haeahn Consortium.

Capacity	22,000
Cost	US\$100m
Completion	2018

Seoul Ballpark

New baseball stadium next to the Han River and sport facilities built for the 1988 Summer Olympic Games. Part of the city's urban development plan in Jamsil, southeastern Seoul. Current stadium will be demolished to make way for exhibition and convention facilities covering 100,000m². Olympic swimming pool and gymnasium will also be renovated into an indoor sports complex. Home for the LG Twins and Doosan Bears, To begin in 2021. Developer: Seoul Metropolitan Government.

Capacity	35,000
Cost	Won 2-3tn
Completion	2023

MALAYSIA

Kuala Lumpur: Sports City

Government refurbishment of Bukit Jalil National Sports Complex into Kuala Lumpur Sports City. Project 1 readies Bukit Jalil National Stadium to host the 2017 Southeast Asia (SEA) Games, will carry out targeted works on Putra Stadium, National Aquatic Centre and National Hockey Stadium, improve integration with current and existing public transport links, and enhance pedestrian access across the site. Project 2 (early 2018) will create KL Sports City, a fully-integrated sports hub with high performance sports training facilities, a sports rehabilitation science centre, a youth park, public sports facilities, a sports museum, youth hostel, convention centre, and a sports-focused retail mall. Project designer: Populous. Design and build: Rukun Juang Sdn Bhd (RJSB).

Capacity	80,000
Cost	US\$237m
Completion	2020

Johor: Sultan Ibrahim Larkin Stadium

Johor Darul Ta'zim's (JDT) new stadium (club owner Tunku Ismail Ibrahim). Part of JDT Sports City project. Construction: Forest City. Area: 35 acres. Finance: private, including investment from Valencia CF.

Capacity	45,000
Cost	S\$180 (US\$127m)
Completion	2019

NEW ZEALAND

Auckland: Waterfront Stadium

Proposals for a new sports stadium on the waterfront in downtown for Vodafone New Zealand Warriors (Chairman Bill Wavish), the Blues and soccer. City supportive but could be as much as a decade off. To replace Mount Smart Stadium. Club looking for government financial support to add to possible private funding of NZ\$100m. Regional Facilities Auckland (RFA) Chief Executive, Chris Brooks, investigating.

Dunedin: University Oval
Proposed enlargement of the playing area of the Dunedin ground for Otago Cricket (Chief Executive Ross Dykes) and to make it a test venue. Owner: Dunedin City Council.

Capacity	6,500 (3,500)
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Tauranga Stadium

Proposed purpose-built stadium at The Domain as part of civic heart project. Proposed by group of property developers. City to consider all submissions.

PAKISTAN

Islamabad: Benazir Bhutto Stadium

Cricket Stadium delayed over environmental concerns as the land is in the National Park Area at Shakarparian. Land lease: CDA (30% of stadium income). Developer/operator: Pakistan Cricket Board. Area: 35 acres. Area: 35 acres.

Capacity	50,000
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Karachi: Bahria Town Cricket Stadium

Pakistan's largest cricket stadium at the Bahria Sports City. Plus football ground, golf course, and a five-star hotel. Architect: GMP Architects. Owner: Bahria Town..

Peshawar Soccer Stadium

Proposed stadium with central government support.

Cost	Rs30m
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PAPUA NEW GUINEA

Port Moresby: Sir Hubert Murray Stadium

Private public partnership. Construction: Curtain Brothers. Government seeking sponsorship from BSP to finish main grandstand. New trustees will be appointed for ongoing operation. Will host games in Rugby League World Cup 2017. Minister for Sports and National Events: Justin Tkatchenko.

Capacity	20,000
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PHILIPPINES

Manila Football Stadium

Home for national soccer team. Location to be decided. Owner: Philippine Sports Commission (PSC). Funding: annual operating costs FIFA.

Capacity	75,000
Cost	P300m

TAIWAN

Tainan Ballpark

City government planning to build an international standard baseball stadium in the city's coastal Annan District, featuring administrative and TV broadcasting facilities. Open international design contest for the baseball stadium and training complex. Second stadium and two little league arenas. Site area: 30-hectares. Gym, training pitches, dressing areas and public spaces. Project Sponsor: Department of Sports, Tainan City Government. Project Organiser: Bureau of Public Works, Tainan City Government. Co-organizer: Taiwan Engineering Consultants Group / Transcend Engineering Consultants.

Capacity	25,000
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SOLOMON ISLANDS

Honiara: National Stadium

To host 17th Pacific Games in 2023.

Completion	2021
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TONGA

Nuku'alota: National Stadium

Upgrade ahead of the 2019 Pacific Games. New Zealand-funded feasibility study and design.

Capacity	5,000
Cost	\$NZ2m

EMEA

ALBANIA

Tirana: National Soccer Stadium

To ensure hosting of UEFA competitions. On site of 70-year-old Qemal Stafa Stadium. Demolition of old stadium under way. Underground parking, hotel, shops and bars. Developer: Albanian soccer federation. Construction: Albstar.

Capacity	22,300
Cost	€50m
Completion	2019

ALGERIA

Algiers: Baraki Stadium

Soccer stadium, including practice facilities. VIP hospitality areas, conference rooms and offices. Secondary stadium, training fields, indoor halls, tennis courts, along with residential/educational and commercial facilities. Architect: Atelier Tom Sheehan & Partners (ATSP). Developer: Wilaya. Manager: DJSL. Engineers: GLI, DVD, Designer: ABDI, QS: AD economist. Contractors: CRCEG (China).

Capacity	40,000
Cost	€100m (overall €210m)
Completion	2018

AUSTRIA

Vienna: Generali Arena



Upgrade for Austria Wien's soccer stadium. VIP lounges: 38. Temporary move to Ernst Happel Stadion. The north stand will hold 4,100 spectators and include 28 VIP boxes, two sky boxes and two boxes for dignitaries. It will have an underground car park for 370 VIPs. The east stand will hold 5,050 spectators and house the fan shop, museum and a restaurant. The west stand will seat 5,600 spectators, while the south stand will take 2,750 spectators and will also be host to two TV studios, the press area, as well as the team dressing areas. It will include 10 VIP boxes.

Capacity	17,500
Cost	€42m
Completion	Q3 2018

AZERBAIJAN

Dalga: National Team Stadium

Base for national team, financed by AFFA.

Capacity	6,000
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FC Gabala Stadium

Stadium, training base (5 natural, 1 synthetic pitches) and Academy of Football Administration (education).

Area:	7 hectares.
Capacity	15,000

BAHRAIN

Sakhir: Football Stadium

International standard stadium with football pitch, an underground shopping complex and a cinema in Southern Governorate. To include an Olympic-size swimming pool, sports training schools and halls dedicated to various sports such as basketball, handball, bowling, badminton and table tennis. Also to help Bahrain enter the race to host the Asian Cup championships. Developer: Southern Municipal Council (council chairman Ahmed Al Ansari).

Capacity	50,000
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BELARUS

Minsk: Dinamo Stadium

Reworking as large track-and-field complex to obtain category 1 IAAF certification. Olympic elements retained. Auxiliary stadium with warm-up ground, a sector for hammer, javelin and discus throwing along with dressing rooms and climbing wall. Perimeter will be covered with structures made of light materials. Turf: natural. New lighting, press centre, a physical culture complex, a medical centre, dressing rooms and halls for boxing, weightlifting and sports games. Catering facilities such as retail outlets, bars, cafes and restaurants as well as parking lots, including for buses, will be constructed. Backs bid to host the 2019 European Olympic Youth Festival. Design: Minskproject. Developer: Tourism Department of the Minsk City Hall.

BELGIUM

Antwerp: Royal Antwerp Bosuilstadion

Royal Antwerp FC plans to build a new western grandstand at its Bosuilstadion after winning promotion back to the top division of Belgian football. The new building will include changing rooms for players, referees and staff, a high-end media centre for the press, facilities for emergency services, catering, loges and VIP rooms.

Capacity	12,975
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Bruges: Club Brugge Stadium

Proposed new stadium and training centre in the north of Bruges for Club Brugge soccer team.

Capacity	40,000
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Cost	€100m
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Leuven: Stadion Den Dreef

New two-tier east stand. Player facilities, club offices (250m²), media zone and two cafeterias. Corporate boxes: 10. Finance: €4m public loan, €500,000 grant, rest commercial.

Capacity	3,500
Cost	€5m

Liege: Stade Maurice Dufasne

Corner filling to add 7,000 capacity at the home of Standard Liège. Possible car park.

Capacity	+7,000
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Completion	2018
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Ostend: KV Oostende Stadium

New stand with three floors in red-green wooden façade. Business seats: 1,250. Architect: Zwarts en Jansma and ABV+ Architecten.

Capacity	8,000 (+3,700)
Cost	€12m

BULGARIA

Plovdiv: Botev Plovdiv FC Stadium

Work on Botev Plovdiv's renovated soccer stadium (Hristo Botev) halted after financial issues surrounding problems with Corporate Commercial Bank AD (owner Tsvetan Vasilev). Restarted. Concession owner: Botev Plovdiv (35 years). Architect: Georgi Savov.

Capacity	18,777
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Cost	€10m
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Completion	2017
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Sofia: National Stadium

Long-term commitment confirmed by Bulgarian Sports Minister Mariana Georgieva. Possible host of Euro 2020 games. Bulgarian Football Union, Bulgarian club Slavia and German investment company IFS have signed a preliminary agreement. On the site of Slavia's stadium. Volleyball and basketball facilities. Replaces Vasil Levski national stadium which will now be used for athletics only.

Capacity	40,000
Cost	€40m

CROATIA

Croatia: Kantrida Stadium

New-build stadium for HNK Rijeka on same site. It will have about 14,000 covered seats and will meet the standards of UEFA category 4. The stadium will have approximately 3,000 seats for VIP visitors and sponsors, around 1,000 family seats and some 4,000 seats for the most loyal supporters.

Capacity	14,000
Completion	2020

EIRE/REPUBLIC OF IRELAND

Bohemians Stadium

Stadium for Bohemians after sale of Dalymount Park. Developer: Andrey Developments.

Capacity	10,000
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Bryanstown: Drogheda Stadium

Proposed for Drogheda United (Vincent Hoey). Uncertainty over land allocation and rival alternatives.

Capacity	10,000
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Dublin: RDS Arena

Planning application granted for redevelopment of three-storey Anglesea Stand as first phase of ground development (capacity to 21,000). Two-storey building attached via glazed bridge. International design competition won by Dublin-based Newenham Mulligan Architects and London-based Grimshaw Architects. Five designs anonymously shortlisted, with the winner chosen by a five-person expert jury. RDS, with Leinster Rugby, will work to complete the design that will host professional rugby matches, equestrian sports, music concerts and other sporting opportunities. Six-month time frame until choice of concept architect. Client: RDS (Chief Executive Michael Duffy). Tenants: Leinster Rugby (Chief Executive Mick Dawson), RDS Dublin Horse Show. Finance: applying for government grant, seeking naming rights deal.

Capacity	25,000 (18,500)
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Cost	€35m (Anglesea Stand €21m)
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Completion	2019
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Dublin: St Patrick's Athletic

League of Ireland Premier Division team St Patrick's Athletic FC has revealed plans to build a new stadium in Dublin. In association with HRS International and FESP International, St Patrick's announced a proposal for a major development at St Michael's Estate in Inchicore, to include new homes and an Inchicore Town Centre with state-of-the-art retail, leisure and community facilities on top of which would sit the club's new stadium. The stadium has been designed by a leading European architect, David Mizrahi of HRS International.

Capacity	12,000
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Limerick FC

Medium-term plan to build new stadium for Eircom League team playing at Hogan Park.

Capacity	7,000
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Tallaght Stadium

Plan for third stand for home of Shamrock Rovers. UEFA category 4 capable of hosting Champions League group and play-off games. Owner: South Dublin County Council. Funding: public.

Capacity	8,000 (+2,150)
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ENGLAND

Accrington: Wham Stadium



Redevelopment of the Accrington Stanley (owner Andy Holt) stadium. Terms agreed with Hyndburn Council on a 50-year lease. First phase: new 1,500-capacity all-seater single-tier stand down the Whinney Hill side of the ground. Ability to split to accommodate home and away supporters. Expandable to add corporate entertainment boxes and facilities. Architect: Frank Whittle Partnership.

Capacity	5,000
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Aldershot: Aldershot Town FC

Aldershot Town Football Club has presented Rushmoor Borough Council with its proposals for the redevelopment of the entire EBB Stadium. The stadium has been the club's home since it was originally reformed in 1926. This would see the potential development of a new stadium, containing both seating and standing areas, that will give the Club a long-term home from which to build its ambitions on the pitch.

Barnet: The Hive

Barnet FC have announced plans for a major overhaul of The Hive that would increase the stadium's capacity to approximately 8,000. Architects proposals will involve replacing the current South terracing with a new all-seater stand as well as a revamp and extension of the East Stand. Also a new-look indoor Academy centre with indoor pitches behind the South Stand. A new multi-purpose indoor sports hall will also be built at the back of the North Stand, with facilities for other sports such as basketball, netball and badminton. Behind the North Stand sports hall will be a new 11-a-side 3G AstroTurf pitch alongside eight smaller ones – open to the wider community as well as the Bees' Academy teams. Subject to planning approval from Harrow Council, the club anticipate that work on the site will begin at the end of the 2017-18 season.

Capacity 8,000

Barrow: Furness Building Society Stadium

Five-year plan from owner Mark Casson to redevelop the Barrow AFC's stadium, including new stands on the Popular Side (currently a terrace), the Main Stand (seats and standing) and the Steelworks/Crossbar End (standing) sections of the ground. New fan, corporate and hospitality facilities will also be installed and the previously planned ground improvements, including the floodlights and Crossbar building, will be completed.

Cost £10m

Completion 2018

Beverley: Beverley Racecourse Grandstand

Beverley Racecourse has submitted an application to East Riding of Yorkshire Council for full planning permission for the £4.8m development, which will provide an enhanced customer experience and additional hospitality opportunities for racegoers. The new grandstand will provide improved viewing for spectators, both inside and outside the building; expanded and enhanced catering and hospitality facilities; and fit-for-purpose kitchens, toilets and other amenities. The grandstand would replace the existing 1960s main stand which has rudimentary facilities and no disabled access beyond the ground floor.

Birmingham: Alexander Stadium



Plans have been revealed for a major revamp of Birmingham's Alexander Stadium to get it up to standard for the 2022 Commonwealth Games. The capacity of the stadium will be increased from 12,700 to 40,000 and 20,000 seats will be retained after the event.

Prime Minister Theresa May confirmed the expansion of the stadium, which will host the 2022 opening and closing ceremonies as well as athletics, when she visited Birmingham on Wednesday. She said the investment would be transformational and benefit the local community and the West Midlands region.

Cost £75m

Boston: Boston United Stadium

Community stadium for Pilgrims as part of The Quadrant. Developer: Chestnut Homes. Architect: WMA Architects and Planners. Planning permission granted. All-weather 3G pitch, educational facilities, conference and banqueting facilities; a café; education and community facilities; meeting rooms for hire; sports hall attached to stadium. Specifications to Football League standards.

Capacity 5,000

Completion 2018

Bournemouth: AFC Bournemouth Stadium

AFC Bournemouth has identified a site on which to build its new stadium at Kings Park in the seaside town. With support from Bournemouth Council, the club has been looking at potential sites for a new stadium and has identified an area of land which includes the park's athletics stadium and the club's existing training pitches. A planning application for the new stadium is expected to be submitted next year. As part of the planning process an additional feasibility study will also be carried out into the potential relocation of the athletics stadium which is currently in Kings Park. It is not the intention to utilise the current Vitality Stadium as the site for any relocated athletics track.

Completion 2020

Bristol: UWE Stadium



Bristol Rovers FC have abandoned plans to build a stadium on land leased from the University of the West of England at its Frenchay campus. Parties were unable to agree acceptable terms. Council permission had been received. Project included supporters' club bar, shop, banqueting and hospitality suite, convenience store, crèche, gym, jogging track, teaching area (19,000ft²). Facilities available to university on non-matchdays. Possible share with Bristol RUF. Parking: 1,270. Bristol Rovers sold in 2016 to the Jordanian Al-Qadi family. The club's new President, Wael Al-Qadi, has confirmed a new stadium is a "key requirement" for the new owners. Funding: private.

Capacity 21,700

Cost £40m

Cambridge Abbey Stadium

With the proposed community stadium for Cambridge United, Cambridge City and Cambridge Rugby Club blocked, the Club will now redevelop their existing Abbey Stadium. Stadium owner Grosvenor released their first sketches of potential designs for the redeveloped stadium in May 2015, with plans to change the name to the Cambridge Community Stadium. At present, the main plans are to increase the capacity in the Newmarket Road End to 3,500 and to introduce safe standing. The new design will include community facilities for public use. The Habbin Terrace will also be completely redeveloped, which will see it become fully seated and expanded as well. The main stand will also be expanded slightly and redeveloped. Feasibility study: Cambridgeshire Horizons.

Capacity 8,000

Cambridge City FC Stadium

Planning permission granted but now under judicial review. Club owns 35 acres of land and has done some preliminary work.

Capacity 3,000

Castleford Tigers Stadium

Stadium for Rugby Super League Club Castleford Tigers (CE Steve Gill) as part of £135m Five Towns Park regeneration project in former coalfields area in West Yorkshire. Adjacent to Junction 32 of the M62. Replaces Wheldon Road ground, which opened in 1926. Designed to meet Super League requirements, the purpose-built stadium will provide administration, changing facilities, restaurants and hospitality areas, with a mixture of both seating and standing terraces. Work is expected to start early 2016, with a view to Castleford Tigers moving in by the 2018 season. Developers: Lateral Property Group (MD Philip Lunn), Wakefield MDC and the Tigers. Main contractor: GMI Construction Group plc.

Capacity 13,300

Cost £15m

Completion 2021

Edgbaston: Warwickshire County Cricket Club

Warwickshire County Cricket Club has announced the next phase of development at Edgbaston Stadium. An £85 million project has been agreed with PATRIZIA UK and the Homes and Communities Agency to build 375 new Build to Rent homes and new retail and catering opportunities. The new development, which is subject to planning and local consents, will be built on a four-acre area of Edgbaston's site and it will also provide a new main entrance to the stadium on Edgbaston Road, a plaza area for match day spectator experience opportunities and an extension to the on-site car parking behind the RES Wyatt Stand.

Capacity 9,200

Exeter: St James Park

Exeter City Football Club has confirmed that work will start on its stadium improvement project this summer. Contracts to start the work at the St James Park Stadium have been signed and developers plan to begin construction in June. The project began with a feasibility study in 2006, which led to a planning proposal in 2011. This was aborted following a number of problems. The current scheme, with developer partner Yelverton Properties Developments Ltd, was instigated in 2014. It has overcome many setbacks and delays, including two substantial legal challenges. The provisional programme for the works is: June – November 2017: construction of the Big Bank toilets, new changing rooms and associated works. November 2017: demolition of the existing Old Grandstand followed by construction of the new stand and external works. This phase will also include the demolition and construction of the new Away End stand. The project is due to finish by October 2018. Enabling development of approximately 320 student beds. Commercial partner: Yelverton Properties.

Completion 2018

Forest Green Rovers Stadium

Zaha Hadid Architects won the competition to design stadium for Chairman Dale Vince. Competition oversight: Frank Whittle Partnership. Priority is sustainability – materials and operational. Public consultation on plans for a new stadium at Junction 13 of the M5 for English National League side. Part of a 100-acre sports and green technology centre called 'Eco Park' to include training fields, 4G pitches, multi-disciplinary sporting area, as well as a sports science hub.

Capacity 5,000 (expandable to 10,000)

Cost £100m (overall project)

Gloucester: Meadow Park Stadium

Gloucester City AFC seeking full planning approval for a new stadium at Meadow Park. Currently ground-sharing at Cheltenham Town's Whaddon Road since forced out by flooding.

Capacity 4,000

Completion 2019

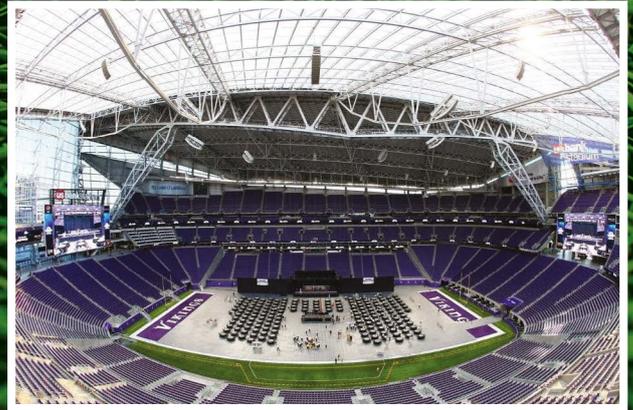
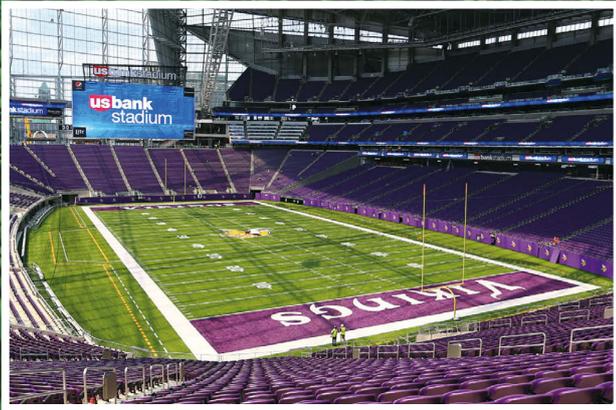
Grimsby: Grimsby Town FC Stadium

Sports and leisure property developer Extreme Leisure has teamed up with Grimsby Town FC to develop a new stadium at Peaks Parkway. Having signed an agreement with the Club, Extreme is now progressing with the viability assessment with a view to obtaining pre-application planning. The facility mix being considered includes a state-of-the-art 14,000-capacity soccer stadium, a new ice rink, additional sports & leisure facilities, retail and food & beverage offers.

Capacity 14,000

Cost £55m

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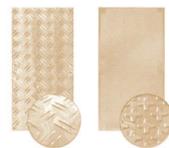
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Harrogate: Harrogate Town FC

Harrogate Town FC has been granted planning permission for its proposed developments to the CNG Stadium.

The National League North club's application was granted approval at a meeting of Harrogate Borough Council's planning committee. Proposals include a new two-storey clubhouse, seated terraces, an office building, classrooms to be used as community facilities and a new, improved floodlighting solution. The club's recently-installed 3G playing pitch was also approved by members.

The development will increase the capacity of the ground from 2,800 spectators to around 5,000.

The club was advised on its application by Indigo Planning and the scheme was designed by Bowman Riley Architects.

Leeds: Headingley Stadium



Leading structural engineering specialist TRP Consulting has been appointed to the team that will deliver the £40 million redevelopment of Emerald Headingley Stadium in Leeds. Funding agreed and planning granted for an increased capacity cricket stadium with modern fan facilities, athlete accommodation and improved integration with the surrounding neighbourhood. For the rugby stadium, the proposals will provide a replacement North and South Stand with enhanced facilities for players, fans and visitors. The new South Stand will also replace some of the Rugby capacity lost by the development of the joint Stand between rugby and cricket, and for the first time will include an element of seating within the stand. Standing capacity will still exceed the current level of members in the South Stand. Finance: public and private (Yorkshire County Cricket Club and Leeds Rhinos – CD Chief Executive, Gary Hetherington). Finance: Leeds City Council grant: £4m. Yorkshire County Cricket Club's 20-year masterplan phase one: erection of four permanent floodlight pylons; phase two: rebuild the North/South Stand in conjunction with Leeds Rugby to incorporate a three-tiered seating area to accommodate 5,060 seats, enhance corporate facilities and new permanent concession units; phase three: incorporates an additional 915 seats in the upper tier of the North East Stand; phase four: development of a new pavilion in the North West area of the stadium, which will be built on five levels and is to include state-of-the-art corporate facilities, new dressing rooms, a Members' Long Room, plus the creation of a main entrance to the stadium on Kirkstall Lane; phase five: The erection of a translucent cantilever roof to cover the White Rose Stand on the western side of the ground. Phase Six: Landscaping on the White Rose Stand and North East stand concourses.

Cost £40m

Capacity 20,000

Herne Hill: Velodrome Pavilion

Planning permission for the pavilion was granted by Southwark Council in June 2015. Construction is expected to begin this spring with completion due late in the year. Area: 275m². Owner: Herne Hill Velodrome Trust. Architect: Hopkins Architects.

Cost £1.75m

Completion Spring 2017

Leamington: Leamington FC Stadium

Leamington FC looks set to push ahead with the development of a new 5,000 capacity stadium after a deal to buy land for the project was agreed.

Warwick District Council has approved the purchase of land off Europa Way in Leamington to allow for the development of the community football stadium. Plans call for football stadium with a 3G artificial pitch, conference facilities, a gym, bar, café and community facilities on land adjacent to Europa Way and Gallows Hill.

Capacity 5,000

Leeds: Leeds United FC training ground

Leeds United unveiled plans to build a new training complex in the city, close to their Elland Road ground. In talks with Leeds City Council. The current first team training ground is based at Thorp Arch, which is over 40 minutes away from the heart of the City. In addition, the Club does not own the training facility at Thorp Arch, making it challenging for the club to bring forward their own improvement proposals that would meet the required Category 1 status. Leeds United is looking to move its official training facilities for senior and academy players to the currently vacant former Matthew Murray High School site in south Leeds. As part of the new developments, a 'Community Sports Village' would be built at Elland Road's Fullerton Park site.

Leicester: Leicester City training Ground

Leicester City Football Club has unveiled plans for a brand new, state-of-the-art training facility. The development will be on a site in Charnwood. A programme of public consultation has been scheduled for Spring 2018, giving local residents, businesses, communities and Foxes fans the opportunity to discuss the proposals for the new site – previously occupied by Park Hill Golf Club. Future plans for the site of the club's current training facility at Belvoir Drive in Leicester are under consideration and will be decided upon in due course.

Liverpool: Everton Stadium

The architect of Everton FC's new stadium is determined to capture the magic of Goodison and build a fan-first, football-first home for generations of Evertonians. Dan Meis revealed he has fallen "in love" with Everton and said the Club's "vision" and strong identity will allow him to design a stadium at Bramley Moore Dock that will be "a model for football the world over." The club and Liverpool City Council have agreed the principles of an innovative finance model.

Capacity 50,000

Liverpool: Liverpool FC Training Ground

Liverpool FC has confirmed that it will proceed with the redevelopment of its Academy site in Kirkby. The KSS-designed project will provide the club with world-class training facilities, including an elite performance centre for the first team and state-of-the-art training centre for its development squad teams. The new 9,200m² training centre on LFC's Academy site creates a combined first team and U23 Academy facility, each of which has their own identity, along with new first-team pitches and parking within the site. The facilities will incorporate two gyms, a full-size sports hall, pool, hydrotherapy complex and specialist sports rehabilitation suites. There will also be dedicated TV studios, press conference facilities and office accommodation. The club has appointed building and civil engineering contractors, McLaughlin & Harvey, to deliver the project. Architects: KSS.

London: Allianz Park

Aviva Premiership rugby club Saracens improving Allianz Park ground after winning planning permission for the scheme from Barnet Council. Replacement of ageing West Stand with a new, modern stand which would consolidate and enhance the provision of community, education and sporting facilities at the stadium. Allianz Park, as a multi-use community stadium, has become an essential hub of community, education and sporting activity in Barnet and North London.

Completion autumn 2018

London: Craven Cottage Stadium

Fulham Football Club's plans to redevelop the Riverside Stand at Craven Cottage have been approved. The Club's previous Riverside Stand design received planning permission in 2013 and this enhanced scheme also incorporates the opening of the riverside walk from Putney to Hammersmith, an aspect of the approved design and a major benefit to the local area, in addition to improved facilities for users on both match and non-match days. The new stand will increase the overall capacity of Craven Cottage and the main works are expected to commence in the Summer of 2019, with a full timeline of scheduled works announced in due course.

Architect: Populous.

Capacity 30,000 (25,000)

London: Emirates Stadium

Arsenal FC plan to increase capacity at the Emirates Stadium over the next two years. The Premier League club said the stadium's capacity has been reduced in recent seasons due to safety requirements and improvements to facilities for disabled supporters. Work will begin next May on adding approximately 780 extra seats to Club Level to help bring capacity back in line with the original figure from 2006. It will involve adding an extra row to the front of Club Level and will take the stadium's capacity to just over 60,600. Construction will be completed in two stages during the summers of 2018 and 2019. Arsenal also plans to upgrade and refurbish additional areas of Club Level over the next two years. The first upgrade will be to Dial Square in the summer of 2018, which will see the area transformed to celebrate the club's original name of Dial Square Football Club.

Completion 2019

London: Brentford Community Stadium



Construction work on Brentford FC's new 17,250-seater stadium has been underway for more than four months and the venue is starting to take shape. Key milestones have been satisfactorily achieved with piling works for the foundations now 90% complete, the first parts of the steel frame in place, and the laying of sections of terracing for the south stand well in hand. Move to new stadium delayed until 2020/21 season. The club, which is set to share the new venue with London Irish RFC, submitted a revised planning application. Amendments included: Reducing the capacity from 20,000 to circa 17,250+; Reducing the stadium footprint to introduce a new road along the northern perimeter; Compressing the stadium 3m to the south (staying within the approved planning envelope); Converting the east and west stands to a single tier; Lowering the roof form on the east and west stands; Lowering the south stand by removing the top tier; Providing more premium seats from 1,800 to 2,930. This will strengthen an important revenue stream for the Club; Making it Premier League and Premiership Rugby compliant from day one.

Capacity 17,250

Cost £70m

Completion 2020



Lords Cricket Ground

London: Lords Cricket Ground

Marylebone Cricket Club (MCC) has unveiled WilkinsonEyre's designs for the new Compton and Edrich stands which will form the next phase of the Lord's Masterplan. The new three-tier stands will accommodate around 11,500 members of the public at the Nursery End of the Ground.

Capacity will be increased by 2,500 seats, and a walkway linking both stands and overlooking the Nursery Ground will be introduced. From the Pavilion, MCC Members will still be able to view trees through gaps in and over the top of parts of the new stands.

The timeline of the Updated MCC Masterplan is: 2019-21: new Compton and Edrich stands with up to 2,000 extra seats built.

2021-22: new East Gate Building (first phase).

2023-25: East Gate Building (second phase), including goods entrance, car park, shop, hospitality facilities and ECB offices.

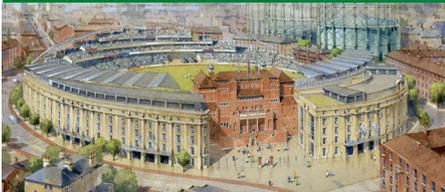
2025-26: demolition of the Nursery Pavilion and extension of the Nursery Ground playing area up to the Wellington Road. The Nursery Ground would be slightly larger than at present.

2027-30: construction of the South-Western Project, principally including the redevelopment of the Tavern and Allen Stands and Lord's Tavern.

2031-32: new facilities for groundsmen and ticket office staff would be built at the North Gate.

Capacity	32,000 (29,500)
Cost	£180-200m
Completion	2022 (second phase) 2027 (entire)

London: Oval Cricket Ground



Surrey CCC has applied for planning permission to redevelop the Lock/Laker Stand at the Kia Oval. The redevelopment would increase the capacity of the Test Match ground in Kennington, London, to 28,000. The news was announced by chairman Richard Thompson to members at Surrey CCC's AGM, during which CGI pictures of the final design were also shown for the first time. The new Lock/Laker Stand will increase the capacity of the ground to around 28,000, adding 2,500 seats. The development will see the existing Peter May Stand extended around to link to the Micky Stewart Members' Pavilion with two tiers, including further roof terracing, added above. There will also be an extension to the Micky Stewart Members' Pavilion, by adding an extra wing to the original building, built in the 1890s, which will make it fully symmetrical when viewed from the Vauxhall End of the ground and add new rooms for Members' use on match days.

Completion 2021

London: QPR Stadium

QPR are looking to develop a new stadium on the site of the Linford Christie Stadium in London after plans for development at Old Oak were thwarted. The Championship side could develop a partnership with athletics club Thames Valley Harriers which use the stadium next to Wormwood Scrubs. The venue was originally called the West London Stadium and was then named after Olympic 100m champion Linford Christie, who grew up in the area. The new potential site is located a mile from QPR's current Loftus Road home. QPR previously announced plans for a stadium at Old Oak, Common but acquiring the land from the owner proved difficult. Development partner: Stadium Capital Developments. Masterplanner: Farrells. Architects: CZWG and Populous. Project manager: EC Harris. Planning advisor: Savills. Land agent: Anthony Green & Spencer.

Capacity	40,000
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London, Chelsea: Stamford Bridge

Chelsea Football Club's plans for a new 60,000 seat stadium to replace Stamford Bridge have been put on hold. The move comes as owner Roman Abramovich was denied a visa to return to the UK. He has since become an Israeli citizen. A right to light issue for neighbours had been solved. The new stadium was set to be built within the grounds of Stamford Bridge on Fulham Road, and required the demolition of the existing 41,600 seat stadium. The plans also included a new club shop, kiosks, museum and a restaurant/café. The brick-clad stadium - which won plaudits from members of the planning committee for its look - has been designed by architects Herzog & de Meuron. Consulting: Herzog & de Meuron, Lifschutz Davidson Sandilands.

Capacity	60,000
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London: Crystal Palace, Selhurst Park

Crystal Palace FC will start work on an iconic new Main Stand at Selhurst Park in summer 2019 after being given the green light by planners. The project, which is expected to cost between £75-100 million, will increase the capacity at Selhurst Park from 26,000 to more than 34,000, transforming the match-day experience for supporters and providing new facilities for the community while retaining the ground's uniquely passionate Premier League atmosphere. New Main Stand capacity of 13,500, with more than 10,700 of these General Admission seats. Design pays homage to the original Crystal Palace on Sydenham Hill.

Improved facilities for supporters with disabilities and a substantial increase in wheelchair spaces. A new museum, a bigger pitch, increased from 101.5m x 68m, to 105m x 68m, making Selhurst Park compliant with UEFA regulations and eligible to host tournament football. Premium hospitality and entertainment facilities for more than 2,500 supporters, including a new Tunnel Club, and between 16-28 boxes. Improved sightlines in the Arthur Wait Stand with the removal of the TV gantry, and improved concourses. Redevelopment of the upper Whitehorse Lane Boxes into mixed bar/box use.

Capacity	34,000
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London: Tottenham Hotspur Stadium



Construction work facing delays over safety critical systems. Single tier end stand with 17,000 capacity will be biggest in UK soccer. Fully retractable pitch with second layer playing surface to NFL standards. Tottenham Experience, visitors centre and arrivals hub, skywalk experience, museum (incorporating Grade II listed Warmington House), cinema megastore, ticket office and cafe. Basement for parking, plant and storage. Leisure facilities, public space, supermarket and housing near current White Hart Lane site. The wide choice of premium suites, new style lounges and seats available including the first purpose-built glass-walled Tunnel Club in the UK which will allow lounge guests to see the inner sanctum with a behind-the-scenes view of the players' tunnel, while also enjoying the action from player-spec 'Recaro-style' seats, located behind the First Team technical area. Planning: Savills. Architect: Populous. Heritage architect: Donald Insall Associates. Project manager: AYH Arcadis (Paul Mitchell). Engineer: Buro Happold. Contractor (civil, engineering, structure): M Anderson Construction (£50m). Construction partner (plans, programs, tenders): Mace.

Capacity	61,000
Cost	£700m
Completion	2018

London: Twickenham East Stand Extension

The East Stand extension will see the first significant development of the stadium since the South Stand was completed in 2008 and provides over 11,600sqm of hospitality and debenture holders across six levels. Architect: KSS.

Mechanical Engineer	ME Engineers
ME is providing MEP design	
Completion	autumn 2018

Luton: Luton Town Stadium

Luton Town FC has taken a significant step forward in its plans to build a new stadium at Power Court in the town after sealing a deal to buy the land for the scheme. The planning application for Power Court is for a new football stadium with ancillary stadium-related facilities, residential floor space, flexible educational, community and commercial uses, hotel accommodation, retail and food and drink outlets. Financially associated Newlands Park development. Planning application submitted summer 2016. Architect: AndArchitects.

Capacity	17,500 rising to 23,000
Completion	2020

Newcastle: Kingston Park

English Premiership rugby side Newcastle Falcons have been given a boost after planning permission was granted for ambitious improvements to their Kingston Park Stadium. Newcastle Rugby Ltd's plans include major development work to the North Stand which would increase the stadium's capacity from approximately 10,000 to 11,730, with additional parking and infrastructure. Significantly increasing the number of covered seats and hospitality spaces, the plans would also improve training, medical and office facilities.

The North Stand, which is currently an uncovered terrace with no bars or toilets, would be transformed into a state-of-the-art facility featuring 1,530 covered seats, standing accommodation for supporters, new fitness and medical facilities, meeting rooms and hospitality space.

Newcastle: Newcastle Racecourse

Arena Racing Company (ARC) has revealed plans for a multimillion pound redevelopment scheme for High Gosforth Park and Newcastle Racecourse. Following on from the success of previous development work, which included the installation of the Tapeta surface and enhanced racing facilities, ARC anticipate submitting plans for the next stage of development of the High Gosforth Estate to Newcastle City Council in Autumn 2018. The proposals will further boost the international prestige of the racecourse, create new jobs in hospitality, tourism and construction, and draw thousands of visitors and their spending into the City. Improvements across the racecourse estate will include a 3,500m2 events centre, alongside significant refurbishment of the public and hospitality areas as well as the racing staff accommodation.

Plymouth: Home Park Mayflower Stand

GL events UK has been appointed to carry out stadium redevelopment at Home Park Stadium, home of Plymouth Argyle FC. Plymouth Argyle were earlier given the green light for the development of Home Park's Mayflower grandstand. The development will provide Argyle with a refurbished grandstand; new players facilities; new offices and classroom; new bars; retail and ticketing functions; and a conference and banqueting facility. Seating capacity will be increased to around 18,600 in stage one and to more than 20,000 in stage two. The wider development includes a new international size ice-rink; a hotel; a gym; offices; and restaurants. It is expected to employ 400 additional people once completed and more during the construction phase.

Salford: Moor Lane

Redevelopment plans for new stands and terraces, with one all-seater stand running the full length of the pitch, submitted to Salford City Council shortly as Salford City FC gets ready for promotion. Also planned is a Class of '92 suite and parking for executives. Design: Zerum. Finance: private (Class of '92 and Peter Lim).

Capacity	5,108 (2,241 seats)
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Scunthorpe: Iron Arena

Planning permission sought for redevelopment of Scunthorpe United's present Glanford Park ground. The new stadium will improve the matchday experience, create new commercial space to enhance its financial viability and support the League One club's development into the future. The current ground was built in 1988 and at the time was only the second new English Football League stadium to be built post-war. It will be a first for any club to have developed and played in three purpose-built stadia. The stadium will host an 11,000-capacity arena that will also create a venue for concerts and conferences, and provide new restaurant and leisure facilities. The arena will also provide up to 100,000ft² of commercial space. The Glanford Park Stadium will be demolished and rebuilt stand-by-stand over the next few seasons to enable the club to continue to play matches during the development. New cantilever style stands will ensure unrestricted views onto the pitch and will include improved seating and new eating and drinking facilities.. Architect: Frank Whittle Partnership (FWP).

Capacity 12,000
Cost £25m

Sheffield: Olympic Legacy Park Stadium

On the Don Valley Stadium site. Tenant team: Sheffield Eagles RLFC (Chairman Ian Swire). Main stand (capacity 2,500) will have a 50-bed hotel, restaurant and hospitality facilities along one side of the ground, and there are plans to develop joint facilities with Sheffield's second University Technical College (UTC) within the stadium complex. Pitch: synthetic - capable of supporting Super League, Rugby Union Premiership and international level, school and UTC. Also in the Park will be an Advanced Wellbeing Research Centre (AWRC) and clinical facilities run by the National Centre for Sport and Exercise Medicine (NCSEM). The Olympic Legacy Park project leader: Richard Caborn. Executive Director for Strategic Planning and Business Development: Andrew Cropley. Sheffield Eagles Director of Community, Development and Education: Ian Anniss. Finance: mixture of private and public (regional growth fund, council).

Cost £6m
Completion 2017

Southend United FC Stadium

Football stadium, 131-bed hotel and residential development, an 11-12 screen cinema, retail and restaurant floorspace, together with related ancillary infrastructure at Fossetts Farm. Two soccer domes. Developer: Martin Dawn plc (in discussion with British Land plc to forward fund the retail development, which will facilitate the first phase of the new stadium).

Capacity 21,000

Stoke: bet365 Stadium

Work is underway at Premier League Stoke City FC's bet365 Stadium to increase capacity to over 30,000. The Club is to 'fill in' the south east corner of the stadium which will add 1,800 seats to the capacity - the first major building project at the home of the Potters since it was constructed in 1997. The Club has appointed South Wales-based contractors Andrew Scott Ltd to carry out the redevelopment work which is currently planned to be completed in time for the start of the 2017/18 season. As part of the multi-million pound project, the Club is also installing two state-of-the-art LED big screens and making further provision for disabled supporters..17,000 seats also being replaced.

Capacity 30,000

Swindon: Abbey Stadium

Speedway and greyhound stadium development to include a play area for youngsters, a racing building, training kennels and market. Jobs: 62. Parking: 479 on-site.

Torquay: Torquay United Stadium

Torquay United FC have revealed plans for the development of a new £40 million stadium, event arena and academy. The proposed project is designed to launch the National League South side to sustainable success on the pitch. The proposed state of the art expandable 10,000 seat community stadium and 30,000 capacity event arena will include, integrated Exhibition and Music Event space, a hotel, integrated hospitality, food/beverage and leisure facilities, indoor leisure attractions, an enabling housing development and substantial car parking and transport links. A separate proposed stand-alone Football Academy and sports Centre of Excellence will provide facilities for both community football and the Clubs youth development programme together with facilities to attract and accommodate foreign students of football.

Capacity 10,000

Truro: Stadium for Cornwall

The Cornish Pirates RFC and Truro and Penwith College are joining forces with Truro City FC and the club's developer partner, to deliver the Stadium for Cornwall project together. Both clubs and the college will jointly occupy a single stadium at Langarth Farm near Truro. Trio working together to secure the £10 million required to fund the 6,000 capacity facility, which will include funding being provided by the Cornish Pirates RFC, Truro and Penwith College and Truro City Football Club. Main grandstand (4,200) and temporary. Pitch: synthetic. Conference centre (200), offices and restaurant. Tenants: Cornish Pirates (Chairman Ian Connell), Truro City Football Club, Truro and Penwith College (£2m), Cornwall College and the Royal Cornwall Hospital. Council no longer offering funds. Enabling project of supermarket also given planning permission. Feasibility study: Gardiner & Theobald LLP. Developers: Inox Group (MD Rob Saltmarsh), Henry Boot Developments (Julian Painter).

Capacity 6,000 (10,000 concerts)
Cost £14m

Wakefield Trinity Stadium

Stadium for the Rugby League Wildcats and 100-acre business park near Stanley. Previous project was referred to the UK Secretary of State, which was a blow to receiving a Super League licence. Developer: Yorkcourt Properties.

Capacity 12,000
Cost £19m

Wimbledon AFC Stadium



English League 1 Football club AFC Wimbledon has AFC Wimbledon have been given the green light to start building their new stadium at Plough Lane. The new development at Plough Lane will bring to the borough an 11,000- 20,000-seater football stadium, 602 much-needed new homes, retail space and a squash and fitness club. Preferred contractor is Andrew Scott Ltd. Expandable design required. House buyer to take over current site. Planning application granted by Merton Council. Phased construction anticipated. A squash/fitness club with contemporary training facilities. Developer: AFC Wimbledon (Chief Executive, Erik Samuelson), Greyhound Racing Authority Acquisition Ltd and Galliard Homes. Parking: 330 car + cycle parking. Consultant: Mott MacDonald.

Capacity 10,000
Cost £25m

Wimbledon, AELTC: No.1 Court



First year completed of three year project to install retractable roof covering entire playing surface. Improvement of public facilities, 15 new hospitality suites on a completely remodelled level, catering facilities, commentary boxes and improved seating. New landscaped entrance plaza and views over the outer courts. Developer: All England Lawn Tennis Club (AELTC). Architects: KSS. Mechanical Engineers: M-E Engineers. Structural Engineers: Thornton Tomasetti. Roofing and cladding: Prater (£8m). Construction: Sir Robert McAlpine.

Mechanical Engineer ME Engineers

ME is providing MEP and lighting design for the roof installation at Court 1.

Capacity 12,400
Cost £70m

Completion 2019

Southend: Southend United Stadium

Southend United FC has submitted a detailed planning application for its proposed new stadium development to Southend Borough Council. The new ground at Fossetts Farm would replace the club's current Roots Hall home and the development would include a 22,000-seat ground, a hotel and flats.

Worcester City FC Stadium

Plans rejected in July 2017 4,400-capacity stadium which would have an all-weather pitch, floodlights and 82 parking spaces at Perdiswell Sports Centre site. Pitch: synthetic. Standing and covered stands. Community use and pool. Club playing at Aggborough, home of Kidderminster in the meantime.

Capacity 4,400
Cost £12m

York Community Stadium

New contractors have been appointed to build York's new community stadium at Monks Cross. City of York Council has confirmed that Buckingham Group will build the 8,000 capacity stadium - which will become the new 'home' to both York City Football Club and York City Knights Rugby League Club. The company replaces builders ISG, who pulled out of the project. Work to begin in October 2017 on all-seater stadium. Combined with community sports facilities, university athletics, swimming pool. Partners (York Teaching Hospital NHS Foundation Trust, York St John University, Be Independent (CIC) and Explore York Libraries and Archives Ltd) will make use of the building on non-matchdays. Project manager: Tim Atkins. Council has approved extra £4m funding. Detailed planning application. Developer/operator: Greenwich Leisure Ltd (Chris Symons). Construction: Buckingham Group.

Capacity 8,000
Cost £44m

Completion 2020

ESTONIA

Tallinn: A. Le Coq Arena

Government funding to increase the capacity of Flora Tallinn's home to act as Estonia National Stadium. Owner: Estonian Football Association.

Capacity 15,000 (+5,000)
Cost €5m

Completion 2018

ETHIOPIA

Addis Ababa: National Stadium

Tender out for contractor. Area: 67,000m². Coffee bean shaped 'Adey Abeba' stadium and sports village. First design dropped. Athletics track, aquatics centre, residential village, sports halls, arenas, retail and commercial zones, and the headquarters of the Federal Sport Commission. Modern ticketing and access control. Developer: Federal Sports Commission. Finance: national government. Design: MH Engineering Plc (GM Mesele Halle).

Capacity 60,000
Cost US\$100m



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FINLAND
Helsinki: Olympic Stadium
Renovation and expansion. Widening of track, roofing over stands, new infrastructure. Work must be monitored by Finnish National Board of Antiquities to ensure preservation. Structural engineering: Sweco.
Cost €2m
Completion 2018

FRANCE

Dijon: Stade Gaston-Gérard
Reconstruction of three-storey east stand (5,112). Loges capacity: 204. Architect: Jean Guervilly, Sarl Herve Regnault.
Capacity 20,000
Cost €18,27m
Completion 2017

Montpellier: FC Montpellier stadium
French Ligue 1 football club Montpellier has revealed plans for a new stadium to be developed as part of wider project in the Cambaceres district of the southern French city. An arena is also being built on the site and it will host the city's handball and basketball clubs. Work on the new venue is expected to begin in June 2019, with completion slated for the start of the 2022/23 season.
Capacity 30,000
Cost €150m
Completion 2023

Nantes: FC Nantes YelloPark Stadium
FC Nantes have unveiled images of their planned new YelloPark Stadium, designed by Atelier Tom Sheehan & Partenaires (ATSP) and HKS. Stadium includes a fixed and a retractable roof to improve comfort and optimise the carbon footprint. The roof is composed of two parts: a fixed 25,500m ² roof and a retractable central 12,000m ² oculus. The system provides shelter to all spectators in case of bad weather. Moreover, the footprint of the perimeter remains as convex and compact as possible to ease circular movement around the stadium while being protected by the roof. The new stadium will benefit from: 40,000 seats; 125m diameter oculus; 37m of free height above pitch; 10 main entrances; 1 giant 360° screen; a 1,000m ² museum; 7,000 Kop seats in the same area; 150 media seats; 150 conference room seats; 600m ² shop; 25,500m ² fixed roof; 12,000m ² retractable roof.
Capacity 40,000

Paris: Roland Garros
Enlarging, modernising and rethinking of the historic Roland Garros site at Porte d'Auteuil. French Tennis Federation chose to stick with Roland Garros. Area: 35 acres. Courts: 35 outside. New 5,000-seat stadium and a new press centre. Main Philippe Chatrier court will be redesigned and feature a retractable roof.
Cost €273m
Completion 2017

GABON

Port-Gentil Stadium
Lionel Messi and President Ali Bongo Ondimba laid foundation stone for a new facility that will host matches of the 2017 Africa Cup of Nations.
Capacity 20,000

GEORGIA

Batumi Stadium
In holiday destination alongside a newly created avenue in the western part of the city, just a short walk away from the beach. Aiming for UEFA category 4. Design approved, construction tender soon. Concept inspired by Georgia's passion for dance, utilising the motion of 'whirling'. Cladding will be dynamically illuminated at night to represent colours of Georgia, Adjara region or local football team Dinamo (President Otar Redichkini). Funding: Batumi Municipality (Chairman Giorgi Ermakovi). Two-tier grandstands, lower 10,040, upper 9,995. Area: 87,000m ² . Parking: 1,000 Architect: Bahadir Kul Architects (BKA).
Capacity 20,000
Cost 25m lari (US\$10m)
Completion 2019

GERMANY

Berlin: Hertha Berlin
Hertha Berlin plans to build a 55,000 capacity football stadium in the Olympiapark. Albert Speer + Partner reviewed over 50 potential sites for a new stadium both inside and outside of the Berlin city boundary.

Completion 2025
Berlin: Union Berlin
Union Berlin plan to increase the capacity of their Alten Försterei stadium to 37,000 by 2020. The work will cost around €38 million and will increase capacity from 22,000 currently. Reconstruction work is due to begin in 2019 and will leave the ground with a standing capacity of 28,700. The number of seats in the stadium will be increased to more than 8,000, meeting German Football League requirements for top division football. Union Berlin currently play in the second division. The reconstruction will keep the stadium, built in 1920, true to its existing style, with the three standing areas in the lower tier remaining in place. An upper tier will be built to accommodate more fans.
Completion 2020

Darmstadt: Merck Stadion
SV Darmstadt 98 (President Rüdiger Fritsch) modernising Merck-Stadion am Böllenfalltor. Improvements to accommodation under one roof. Tender for construction going out.
Capacity 19,000 (17,000)
Cost €33m

Freiburg: SC Freiburg stadium
A new stadium to be after the city council voted for the project to go ahead. SC Freiburg will now be able to build the new 34,700-capacity stadium in the Baden-Württemberg city. The new stadium will be built on an area of land in Wolfswinkel, close to the city's airfield - a similar distance from the centre of Freiburg to the north as their current Schwarzwald-Stadion is to the East. According to the provisional timeplan, it should be open for the start of the 2020/21 campaign. The new venue has been designed by HPP Architekten and will be built by general contractor Köster GmbH. Finance: public, including infrastructure, club €15-20m.
Capacity 35,000
Cost €70m
Completion 2020

Jena: Ernst-Abbe Sportfeld
Conversion to football only stadium for Carl Zeiss. Secondary athletics stadium to be built elsewhere (€3m). Premium seats: 500.
Capacity 15,000
Completion 2018

Kiel: Holstein Stadion
Phased capacity expansion. Parking: 1,500.
Capacity 15,000 (expandable to 20,000)

Leipzig: Red Bull Arena expansion
Capacity increase to meet growing demand. German Bundesliga newcomers RB Leipzig have announced plans to expand the Red Bull Arena after agreeing a deal in principal to buy the stadium. The team, owned by Red Bull, want to increase the capacity of the Stadium, formerly known as the Zentralstadion, to 57,000 from its current capacity of 42,500.
Capacity 57,000 (currently 44,345)

Oberhausen: Stadion Niederrhein
Northern grandstand demolition. Stands closer to field. New 3,110-capacity grandstand.
Cost €2.8m

Regensburg: Continental Arena
New soccer stadium for SSV Jahn, a third division club. Naming rights: Euro 200,000 (5 years). Four grandstands visually pulled together by red facade. Architect: agn Niederberghaus & Partner (Stefan Nixdorf). Design and build: BAM Sports.
Capacity 24,000

Saarbrücken: Ludwig Park Stadium
Planning under way to update home stadium of FC Saarbrücken to DFL standards. Three-storey main stand. Loges: 10. Business Club: 635m ² . VIP terrace: 170m ² . Alternative stadium required from January 2016. Architect: GMP. Structural engineer: Schlaich Bergemann. ME: Paul GmbH. Transport: WSV/PCE.
Capacity 20,400
Completion 2020

GHANA

Accra Sports Stadium
Public-private partnership to renovate. Memorandum of understanding in place. Developer: Ministry of Youth and Sports. Finance: Government GH¢1.5m.
Cost GH¢12m (US\$3m)

Bekwai: Edubiase Sports Stadium
Revamp for Premier League team in stadium formerly passed unfit.

GIBRALTAR

National Football Stadium
Gibraltar national football stadium to be built at site of Victoria Stadium. The Gibraltar FA said an agreement has been reached with the Gibraltar Government and UEFA on a major project that will see both the construction of a UEFA Category 4 National Football Stadium in Gibraltar and other sporting facilities.n.
Capacity 10,000

GREECE

Athens: AEK Athens Stadium
Proposed temple 'Ayia Sophia' of football and of Greek sport according to AEK owner Demetri Melissanidi. At the site of its old stadium at Nea Filadelfia, north of Athens city centre. AEK obliged to develop park as part of deal to use land. Planning also requires construction 4m below street level - height 17.9m. Environment, Energy and Climate Change ministry funding local infrastructure upgrade. Home for AEK and New Philadelphia teams. UEFA 4-star. Religious-leaning architecture, grand central entrance; four corner towers hold up a fabric roof. Two tiers. Club seats: 1200. Suites: 40. Underground parking: 400-500. Parking lot: 250. Area 65,000m ² . Finance: €20m Attica Regional Authority; €50,000 Ecumenical Patriarchate of Constantinople (symbolic).
Capacity 32,500-34,000
Cost €65m

Athens: Panathenaikos Stadium
Addition of upper tiers and skyboxes (28) on south and north stands. Cantilevered roof. Aluminium facade. Finance: fan bonds and public.
Capacity +4,600
Cost €10-15m

HUNGARY

Budapest: National Soccer Stadium
Inside the walls of Ferenc Puskas stadium. Track removed to provide space for updated spectator facilities. Athletics, swimming and velodrome next door.
Capacity 65,000
Cost €300m
Completion 2017

Miskolc: Diósgyőri VTK Stadium
Soccer stadium on current site, to include a new centre of excellence for youth players. DVTK MD Tamas Szabo.
Capacity 15,000
Cost US\$27m
Completion 2016

IRAQ

Al Diwanayah: Al Sunbula Stadium
Main stadium plus hotel 3 floors (75 rooms), indoor hall (2,500) secondary stadium (2,000) and training field. Area: 250,000m ² . Client: Ministry of Youth & Sport. Building Management and Security Systems: Alara Engineering. Landscaping: Turkan Erdem. Architect: Bahadir Kul Architects. Construction: Renaissance Construction.
Capacity 30,000
Cost US\$100m
Completion 2017

Al-Samawah: Al-Samawah Olympic Stadium
FIFA standard soccer stadium. Design and construction management: Hill International (US\$2.2m). Developer: Ministry of Youth and Sports.
Capacity 20,000
Cost IQD 70.9bn (US\$61m)
Completion 2017



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Baghdad: Al Risafa Sports Stadium
New soccer stadium in Al Sadr City to FIFA standards. Finance interrupted at 40% completion. Now back in place. Area: 250,000m². Owner: Ministry of Youth and Sports. Project management: Hill International (IQD3.3-3.8m). Parking: 2,900. Employs prefabricated building systems for the structure. Steel: Integralia. Construction: Triarena.

Capacity	31,200
Cost	IQD116bn (US\$100m)
Completion	2017

Baghdad: Taji Stadium
For athletics and football. 4-star hotel, golf training area, parking and green spaces. Consulting: Harris.

Capacity	60,000
Owner: Ministry of Youth and Sports. Area: 350,000 m ² . Parking: 2,545. Architect: Agence D'Architecture A. Bechu.	
Capacity	32,000

Karbala Olympic Stadium
Muted colours and texture to blend with the surrounding mosques and houses. 73 arcades represent the number of martyrs killed in the Karbala tragedy. Two-layer translucent skin allows air to circulate through the concourse. Client: Ministry of Youth. Architect: Bahdir kul architects.

Capacity	30,000
Completion	2017

Najaf Stadium
Football stadium. Landscaping to connect the stadium to the city. Passive cooling towers. Owner: Iraq Ministry of Youth and Sports. Building services, fire protection, sports lighting design: WSP. Construction: Anwar Soura General Contracting. Architect: 360 Architecture.

Capacity	30,000
Cost	US\$83.75m
Completion	2017

Nasiriyah Stadium
Main stadium for football, plus athletics stadium with 2,000 seat capacity, training stadium with 500 seat capacity, 4* hotel, in Dhi qar Province in southern Iraq. Area: 55,000m². Architect: Agence D'Architecture A. Bechu. Associate architects: Adil Alkenzawi and Alain-Charles Perrot.

Capacity	30,000
Cost	US\$97.5m
Completion	2017

Salah Al Din Stadium
Owner: Iraq Ministry of Youth and Sports. Area: 16.610m². Architect: Agence D'Architecture A. Bechu.

Capacity	30,000
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ITALY

Bergamo: Stadio Atleti Azzurri d'Italia
Renovation plan for Serie A soccer club Atalanta. Architect: Mauro Piantelli. Phased renovation starting with the Creberg stand - improved access for disabled supporters. Removal of the glass separating the supporters from the playing field. Finance: Atalanta \$2.4m-\$2.6m, city the rest.

Capacity	22,000
Cost	\$3.8m

Cagliari: Cagliari Calcio Football Stadium



Italian Serie A club Cagliari Calcio has chosen the Sportium consortium to design its new stadium. Sportium beat off competition from two other design teams, Tractebel Engie with Gau Arena and J+S with One Works. Sardinia-based Cagliari said that in depth analysis will now take place with Sportium with the aim of defining all the contractual and operational aspects of the work. Sportium is made up of partners Progetto CMR, iDeas, B&L Real Estate and Manica Architecture from the US. Once a design has been decided on, the project will collaborate with engineers Ginevra Balletto, Alessandro Gostiano and Mario Marongiu and the University of Cagliari.

L'Empoli: New Stadio Castellani
Major renovation for Italian Serie A side, Empoli FC (Chief Executive Francesco Ghelfi). Architect: Roberto Puliti. Removal of running track, staged demolishing of old stands to create seamless bowl. Renovation of main grandstand, introduction of sky boxes. Restaurants, hospitality areas, VIP suites and commercial areas. Naming rights and solar energy provider: Enegran.

Capacity	17,300 (expandable to 20,000)
Cost	€11m

Florence: Fiorentina Stadium
Fiorentina have unveiled plans for a new 40,000-seat stadium in Florence, which is set to open for the 2021/22 season. The Serie A club said the €420 million stadium will include all the latest technology and put fans at the heart of the action, just 7 metres from the pitch. The Arup-designed stadium is set to be built on a 48 hectare site at Mercafir in north-western Florence. The complex will include a hotel, a shopping centre, a small training centre and a new railway station.

Capacity	40,000
Cost	€420m

Milan: Internazionale Stadium
Proposed new stadium as part of investment from a Chinese consortium. Developer: China Railway Construction Corporation.

Completion	2017
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Naples: San Paolo Stadium
Napoli has decided to stay at San Paolo and upgrade with city's help. Napoli will gain ownership rights (99 years) so that it can exploit the stadium commercially. Development of Fuorigrotta area around the stadium for non-matchday events and services. Napoli museum.

Rome, Tor di Valle: Stadio della Roma

AS Roma reached a deal with the city council for the 52,500-seat Meis Architects designed Stadio Della Roma, which will be built in the south-west of the city. Rome's mayor Virginia Raggi has given plans for the new stadium the green light. Plans include a brand new stadium and training centre in Tor di Valle in southwest Rome for the football team AS Roma. Developer StadCo has secured finance (\$34m) from Goldman Sachs for predevelopment costs. Anchors entertainment district Roma Village. Possible sponsorship deal with Etihad Airways. 14,800-seat detached section behind one of the goals for the hard-core "ultra" supporters, replacing the Curva Sud from the Stadio Olimpico. Floating stone facade reminiscent of Colosseum. Polycarbonate roof. Super premium lower bowl club: 600. Luxury boxes, plus commercial areas and training grounds outside the stadium. Green: carbon neutral. Transport: 50% public. Currently the club rents the city's Stadio Olimpico for its home matches. The new stadium will be developed and managed by Italian real estate firm Grupo Parsitalia. Finance: naming rights, sponsors and priority seating, bank loans and equity. Feasibility 2013, approval 2014, build 2015. Project manager: Eurnova (Luca Parnasi). Architect: Dan Meis. Pre-opening services: AEG Facilities Global Solutions.

Capacity	52,500 (expandable to 60,000)
Cost	€210m (overall project €1.5bn)
Completion	2020

Turin: Stadio Filadelfia

Park and soccer stadium for Fondazione Torino Calcio. Refurb of stadium that was Torino's home from 1926 until 1963 and then training. Crowd-funded project kicked off in autumn 2015. Latest funding has bought the grandstand seats. Architect: Studio Zoppini Associati. Area: 26,500m².

Capacity	3,600
Cost	€23m
Completion	2017

KAZAKHSTAN

Aktobe FC Stadium
For football club FC Aktobe to replace 13,500-seat Aktobe Central Stadium. Design and feasibility study for UEFA category four stadium under way, for a planned construction start in 2016.

Capacity	32,000
Completion	2017

KENYA

Kakamega: Bukhungu Stadium
Renovation. First phase ready December 2016.

Cost	Ksh 1bn (US\$10m)
Completion	August 2017

Manga Nyamira County Stadium
Soccer and athletics stadium. Partners sought.

Capacity	30,000
Cost	Sh63m

Mombasa County Stadium

To host 2018 CHAN championships. Phase two of the project will start in July, including infrastructure around the stadium. Developer: Mombasa County.

Completion	September 2017
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LIBYA

Tripoli: National Stadium

One of the stadiums due to host the African Cup of Nations in 2017 but Libya's civil war has put all development on hold. Two venues are planned for the capital Tripoli. In addition to the National Stadium, the project includes an indoor pool, a multi-purpose arena and Family Sportsworld. The complex, which is being built around a circular basin of approx. 500m diameter, is designed with a symbolism focusing on the number 3 in deference to the historic genius loci, as represented by the city's name (tri-polis = city of three). Architect: GMP - Volkwin Marg and Hubert Nienhoff. Associate Partners: Hans-Joachim Paap, Jochen Köhn. Structural design (outline design): Werner Sobek Ingenieure, Stuttgart. Structural design (scheme and detailed design): Schlaich Bergermann und partner, Stuttgart. Services engineering (outline design): Bechtold Ingenieurgesellschaft mbH, Berlin. Project commissioned by: Masterplan Libya, Tripolis, Kronberg. Client: Lidco - Libyan Investment and Development Co. Tripolis. General contractor: Porr Libya.

Capacity	71,000
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LITHUANIA

Vilnius: National Stadium

Ministry of Finance given the job of reviving national stadium project. Financial aid sought from EU.

Cost	€50m
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LUXEMBOURG

Luxembourg National Football Stadium

Football stadium in Kockelscheuer. Finance: City of Luxembourg and the state. Master plan April 2015, preliminary design September 2015, final plan January 2016, final project June 2016, construction early 2017. Architects: gmp, Beng Architectes Associés.

Capacity	9,600
Cost	€59m
Completion	2018

MALAWI

Karonga: Community Stadium

In construction. Construction: Nangaunozge Building Contractor. First phase to complete October 2016.

Capacity	20,000
Completion	2017

Salima Stadium

First phase (K47m) complete. Second phase requires funding for VIP stand, dressing room and toilets.

Completion	2020
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MOROCCO

Tangier: City of Sports

City of Sports complex under construction with tennis compound, Olympic swimming pools, multi sports halls, hotels and a football stadium. Construction: Adgeco.

Capacity	4,000
Cost	£44m
Completion	2016

Tetouan: Soccer Stadium

Soccer stadium to FIFA standards. Four training pitches. Conference rooms and retail. Area: 35ha.

Capacity	40,410
Cost	700m DH (€64m)
Completion	2018

NETHERLANDS

Amsterdam: ArenaA expansion

The Amsterdam Arena, home of Ajax FC, has kicked off a large-scale renovation project. The lower and upper tier concourses at the stadium will be enlarged. The project is the largest renovation since the ArenaA was opened in 1996. Seats in the lower south stand have already started to be replaced with red seating to reflect the team's colours. Project ArenaA 2020 consists of three phases. Phase 1 concerns the east side of the stadium. Phase 1 will be followed by phase 2 (south side) and phase 3 (north side). Once these three phases have been completed, together with the already renovated main building, the ArenaA will have undergone a 360 degree renovation.

Completion 2017

Helmond Stadium

Proposed new home for Helmond Sport (to replace Lavans Stadion) and several smaller football teams. Eight outdoor pitches and indoor training hall shared with school. Feasibility study for new stadium due in the autumn.

Rotterdam: Feyenoord Stadium



Proposed new stadium for famous soccer club, in south of city. A masterplan has been approved. The city council has given its backing to architect OMA's masterplan for Feyenoord City, including the New Feyenoord Stadium on the river Maas. Club seeking sustainable solution for community and legacy for De Kuip Stadium site.

Capacity 60-65,000

NIGERIA

Nigeria, Lagos: National Stadium Surulere

Government seeking partners to bring the stadium back to life - built 1972, renovated 1999, closed 2004. Developer: Ministry of Youth and Sports. Construction consulting: Maysu Construction.

Capacity 55,000

Minna: Minna Stadium

Developer: Niger State Government (Commissioner for Sports Daniel Shashere).

Capacity 10,000 (expandable to 15,000)

Cost N2.4bn

Completion end 2016

Plateau State: Jos Stadium

Stalled under construction soccer stadium. State seeking bank loan to complete. Construction: BCC Tropical Nigeria.

Cost N11.3bn (US\$6.5m)

NORTHERN IRELAND

Belfast: Casement Park



For Gaelic sport and Ulster rugby. Ulster GAA has submitted a new planning application to Belfast City Council for a new stadium at Casement Park. Submission follows an unprecedented 32 week consultation period, with 95% of people that responded to the proposed design coming out in favour of the project. Circulation zone of 9,000m² around the perimeter to improve crowd movement. Standing terrace: 8,500. Owner: GAA. Developer: Casement Park project board (chairman Tom Daly). Finance: public. Architect: Populous. Construction: Heron Buckingham joint venture.

Capacity 34,500

Cost £77m

Completion end 2019

Belfast: Cliftonville Stadium

Redevelopment to provide more community facilities for Irish League club. Planning application submitted by Community Interest Company. First phase to replace the Main Stand at Solitude.

Cost £4m

Derry: Brandywell Stadium

Council announcing contractor in November. Work to start immediately. Stadium for Derry City FC with 3,600 seat stand along the Lone Moor Road side. Replaces existing uncovered seated area and the old Glentoran Stand. New changing and treatment facilities. Turf: synthetic 4G. Showgrounds area to be revamped with new greyhound track, bookmaking, spectator and kennel facilities. Demolition and redevelopment of Brandywell Sports Centre. Tenants: Ballymore FC, Oak Leaf boxing and the Over the Hill Club. Funding: city council, regional funds. New greyhound track July 2016 - Dec 2016, 3G pitch Aug 2016 - Dec 2016. Construct New Stand Sept 2016 - Mar 2017. DCFC unable to play home games for possibly last 3 months of 2016 season.

Capacity 6,000

Cost £8.8m

Completion 2017

Belfast: Glentoran Stadium

Glentoran Chairman Terence Brannigan looking to move club away from the Oval, possibly to the Blanchflower Stadium site.

Capacity 8,000

Cost £10m

NORWAY

Sandness Stadium

New football stadium for Sandnes Ulf. Architect: Plank Arkitekt. Area: 4,500m².

Capacity 7,582 (expandable by 2,023)

Cost NOK150m (€16m)

Completion 2018

Valerenga Stadium

New football stadium at former velodrome site opened in September. Includes educational facilities in north-western corner and main stand. Main grandstand has six floors, others are single tier. Four corners can be filled in later to extend capacity. Tenant: Vålerenga IF.

Capacity 17,500-18,000

Completion August 2017

OMAN

North A'Sharqiyah: A'Rustaq Sports Complex

Public facilities and football stadium.

Capacity 12,000

South Al Batinah: Al Sa'ada Sports Complex

Expansion of complex and doubling of current stadium's capacity.

Capacity 18,000

Musandam: Khasab Sports Complex

International standard football stadium, hockey, tennis, covered pool (800), gymnasium (1100).

Capacity 17,000

POLAND

Chorzow: Ruch Chorzow Stadium

Proposed new stadium for Ruch Chorzow soccer team, with realistic capacity, unlike Stadium Slaski. First phase in early 2017 with 4,500 seats. Architect: GMT. Finance: public.

Capacity 16,000

Cost PLN 60m (€14.5m)

Completion 2020

Chorzow: Stadium Slaski

Five years behind schedule, final straight now in sight for cable-roofed stadium. Loss-making operation predicted. New revenue sought.

Capacity 55,000 (athletics), 90,000 concerts

Completion 2017

Jaworzno: Sport Stadium

Athletics stadium with sports and culture complex nestled in a quarry. For local and regional track and field events and training camps. The design is inspired by the rich geological landscape of the region and to resemble a rock and six free-standing buildings evoking scattered boulders. Sports facilities, restaurants, exhibition space and high-end hotels for tourists, spectators and athletes. Area: 4,200m². Architect: Mateusz Tariski & Associates (design competition winner). Developer: Jaworzno City.

Capacity 1,000

Cost 10m zloty (US\$2.5m)

Lodz: Wlzew Stadium

Polish fourth division football team Wlzew Łódź has played its first match in its new 18,000 seater stadium. The new Stadion Wlzew has been built in the city of Łódź on the site of the club's former home, which was demolished in 2015. Plans were announced for the new venue in October 2014 and it has taken two years to build. The West Grandstand is the main stand and contains the changing rooms, gym, 24 corporate boxes, eight commentary boxes and two TV studios. The other three stands are simpler and include space for 900-1,200 visiting supporters.

Sosnowiec: Zagłębiowski Park Sportowy

Stadium plus indoor arena for 3,000 and covered ice rink for 2,500. Three phases, following approximately a year of detailed design work. Design competition won by JSK Architekti.

Capacity 12,000 (expandable to 15,000)

Completion 2019

Warsaw: Polonia Warszawa Stadium

Early stage proposal for lower league football club. Office building development to help fund new stadium, retaining only historical western façade. Funding: private.

Capacity 20,000

Wroclaw Olympic Stadium

Work completed on rebuild of Olympic Stadium to host World Games and speedway. Retention of some historical elements, including floodlight masts. Developer: Municipality of Wroclaw.

Capacity 11,000

Cost PLN 130m (\$32m)

Completion 2017

QATAR

Al Khor City: Al Bayt Stadium

Construction has taken another step forward as work began on installing the venue's retractable roof. Once fully assembled, the roof will weigh around 1,600 tons - the equivalent of almost 380 medium sized motor cars. It will be possible to close the roof at the touch of a button, in a three-phase movement that takes approximately 20 minutes. Each roof truss measures 94.4m and weighs between 82 and 104 tons. Each truss was fabricated into eight pieces at the workshop, transported to site, and welded together at a dedicated area outside the stadium before being lifted into place. A modular design includes an upper tier of removable seats. Retail spaces and restaurants will sit alongside landscaped paths for use by local residents and there will be dedicated women-only facilities within the complex. Green: energy-efficiency and green building materials, with renewable energy to power the venue. Owner: Supreme Committee for Delivery & Legacy and the Aspire Zone Foundation. Construction: Qatari contractor Galfar Al Misnad will construct the stadium and precinct in a joint venture with two Italian firms, Salini Impreglio Group and Cimolai. Construction supervision consultant: KEO International Consultants Design Consultant: Dar Al-Handasah. Landscape architect: Polis Group. Project Manager during design stage: Projacs.

Mechanical Engineer ME Engineers

ME is providing MEP design.

Capacity 32,000 (70,000 for World Cup)

Completion September 2018



<p>Al Rayyan Stadium</p> <p>One of the venues for the Qatar 2022 FIFA World Cup and new home for Qatar Stars League champions Al Rayyan on the site of Al Rayyan Sports Club's existing stadium, Ahmed Bin Ali Stadium. The upper tiers of the 40,000 seater stadium will be demounted after the 2022 FIFA World Cup in order to retain 20,000 seats in legacy mode. Ornate façade is a contemporary take on traditional Naquish patterns specific to Qatari culture. Green: recycling old stadium materials, renewable energy, lightweight building design, careful selection of materials, and energy and water efficiency measures. Aiming for GSAS and LEED. Developer: Supreme Committee for Delivery & Legacy (project manager Abdulla Al Fehani). Consultant: AECOM. Lead Design Consultant: Ramboll. Architects: KSS and Pattern Design (Dipesh Patel). Main contractors: Al Balagh Trading & Contracting, Larsen & Toubro (M V Satish). Design execution: KSS and Schlaich Bergermann.</p> <p>Capacity 40,000</p> <p>Completion Early 2019</p>
<p>Al Thumama Stadium</p> <p>World Cup stadium on site already comprising four outdoor training pitches and office facilities used by the Qatar Football Association Technical Committee. Community engagement with residents about the stadium development may result in a clinic, green spaces, retail area and sporting facilities, including a walking and cycling track. Area: 515,400m². Design consultant: AEB Group (CEO & Chief Architect Ibrahim Mohamed Jaidah). Project management: TIME Qatar.</p> <p>Capacity 40,000 (20,000 legacy)</p>
<p>Al Wakrah Stadium</p> <p>The development of Al Wakrah Stadium – a proposed 2022 FIFA World Cup tournament venue – has taken a major step forward with the installation of the final piece of the roof structure. Weighing 378 tonnes and measuring 92 metres, the steel structure – known as an 'oculus beam' – sits 50 metres above pitch level. It will connect and support the entire roof, while providing maintenance access to some of the retractable parts of the structure. Two 540-tonne pillars, resembling curved hockey sticks, are the main support for the retractable roof of the arena. Upper tiers will be removed after the World Cup. Area (precinct): 586,000m². Sports centre & community hub. Tenant: Al Wakrah Sports Club. Green: renewable energy & structural design efficiency; targeting GSAS and LEED certification. Developer: Qatar 2022 Supreme Committee (Hassan Al Thawadi, Secretary General). Project manager: KEO. Design consultant: AECOM. Architect: AECOM and Zaha Hadid Architects. Programme manager: CH2M Hill. Enabling works: HBK Contracting Co. Main contractor: MIDMAC in a JV with PORR Qatar.</p> <p>Capacity 40,000 (World Cup) 20,000 (legacy)</p> <p>Completion 2018</p>
<p>Doha: Sport City Stadium</p> <p>Design draws inspiration from traditional Arab tents. A retractable roof, partly retractable pitch and retractable stands for multi-use after hosting 2022 FIFA World Cup.</p> <p>Capacity 47,560</p>
<p>Foundation Stadium</p> <p>Soccer stadium for FIFA World Cup™ 2022. Plus swimming pool and indoor pavilion on same site. Green: photovoltaic and solar thermal panels. Aiming for LEED Gold. Design consultant: RFA Fenwick Iribarren. Project manager: Astad. Construction: Four companies, led by Cyprus-based contractor Joannou & Paraskevaides (J&P), are teaming up in the Main Contractor role: J&P Qatar WLL, Conspel Qatar WLL, J&P-Avax S.A and J&P (Overseas) Ltd. who have been awarded the contract as a joint venture.</p> <p>Capacity 26,000 (40,000 for World Cup)</p> <p>Completion Q3 2019</p>

<p>Khalifa International Stadium</p> <p>Work has completed on the refurb for 2022 World Cup. Also 3-2-1 Qatar Olympic and Sports Museum. New building has been added to the stadium's east wing, and which contains food courts, shops, multi-purpose rooms, VIP lounges and a health centre. Roof: tensile membrane (Birdair). Roof installation: Taiyo Middle East. Project manager: Projacs. Design consultant: Dar Al-Handasah. Main contractor: MIDMAC in a JV with PORR Qatar.</p> <p>Capacity 40,000</p>
<p>Lusail City: Lusail Stadium</p> <p>Construction is progressing rapidly, according to the Supreme Committee for Delivery & Legacy (SC). Work on the substructure of the stadium has surpassed 75% and the west stand, which contains the VVIP, VIP and media tribunes, among other elements, is visibly rising up from the ground to reach an imposing elevation of more than 70 metres. The installation of the west stand's precast elements, which will support the bleachers on which fans will sit, has also now commenced. Largest venue for the 2022 FIFA World Cup Qatar and the site of the opening ceremony and the Final. Open-air pitch that can be cooled to an optimal 26 degrees Celsius using cooled and shaded spectator stands and state-of-the-art green technologies. Owner: The Supreme Committee for Delivery & Legacy. Architect: Foster + Partners (design competition). Consultants: ARUP, Populous.</p> <p>Capacity 80,000</p>
<p>Ras Abu Aboud Stadium</p> <p>Qatari firm HBK Contracting Company (HBK) has been awarded the main works contract for Ras Abu Aboud Stadium. The 40,000-seat venue will be built using modular building blocks, making it the first fully demountable FIFA World Cup stadium in history. Located in a 450,000m² water-front site with exceptional views over Doha's skyline, the stadium will host matches up to the quarter-finals in 2022. On waterfront with a 'design for legacy' concept with an ability for it to become part of a larger mixed-use neighbourhood after World Cup. Developer: Supreme Committee for Delivery & Legacy. Area: 450,000m². Parking: 6,000 (2,000 in legacy). Architect: Populous. Project management: Time Qatar (Turner Construction).</p> <p>Capacity 40,000</p>

<p>ROMANIA</p>
<p>FC Botosani Stadium</p> <p>New stadium proposed for Liga I club. City support in seeking funding.</p> <p>Capacity 11,000</p> <p>Cost €18m</p>
<p>Bucharest: Ion Oblemenco Stadium</p> <p>Construction completed on stadium replacement of Craiova's stadium to create UEFA 4-star venue. The two-tier concept design includes Club/VIP seating. Roof form inspired by Brancusi work Miss Pogany. Architectural lighting for night impact. Area: 56,900m². Green: photovoltaics, ground source heating/cooling. Fencing arena in grandstand. Training ground with athletics (5,000) on same complex. Soft and hard landscaping of complex. Architect: DICO si Tiganas.</p> <p>Capacity 30,000</p> <p>Cost €50m</p> <p>Completion 2017</p>
<p>Bucharest: Dinamo Stadium</p> <p>To replace Stefan cel Mare stadium, possibly to host Euro 2020 games. Developer: Dinamo Bucharest (chief executive Elisabeta Lipa). In northern Bucharest. Underground parking: 1,087. Large public plaza south of the stadium. Finance: Romanian government. Upper tier 17,350; lower tier 10,350. Skyboxes: 20 (2,015). Media: 450.</p> <p>Capacity 30,000</p>
<p>Targu Jiu: Targu Jiu Stadium</p> <p>New-build home for CS Pandurii Targu Jiu on old stadium site. Stadium, hotel rooms, conference rooms and a car park. Area: 37,500m². Architect: DICO si Tiganas.</p> <p>Capacity 15,000</p> <p>Cost €20m</p>

<p>RUSSIA</p>
<p>Krasnodar: FC Kuban Stadium</p> <p>Stadium for soccer team but capable of staging other events including rugby. Angled roof to retain noise. On podium with surrounding landscaped parking. Envelope design influenced by Russian artist and architect El Lissitsky. Plates of solid and perforated metal peel away from the bowl. Facade material: TECU Gold. Architect: AFL Architects, Tecnon, Syntesis Rus.</p> <p>Capacity 45,000</p>
<p>Moscow: VTB Arena</p> <p>Stadium and arena combination on site of Dynamo stadium, designed to retain historic elements of Petrovsky park. Also two levels of retail and one of parking. Developer: Dynamo Mangement Company. Architects: MANICA Architecture and SpeeCH. Construction: Codest International (US\$707m).</p> <p>Mechanical Engineer ME Engineers</p> <p>ME provided LEED, sustainable design and energy modeling in early design stages.</p> <p>Capacity 27,000 (stadium)</p> <p>Completion 2018</p>
<p>Novosibirsk: Sibir Football Stadium</p> <p>UEFA Category 3 (1A Russian ranking) stadium for FK Sibir in the north of the city in development area. Two-tier grandstands, business zone in west stand, heating in some areas (average temperatures of below 0° from October to May).</p> <p>Capacity 15,000</p> <p>Cost €11.2m</p>
<p>Vladivostok Stadium</p> <p>Proposed soccer stadium as part of sports and leisure development by local authority.</p> <p>Capacity 16,000</p>

<p>SCOTLAND</p>
<p>Aberdeen FC Stadium</p> <p>Aberdeen FC has been granted official planning permission for a new stadium and training complex at Kingsford, near Westhill. Aberdeen City Council's planning department has formally approved the development and the club plans to begin construction of the 20,000-capacity stadium in June 2018. Phase one will include the construction of the training pavilion, groundsman's accommodation, three professional training pitches, two 3G pitches, a full size and a half size grass pitches, the latter being mainly for use by AFCCT. Club previously worked on outline plans for stadiums at Loirston Loch and King's Links but both failed. Finance: sale of Pitodrie stadium for development, council contribution, grants, naming rights. Construction: McLaughlin & Harvey Construction (preferred bidder). Consultant: Gardiner & Theobald. Architect: Miller Partnership.</p> <p>Capacity 20,000</p> <p>Cost £50m</p> <p>Completion 2019</p>
<p>Dumbarton: Community Stadium</p> <p>For Dumbarton Football Club at Young's Farm, which is bounded by the River Leven to the east, the A82 to the north and a railway line to the west. Hospitality and dedicated training facilities, plus additional playing pitches for community use and car parking. Non-football related uses could include gym/leisure facilities, a hotel, conferencing facilities, a restaurant, a shop and offices.</p> <p>Capacity 4,000 (1,000 standing)</p>
<p>East Kilbride Stadium</p> <p>Proposal by East Kilbride Community Trust (EKCT) to build a multi-million pound stadium to replace K-Park for senior teams. Location could be South Lanarkshire Council-owned site at Langlands West. Council considering proposal. Local campaign in support under way.</p> <p>Capacity 4,000</p>
<p>Edinburgh: Academicals Rugby Club</p> <p>Edinburgh Academicals Rugby Club, the second oldest club in the UK, has confirmed that it will build its new facility in Stockbridge, Edinburgh. It will contain conference facilities and a rugby museum, with associated retail. Planning agreed 2013, S75 with City of Edinburgh Council 2014. Planning permission granted. Finalising design and layout, researching best practice, setting leasing arrangements, applying for building warrants, Architect: Michael Laird Architects. Jobs: 100.</p> <p>Capacity 5,000 (2,500 seated)</p> <p>Cost £8m</p> <p>Completion 2017</p>

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SUBSTRUCTURES



CAMERA TOWERS



BRIDGES



STAIRCASES



BROADCAST STUDIOS



SCREEN SUPPORTS



VIEWING PLATFORMS



BRANDED WALLS



Edinburgh: Edinburgh Rugby

Scottish Rugby has applied for planning permission to install a new stadium in the grounds of BT Murrayfield, which will have a capacity of up to 7,800. The development is intended to be the new home of Edinburgh Rugby and would be located on a section of land currently used as training pitches. A detailed planning application has been submitted to City of Edinburgh Council to provide a fan-focussed playing venue in the city that will incorporate a new 3G surface and covered spectator stands around all four sides of the ground. Edinburgh will play its home matches on the international pitch at BT Murrayfield for the coming 2018/19 season, with the aim of commencing the 2019/20 campaign in the new purpose-built venue. Scottish Rugby has designed the project using flexible infrastructure and is open to making the space available to other users from the wider rugby community in Scotland, and the possibility of other sports as well.

Capacity	7,500
Completion	2019

Edinburgh: Heart of Midlothian Stadium

New main stand (7,000) to replace the 1914 Archibald Leitch stand on the McLeod Street side of the stadium. Public consultation on plans undertaken. Construction without relocation. During a 'fitting out' period the players will use new changing facilities beneath the Wheatfield Stand, where temporary office and retail space is also being created. Office, shop, ticketing facilities, new hospitality spaces and Tynecastle Nursery School. Architect: James Clydesdale. Finance: club £3m, benefactors £2.5m, commercial: £0.5m, cash available £6m.

Capacity	20-21,000
Cost	£12m

Completion	September 2017
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Edinburgh: New Meadowbank Stadium

Vision for refurbished venue. February 2015 report estimated project cost was £43m with a funding shortfall of between £11.3m and £19.8m. Shortfall now at £6.8m Outdoor athletics track with seating for 500, indoor 60m six lane athletics track with jumps area, outdoor throws area, 3G synthetic sports pitch or grass pitch in the centre of the outdoor athletics track for football, rugby and other pitch sports, outdoor 3G synthetic sports pitch, eight badminton court sports hall with 500 permanent seats plus bleachers, four badminton court sports hall with 500 permanent seats, gymnastics hall, gym, studios, changing facilities, café and meeting rooms. Aim is to find finance, appoint development team by February 2016, demolition autumn 2016.

Cost	£43m
Completion	Q1 2018

Glasgow: Celtic Park

Celtic Football Club's plans to expand Celtic Park and build new hotel, museum, retail and ticket office facilities have been given the green light. The Scottish champions unveiled plans earlier in 2017 to regenerate the area around Celtic Park and those have now been approved by Glasgow City Council. The hotel will be based on London Road, outside the main stand of Celtic Park and across from the Emirates Arena.

Glasgow: Partick Thistle FC

Partick Thistle FC are pushing ahead with plans to build a dedicated training ground for the club in Glasgow. The Scottish Premiership team has agreed a deal with Three Black Cats, a company set up by the Weir family for long term investments, to build the new £4 million facility. Three Black Cats was seeking a new investment project and has agreed to work with Partick Thistle to design and build a new training ground to the Club's specification. It will then be leased to Thistle while remaining in the ownership of Three Black Cats. A location has yet to be found.

Paisley: St Mirren FC

New in Ferguslie area. Seeking buyer of Love Street ground.

Capacity	10,000
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SLOVAKIA

Bratislava: National Stadium

Public/private partnership lost private investor. Government has agreed to purchase the stadium from current owner Ivan Kmotrík once it's built. Home to national team and Slovan Bratislava. International tender for design and construction of UEFA standard stadium to play queen internationals. Finance: government subsidy. Construction: Strabag (€42m)

Capacity	23,000
Cost	€75m
Completion	2018

Kosice: MFK Kosice Stadium

New soccer stadium for Fortuna Liga club. Area: 60,000m². Operating company: Kosice 85%, club 15%. Funding: city, state (€4m).

Capacity	9,080
Cost	€15m
Completion	2017

Trencin: Stadion na Sihoti

Phased replacement stadium for AS Trenčín. Municipality to provide land and infrastructure. Finance: AS Trenčín, Slovak FA, Slovak government.

Capacity	12,000
Cost	€7.4m
Completion	2018

SOUTH AFRICA

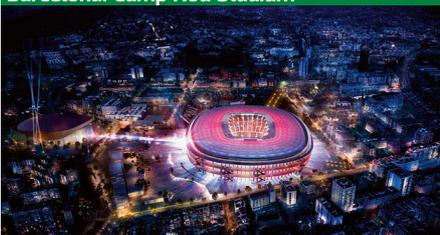
Krugersdorp: Amakhosi Stadium

Proposed, revised and stalled new stadium project for Kaizer Chiefs. Developer: Lefika.

Capacity	35,000
Cost	R700m

SPAIN

Barcelona: Camp Nou Stadium



Designed to facilitate circulation and achieve diverse urban usage in the Barça Campus. The stadium is the biggest component of €600m (US\$651.9m, £467.4m) sports district called Espai Barça, which also includes the New Palau Blaugrana multi-use arena. Scheduled to start in the 2017/18 season. Architect: Nikken Sekkei + Pascual i Ausió Arquitectes (design competition winner – lead architects Joan Pascual and Takeyuki Katsuya). Sport design services: Manica Architecture. Super-uptake for FC Barcelona's Catalan home voted for by club members in referendum. (Previous Foster+Partners design didn't go ahead.) Third tier on west side and roof (47,000m²) over all stands. Jury of club officials and local architects reviewed proposals of eight design teams. Stadium specialist consultants: ISG, AEG, ICON Venue Group and Ryder Levett Bucknall. As well as a reconfigured spectator bowl, there will be a new ring of boxes and restaurants overlooking the pitch, along with 'superboxes' and other VIP services between the first and second tiers. The quality of the VIP services will be vastly improved both in terms of quantity and quality (3,500 new seats would create a total of 5,700 luxury seats).

Capacity	105,053
Cost	€360m
Completion	2020

Barcelona: Johan Cruyff Stadium

Training stadium for FC Barcelona at the Ciutat Esportiva training ground. FC Barcelona has kicked off construction work at the club's new training centre – the Johan Cruyff Stadium – in the city. The stadium, named after club legend Cruyff, will be the home of Barça B, the Barça Women's team and the Under-19 team for Youth League matches. The shape will be asymmetric with a two-level grandstand. There will be 1,000 seats in the second level of the main grandstand and 5,000 seats on the entire, 360-degree lower level. The corners will be rounded to bring the fans as close to the action, and the players, as possible. UEFA category III with covered terraces. Parking: 600. Architect: Batlle i Roig Arquitectes.

Capacity	6,000
Cost	€12m
Completion	2018

Madrid: Santiago Bernabeu

Remodelling for Real Madrid. Club currently working with lawmakers on getting permission to build. Retractable roof added to the design. Architect: GMP Architects and L35 Ribas (winners of the 'International Tender for Architectural Ideas for the remodelling of the Santiago Bernabéu'). New skin, retail mall and sliding roof. Planning permission sought. Funding: commercial sponsorship (International Petroleum Investment Co.).

Capacity	80,000
Cost	US\$400m
Completion	2020

San Sebastian: Estadio Anoeta

Four-phase upgrade while continuing to operate. Removal of athletics track and new roof, followed by grandstand rebuilds. Municipality hiring construction manager to handle contracts.

Capacity	32,000
Cost	€40m
Completion	2019

Sevilla: Estadio Benito Villamarín

Tender for the construction of new stand (14,700) for Betis is under way. Old stand (8,500) demolished already.

Cost	€16m
Completion	2017

Sevilla: Estadio Ramón Sánchez Pizjuán

Modernisation over two years for Sevilla FC. Redesign of the entrance area, new seats, concrete treatment, new scoreboards and floodlights, improved facilities for players and disabled supporters.

Completion	2017
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Valencia CF Stadium

Spanish La Liga club Valencia CF have enlisted heavyweight consultants Deloitte as they look to push ahead with a move to a new stadium. Deloitte will be responsible for the overall business plan, including the sale of assets, restructuring of debt and financing of completion of the new stadium. Plans are for it to open for the 2021/22 season. Half finished and on hold since 2008 after financial difficulties of club. Three-tier (22,000 bottom tier, 18,000 middle, 25,000 upper) soccer stadium in NE Valencia. Architects: Reid Fenwick Associates. Engineer: Arup Sport. Mestalla stadium to be sold to property developers.

Capacity	65,000 (75,000)
Cost	€200m (€300m)

SWAZILAND

Siteki Soccer Stadium

Developer: National Football Association of Swaziland (NFAS). NFAS reported that it is trying to secure a title deed for the construction of a stadium in the Shiselweni region.

SWEDEN

Helsingborg: City Stadium

Project to rebuild the Olympia soccer stadium. Project manager: Karnfastigheter (Catharina Branden). Construction: Peab AB (US\$44.4m).

Cost	US\$140m
Completion	mid-2017

SWITZERLAND

Lausanne Football Stadium

Rectangular Tuilliere Lausanne stadium as part of larger redevelopment in north of city. Training areas, restaurant and media. Architects: MLZD and Sollberger Boegli.

Capacity 12,000

Cost €70m

Completion 2019

Schaffhausen: FCS-Park

New stadium for FC Schaffhausen (President Aniello Fontana).



Capacity 8,000

Cost CHF 60m

Completion 2017

Zurich football stadium

Proposed soccer-dedicated stadium. Possible standing area. Developer: city.

Capacity 16,000 (international), 20,000 (domestic)

Cost CHF 150m

Completion 2017

TANZANIA

Kaunda Stadium

For Yanga soccer club. Start June 2016. Contractor: Beijing Construction Engineering Group Co Ltd.

Capacity 40,000

Cost \$20m

TURKEY

Adana: Adana Stadium

For soccer club Adanaspor. Suites: 49 (552). Club seats: 992. Media seats: 178. Officials seats: 196. Funding: public. Concrete bowl complete, roof steel being erected.

Capacity 36,117

Cost TL 107m

Completion 2017

Sakarya Stadium

Concrete bowl, steel roof. Roof cladding going on. Parking: 1445. VIP: 661. Area: 136,000m². Architect: Alper Aksoy Architects (A.Arch). Construction: Ahes Construction.

Capacity 28,710

Completion 2017

Trabzonspor: Akyazi Stadium

Main construction complete. Roof cladding going in, pitch yet to be installed. Replaces Huseyin Avni Aker stadium. Built on artificially created land on the shore of the Black Sea.

Capacity 42,000

Completion 2017

TURKMENISTAN

Ashgabat: Olympic Stadium

Refurb for athletics and soccer stadium ahead of Asian Indoor and Martial Arts Games. Architect: AFL.

Capacity 48,000 (35,000)

Completion 2017

UGANDA

Ruti: Mbarara Stadium

Football stadium next door to Mbarara-Kabale Highway. Government has entered talks with Chinese firm Anhui Foreign Economic Construction Group Company (AFECC) to create plans. 500 seater pavilion, protected perimeter fence, modern dressing rooms, boardrooms, stores.

Capacity 15,000-20,000

UNITED ARAB EMIRATES

Abu Dhabi Stadium

Developer Mubada has prequalified five companies to build a new sports stadium with retractable roof as part of the Capital City District development next to Khalifa City.

Capacity 65,000

Cost US\$1bn

Dubai, Al Aweer: Rashid Al Maktoum Stadium

Elevated in a diagrid bowl. Playing field 18m above entry plaza. Open tensile roof. Skin allows in air but not sun and sand. Water features will create natural thermal sink to cool air. Landscaping to block hot wind. Site area: 120,000m². General seating: 23,116 upper, 6,688 lower. Suites: 1,642 capacity. VIP: 8,941 Design and construction: Dar Group and Perkins+Will. Warm-up area, athletic training hall. Parking: 5,000. Sport museum (1,500m²). Multi-purpose hall (3,500m²), exhibition halls and conference facilities, shops and restaurants. Developer: Dubai Sports Council. Named after His Highness Shaikh Mohammad Bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler of Dubai.

Capacity 60,000

Cost AED 3bn (US\$817m)

Dubai: Al Wasl Sports Club

Proposed upgrade to become air-conditioned stadium. Developer: Dubai Sports Council.

Capacity 25,000

WALES

Ebbw Vale: Circuit of Wales

The proposed Circuit of Wales motor racing track suffered a possible fatal blow when the Welsh Government refused to guarantee a £210 million loan for the project. The circuit is planned to be built in an area near Ebbw Vale and has a deal to host the British MotoGP round until 2020. Developer: Heads of the Valleys Development Company. Construction (preliminary): FCC and Alun Griffiths Contractors.

Capacity 15,000

Cost £280m

Newport: Dragons Stadium

New stadium on site of Rodney Parade going through planning permission. Includes an 84-room hotel, 105 student flats, restaurant, conference facilities, offices and public gym. Architect: S&P. Planning: RPS. Cost consultant: Gleeds. Transport: Pinnacle. Boxes: 20.

Capacity 15,000

Cost £40m

ZAMBIA

Southern Province: Livingstone Stadium

Soccer stadium and community sport facilities in sight of the Victoria Falls.

Capacity 30,000

Completion 2017

ZIMBABWE

Tsholotsho Stadium

Football stadium for Tsholotsho FC who are playing temporarily at White City during the first half of the Castle Lager Premier Soccer League season. Contractor: JR Goddard.

Completion 2016

Victoria Falls Cricket Ground

Local council has granted planning approval for a stadium near the iconic site to become country's third international Test ground. Also home for domestic side Matabeleland Tuskers and open for touring teams to practise. Floodlights proposed.

Capacity 12,000

AMERICAS

ARGENTINA

Buenos Aires: Mary Teran de Weiss Stadium

Redevelopment of tennis stadium with retractable roof. In Parque Roca.

Capacity 14,000

BAHAMAS

Andre Rodgers Baseball Stadium

Ballpark named after the first Bahamian to play in the major leagues, plus auxiliary practice fields to the east of the stadium, locker rooms, meeting rooms, physical/therapy/training rooms; vendor spaces, eight luxury boxes, state of the art audio/visual scoreboard, parking and offices for the sport's partner, the Bahamas Baseball Federation. East of the Government High School in the Queen Elizabeth Sports Centre. Original was demolished in 2006 to facilitate construction of the new TAR National Stadium. Budget for statutory utility connections, baseball accessories and installations, digital/video scoreboard and installation, supply and construction of synthetic field, stadium lighting, stadium 'Smart Technology' design, PA system, AV system and security/surveillance system install: \$4m. Construction: Woslee Construction (\$21.352m). Architect: Arconcepts (\$3.96m).

Capacity 4,500

Cost US\$21m

BRAZIL

Rio de Janeiro: Olympic Stadium

Temporary capacity update of 2007 Pan-American Games stadium for Olympic athletics.

Capacity 60,000 (45,000)

CANADA

Calgary: CalgaryNEXT

Proposal for a new stadium to replace the Saddledome and McMahon Stadium. New field house, NHL arena, and football stadium in the West Village. Evaluation by city under way.

Cost C\$890m

Montreal: Baseball Project

Study funded by a group comprised of the Board of Trade of Metropolitan Montreal (BTMM), the Montreal Baseball Project (MBP), EY and BCF LLP. Costed as \$500m to buy team and \$500m for an open-air ballpark.

Capacity 36,000

Cost C\$500m

GUYANA

Soccer stadium plus training fields, a co-ed sports academy, amphitheater, golf course, resort and retail. Architect: Baker Barrios Architects Inc.

Capacity 24,000

Cost US\$30m

UNITED STATES OF AMERICA

AL, Auburn: Jordan-Hare Stadium

Proposed renovation at Auburn University of the North end zone to include expanded concourse and walkways, club seating, additional concessions, new locker rooms, recruiting lounge. Big screens: 2. Currently working with architects and engineers to meet projected budget.

Cost US\$145m

Completion 2018



AL, Birmingham: University of Alabama Stadium

New horseshoe-shaped, on-campus football stadium with a downtown view, for UAB Hornets (Athletics Director Brian Mackin). Capacity: 27,511 (seats), 2,500 (lawn end zone). Suites: 33. Loge boxes: 24 (4). Parking for 300. Finance: \$60m bonds, \$15m donations.

Cost US\$75m

AL, Jacksonville: JSU Baseball Stadium



Ballpark for Jacksonville State University Gamecocks (Athletics Director Greg Seitz). Grandstand with a shade canopy, media box and a game operations centre. Suites: 4. New clubhouse with locker room, lounge, team meeting area and athletic training treatment area. Clubhouse attached to an enclosed training facility that will allow for batting and pitching workouts. New step-down team dugouts, bullpens, new coaches offices and meeting space. Finance: donations. Architects: Davis Architects, Inc., architect Bill Whittaker.

Capacity 1,000

Cost \$7.5m

Completion 2018

AL, Mobile: Uni of South Alabama Stadium

The University of South Alabama (Director of Athletics Dr. Joel Erdmann) has selected three consulting firms to assist with the exploration of the financial, logistical and infrastructural requirements associated with the possible construction of an on-campus football stadium. Consulting: CDFL Architects and Engineers, Populous and Hunden Strategic Partners.

AR, Fayetteville: Razorback Stadium

Arkansas, Fayetteville: Expansion project for Donald W. Reynolds Razorback Stadium at University of Arkansas. New loge boxes, suites, club seating and club areas, plus concessions and restrooms in the north end zone. New elevators and updated security and safety systems. Finance: athletics revenues, capital gifts and bond proceeds from a future bond issue.

Cost US\$160m

Completion 2019

AZ, Phoenix: Sun Devil Stadium

Redevelopment for home of Arizona State University sport. "Double Inferno" upgraded student section, enhanced seating and legroom, more restrooms and concession options, technological upgrades, improved air and traffic flow through the venue, a connection to the surrounding landscape, additional premium seating options, and a new video board and sound system. Phase 1: new student section in the south end zone, permanent stadium seating, student section in the north end zone. Removal of loge structure in the southwest corner and demolition of the upper deck of the northeast end zone. Phase 2: work on east and north sides. Phase 3: work on the west side and on the Student Athletics Facility. Work includes connecting the main concourse with the south end zone. Premium seating will be added, along with expanded restrooms. Infrastructure improvements to water, electrical and mechanical systems. Architect: Gould Evans and HNTB. Construction: Hunt/Sundt Construction. Finance: real estate project University Athletics Facilities District.

Cost US\$300m

Completion 2019

AZ, Phoenix: Phoenix Rising Stadium



Phoenix Rising Football Club has picked Populous and Gould Evans to design its proposed Major League Soccer (MLS) stadium. The pair will collaborate to create the newest professional sports stadium in the greater Phoenix area. Phoenix Rising FC is the highest-level professional soccer franchise in Arizona's history. The club is owned by legendary Chelsea and Ivory Coast striker Didier Drogba, Kona Grill CEO Berke Bakay and an impressive collection of business leaders and international celebrities.

AZ, Phoenix: State Farm Stadium



The NFL's Arizona Cardinals have unveiled the latest \$28 million renovations to their newly named State Farm Stadium. The most recent phase of renovations included the creation of "The Tail Feather," a speakeasy lounge and full-service bar located on the northeast side of the stadium. Other club level upgrades include new bars and food service in all four corners, new flooring, new lighting, more televisions, a new sound system and new furniture. A speciality lounge area called the "Bird's Nest" boasts a new bar and buffet, as well as extensive millwork finishes and new furniture. All the restrooms on the club level were completely renovated with new floors, ceilings, lighting and wall tiles.

AZ, Tucson: Arizona Stadium

Proposed makeover of Arizona Stadium as part of campus-wide 2017-19 Capital Improvement Plan. Seeking student and other stakeholder input while researching requirements. Replace dated restrooms, concessions facilities and about 50,000 bench seats. Arizona Wildcats (athletic director Greg Byrne). Also seeking to build an indoor training facility.

Capacity 50,000 (56,000)

Cost US\$146m

CA, Fresno: Bulldog Stadium



Renovation plans for Bulldog Stadium that will transcend the 35-year-old facility into a new era for Fresno State Athletics (Director of Athletics Jim Bartko). Improve all amenities, enhance the fan experience. Access tunnels built into the berm and a cross-sectional concourse at the midpoint of the bowl, doubling of restrooms and concessions, extra suites, club seats, loge areas, sponsorship displays and the possibility of naming rights, new press box and a new two-story football facility in the south end zone with a HD video board on top + ribbon boards. Phased construction. Architect: AECOM Sports.

Completion 2019

CA, Indian Wells Tennis Garden: Stadium 3

Proposed stadium to include a tennis museum that would be open to the public 10 months a year.

Capacity 4,000-5,000

Completion 2017

CA, Los Angeles: Inglewood NFL Stadium



The new home of the Los Angeles Rams and Chargers is beginning to take shape. Construction was held up last year because of an unusually wet winter, meaning the opening date for the \$2.6 billion stadium was pushed back to 2020. For the Rams (owner Stan Kroenke) and NFL west coast operations on the former site of Hollywood Park racetrack and casino. NFL owners overwhelmingly voted for the St Louis Rams to relocate to Los Angeles. San Diego Chargers and Oakland Raiders could end up taking a stadium-share option if they can't resolve own stadium issues (NFL US\$100m subsidy to remain in their current home markets). Outdoor feel under a canopy covering 19 acres with all sides of the building open-air, allowing natural breezes to pass through the venue. Site area: 3.1m ft². Height: 175ft. Roof: transparent ETFE canopy (19 acres). Developers: Stockbridge Capital Group (Terry Fancher). City of Champions Revitalization. Project to develop 300 acres for shopping mall, office, hotel, residential, entertainment/performance venue and a NFL stadium. Integration into LA County a priority to create destination. Project manager: Legends Project Development. Infrastructure management: Wilson Meany. Architect: HKS. Construction: Turner and Hunt Construction.

Capacity 70,000 (70K fixed, expandable to 80K)

Cost US\$2.5bn

Completion August 2020

CA, Los Angeles: Banc of California Stadium



Doors have opened for the new home of Major League Soccer's Los Angeles Football Club (LAFC). In addition to a soccer field, the \$350 million stadium houses shops, a multitude of food options, and conference space. The 22,000-seat, Gensler-designed stadium has been under construction since 2016 and has been built on a site previously occupied by the Los Angeles Memorial Sports Arena in Exposition Park for the newest MLS team. ETFE roof for shade and to retain fan noise. Jobs: 3,000. Area: 100,000ft². Annual economic activity: \$129m. Construction: PCL Construction. Architect: Gensler.

Capacity 22,000

Cost US\$350m

Completion March 2018

Mechanical Engineer ME Engineers

ME is providing full MEP design.

CA, Los Angeles: LAFC Performance Centre



The Los Angeles Football Club (LAFC) has officially opened its brand new, 30,000ft² Performance Facility on the campus of Cal State LA. The facility is the new home to the club's MLS players, staff, coaches and LAFC Academy. Gensler Sports and AECOM Hunt served as the design build team on the innovative project, with Legends acting as the project manager. The new training site and practice facility features a natural grass practice field exactly mirroring that of Banc of California Stadium, locker rooms, sports medicine facilities, office space for LAFC coaches and staff and will be completely financed by LAFC. Architect: Gensler.

Cost US\$30m

Completion 2018



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CA, Oakland: Oakland A's ballpark

Bjarke Ingels Group (BIG) and Gensler are set to design a new privately financed Oakland Athletics ballpark. "We envision a stadium district that will be active and inviting 365 days a year for athletes, fans, and Oaklanders alike," Bjarke Ingels said in a statement on the firm's website. BIG will lead master site planning and design for the ballpark, either at Howard Terminal or near the Coliseum, and Gensler will collaborate on the ballpark design.

Capacity	32,000-36,000
Cost	US\$300-\$400m
Completion	2020/21

CA: Sacramento Republic FC Stadium

Ground-making carried out at soccer specific stadium for franchise with MLS ambitions. This phase one of the project will set the stage for the "groundbreaking," which is inked in for spring 2018 with actual construction of the facility. The stadium plan is projected to cost \$245 million, privately financed, with initial capacity for 20,000, to expand to 22,000. Planning commission approval given, council vote imminent. Suites: 36. Party suites: 3. Premium seats: 3,100. Standing: 500. Development requires spot in MLS. Architect: HNTB.

Capacity	22,000
Cost	US\$245m
Completion	2020

CA, San Diego: San Diego State University

SDSU has unveiled more details of plans for a multi-use stadium in Mission Valley. SDSU Athletic Director John David Wicker said the proposed 35,000-seat stadium at the site could morph into a 55,000-seat facility that could serve as a future home of a San Diego National Football League (NFL) franchise. By working with Populous and JMI Sports from the outset, SDSU's proposed Mission Valley stadium would offer a future San Diego NFL owner the opportunity to partner on a state-of-the-art professional football stadium in the centre of San Diego. Regardless of when an NFL franchise returns to San Diego in the future, a professional football tenant would also be able to utilise the west side of the proposed SDSU multi-use stadium that would result in a significant savings to construction costs. The stadium interior would feature more than 82 suites, including field level, lower bowl sideline and upper sidelines, five different club sections (totalling approximately 6,500 seats), 50 loge boxes with lounge access, two end zone party decks and six exterior balconies, providing fans in San Diego unparalleled methods to enjoy games, concerts and a wide variety of events.

Capacity	32,000
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CA, San Diego: Saddleback College Stadium

Replaces campus's existing stadium. Press box, restrooms, scoreboard, synthetic turf, and a nine-lane running track, improvements to the athletic practice fields for football and soccer and new surface parking lot. Design and build: PCL Construction Services

Capacity	8,000
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DC, Washington Football Stadium



New stadium proposal by Washington Redskins (lease at FedEx Field expires 2027). Curvaceous, open-air seating bowl enveloped in a mesh-like skin – and surrounded by a moat. Structure will also act as a performance venue for approximately 100,000 people. Parks and pedestrian bridges for tailgating fans. All-year events planned. Locations under consideration: Prince George's County, Maryland; Loudoun County, Virginia; and the District of Columbia. The team now plays at FedEx Field in Greater Landover, Maryland. Architect: Bjarke Ingels Group (BIG).

DC, Washington: DC United's Audi Field

Major League Soccer team DC United is to receive a \$25 million private clean energy funding package for installation of state-of-the-art energy and water efficiency measures at its new Audi Field stadium. Measures include an 884 KW solar array and stormwater retention systems. The measures are funded through the Department of Energy and Environment's (DOEE) Property Assessed Clean Energy (DC PACE) programme, DC's innovative green funding solution which operates through a public-private-partnership, allowing local lenders to fund environmentally beneficial projects at no cost to taxpayers. Ground broken in Feb 2017 on new 'contemporary industrial' style stadium. Lead project amongst infrastructure improvements for Buzzard Point waterfront district. Public private partnership (30 years). The state-of-the-art urban facility has a capacity of 20,000 fans and will feature 31 luxury suites, a bike valet, and 500,000ft2 of mixed-use retail and residential space on site. MLS team has been looking for a number of years. Land acquisition: \$89m. Area: 331,000m². Entrance northeast corner, team store on north side, locker rooms in two-storey secondary structure on the south side. Bicycles: 230. Most fans will arrive by public transport. Finance: half team, half city. Complex land deal. Suites: 32. Architect: Populous. Associate: Marshall Moya Design. Construction: Turner Construction.

Mechanical Engineer	ME Engineers
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ME is providing full MEP, technology, and sports lighting design services as a joint venture with JVP Engineers.

Capacity	19,000
Cost	US\$300m
Completion	Q2 2018

FL, Gainesville: University of Florida

The University of Florida Athletic Department has announced plans to build a new baseball park, a new \$65m stand-alone football training complex (Architect: HOK) and carry out upgrades to its current softball stadium. The projects, which combined are estimated to cost \$130 million, are part of phases 2 and 3 of the University Athletic Association's (UAA) Facilities Master Plan. Construction for the estimated \$50 million baseball ballpark, with an overall capacity of 10,000, will begin in the fall of 2018 with a completion goal prior to the 2020 season. Home plate will face northeast with the sun behind the stadium for a cooler atmosphere for the student-athletes and fans. A 360-degree open concourse will give fans constant field views and multiple seating options will be under shade. Permanent chairback seats will increase from 2,408 to approximately 5,000, while fans will also be able to choose from premium seating and non-traditional seating options to bring overall capacity to approximately 10,000. Architects and Engineering – Populous and Walker Architects.

Cost	US\$50m
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FL, Jacksonville: EverBank Field

Renovation for Jacksonville Jaguars (President Mark Lamping). Includes addition of a 5,000 seat amphitheater and renovations to the stadium's clubs.

Mechanical Engineer	ME Engineers
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ME is providing full MEP and technology design.

Cost	US\$37m
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FL: Miami MLS Soccer Stadium

Miami Beckham United has bought a three-acre parcel of land in Miami's Overtown neighbourhood off the Miami River, giving Beckham's group a total of nine acres for the purpose of building a privately-financed, 25,000-seat downtown soccer stadium in its pursuit of an MLS expansion team. The group is still awaiting the result of a lawsuit appeal for the final parcel of land that will complete the site. The group has won an MLS franchise in Miami. Close to transport and River District. Developer: David Beckham group (Beckham exercising option on MLS franchise, Simon Fuller). Finance: private. Architects: Arquitectonica (Principal Bernardo Fort-Brescia) and HOK.

FL, Sarasota, Braves Spring Training Ballpark

Construction underway on Spring training facility in North Port, Sarasota for Atlanta Braves. Six-field training complex with two half-size pitches. Team's lease at Champion Stadium in Disney World ends in 2017. The 9,000 capacity facility is slated to open in 2019 and would have 6,500 seats with room for a further 2,500 on benches or standing. The venue would include a number of suites, along with six full and two half practice fields, a player academy, training spaces and clubhouses.

Capacity	9,000
Cost	US\$80m
Completion	2019

FL, St. Petersburg: Al Lang Stadium

The Tampa Bay Rowdies have taken a major step towards bringing a Major League Soccer (MLS) franchise to Tampa Bay after St. Petersburg voters approved expansion of the Al Lang Stadium. The vote now means the City Council has the authority to negotiate a long-term use agreement for Al Lang Stadium.

FL, St. Petersburg: Carillon Ballpark

Rays seeking new stadium site with council approval. Hillborough County in the running. Carillon proposed by developer CityScape (Darryl LeClair) for Tampa Bay Rays. Club noncommittal. Offices as part of stadium structure. Part of retail and residential development. Retractable or fixed transparent roof options. ETFE roof and wall. Consultants: HKS and Hunt Construction.

Capacity	35,000
Cost	US\$577m (retractable), US\$548m (fixed)

FL, Tampa: Raymond James Stadium

Tampa Bay Buccaneers have announced the next phase in the more than \$150 million renovation of Raymond James Stadium. The latest enhancements are highlighted by a completely redesigned West Stadium Club, a new team retail store, expansion of the highly successful Hall of Fame Club, and a new home team locker room. The redesigned West Stadium Club will incorporate modern style with high-end finishes and furnishings, while providing more than 60,000ft2 of total lounge space – an increase of more than 25% from the original event space.

FL, Tampa: Tampa Bay Rays Stadium

Major League Baseball's Tampa Bay Rays have announced a site for their proposed new ballpark. The Rays have selected a site in Ybor City in Tampa, which is the centre of Tampa's historic cigar industry. The stadium site covers 14 acres and it contained by Channelside Drive to the west, 4th Avenue to the north, 15th Street to the east, and Adamo Drive to the south. The team currently plays at Tropicana Field, which is located across Tampa Bay in St. Petersburg.

GA, Athens: Sanford Stadium

The University of Georgia has approved major enhancements to the west end zone of its Sanford Stadium. The renovations will encompass 120,000ft2 of new and improved space that will include a new locker room for the Bulldogs, room to host and entertain prospects on game day, a larger video board and a new plaza for game day fans. The construction project is expected to take approximately 17 months to complete. In order for the enhancements to be ready for the 2018 football season, initial work needs to begin by April 2017..

Cost	US\$63m
Completion	2018

GA, Atlanta: Bobby Dodd Stadium

Georgia Tech athletics has announced a series of comprehensive fan experience enhancements. The planned enhancements are aimed at improving all aspects of the gameday experience for fans attending Georgia Tech football games at Bobby Dodd Stadium. Located in the heart of Georgia Tech's Midtown Atlanta campus, Bobby Dodd Stadium was constructed in 1913 and is the oldest stadium in NCAA Division I FBS. It has not undergone major renovations since the construction of the stadium's north end zone structure in 2003, which added 15,000-plus seats and 10 luxury suites to the historic facility. Among the items being planned for implementation by 2023: improvement and enhancement of existing premium seating areas; creation of additional premium seating areas; improved cellular and Wi-Fi connectivity; enhanced stadium audio; improved general seating options; expanded tailgate offerings.

Completion	2023
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GA, Statesboro: South Georgia Tormenta



South Georgia Tormenta FC are looking at building a soccer-specific stadium in Statesboro, Georgia. Tormenta FC Owner and President Darin Van Tassell revealed intentions to explore the possibilities of a move from the Premier Development League – the top amateur league in North America – to the USL's Division III in May. Since then, Van Tassell has been busy expanding the club's ownership group and researching plans for a new stadium should Tormenta FC join the third-division league.

Capacity 5,000

HI, Honolulu: Aloha Stadium redevelopment

Crawford Architects has been selected to lead a multi-disciplined team planning for a new stadium and site redevelopment of the entire 100-acre + Aloha Stadium site in Honolulu, Hawaii. Aloha Stadium, which opened in 1975, is Hawaii's largest outdoor facility, home to the University of Hawaii's Rainbow Warriors football team and former host of the NFL Pro Bowl. The 50,000-seat stadium can be configured to offer multiple seating arrangements and field formations that allowed football, soccer and baseball.

IA, Iowa City: Kinnick Stadium

Improvements to north stands at the University of Iowa. Athletics Director: Gary Barta. New suites, restroom upgrades and expanded food options in the north end zone – not been upgraded since 1983. Planning addressing logistics challenges ahead of design. Finance: city, university.

Cost US\$75m

IL, Champaign: Memorial Stadium

University of Illinois continuing Illinois Renaissance project to renovate Memorial Stadium with priority given to the south horseshoe and the east side of the stadium. Director of Athletics Josh Whitman. Finance: donations and Department of Intercollegiate Athletics money. Phase one: reconfiguration of the south end zone will include construction of a new home for all football operations including locker rooms, training, recovery, sports medicine, meeting and office space, coaches offices, equipment room, recruiting venues, a grand entrance and a student-athlete dining space. Request for Proposal for architectural services issued. Second phase: east grandstand lower and upper levels – new restrooms, concessions, elevators, enhanced fan accessibility and ADA seating (end 2020 season).

Capacity 60,000

Cost US\$132m (\$95m phase one)

Completion 2019 (phase one)

IL, Chicago: Chicago Bears Halas Hall

The Chicago Bears have partnered with global design and architecture firm HOK to design a 162,500ft² extension to their training facilities. The building work will add to the already existing 143,000-square-foot Halas Hall facility and a 30,600ft² remodeling project on the northeast side of the building. The addition will feature a 13,000ft² indoor turf space for training and walkthroughs with a 133ftx26ft video projection wall and adjacent virtual reality room, in addition to a weight room expanded by 2,000ft². Also included will be an equipment room, recovery space and nutrition/fuel station that are double the current size. Additionally, the sports medicine space will be four times larger than the present area and will feature a hydrotherapy pool.

IL, Chicago: Wrigley Field

Cubs to upgrade player facilities, add a big screen in left field and an ad screen in right field. Main screen: 5,700ft². Hotel development across street but no connecting bridge. City council approval gained as first step in getting full planning permission. Four phases to upgrade club houses, concourses, suites and retail. Architect: VOA Associates. Consulting architect: DAIQ Architects and Harboe Architects. Contractor Pepper Construction. Owners' rep: ICON Venue Group., Structural engineer: Thornton Tomasetti. Steel: David Architectural Metals, Lenex Steel and Byus Fabricators. ME: ESD. AV consultant: WJHW. F&B: Levy Restaurants.

Mechanical Engineer ME Engineers

ME is providing MEP and lighting design.

Capacity 42,495

Cost US\$575m

Completion 2020

IL, Woodstock: Lakewood Sportsplex

Proposed minor league ballpark for McHenry County K-Nines. City providing land for a stadium. Finance: Private investors now sought. Developer: Equity One Sports Development.

Cost US\$40m

IN, Bloomington: Indiana University

A new volleyball/wrestling indoor arena to be built on the Bloomington campus for Indiana University. Will allow the volleyball and wrestling teams to move from their current locations to the athletics campus. The 2,500- to 3,000-seat venue will be used as a competition facility for both volleyball and wrestling, as well as the practice facility for volleyball.

IN: Indianapolis Motor Speedway

Proposed new grandstands and possibility of floodlighting. Seeking public funding.

Cost US\$100m

IN: Indianapolis Soccer Stadium

Proposed soccer stadium for Indy Eleven. Multipurpose ambitions. Team seeks tax dollar help in the form of bonds paid for by an event tax. Proposal going to vote in senate. Currently plays at Carroll Stadium at IUPUI.

Capacity 18,500

Cost US\$87m

KS, Lawrence: Memorial Stadium

Proposed renovation of Memorial Stadium for Jayhawks' football. Consulting: HNTB. Track can be removed after building of \$39m complex in west Lawrence for soccer, softball and track and field.

KY, Papa John's Cardinal Stadium

University of Louisville Athletic Department (athletic director Tom Jurich) has begun fundraising to add 10,000 seats to the north end of the stadium. The Howard Schnellenberger Football Complex will also undergo major renovations. Doubling of size of team's weight room and conditioning centre. Improved players and coaches facilities. Club seats: 1,000. Premium boxes: 70. Field level suites: 12. Finance: PepsiCo \$5m, Planet Fitness \$3m.

Capacity 65,000 (55,000)

Cost US\$55m

Completion 2019

KY, Lexington: University of Kentucky Ballpark



Ground has been broken on the construction of the new baseball stadium. Construction is expected to take 18-20 months, meaning the stadium will open in late autumn 2018 in time for the 2019 UK baseball season. Final approval for the project was given by the UK Board of Trustees in October, continuing the ongoing \$2.2 billion transformation of the University of Kentucky campus. Stadium being built next to Kentucky's football stadium. For Southeastern Conference Wildcats (athletic director Mitch Barnhart). Suites and a club area. Ability to add temporary facilities to host 6,000 for big tournaments. Parking: 1,200. Architects: Ross Tarrant Architects and HNTB.

Capacity 4,000 (2,400 seats)

Cost US\$49m

Completion fall 2018

KY: Louisville Soccer Stadium

Louisville City FC has moved a step closer to building its own 10,000 seat, soccer-specific stadium after taking an option on land in the Butchertown neighbourhood. Lou City has entered into a partnership with architects HOK for the design of a soccer-specific stadium. HOK will design a 10,000-seat stadium that could later expand in capacity to 20,000. The overall site plan will also include space for office and retail development. Louisville City currently plays at Louisville Slugger Field (6,500 crowd). Study: Conventions, Sports & Leisure Int (\$75,000).

Capacity 10,000 (expandable to 20,000)

LA, Lafayette: UoL Ballpark

Renovation for University of Louisiana M.L. "Tigue" Moore Field. Athletic director: Scott Farmer. Architect: Abell + Crozier + Davis, DLR Group. Also on campus: new sports plaza behind the south end of Cajun Field, renovation of the Academic Center, proposed improvements at Earl K. Long Gym and the Culotta Tennis Center and a new basketball practice facility.

Cost \$10m

MA, Boston: New England Revolution Stadium

Proposed new soccer-specific stadium at the site of the former Bayside Expo Center. Vice president of construction and development for the Kraft Group: Ted Fire.

MA, Cambridge: Harvard Stadium

Renovation of and addition to the Harvard Stadium over the next two years. Repairs, increase accessibility, expand and upgrade stadium's restroom and concession facilities. New locker room spaces, press areas, indoor seating, and office space. Decreased capacity by approx. 8,000.

Capacity 22,000 (30,262)

Completion 2018

MA: Malden Ballpark

Proposed ballpark for minor league team (Atlantic League). Developer purchasing land parcels. Artificial turf and winter bubble to cap the surface and for community use in off-season. Developer: Boston Field of Dreams (Alexander Bok). Preconstruction: Turner Construction.

Capacity 6,000

Cost US\$30-\$35m

Completion April 2017

MD: Baltimore: M&T Bank Stadium

NFL's Baltimore Ravens three-year programme to enhance the fan experience at M&T Bank Stadium. Improvements include new 4K ultra-high definition video displays, escalators and elevators to the upper deck, a new sound system and upgraded kitchen facilities. Another improvement will be the addition of new LED ribbon displays, which will be installed around the seating bowl's suite level. In total, the Ravens will be installing more than 28,000 square feet of video displays. The Maryland Stadium Authority has also agreed to contribute an additional \$24m – designated for general stadium upkeep – bringing a \$144 million in combined funds that will improve the stadium over the next several years.

Cost US\$120m

MD: Baltimore: UMBC Event Center

The University of Maryland Baltimore County (UMBC) Event Center has opened for action. It is a comprehensive, all-in-one athletics venue designed as one of the premier mid-major NCAA Division 1 facilities in the US. The arena will be home to the UMBC Retrievers M&W basketball programs and women's volleyball team.

Flexible and multi-purpose in nature, the event centre has seating capacity for 5,000 in its stadium bowl and an additional 1,000 on the floor. The arena will be used for commencement, concerts and various public speaker events and is equipped with concessions, catering, hospitality, restrooms and security and guest services amenities.

Capacity 6,000

Cost \$85m



MD: Baltimore Soccer Stadium

Maryland Stadium Authority investigating market for a MLS team with feasibility study (\$100,000). 42-acre waterfront site identified.

Capacity 17,000-20,000

MI, Detroit: Ford Field

NFL's Detroit Lions have unveiled a design renovation plan of Ford Field's hospitality areas. The renovations are part of a larger \$100 million upgrade project which includes a larger scoreboard, technology upgrades and architectural renovation. A total of 210,000ft² of premium space, ranging from large social clubs to suites and loges, will be renovated in place or completely reconfigured. ROSSETTI, which is headquartered in Detroit, is the design architect for the renovation and was also the original designer of the stadium, which opened in 2002.

Cost US\$44m

MI, Detroit: MLS Stadium and District



Proposed soccer stadium to establish MLS in Detroit as cornerstone of larger development at Wayne County's unfinished jail site. Early discussions under way. Restaurants, retail, fitness, spa and conference centre. Also 30-storey hotel/residential tower, 24-storey residential tower, 18-storey office tower and 12-storey office tower. Podium open to the public at all levels from the ground up to the park-like setting along the rooftop nature trail, an 8-10 block continuous elevated greenspace that connects all four towers. Area: 15 acres. Parking: 5,400. Developer: investor partner group spearheaded by Tom Gores (Detroit Pistons owner) and Dan Gilbert (Cleveland Cavaliers' owner). Architect: ROSSETTI (Matt Rossetti, Dan Soleski, Nick Moriarty, John Bigtacion, Joe Donelko).

Capacity 20,000-25,000

Cost US\$1bn (overall project)

MI: Central Michigan University

Populous has been picked to take the lead in designing the Chippewa Champions Center at Central Michigan University's Kelly/Shorts Stadium. Populous will partner with GMB, the architectural firm that designed CMU's soccer and lacrosse stadium. Meeting spaces, an alumni centre and offices housing the CMU Advancement team are included in the plan. The Chippewa Champions Center will replace the current locker room building in the north end zone of Kelly/Shorts Stadium.

The current vision includes a new football locker room, a rehabilitation centre and a nutrition centre for all 475 CMU student-athletes, team meeting space and offices for football staff and a weight room.

MI: Rosemont Ballpark

Minor league baseball stadium for team in the American Association of Independent Professional Baseball on 10 acres of village-owned land north of Balmoral Avenue and west of the Tri-State Tollway. Four-level parking garage (+\$20m). One-level stadium with skyboxes, party decks and club areas. Finance: Village. Architect: AECOM Services (\$2.6m).

Capacity 6,300

Cost US\$35m

Completion 2018

MI: St. Louis: St. Louis Soccer Stadium

Proposed MLS stadium on 13-acre plot located at the intersections of Grand Boulevard and Chouteau Avenue, owned by St. Louis University. Tenants: MLS expansion team, women's soccer team, SLU's men's and women's soccer teams. Two groups are bidding to provide an expansion team in the city.

Capacity 22,500

Cost \$135m-150m

MN, Eagan: Twin Cities Orthopedics Performance Center and TCO Stadium

Team base and practice facility for the Minnesota Vikings. Area: 40 acres. Outdoor stadium (natural turf) and four additional outdoor practice fields - three grass, one synthetic; outdoor training areas, including a sand pit and inclined surfaces; an indoor practice facility with a 100-yard synthetic surface field and full-clear height for kicking; a team auditorium and player position meeting rooms; media center/press facilities; expanded locker room, weight room and equipment facilities; cardiovascular and specialized speed rooms; and a hydrotherapy room and post-workout recovery rooms. Naming partner: Twin Cities Orthopedics (TCO). Architect: Crawford Architects. Construction: Kraus-Anderson Construction Company.

Capacity 6,000

Completion March 2018

MN, Minneapolis: University Athletics Village

University of Minnesota Center for Excellence, which will house academic, leadership and nutrition centers, a Football Performance Center, Football Indoor Practice Facility and a Basketball Development Center. Finance: private (US\$70m). Architect: BWBR Architects. Director of athletics: Norwood Teague. Area: 340,000ft². Construction: Mortenson.

Cost US\$190m

MN, Saint Paul: Allianz Field

Work well underway on new home for Minnesota United. Stadium to be known as Allianz Field. Roofed stadium at the Snelling-Midway site. Privately financed, publicly owned. Safe standing area for fans (2,900). Variety of corporate spaces and seating options. Clubs: 3. Green: LED lighting throughout. Pitch: natural (heated). PTFE building skin, native materials in exterior finish. Retail: 1,600ft². Architect: Populous.

Capacity 20,000

Cost US\$150m (\$120m)

Completion 2019

Mechanical Engineer ME Engineers

ME is providing full MEP design.

MO, Columbia: Mizzou Softball Stadium

University of Missouri's new softball stadium located east of the Hearnes Center. To host the 2018 Southeastern Conference Tournament. Full-view concourse and outfield plaza.

Capacity 2,700 (1,700 seated)

Completion 2017

Mechanical Engineer ME Engineers

ME is providing full MEP design.

MS, Jackson: JSU Dome

For Jackson State University to host football and basketball games, as well as concerts on campus. Sports Hall of Fame on first floor. Parking: 4,500. Finance: up to \$75m state-issued bonds.

Capacity 50,000

Cost US\$200m

MS, Oxford: Swayze Field

Upgrade to improve fan experience at home of Rebels, Ole Miss Baseball (Director of Athletics Ross Bjork). New baseball performance center, a field level club, additional box seating, a rooftop plaza down the first base line and an expansion/realignment of the left field terrace. Part of the \$200 million Forward Together campaign.

Capacity 10,715 (10,323)

Cost US\$13m

Completion 2018

MS, Oxford: Vaught-Hemingway Stadium

Enclosure of north end zone and adding suites (30) and skyboxes on the south and west sides. Athletic department (Assistant Athletic Director Kyle Campbell) authorised by The University of Mississippi's College Board to hire AECOM Technology Corp. for \$2.4 million to design the expansion. Finance: donations to Ole Miss' Forward Together athletics fundraising campaign. The university is also building a new basketball arena and plans to pay for the stadium expansion from the same campaign.

MS, Starkville: Polk-Dement Stadium

A complete overhaul of Mississippi State University's (MSU) Dudy Noble Field-Polk DeMent baseball stadium can push ahead after a funding deal was agreed. Trustees have approved plans for MSU to borrow up to \$30 million to expand and upgrade the stadium. The Dudy Noble Field Master Plan calls for a new double-tiered grandstand, welcoming entry plazas, restrooms, concessions, a kids' play area, berm seating and upgraded field lighting. Design team: Wier Boerner Allin Architecture, Populous, Janet Marie Smith. Finance: \$25m donations, \$30m loans. Skyboxes: 25. Left Field Lofts. 1,000ft² apartments behind Left Field Lounge: 25. Left Field Lounge will have also have a walkway through the middle where those who do not know lounge owners can walk through and not block anyone's view. New locker rooms, training rooms, equipment rooms and potentially coaches' offices. Two main entrances: one behind home plate and one in right field with a large entry plaza. Additional and bigger concession areas and restrooms, both in the grandstand and outfield. HD video board, ribbon boards and field lighting.

Mechanical Engineer ME Engineers

ME is providing MEP and Technology design.

Cost US\$55m

NC, Charlotte: American Memorial Stadium

Renovations to house the Charlotte Independence pro soccer team and school and amateur sports. Club seating, concourse and concession renovations, synthetic turf field. Finance: private, county (\$8m), city (\$8m) and tourism. Team currently play in temporary 4,300-seat facility at Charlotte's Ramblewood Soccer Complex (Nussli Group).

Capacity 14,000

Cost US\$25m

Completion 2017

NC: Fayetteville Ballpark

Minor league baseball stadium in downtown behind the Prince Charles Hotel. Hotel part of development and investment group. City dealing exclusively with the Houston Astros, which would like to relocate a Class A-Advanced ball club from California to play in the Carolina League by 2018. City refining site plan and design.

Capacity 5,000

Cost US\$30m-\$40m

Completion 2018-19

NC, Greenville: Dowdy-Ficklen Stadium

Renovation for East Carolina. Southside tower. Premium seats: +1,000, club level, suites and a new press facilities. Improvements to Ward Sports Medicine Building and Scales Field House to increase space for student-athletes. New nearby hitting facility for baseball and softball.

Cost US\$55m

Completion 2018

NC, Raleigh: North Carolina FC Stadium

MLS hopeful, North Carolina Football Club, has chosen its preferred location to build a new stadium and entertainment complex in Raleigh. In partnership with Kane Realty, the community hub will include conference space, office, hospitality and retail space, housing and public parking. The project's footprint is approximately 13 acres in the area currently known as the State Government Complex, located within the boundaries of Peace St., Salisbury St., Lane St. and the CSX Rail easement. Architect: Gensler.

NJ, Monmouth County: Kessler Field

A four-storey building behind the Monmouth stadium stands is planned. Restrooms, concession stands, Press box, scoreboard operations, broadcast booth and many other media uses. Finance: \$11.25 private. Donors still required. Athletic Director Marilyn McNeil. Construction will start once funds are acquired.

Capacity 4,200

Cost US\$15m

Completion 2017

NM, Portales: ENMU Football Stadium

Proposed replacement for 45-year old stadium. Funding: student vote on fee increase. Also for schools use and with City Manager's support.

Cost US\$18m

NV, Las Vegas: Las Vegas Motor Speedway

Las Vegas Motor Speedway (LVMS) to undergo series of improvements. The speedway is making a number of enhancements to the seating and viewing areas for 2018 in an effort to improve and diversify its fan experience. The renovations, designed by the Detroit-based architectural firm ROSSETTI, will modernise and transform LVMS's fan experience. Enhancements include three completely renovated, exclusive clubhouse areas; the new Turn One Social Pavilion; two separate loge-box seat offerings; and a racing-inspired, interactive sports lounge..

Completion March 2018

NV, Las Vegas: Football Stadium



A groundbreaking ceremony has taken place at the home of the NFL Raiders' Las Vegas stadium. The event kicked off the construction of the 65,000-seat domed stadium that will serve as the team's new home. NFL owners approved the Raiders' relocation from Oakland in March, with 31 of the 32 owners voting in favour of the move.

Capacity 65,000

Cost US\$1.2bn-\$2.1bn

NV, Las Vegas: University of Nevada Stadium

UNLV is a possible partner in football stadium construction. Previously looked at funding of an on-campus stadium (deal with Majestic fell through.) Consultant: Conventions Sports & Leisure International (\$325,000).

Capacity 60,000

Cost US\$500m (stadium) US\$2bn (overall)

NV, Summerlin: Las Vegas Ballpark



The Howard Hughes Corporation has unveiled plans to develop and construct a baseball stadium in Downtown Summerlin for the Las Vegas 51s. Stadium to be built on approximately eight acres just south of City National Arena, the National Hockey League practice facility for the Vegas Golden Knights. The Las Vegas Ballpark is being designed by HOK. The 10,000-fan-capacity stadium blends the distinct architectural style of the Summerlin community with the aviation legacy of Howard Hughes. The ballpark will provide a wide range of seating options including 22 suites, club seats, berm seating, party zones and decks, picnic tables, kids' zone, bars and a pool beyond the outfield wall.

Completion 2019

NY, New York: NTC Flushing Meadows

A second roofed court made its debut at the US Open at Flushing Meadows in New York in August 2018. The new Louis Armstrong court has a retractable roof and is the final phase of a five-year, \$600 million project that rebuilt the USTA Billie Jean King National Tennis Center. It will be the first naturally ventilated stadium of its kind with a retractable roof, with openings at the north and south ends allowing air to flow through even when the roof is closed. The new court has 14,000 seats. Part of Multi-year 'Sports Spectacle' project to redevelop the Billie Jean King National Tennis Center (NTC). Phase one completed: retractable roof on Arthur Ashe Stadium, Grandstand Stadium and South Tournament Courts renewed. Architect: ROSSETTI. Construction: Hunt. Developer: USTA.

Mechanical Engineer ME Engineers

ME provided MEP design for the roof addition.

Capacity +10,000

Cost US\$550m

Completion 2018

NY, New York: Queens Soccer Stadium

New York City FC playing in Yankee Stadium while seeking to build a soccer-specific stadium in Queens or or Brooklyn. MLS Commissioner Don Garber has presented plans to build a 25,000-seat stadium at Flushing Meadows Corona Park. Designed to allow upgrade to 35,000. The plans call for parkland used for the project to be replaced acre-for-acre. Jobs: 150 full-time, 700 part-time.

Capacity 25,000

NY, Elmont: Belmont Park Soccer Stadium

A proposed plan to the Empire State Development Corporation for a soccer stadium in the underused Belmont Park. Tenant team: New York Cosmos. Included in the proposal are plans for 9 new restaurants, 250,000 square feet of retail space and a 4.3-acre park. Construction jobs: 500. Full-time jobs: 3,000. Expected \$200m annual revenue after build.

Capacity 25,000

Cost US\$400m (privately funded)

Completion 2017

NY, Syracuse: University Stadium

Syracuse University is to spend \$118 million on revamping its stadium over the next few years. Upgrades include a new fixed roof, a vertically hung scoreboard, state-of-the-art sound and lighting systems, improved accessibility and added Wi-Fi capabilities. The investment, authorised by the Board of Trustees, will enable the University to create a new stadium experience for students, faculty, staff, alumni and fans alike. The stadium upgrades represent the next step in advancing the \$255 million West Campus transformation strategy the University first announced in 2016. Consultant: Irwin Raji.

Cost US\$118m

OK, Oklahoma University softball/baseball



The University of Oklahoma (OU) has completed the drafting of master plans for the baseball and softball facilities at OU. The work encompasses expansion and enhancements at both L. Dale Mitchell Park and the OU Softball Complex. Populous, the firm retained for the south end zone project at Gaylord Family - Oklahoma Memorial Stadium, has performed the work on the two ballparks. The full master plan calls for approximately \$15 million of work at the softball park and \$10 million at the baseball park. The work could be phased if necessary.

OH, Akron: MLS Stadium

Proposed retail village and retractable-roof stadium for MLS expansion team. Developer: Wolstein Sports & Entertainment Group LLC (Paul Garofolo). Finance: \$7m per year tobacco tax, Wolstein \$100m.

Capacity 20,000-25,000

Cost US\$327m (stadium \$110m-\$165m)

OH, Canton: Tom Benson Hall of Fame Stadium

Hosts Hall of Fame game. First phase connected stadium to HOF and added specialist features. Next phase: premium environments with suites, clubs and club seats; technology integration; roof terraces; fan concourses and amenities; and NFL standards throughout. HKS is also designing and creating an expanded destination environment for the Hall of Fame Village. With the Hall as its nucleus and a new stadium to accommodate additional sports and entertainment events, the masterplan envisions the site as a national destination and a regional asset that provides local connectivity to the Canton community. Architect: HKS Sports & Entertainment Group.

Completion August 2017

OH, Cincinnati: FC Cincinnati Stadium

FC Cincinnati has released renderings for their proposed Dan Meis designed soccer-specific stadium. The design features a canopy on all four sides and a façade that can be illuminated with LED lights reflected off translucent material. The 25,000-seat, horseshoe-shaped concept has been inspired by Bayern Munich's Allianz Arena. The stadium is expandable to 30,000 seats when berm seating is added to one end of the closed-in horseshoe. FC Cincinnati does not yet have a site secured for their proposed \$200 million stadium, which they are seeking to fund through a public-private partnership. The USL club currently plays at the University of Cincinnati's Nippert Stadium and is currently considering three sites: one in Cincinnati's West End neighbourhood, another in the city's Oakley neighbourhood and a third just across the Ohio River from downtown in Newport, Kentucky. Architectural firm MEIS will design the stadium, while Turner Construction will manage its construction. The Machete Group will manage all phases of FCC's West End stadium, and U.S. Bank is the finance partner for the stadium.

Cost US\$200m

OH, Columbus: Ohio Stadium



Four-year renovation project for Ohio State University's iconic home (1922). Restore and re-coat the 94-year old concrete on C-deck, upgrade power distribution systems for the east, west and south stands, improve and upgrade B-deck to include better lighting, larger televisions, an improved sound system and better scoreboards, renovate the premium seating area to consolidate the university suites into one University Suite and add 35 loge boxes and 12 luxury suites. Finance: Department of Athletics using auxiliary funds, debt and private donations. Design and build process autumn/fall 2016, C-deck concrete restoration 2017-2020, University Suite expansion completed in August 2017, removal of 2,600 seats 2018, suites and loge seats completed in 2019.

Capacity 102,854 (104,944)

Cost US\$42m

Completion 2020

OR, Eugene: University of Oregon

The University of Oregon has unveiled plans to build a futuristic new track and field stadium. The University said Hayward Field will set a new standard for sports venues, create world-class training and competition facilities for student-athletes, and incorporate new laboratories and research facilities to better understand the potential of human performance.

Watch a video of Hayward Field's history and planned future here. The new stadium's permanent capacity will be 12,900, slightly larger than the 10,500 fans it currently holds. This will be expandable to nearly 30,000 for the IAAF World Outdoor Championships in 2021.

Completion 2020

OR, Portland: Providence Park

MLS's Portland Timbers planning a major expansion of their Providence Park Stadium Proposed design by Allied Works would add a 93-foot high covered structure on the east side of the stadium, taking a vertical approach to a relatively small footprint while integrating well with the existing stadium. The proposed project includes four new levels on the expanded east side, with three of the four levels created for reserved and group seating sections to help meet demand, while including a unique, pedestrian-friendly public arcade along SW 18th Avenue.

Capacity 24,644 (21,144)

Completion 2018



PA, Penn State: Panzer Stadium
Penn State University to build new lacrosse stadium at its existing lacrosse field on the University Park campus. The team of Moody Nolan of Columbus, Ohio, and APArchitects LLC of Boalsburg designed the project. PJ Dick of Pittsburgh will construct the stadium. If approved by the university board of trustees the Panzer Stadium project will tentatively begin early phases in July 2017. Penn State Intercollegiate Athletics announced \$3.55 million in gifts for a new lacrosse stadium on the University Park campus.
Cost US\$8.4m
Completion 2018
PA, Reading: Ballpark
Ballpark for Reading Phillies to replace FirstEnergy Stadium as part of proposed RiverView at Reading development.
Cost US\$70m
PA, Philadelphia: Temple University Stadium
Temple University's Board of Trustees voted to authorize the development of preliminary designs (\$1m), usage options and environmental impact studies for a multipurpose retail and football stadium project on the northwest corner of Main Campus. Architect seeks to create a vibrant streetscape experience that blends together the planned stadium, the significant retail components, the adjacent indoor recreation facility and various pedestrian plaza and green spaces. Engagement process under way. Architect: Moody Nolan (Curtis J. Moody). Moody Nolan is also designing Temple's new indoor practice facility next to the stadium site and is collaborating with AECOM (engineering design) and Langan (civil engineering and landscape design. Required funding: \$50m donations. City approvals required. Task force of students, staff, and community members, will advise on maximising use.
Capacity 35,000
Cost US\$126m
PA, University Park: Beaver Stadium
Revamp for football stadium which has been in its current location on Penn State's campus since 1960 and seats 107,000. Improvements will be decided as part of the Intercollegiate Athletics' facilities master plan. Athletic director: Sandy Barbour. Aiming to generate more revenue from the stadium beyond football games, attracting concerts, NHL preseason games and international soccer matches.
RI: Providence: Pawsox Ballpark
New owners of Pawsox intend to take the Triple A franchise out of Pawtucket. Undertaking a structural study on McCoy Stadium Target site for new stadium is a piece of freed-up 1-195 land near the intersection of Dyer and Dorrance streets in Providence. Plus parking garage (\$10m). Concept design: DAIQ and Populous. Economic consultant: Brailsford & Dunlavey.
Capacity 10,000
Cost US\$70m
SC, Clemson University Football Complex
Clemson opened its new Football Operations Complex on February 1. Features include 1.5 acres of outdoor leisure and entertainment space, state-of-the-art training, weight equipment, technology and hydrotherapy. HOK's Sports + Recreation + Entertainment group designed the complex with GMC serving as the architect of record and DPR as the contractor. The training facility for the national champion Clemson Tigers will be the country's largest, most programmatically inclusive football training complex.
Cost US\$55m
SC, Myrtle Beach: Brooks Stadium
Proposed expansion of Coastal Carolina University's Football Stadium. Donations sought to build fund sufficient for state finance matching. Finance: athletic fund, renovation fund. Depends on approval of financing by South Carolina Commission on Higher Education (CHE). Chants' move to the Sun Belt Conference and to the NCAA's Football Bowl Subdivision means they are required to average 15,000 in attendance per game.
Capacity 19,000 (9,214)
Cost US\$29.9m

TN, Johnson City: ETSU Football Stadium
The State Building Commission has approved a project to build a new football stadium for East Tennessee State University. In southwest corner of the university's campus between the Basler Center for Physical Activity and the ETSU physical plant building. To include skyboxes. Third level dedicated to press, game-day operations and logistics. Phase one: 7,000 seats in west and east. Phase two: 3,500 seats along horseshoe stretch. More concessions and toilets. Construction manager and general contractor: BurWil Construction (COO Bill Prince). Team will play two seasons at Science Hill High School's Kermit Tipton Stadium. Finance: student fees and donations.
Capacity 10,500
Cost US\$26.6m
Completion Q3 2017
TN, Knoxville: Neyland Stadium
University of Tennessee (UT) Athletics has completed a comprehensive nine-month feasibility study into future renovations. The overall plan sequences the renovations in phases by beginning at field level and progressing upward and around by concourse. First phase: south concourse 1 expansion and renovation, south field wall movement, visiting team locker room relocation, kitchen and commissary addition, lower/lower west bowl infrastructure rebuild, hospitality area upgrades (e.g. field-level club), upper bowl handrail augmentation, electrical transformer replacement, and storm sewer line repair. Finance: gifts and athletics department. Consultant: Populous.
Cost US\$106m
Completion August 2019
TN, Memphis: Liberty Bowl Memorial Stadium
Home to University of Memphis' Tigers football team is seeking to install more than 5,000 premium seats. Finance: Tigers.
Capacity 57,800 (60,000)
Cost US\$3m
TN, Nashville: MLS stadium
Plans to bring a Major League Soccer (MLS) expansion team to Nashville boosted by the city's Metro Council decision to approve a \$275 million stadium project. Stadium to be built on a portion of the city's fairgrounds, and includes a funding package of \$225 million in the form of revenue bonds. The MLS stadium plan integrates the new stadium with the existing Metro masterplan for the fairgrounds. Stadium funding would come from a combination of three sources: \$200 million in revenue bonds, \$25 million in cash from the MLS ownership group, and \$25 million in Metro general obligation bonds to pay for public infrastructure associated with the stadium.
Cost \$275 million
TX, Amarillo Ballpark
Property swap between Coca-Cola and Amarillo Economic Development Corp. likely to allow go-ahead on downtown baseball stadium/multipurpose event venue. City council sorting out zoning and finance. Developer: Local Government Corp. Original developer failed. Development partner and operator sought. Possible tenant/partner: Southern Independent Baseball.
Cost US\$45.5m (US\$30.3m)
Completion 2017
TX, Arlington: Esports Stadium
The City of Arlington has announced plans to build an Esports Stadium Arlington, a state-of-the-art esports-specific venue designed to draw competitive players and fans from around the world. Created in collaboration with Populous, the 100,000ft ² space will be the largest and most flexible esports stadium in the country and is set to open its doors later this year in Arlington's entertainment district. The City of Arlington and Esports Venues, LLC, plan to invest \$10 million into the Arlington Convention Center to transform it into an esports stadium offering the most immersive spectator experience in the live esports event market.

TX, Arlington: Globe Life Field
Architects HKS have been picked to design a retractable-roof stadium and supporting development in the Entertainment District. Site to be parking lot, south of the existing ballpark, south of Randol Mill Road. The design phase of the ballpark is currently underway with construction expected to be begin later in the year. The facility is expected to open in time for the start of the 2020 Major League Baseball season. Putting a roof on Globe Life Park, which opened in 1994 as Rangers Ballpark in Arlington, would be too expensive. Finance: 50/50 public-private partnership (PPP) - Arlington City Council, Texas Rangers - for 30 years. Rangers' 30-year lease on the City-owned Globe Life Park ends in 2024. Economic impact 2016-2054: US\$2.43bn for Arlington and US\$4.35bn for Tarrant County.
Mechanical Engineer ME Engineers
ME is providing MEP and sports lighting design.
Cost US\$1bn
Completion 2020
TX, Austin: Austin FC MLS stadium
Plans have been unveiled for a new stadium for the Columbus Crew SC MLS team. Columbus Crew owners Precourt Sports Ventures (PSV) have been searching for a stadium site since announcing plans to potentially relocate the Major League Soccer club last October. A suitable 24-acre site has now been identified at McKalla Place in north Austin near the Domain. Gensler Sports is the architect.
Cost US\$200m
TX, Texas Tech: Jones AT&T Stadium
Texas Tech Athletics will renovate both its Football Training Facility and the south end zone of Jones AT&T Stadium after receiving a significant monetary gift. Tech has already made significant upgrades to Jones AT&T Stadium as part of the campaign, notably the North End Zone Club Area, the video board, the North End Zone Colonnade and new FieldTurf surface. Gensler Sports is the architect.
TX, College Station: Softball Stadium
Texas A&M (Director of Athletics Scott Woodward, Senior Associate AD for Facilities and Construction Kevin Hurley) softball stadium approved by board of regents. Exterior will resemble Blue Bell Park, home of Texas A&M's baseball team, as well as the new Track & Field Complex next door. Club level seating as well as two luxury suites. Press box - two radio booths, a TV booth and a writing press area. Locker room, player lounge, training room, video/media room, computer lab, and 6,744ft ² indoor hitting facility with four batting cages. Two concession stands, a team store, guest services and restrooms down the first- and third-base lines. Finance: donations. Architect: Gensler Sports.
Capacity 3,000
Cost US\$28.6m
Completion 2018
TX, Canyon: West Texas A&M University
West Texas A&M University will break ground today on the new \$38.8 million on-campus Buffalo Stadium. The new Buffalo Stadium, located in Canyon, Texas, east of the current soccer/track stadium and Jarrett Hall, will be constructed on a north/south axis with easy access to campus. The west side of the football stadium will include a multi-storey building to house concourse-level suites, elevated club seating areas and a modern press box. There will be grade-level entry to the stadium with bowl seating split into an upper level of pre-engineered metal grandstands and a lower level of cast-in-place concrete surrounding a below-grade artificial turf playing field.
Capacity 8,500
Cost US\$39m
TX, Dallas: SMU Soccer Stadium
Phase 1 of Southern Methodist University Athletics' Facilities Master Plan, a \$150 million comprehensive facilities investment that will serve the needs of all 17 sports and 400-plus student-athletes. New stadium for men's and women's soccer. at SMU on Mockingbird Lane. Current site will house indoor performance center with full-sized football field and indoor 300-metre track. Director of Athletics: Rick Hart. Finance: donations (80%).
Completion 2019



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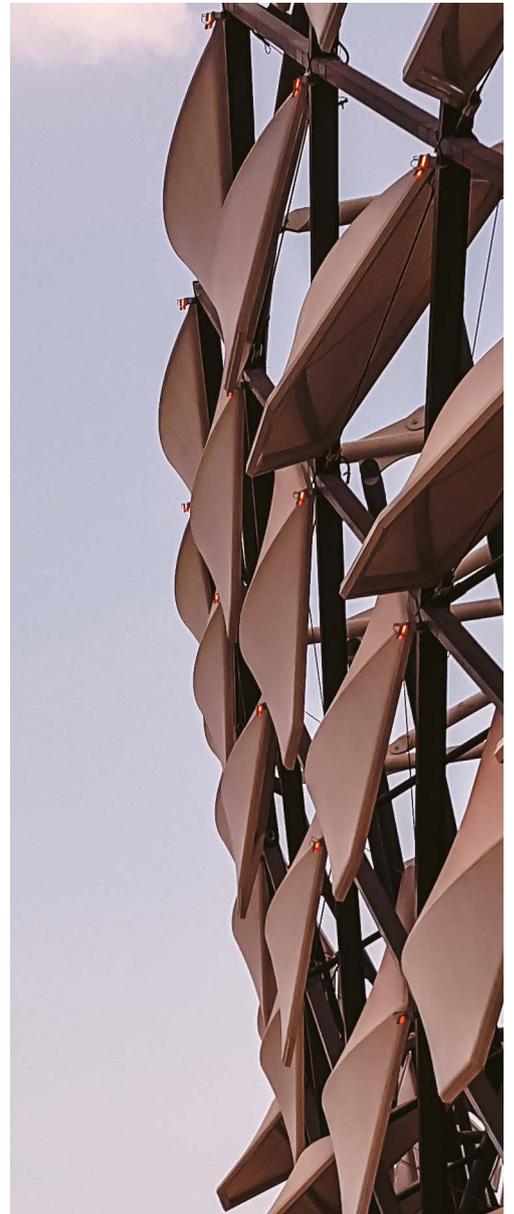
TX, Edinburg: H-E-B Park	
For USL team Rio Grande Valley FC, plus Houston Dynamo and Houston Dash preseason matches, concerts and other community events. At intersection of East Freddy Gonzalez Drive and South Raul Longoria Road. Full-service restaurant and concessions, a park with a playground, an amphitheater with a capacity for 2,000, practice fields, executive lounges, a sports bar. Suites: 33.	
Capacity	16,000
Completion	2017
TX, Fort Worth: TCU stadium	
Amon G Carter Stadium at Texas Christian University (TCU) in Fort Worth will undergo major upgrades after funding for the project was approved. The plans for the home of the university football team include additional luxury seating, two private clubs, 1,000 additional club seats, and a large balcony that will overlook Frog Alley. Work is expected to get underway in May 2018. The expansion will include 48 loge boxes with two private clubs, over 1,000 club seats and 20 luxury suites. There will also be a 100-foot outdoor balcony overlooking Frog Alley, the TCU campus and downtown Fort Worth as well as vast additional premium space that can be used for outside events on game days. Additionally, a new video board will be installed in the north end zone.	
Cost	\$100 million
TX, Fort Worth: Fort Worth Arena	
Ground broken on the site of the new Fort Worth multipurpose arena. Planned to bring a wide variety of programming, including sporting events, concerts, family shows, community and school events, and more. Located adjacent to the Will Rogers Memorial Center campus. Will be the new home to Fort Worth Stock Show Rodeo performances. The arena will have a seating capacity of up to 14,000 for concerts; 13,300 for basketball; 12,200 for family shows and ice hockey and 9,300 for rodeo and equestrian shows.	
Capacity	14,000
Completion	2019
TX, Frisco: Toyota Stadium	
Multiple upgrades to the 10-year-old stadium. More than 100,000ft ² of renovated space, a private club and the National Soccer Hall of Fame Museum. Padded seating in the south end will be covered by a roof and include pre-game dining inside a private club featuring views into the player hallway and out to the field. 7,000ft ² outdoor party deck with an outdoor bar, concession stands and a new team store. Upgraded HD video boards, new sound system will improve fan experiences new skyway connecting the West side suites to the premium amenities on the South end. Locker rooms configurable into four separate soccer dressing rooms or combined into two larger rooms for American football events. Developers: FC Dallas, US Soccer, Frisco Independent School District, City of Frisco.	
Cost	US\$39m
Completion	late 2017
TX, Houston: Houston Strikers	
Newly formed Houston Strikers rugby team to build stadium as it gears up to join Major League Rugby (MLR) in 2018. Strikers are one of the nine teams looking to take part in the new MLR competition and want to build an 11,000 seat, \$10 million stadium. The Strikers say they are in the process of interviewing stadium contractors and that they will build the venue in sustainable phases.	
Capacity	11,000
TX, Prosper: Prosper High School Stadium	
Prosper Independent School District (PISD) has completed the design of its new stadium/natorium complex in Texas. The 12,000 capacity stadium, designed by Huckabee Architects, will serve all PISD high schools when it opens in August 2019. This project was approved and will be funded from the \$710 million bond issue passed nearly 10 years ago, coming in with an approximate cost of about \$48 million. Prosper ISD's new district stadium and natorium complex delivers a state-of-the-art facility for the growing community. The complex will be located to the west of Prosper High School and will be utilised for athletic, extracurricular and community programmes.	
Capacity	12,000
Cost	US\$48m
Completion	August 2019

TX, San Antonio: Alamodome	
Expansions and exterior modifications completed. New wings to the east and west concourse, totaling 55,000 square feet of new space. Expanded field level to the north, outdoor terraces and beer garden. Voted through by the Historic and Design Review Commission.	
Mechanical Engineer	ME Engineers
ME is providing sports lighting and technology design.	
Cost	US\$42m
UT, West Valley City: Real Monarchs Stadium	
Real Salt Lake owner Dell Loy Hansen has signed a letter of intent with city manager Wayne Pyle. 60-day negotiating window. Work in tandem with Maverik Center. Hansen withdrew in February from deal for club and Utah State Fairpark to add a multi-use sports stadium to the fair park.	
Capacity	8,000
Cost	US\$20-23m
VA, Charlottesville: Davenport Field	
	
Redevelopment of the University of Virginia ballpark – Davenport Field at Disharoon Park. DLR Group's design has introduced a new 'front door' – a memorable gateway for fans, student-athletes, recruits, and visitors. Phase I includes new and enhanced options for viewing the game, including wrap-around elevated concourse, chair back seating, outfield bleachers, berm, picnic terrace, and the new Field Level Club. Team training and recruitment will benefit from the new Pitching Development Center, batting cages, bullpens, and baseball operations suite. Additionally, future phase construction has been coordinated to include suite, club, and party deck spaces added above the expansion concourse, fulfilling the expressed desire for a 'big time' look and feel.	
Cost	US\$18.6m
VA, Blacksburg: Virginia Tech English Field	
Virginia Tech's new ballpark – English Field at Union Park – has opened. CannonDesign designed the dynamic new ballpark in design-build partnership with Whiting-Turner. English Field at Union Park is an exciting new ballpark that celebrates Virginia Tech baseball's rich history and serves as a home for its future. Everything from the Hokie stone to embossed university symbols celebrate Virginia Tech, in Blacksburg, Virginia, and its legacy of baseball success. Overhaul of Virginia Tech baseball team's ballpark. Additional seats, modernised concession stands and a new scoreboard. Four design-build teams presenting designs in June. Senior associate athletic director for facilities and operations: Tom Gabbard. Naming rights: Union Bank & Trust (\$3.5m).	
Cost	US\$12m-US\$14m
VA, Fredericksburg	
Proposed multi-purpose stadium in Celebrate Virginia South development. Aimed at sports tourism market and home to minor league baseball team. Artificial turf fields: 5. Parking: 1,800 (\$7m). Developer: owners of the Hagerstown Suns and Diamond Nation. Architect: Pei Partnership Architects and HKS.	
Capacity	4,750
Cost	US\$29m
VA, Norfolk: ODU Foreman Field	
Old Dominion University has announced plans to rebuild and expand S.B. Ballard Stadium to enhance seating and add modern amenities. Construction will begin this summer and end before the home opener of the 2019 football season. The project will not use state funds or require an increase in student fees. It will be funded by athletic revenue, private funding and bond proceeds. The first phase of the \$65 million project will address many of the recommendations that fans made in a 2016 survey. The stadium will have more than 21,000 seats. Bidders – Construction S.B. Ballard. Architects: Moseley Architects, Populous.	
Capacity	21,000
Cost	US\$65m
Completion	August 2019

VA, Henrico County: Richmond Intl Raceway	
Planning future of development of more than 1,000 acres along Laburnum Avenue in Henrico County. Cushman & Wakefield and HOK will work to determine the "highest and best use" of the land the racetrack owns and to plan potential future improvements. RIR President: Dennis Bickmeier.	
VA, Richmond: Ballpark	
Proposed development of minor league ballpark. Flying Squirrels AA affiliate of the San Francisco Giants is reviving interest after failed attempt in 2014.	
WA, Tacoma: Soccer Stadium	
Seattle Sounders FC and the Tacoma Rainiers Minor League Baseball outfit have signed a memorandum of understanding to develop a new soccer-specific stadium in Tacoma, Washington. Architects: Populous.	
Capacity	5,000
Completion	2019
WI, Franklin: Ballpark Commons	
Proposed baseball stadium at The Rock sports complex for an independent professional baseball team; an indoor sports complex with four Little League-sized baseball fields and space for other sports; one or two hotels with up to 220 rooms; around 300 apartments; restaurants and other retail space, and an office building. Common Council has authorised financial consultancy. Developer: Mike Zimmerman	
Capacity	2,500
WI, Whitewater: UW Athletic Complex	
Renovation of campus athletic complex buildings for UW-Whitewater. Director of intercollegiate athletics: Amy Edmonds. Upgrades to football and baseball stadiums, relocation of maintenance shed.	
Cost	US\$5.2m
Completion	September 2017
US VIRGIN ISLANDS	
St. Croix: Paul E. Joseph Stadium	
Demolishing the existing stadium (under way) and rebuilding pro baseball field and sports complex to include 750-seat Little League baseball field; associated lighting, a press box and other amenities; an entry plaza with ticket booths; restrooms; a concession building; an open pavilion; a locker and maintenance building; and a permanent St. Croix Christmas Carnival Village. Finance: V.I. Public Finance Authority \$17.5m. Client: VI Dept of Sports, Parks and Recreation. Architect: Steven E. Hutchins. Design consultant: Populous. Design and build: General Engineering Corp.	
Capacity	3,500
Cost	US\$35m (US\$20m)
Completion	June 2018
VENEZUELA	
Caracas: La Rinconada Stadium	
Baseball stadium under construction in La Rinconada Park as first phase of a new public park master planned by Rogers Stirk Harbor + Partners. Located just outside the capital, this 36,500-seat baseball stadium is slated to be a venue for the Venezuelan winter baseball league and for international baseball events. The park will include world-class sports venues, public plazas, and a hotel and convention centre. Architect: Gensler	
Mechanical Engineer	ME Engineers
ME is providing the MEP, sports lighting and technology systems design.	
Capacity	36,500
Completion	2017
WEST INDIES	
Jamaica, Clarendon: Herb McKenley Stadium	
Work under way by Minister of Transport and Works seeking full finance. Nine-lane, all-weather running track, football field, basketball and netball courts.	
Capacity	12,000
Cost	US\$200m
Trinidad, Tarouba: Brian Lara Stadium	
Refurbishment for moth-balled cricket stadium. Repair, electrical, landscaping, fencing, plumbing, air-conditioning, and elevators. Developer: Urban Development Company of Trinidad and Tobago (UDCOTT). Consultant: NLBA Architects.	
Cost	TT\$90m (US\$13.5m)
Completion	2017

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HOME RUN!



Minor League baseball parks and college sports facilities across the US are booming, as feature writer Steve Traiman discovers from ownership.

Playing their part in a continually upbeat US economy, colleges continue to expand and rebuild baseball facilities, with more than \$2 billion in projects underway across the country.

At the same time, **Minor League Baseball (MiLB)** is adding at least four new ballparks – and new markets – for the 2019 and 2020 seasons.

On the college side, this sampling of projects includes the new \$166 million **University of Minnesota Athletes Village** completion, Minneapolis; \$160 million renovation and addition for the **University of Arkansas Donald W. Reynolds Stadium**, Fayetteville; \$100 million premium seating expansion at **Texas Christian University Amon G. Carter Stadium**, Fort Worth; \$65 million **Ballard Stadium** reconstruction at **Old Dominion University**, Norfolk, Virginia; and \$63 million renovation at **University of Georgia Sanford Stadium**, Athens.

For MiLB, Jeff Lantz, Senior Director, Communications, confirmed several new projects: The \$150 million **Las Vegas Ballpark** will open for the 2019 season in suburban Summerlin for the **Las Vegas 51s** of the **AAA Pacific Coast League**. The \$48 million **Madison Ballpark** (Alabama) will host the relocating **Mobile BayBears** in the **Class AA Southern League** for the 2020 season. The \$45.53 million **Amarillo Multi-Purpose Event Center (MPEV)** opens April 2019 for the **AA Texas League** team the **Elmore Group**, which is moving from San Antonio. The \$37.8 million **Fayetteville Ballpark** (North Carolina) will be home next April for the new **Fayetteville Baseball Club**, a **Class A-Advanced** affiliate of the **MLB's Houston Astros**.

UNIVERSITY OF MINNESOTA ATHLETES VILLAGE, MINNEAPOLIS

The University of Minnesota unveiled its completed new Athletes Village earlier this year, Jake Ricker, Director of Strategic Communications, confirmed. The \$166 million project meets the goal of upgrading existing development facilities for all 700 Gopher student-athletes. Partnering with experiential design firm **Advent**, **BWBR Architects**, **Mortenson Construction** and **RDG Planning & Design**, this campus within a campus concept includes the Land O'Lakes Inc. Center for Excellence, David and Janis Larson Football Performance Center, Indoor Practice Facility, and Charlie and Kathy Cunningham Basketball Performance Center. The quartet joined the existing Bierman Athletic Complex and Gibson-Nagurski Athletic Center. The spaces strike a balance between honoring the history of Gopher Athletics and motivating current student athletes to strive for academic excellence and service to their community. The true impact of these new facilities is meeting the goal to provide student athletes an expanded academic center and the first-ever Gopher nutrition center, leadership center and dedicated basketball facilities, incorporating the latest cutting-edge technology throughout the Village. As an example, the Hall of Fame includes a Gameday Experience room with two screens — one at 2,754 x 1080 pixels and another at 2,592 x 1080 pixels — eight speakers and two subwoofers.

UMN Athletes Village includes (clockwise from upper-right): Indoor Practice Facility, Land O'Lakes Inc. Center for Excellence & Cunningham Basketball Performance Center, Bierman Athletic Complex, Gibson-Nagurski Athletic Center & Indoor Field, Larson Football Performance Center.

Image credit: UMN Athletics



UNIVERSITY OF ARKANSAS DONALD W. REYNOLDS STADIUM, FAYETTEVILLE

Donald W. Reynolds Razorback Stadium will open a \$160 million renovation and north end zone addition this fall, according to Kevin Trainor, Associate AD, Public Relations. The project is funded entirely by athletic revenues, gifts and proceeds from a future bond issue. With all security and safety systems enhanced, the project scope includes: New North end zone addition with new suites, loge boxes, club seats, and club areas. East and west concourses will connect to allow the flow of patrons around the stadium, as well as provide new concessions and restrooms. Additional and expanded entrances will improve patron flow. A new game day locker room, training room, and pre/post game support rooms are being added for the football team.

New elevators are being installed at the northeast and northwest corners to service the existing east and west suites, club areas, and upper-level seating. Existing suites and club areas are being renovated and updated. A new video board is added at the south end. The Frank Broyles Athletic Center is being rebuilt in the new north end, housing administrative offices, and space for ticketing, merchandise, and Razorback history and traditions. The Athletics Department worked with **Populous** and **Polk Stanley** (Architects), **Legends** (Cost Estimator), **CDI-Hunt** (General Contractor) and UA Facilities Management on the project.



Reynolds Razorback Stadium has new North End Zone addition
Image credit: UA Athletics

TCU AMON G. CARTER STADIUM, FORT WORTH, TEXAS

Construction has begun on the \$100 million expansion of premium seating at Amon G. Carter Stadium, TCU Director of Intercollegiate Athletics Jeremiah Donati announced. To open for the fall 2019 Big 12 conference football season, the project includes two new levels of luxury seating above the current upper deck on the east side of the stadium. The new Legends Club and Suites will include 48 loge boxes with two private clubs, over 1,000 club seats and 22 luxury suites. Also new is a 100-foot outdoor balcony overlooking Frog Alley, the TCU campus and downtown Fort Worth, and a new video board in the north end zone. In addition to upgrading the capacity from 45,000 to 47,000, the project will include meeting spaces for corporate events, which will foster year-round use of the facility. TCU partnered with the original Stadium architect, **HKS**, to ensure symmetrical integrity of the design. *"This is more than just a football project,"* Donati said. *"This facility will be used to benefit all 21 of our sports, our campus community and Fort Worth."* Added TCU Head Football Coach Gary Patterson, *"Our stadium expansion project will have a positive impact on our recruiting efforts, plus our fan experience. It will also further strengthen our university's foundation going forward in the near future."*

Premium seating expansion at TCU Amon G. Carter Stadium
Image credit: TCU Athletics



MADISON BALLPARK (ALABAMA)

Groundbreaking was held in June for the new Madison (Alabama) Ballpark in the Huntsville suburb after the City Council approved \$48 million for a 7,000-capacity multi-use facility in January, according to BallCorps President Roger Wexelberg. The facility, designed by **Populous**, will host the relocating Mobile BayBears in the Class AA Southern League for the 2020 baseball season. BallCorps LLC, which had purchased the BayBears, proposed the venue, which would host the team as well as other events, including concerts, group events and perhaps other sports like pro soccer and high-school football. The ballpark will be part of the Town Madison development, a large-scale project that will see a mix of retail and commercial space, hotels and residential units. BallCorps ran a team name contest, with fans selecting **Rocket City Trash Pandas**. Others included Army Ants, Comet Jockeys, Glo Worms, Lunartics, Moon Possums, Puffy Head Bird Legs, Space Chimps, Space Sloths and ThunderSharks. >>

New Madison (Alabama) Ballpark.
Image credit: Populous



OLD DOMINION UNIVERSITY BALLARD STADIUM, NORFOLK, VIRGINIA

Old Dominion University has announced plans to rebuild and expand 81-year-old S.B. Ballard Stadium to enhance seating and add modern amenities. Construction began this summer on Phase 1 of the \$65 million project, and will end before the home opener of the 2019 football season with more than 21,000 seats.

The project will not use state funds or require an increase in student fees, with funding by athletic revenue, private funding and bond proceeds. **"We are excited to begin Phase 1 reconstruction,"** said Greg DuBois, Vice President for Administration and Finance. **"Fan comfort and high-quality amenities are the primary focus. It will help us create the type of game-day experience fans want, and will set us up for future expansions."** The University's Department of Design and Construction is working with Intercollegiate Athletics and a management team including **Moseley Architects, Populous** and **S.B. Ballard Construction Co.** Project scope includes new and enhanced seating; improved traffic flow into the stadium with a new west entry gate and a pre-game plaza, centered below a new press box; new concessions with 45-plus food and merchandise points of sale, and more restrooms on new 30-foot-wide ground-level concourses on the east and west sides under the new grandstands; a new mezzanine-level concourse — a 30-foot-deep deck — will ring the east and west lower bowls; and a new sound system will be installed, complemented by new sports lighting.

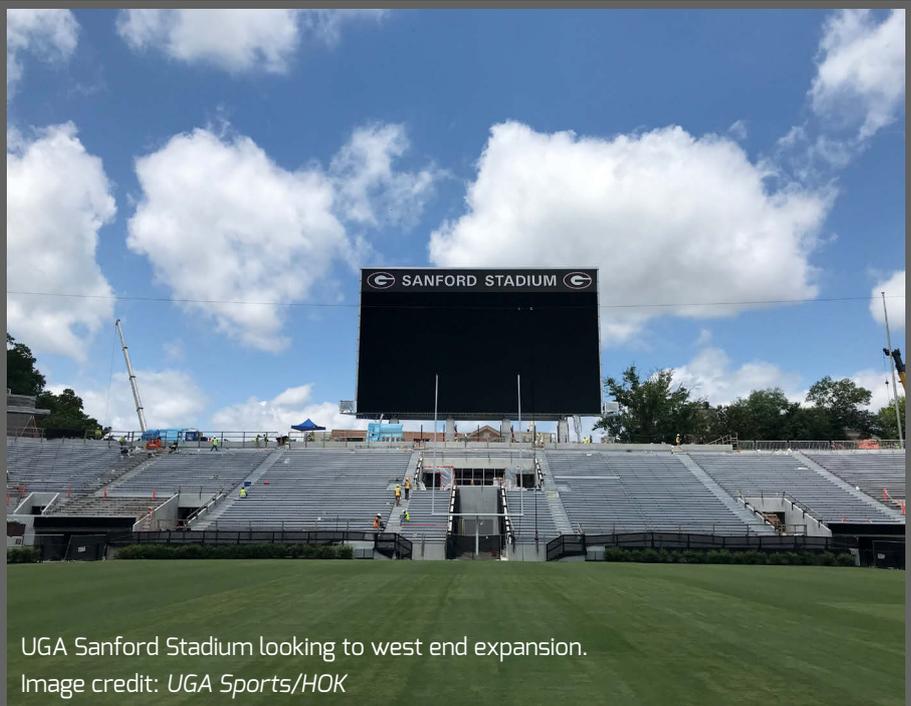


Phase 1 of ODU Ballard Stadium reconstruction.

Image credit: ODU Athletics

UNIVERSITY OF GEORGIA SANFORD STADIUM, ATHENS

The \$63 million renovation project for Sanford Stadium, home of the SEC Bulldogs, opened for the new football season this September, confirmed Josh Brooks, Deputy AD, Operations. With **HOK** as architect and **DPR** as general contractor, the project includes a new team locker room, hospitality room for hosting recruits, 12 new east end zone field-level suites with 500 seats to boost capacity to 93,246, a much larger video board, and new plaza for fans. The team's former locker room at the east end is now used as a staging room, with the new area fully equipped with shower facilities, equipment and training rooms, nutrition area and coaches' locker room, and will be nearly twice as big with 5,400ft²; The 10,500ft² lounge will be exclusively used for hosting recruits and their families on game day; Above the lounge will be a new 11,539ft² upper plaza with a new west end entry gate located below the scoreboard, that allows access into the stadium from the bridge; The new west end HD scoreboard will be 33% larger at 100 by 52ft and will move back closer to the bridge behind it; and the project will also create new restrooms and concession stands on the west end. Approval for the stadium renovation came on the same day as dedication of the new \$30.5 million Indoor Athletic Facility, funded entirely on private gifts. The 102,306ft² structure includes a 100-yard football practice field, 65-meter track runway and jumping pits, and a netting system that will provide indoor practice areas for the school's other teams.



UGA Sanford Stadium looking to west end expansion.

Image credit: UGA Sports/HOK

LAS VEGAS BALLPARK, SUMMERLIN, NEVADA

The Las Vegas 51s of the AAA Pacific Coast League are rebranding and will have a new team nickname (TBA) and a new Major League affiliate (TBA) when they move into a new \$150 million Las Vegas Ballpark for the April 2019 season opening, according to Jim Gemma, Media Relations Director. The new stadium is owned by the Howard Hughes Corporation, sole owner since March 2017. In October 2017, the Las Vegas Convention and Visitors Authority (LVCVA) approved a 20-year, \$80 million naming rights agreement for the 10,000-seat stadium. The Triple-A baseball team, in conjunction with the LVCVA, will have up to 100 events annually in the ballpark. Construction began this past February in Downtown Summerlin, a 1.8 million-ft² retail and office space complex, with **HOK** as architect and the **Hunt/Penta** joint venture as general contractor. Site is next to the NHL Vegas Golden Nights training facility. Las Vegas Ballpark will replace the team's current home at Cashman Field, where it has played since 1983. The stadium is expected to include 22 suites, a right-center field pool, and kids' zone, among other features.



New Las Vegas Ballpark for Las Vegas 51s.
Image credit: Las Vegas 51s/HOK



FAYETTEVILLE (NC) BALLPARK

Construction is underway for the 4,786-capacity, \$37.8 million ballpark that will be home to the Class A Advanced League affiliate of the MLB Houston Astros for the 2019 season, Astros spokesman David Lane confirmed. The downtown site is surrounded by the Airborne & Special Operations Museum, Fayetteville Amtrak station, and the Prince Charles Hotel, and the city is home to Fort Bragg, the world's largest military installation. In August 2016 the city signed a 30-year agreement with the Astros, and as part of the deal, general contractor **Barton Malow** contracted 83% of the construction to local and Small Disadvantaged Business Enterprise firms. In conjunction with the ballpark financing, Prince Charles Holdings plans to invest \$15 million toward renovating the adjoining Prince Charles Hotel into apartments and to invest an additional \$60 million toward a hotel, 150

New Fayetteville (NC) Ballpark.
Image credit: Populous

residential units, 10,000ft² of retail space, and a parking garage at the stadium site. Design by architects **Populous** and **SFL+a** includes natural grass, a 25 by 70ft LED scoreboard, six luxury suites, four field boxes, a premium club level, outdoor party deck, outfield bleacher bar, infield craft beer bar, kids' zone and more. The City, the Houston Astros and the NCAA Big South Conference recently announced an agreement to host the 2019-21 Conference Baseball Championships at the new ballpark.

AMARILLO (TEXAS) MULTI-PURPOSE EVENT CENTER

Groundbreaking for the Amarillo Multi-Purpose Event Center (MPEV) was held in February and it will host 70 home games for the AA Texas League Missions team the Elmore Group is moving from San Antonio, team President and GM Tony Ensor confirmed. Contractors **Western Builders** and **Hunt Construction** started prep work in March, with opening in April 2019 for the \$45.53 million downtown project. The **Populous** design was approved in late 2017 to enable the ballpark to host soccer, concerts and other municipal events. The Elmore Group signed a 30-year contract to pay \$400,000 a year to the city through 204, and the Elmore Group will play musical chairs when the new stadium opens. That season will see the shift of the Colorado Springs Sky Sox (Class AAA Pacific Coast League) to San Antonio and a temporary tenancy in Wolff Stadium; the shift of the Missions to Amarillo; and the move of the Helena Brewers (Rookie Pioneer League) to Colorado Springs. ■



New Amarillo Multi-Purpose Event Center.
Image credit: Elmore Group/Populous

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ARENAS

ASIA & AUSTRALASIA

AUSTRALIA

Brisbane: Live Precinct

Arena and entertainment precinct proposed for the Roma Street rail yards. Developer: AEG Ogdén.

Capacity 17,000
Cost AU\$2bn

Gold Coast: Convention and Exhibition Centre

Commonwealth Games 2018: netball in 5,000 seat capacity arena. Overlay works only. The International Broadcast Centre (IBC) and Main Press Centre (MPC) will also be located in this venue, forming the Main Media Centre. Owner: Department of Public Works.

Coomera Sport and Leisure Centre

Commonwealth Games 2018: gymnastics, basketball and netball. Outdoor courts, change rooms, administration and a café. Indoor courts: 9. Gym: 2,500m². for a dedicated gym. Area: 10,000m². Green: systems to minimise the use of light, power and water. Architect: BDA Architecture/Peddle Thorp (Director Peter Brook).

Capacity 7,500 (temporary)
Cost AU\$52m

Frankston Regional Basketball Centre

In Victoria. First stage upgrade. Courts: 10 (6). Upgrades to spectator seating, car parking, change rooms and public toilets. Finance: federal government \$4.95m, state government \$2.5m, council \$4m, Frankston and District Basketball Association \$1m.

Cost AU\$12m

Melbourne and Olympic Park

Stage two of the Melbourne & Olympic Park redevelopment, being financed by the State of Victoria (AUS\$298m) and the Melbourne & Olympic Park Trust (AUS\$40m). The project includes the refurbishment of Rod Laver Arena and a new 5,000-seat show arena. Phase 2 developments also include a new eastern entrance, better loading bay, rigging and automated retractable seating, construction of footbridge over Batman Avenue and a new Administration & Media building. Construction on Stage 2 to begin after the 2016 Australian Open. The Administration and Media Building open design EOI is available at: www.tenders.vic.gov.au. Construction (Rod Laver refurb): Lend Lease. Engineering (Administration and Media Building): Arup and HASSELL. Architect: COX Architecture (Patrick Ness).

Mechanical Engineer ME Engineers

For the Rod Laver Arena refurbishment ME is providing ESD scope, modeling to evaluate thermal comfort and providing design recommendations to reach LEED Gold certification as well as peer review of MEP design.

Cost AU\$338m
Completion 2019

Sydney: Ken Rosewall Arena



Roof to change tennis venue to multi-purpose facility. Oculus design on a rotating louvre system that would allow the control of light and ventilation while also providing protection from wet weather. Developer: Sydney Olympic Park Authority (SOPA). Architect: BVN Architects (Ross Seymour). Tenants: Sydney Kings and NSW Swifts. Finance: SOPA, state government. Backing: Tennis NSW, Netball NSW and Basketball NSW.

Capacity 11,000
Completion 2018

CHINA

Beijing: National Speed Skating Stadium

Part of bid for the 2022 Winter Olympic Games and scheduled regardless of the result. West of the Olympic Park and south of the National Tennis Center. For both athletic training and public recreational use.

Capacity 12,000
Completion 2017

Hong Kong: Kai Tak Sports Park



Tender expected in summer 2017 after financial package agreed with government for arena for badminton, volleyball, basketball and other community sports, as part of 24 hectare sports hub as part of redevelopment of former Kai Tak airport site. Potential to hold events such as Sudirman Cup. Discussions around capacity, especially for badminton which attracts nearly 6,000 at Hong Kong Coliseum. Developer: Home Affairs Bureau. Finance: public.

Capacity 7,000
Completion 2020

Hubei Province: Yichang Sports Centre Arena

Arena to include a 4,000-seater shooting hall and a 2,000-seater tennis court. Separate swimming hall for 1,500 visitors.

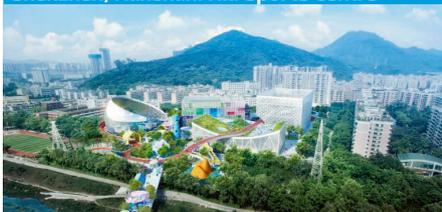
Capacity 6,000

Jiangsu Province: Yancheng Sports Arena

Jiangsu Province: Yancheng Sports Centre Arena Indoor facility as part of multi-sport centre.

Capacity 6,000

Shenzhen, Nanshan: Xili Sports Centre



Basketball and badminton arena (15,000m²), a multifunctional arena (10,000m²), swimming pool (6,000m²) and theatre. Elevated running track weaves in and out of all areas. Plaza level with lobby, changing rooms, second basketball venue surrounded by a mezzanine for badminton, fitness spaces, and a sports bar. Gets under way in 2017. Area: 105,000m². Owner: Shenzhen Nanshan Government announced.. Architect (competition winner): MVRDV and Zhubo Architecture Design.

Suzhou: Arena

Sports and entertainment arena. Developer: Suzhou Industrial Park Sports Industry Development Co. Ltd (SIPSID). Building services, energy planning and LEED green building consultancy services: Mott MacDonald. One of five facilities on a single campus.

Capacity 13,000
Completion 2017

Zhejiang Province: Ningbo Sports Arena

Arena plus swimming hall (+3,000) as part of Ningbo Sports Centre.

Capacity 13,000 (arena), 3,000 (swimming)

JAPAN

Tokyo: Olympic Aquatics Centre

Tokyo 2020: swimming, diving and synchronised swimming. Legacy as Tokyo Tatsumi International Swimming Centre. Owner: Tokyo Metropolitan Government.

Capacity 20,000, legacy 5,000
Cost \$363.189m

Ariake Arena

Part of the Waterfront sports area. Tokyo 2020: volleyball and Paralympic basketball final. Legacy: for national volleyball league, and international competitions. Owner: Tokyo Metropolitan Government.

Capacity 15,000, legacy 12,700
Cost \$199.131m

Water Polo Arena

Temporary structure. Tokyo 2020: water polo.

Capacity 6,500

Youth Plaza Arenas A and B

Tokyo 2020: badminton, basketball. Legacy: large gymnasiums. Owner: Tokyo Metropolitan Government.

Capacity A 7,000 (legacy 5,700); B 18,000 (legacy) 16,300
Cost \$411.84m

INDONESIA

Jakarta Velodrome

For the 2018 Asian Games, to cycling federation standards and in legacy converted to multi-use. Stakeholder workshops have already kicked off the design process. A modular structure will be used and readily available materials chosen. Roof: membrane. Contractor: ES Global, leading the Design & Build team – Cox Architecture, engineering Mott MacDonald, construction Wika and local architects BKM.

Capacity 3,000
Cost US\$40m
Completion June 2018

KOREA

Seoul Ballpark

New baseball stadium next to the Han River and sport facilities built for the 1988 Summer Olympic Games. Part of the city's urban development plan in Jamsil, southeastern Seoul. Current stadium will be demolished to make way for exhibition and convention facilities covering 100,000m². Olympic swimming pool and gymnasium will also be renovated into an indoor sports complex. Home for LG Twins and Doosan Bears, to begin 2021. Developer: Seoul Metropolitan Government (SMG).

Capacity 35,000
Cost Won 2-3 trillion
Completion 2023

MALAYSIA

Nilai: Velodrome

Indoor velodrome to be built by youth and sports ministry.

Cost US\$24m

NEW ZEALAND

Christchurch: Metro Sports Facility

10-lane competition pool and seating for a minimum of 1,000 spectators, a leisure area including hot pools and hydrosides, nine indoor sports courts and retractable seating for a minimum of 2,500 spectators. Base for High Performance Sport New Zealand and spaces for fitness and other activities. Request for proposals from construction companies in progress. Architects: Warren and Mahoney, Peddle Thorp Architects and MJMA. Engineering team: Aurecon and ARUP, Powell Fenwick Consultants, Aquatic Design and Engineering.

Capacity 3,500

Hawke's Bay: Multiuse Velodrome

Council choosing design team for the construction on a design-build basis of an indoor track cycling and multiuse facility alongside Pettigrew Green Arena. Seeking to maximise club and community use, host Cycling New Zealand development programmes and national events, and supports the region as a whole by being a multiuse facility used by other sports and a range of community events. 250-metre cycling track, three courts, 300-metre walking track. Business case and design stage: NZ\$500,000. Finance: council, private donations.

Cost NZ\$15m

EMEA

CZECH REPUBLIC

Pardubice: Dukla Sports Centre

International architectural and urban planning competition – begins June, ends October – to find design for multifunctional sports complex. Area: 85,000m². Close to the city centre, offering excellent transport access and strong potential for development. Indoor athletics hall, a multifunctional sports hall for ball games (with a capacity of 2,500 spectators), plus facilities for gymnastics, martial arts and other sporting activities. Outdoor sports facilities plus all essential infrastructure – a restaurant, office premises, storage areas, accommodation, and facilities for physiotherapy, massage etc. Project team assembled from sports clubs plus architects and City officials. Project Manager: Miroslav Janovský. Planning and design budget: 12m CZK (€450,000).

Cost 200-200m CZK (€7.5m-9m)

EIRE/REPUBLIC OF IRELAND

Cork: Concert Centre

An Bord Pleanála has granted planning permission for Cork concert centre on Albert Quay in Cork city centre. Developer Owen O'Callaghan. (Heineken Ireland and Barn have also proposed a concert venue on the site of the former Beamish brewery.) Area: 100,000ft². Jobs: 300 (construction), 40 (permanent), 150 (part-time).

Capacity 7,500 (5,000 seated)

Cost €50m

Dublin: Liffey Valley Ice Arena

Arena with international competition-size ice rink to host major tournaments – figure skating, ice hockey – and community use, as well as serving as a major leisure destination for the Liffey Valley Shopping Centre. An application for planning permission is currently being considered by the planning authority. Consultant: Vibrant Partnerships. Property developer: Hines.

Capacity 2,500

ENGLAND

Birmingham Aquatics Centre



Plans have been unveiled for the Birmingham Commonwealth Games 2022 aquatics centre in Sandwell – including an Olympic-sized swimming pool. Sandwell Council is proposing to build the centre on part of the site at Londonderry Playing Fields in Smethwick. The centre would feature an Olympic-sized competition swimming pool and a 25m diving pool, plus 5,000 spectator seats. Also planned at the centre – which would be run by Sandwell Leisure Trust – are two activity studios, a 12-court sports hall, a 125-station gym, a 25-station ladies-only gym, an indoor cycling studio, a sauna/steam room and a café.

Cost £60m

Bristol Arena

Bristol City Council's Cabinet has scrapped plans to build a new arena in the centre of the city. They have decided to explore plans for a mixed development on Temple Island instead of an arena. The decision follows a recommendation by officers to investigate an alternative scheme which could include a bespoke conference centre and a four or five star hotel, commercial spaces with supporting retail and residential homes for city centre living, and affordable homes on the site next to Bristol Temple Meads. The move paves the way for a privately funded arena at the Brabazon hangar on Filton Airfield. Team on the original proposal was RIBA international design competition winners: Populous, working with local architects Feilden Clegg Bradley Studios, BuroHappold Engineering and Vanguardia Consulting. Consultant: AECOM. Preliminary work: £250,000. Programme manager: Stuart Woods. The local enterprise partnership is working with the mayor to advance the project. Operator: SMG and Live Nation.

Capacity 12,000

Cost £91m (£80m)

Completion 2020

Cambridge Ice Arena

Permanent rink to international standards (56m x 26m) for university hockey team and public skating. On land leased from Marshall next to the Newmarket Road Park & Ride site. Operator: Cambridge Leisure and Ice Centre (Chairman Professor Bill Harris). Consultant: Cool Venues (Jim Kay). Finance: loan South Cambridgeshire District Council (25 years).

Capacity 1,000

Cost £1.85m

Completion 2017

Gateshead: Gateshead Quays



Three firms of architects, headed by HOK appointed to design the new £200m regional arena and conference and exhibition centre for Gateshead Quays. Team to plan the 10-acre site on Gateshead Quays. HOK have been appointed to design the new 12,500 seat arena and international conference and exhibition centre. AHR Architects has been selected to develop and design the overall masterplan of the site including hotels, bars and restaurants and car parking for the scheme. Planit-ie, with particular experience in designing outside spaces, has been selected as landscape architects.

Capacity 12,500

Cost \$200 million

Hull: Bonus Arena



Super theatre style venue adjacent to Princes Quay in Hull City Centre. For concerts, conferences, family shows and exhibitions. The centre will include a large auditorium, exhibition space, conference auditorium, food and beverage outlets, break out spaces and a public realm to fully support all inclusive access. Part of wider retail development. Architect and Design Team Leader: AFL. Operator SMG.

Capacity 3,500

Cost £36.2m

Completion Q2 2018

London: Leyton Ice Arena

Lee Valley Regional Park Authority is consulting on developing a new twin pad ice centre on the site of its existing ice centre on Lea Bridge Road, Leyton. To complement the Council's regeneration programme for the area.

Newcastle: Eagles Community Arena

Work has now begun on a brand new, purpose-built community sports arena as the new multi-million pound home for the Eagles Community Foundation (ECF). The state-of-the-art venue will host the region's most successful sports team – Esh Group Eagles Newcastle. It is anticipated that more than 11,000 people will be engaged in sport during the facility's first year. And more than 1,000 disabled users will be encouraged to play sport annually at the arena – based at Riverside Dene in Elswick, reflecting the ECF's commitment to deliver recreation and education opportunities to the wider community. The new venue will provide a home for the ECF and enable it to develop its current player pathway structure under one roof whilst also providing educational routes and workforce development. The move to the 2,800-seater venue will allow the most successful franchise in British basketball history to pursue its long-term dream of competing on the European stage.

Capacity 2,800

Reading: Royal Elm Park Convention Centre

Convention centre, ice rink, restaurants and a large public square. Mixed use development next to Madejski Stadium. Development consultant: Peter Brett Associates. Technical services: Arup. Convention centre design: NRY Architects.

Sheffield Community Arena

Future home of the Sheffield Sharks basketball team. Finance: private. Multipurpose for sport, culture and business. Courts: 3. See Olympic Park Stadium for more details about the Park.

Capacity 3,000

FINLAND

Tampere Central Arena

Multipurpose arena above the existing railroad track near the city's main railway station as part of the new urban city centre development. 5.5 million passengers passing yearly. Intends to be event and promoter friendly and the most modern in Europe for event and fan engagement, technology and sustainability. Suites: 46. Party suites: 6. Restaurants: 6,750m². Integrated training ice for ice hockey, figure skating etc. 400-room integrated hotel. Architects: Studio Daniel Liebeskind, Aihio Architects, Ramboll. Concept Design: Sport & Live Vision, Ramboll. Developer & Construction: SRV Group. Owner: Investment group. Finance: Tampere City €26m, private €76m (€26m loans).

Capacity 12,000 (hockey), 15,000 (concert)

Cost €124m (€95m) (plus €12.5m car park)

Completion 2020

FRANCE

Bordeaux Arena

Multipurpose hall. Flexible seating capability. Events: 118. Parking: 4,000. Developer: Communauté urbaine de Bordeaux (CUB). Build and operate consortium: Group Lagardère Unlimited, DV Construction, Rudy Ricciotti architects and Bouygues energy. Funding: City of Bordeaux.

Capacity 11,000
Cost €49.2m

Completion 2018

Dunkerque Arena

New mayor has confirmed more modest arena than previously.

Capacity 5,000-6,000
Cost €15-20m

Completion 2017

Villeurbanne-Lyon: ASVEL Arena

For basketball tenant Olympique Lyonnais, plus other sports such as handball, concerts and business events. Earlier project didn't get off the ground. At current location of the Georges-Lyvet Stadium, close to the current basketball arena, Astroballe. Finance: private.

Capacity 10,500 (basketball), 12,000 (concert)
Cost €45-55m

Completion 2020

GERMANY

Erlangen Sport Complex

Multi-functional gymnasium, bouldering/climbing facilities, office spaces and space for university sports science study. Owner: Stadt Erlangen Area: 19,000m² Architect: Schulitz Architects.

Capacity 3,000

Kassel: Multipurpose Arena

Feasibility study (euros 80,000) under way for arena to be home of German Bundesliga handball team MT Melsungen and boxing. Discussions on financing with town. Developer: Herbert Aukam. Area: 12,000m².

Capacity 7,500-10,000
Cost €30m

Kaufbeuren: Eisstadion

Modelled after a block of ice, situated on the training ground of the Park Stadium. CCTV and an ammonia evaporation plant. Architect: asp.

Capacity 3,500
Cost €22.5m

Completion June 2017

Koblenz: CONLOG Arena

Upgrade menu list issued for ageing arena: seating €1.1m, floodlighting (€60,000-€200,000), a new video scoreboard (€250,000) and a new sound system (€250,000), space for seminars and conferences (€800,000).

Selb: Netzs Arena

Town is funding modernisation of home of VER Selb ice hockey club to meet safety standards by building two separate sets of facilities for home and away fans. Finance: Government of Upper Franconia/VER Selb ice hockey team.

Cost €1.1m
Completion 2017

KUWAIT

Kuwait: 360 Mall Tennis Arena



Sheikh Jaber Al Abdullah Al Jaber Al Sabah International Tennis Complex in retail development, also with hotel. Developer: Tamdeen Group. Two main arenas - 4,000 and 1,600, eight indoor courts with over 500 seats and eight outdoor courts with 1,500 seats. Doubles up as an entertainment venue.

Capacity 7,600

NORWAY

Oslo, Nye Jordal Amfi Sports Arena

Ice hockey arena for elite and recreational sports, and public events. Restaurants, cafes and conference facilities. The project will also address Jordal Athletic Park as an important recreational area. Developer: Culture and sports Oslo KF CO₂ neutral construction. Developer: City of Oslo's Municipal Body for Culture and Sports Facilities (Simen Bakken). Construction: NCC (Brudevold Eek) - SEK 445m (US\$49m).

Capacity 10,500
Cost €70m

Bergen: Bergen Arena



3XN has been commissioned to design a proposal for a new arena and a masterplan for central Bergen in Norway. The proposal is a response to Bergen City's ambitious plans for sustainable development of the area.

The arena will become a catalyst for transforming the city by becoming an anchor for the development of an entirely new neighborhood that connects the inner city with the waterfront, and that will become a destination for concerts, sport and cultural events.

ROMANIA

Constanta Arena

For tenant handball team HCM. Also on site: indoor Olympic pool (2,000), gymnasium (1,000), hotel, pedestrian plaza landscaping and water elements. Parking: 2,000. Area: 37,500m².

Capacity 10,500
Cost €70m

RUSSIA

Krasnoyarsk: Platinum Arena

Multi-level, multi-functional sports and entertainment complex with an ice arena for the 29th Winter Universiade Krasnoyarsk 2019. Near river bridge which connects river bank area with both sides of the city. Primarily intended for winter sports competitions: figure skating, ice hockey, short track. Area: 22,500m². Design and construction: Russian Platinum (Director General Yevgeniy Vorobeychik).

Capacity 7,000
Cost 3 billion rubles (US\$39m)
Completion end 2017

SCOTLAND

Aberdeen: AECC

Aberdeen Exhibition and Conference Centre (AECC), off the A96 near Aberdeen International Airport, will be four times the current exhibition space and increase the arena seating capacity from 4,750 to 15,000 (standing). Hotel, leisure, restaurants. Multipurpose arena: 9,000m². Floor space: 45,000m². Owner: Aberdeen City Council. Development partner: Henry Boot Developments. Construction: Robertson Construction Group.

Capacity 10,000
Cost €333m
Completion Q2 2019

Edinburgh Ice Arena

Proposed refurbished hockey and curling arena in the Murrayfield quarter as part of mixed use development. Proposal of Application Notice (PAN) lodged. Consultation with Scottish Rugby Union (SRU), Edinburgh Curling Club Ltd, Murrayfield Ice Rink Ltd. Developer: Murrayfield 2020.

SENEGAL

Dakar: Basketball Arena

Potentially home to Senegal basketball, women and men.
Capacity 15,500
Completion Q2 2017

SPAIN

Barcelona: New Palau Blaugrana

On the current site of the Miniestad, next to the new Camp Nou station on Metro Line 9. Areas that can operate independently. Multi-purpose pavilion (10,000 for Euroleague), auxiliary court (2,000), ice rink. VIP boxes: 24. Skybars: 4. Press area: 200m². Start: 2017/18 season. Masterplan of Palau, annex court, ice rink and the FCB Escola facilities. Architects and Barça technical teams and the Barcelona City Council are working on the integration of the new facilities with the rest of the Espai Barça and the city. Arena will maintain energy in a unique asymmetrical configuration to create a wall of people in the bowl. Metallic facade and transparency, with large projection screen. Outdoor concourse with concessions for open air festival environment. Owner: FC Barcelona. Architect: HOK + TAC Arquitectes (Eduard Gascón).

Capacity 10,000 (12,000 concerts)
Cost €100m
Completion 2020

SWITZERLAND

Lucerne: Pilatus Arena

New arena for handball club HC Kriens. Multipurpose for volleyball, tennis and concerts. City to make land available. Developers: HC Kriens-Luzern. General contractor: Sarnen AG.

Capacity 4,000
Cost €28m
Completion 2018

Zurich, Altstetten: Theatre of Dreams arena

Business plan for pure ice hockey arena after multipurpose ambitions dropped on cost grounds. Home for ZSC Lions. Finance: €33m private + city of Zurich.

Capacity 12,000
Cost €146m
Completion 2018

UNITED ARAB EMIRATES

Dubai: Meydan Arena

Part of Meydan One project. Arena at the base of the indoor ski-slope for live concerts, sports and theatrical. Outdoor leisure sport options.

Capacity 8,000

Abu Dhabi: Yas Arena



Abu Dhabi is to build a new multipurpose sports and entertainment arena in the city. Yas Arena's dynamic form and illuminated lantern facade is intended to both complement and animate the expanding waterfront promenade at Yas Bay. HOK is part of the WSP-led team responsible for delivering the design of Yas Arena, with support from Pascall+Watson. In addition to the architectural design of Yas Arena, HOK designed the adjacent arena retail and dining destination along the boardwalk, forming a mixed-use anchor on the east end of Yas Bay. The arena is designed to expand from an intimate 500-seat theatre to an 18,000-capacity venue, maximising revenue and supporting a wide variety of events. Premium spaces include a VIP lounge that can be transformed into a grand ballroom for events, hospitality boxes and unique terrace bars for receptions and parties.

Capacity 18,000

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AFRICA
ADDIS ABABA, ETHIOPIA

WALES

Swansea Arena

Proposed on the current LC car park site. A new underground car park. Part of city improvement plan with improved links between the centre and the waterfront. Owner: Swansea council. Developer: Rivington Land.

Capacity 3,500

Cardiff Arena

Atlantic Wharf to be named the preferred location for Cardiff's planned 15,000-seat indoor arena. The proposed new multi-purpose facility - which could bring major cultural, sporting and entertainment events to Wales' capital city - could be built across two sites in Atlantic Wharf adjacent to Cardiff Council's County headquarters and the nearby Red Dragon Centre in Cardiff Bay.

Cost £85m

AMERICAS

CANADA

Calgary Arena

Proposed new multi-purpose home in West Village district for Flames NHL team, to replace the Saddledome. Possible link with council-funded fieldhouse.

Conception Bay North, Newfoundland: Arena

New Multi-purpose facility in Harbour Grace. Single-pad NHL-size ice surface, community room and kitchen. Replaces S. W. Moores Memorial Stadium. Finance: provincial government \$15m, Town of Harbour Grace \$6m. Construction: Pomerleau.

Cost \$21m

Fort McMurray, Alberta: Arena

Downtown sports and entertainment centre. A privately owned hotel would be built with interior access to the arena. Developer: Regional Municipality of Wood Buffalo. Consultant: International Coliseum Company. Hope to attract a NHL affiliate. Projected total cost over 40 years, including financing, operations, facility updates for arena, parkade and retail space: \$580m. Public engagement sessions set for late spring 2016. Finance: Capital cost for arena \$120m, capital cost for parking structure with 508 stalls \$29m, capital cost for retail space to be built into the facility \$7.2m. Events: 70.

Capacity 6,200 (expandable to 8,000)

Cost C\$404m

Completion July 2018

Kitchener Arena

Kitchener Rangers interested in expanding Memorial Auditorium or building new arena. Preparing business plan and detailed development proposal. Architect: BBB Architects. Construction: Ball Construction.

Capacity 10,000 (extension)

Cost C\$44m

Peterborough Hockey Arena

Hockey arena to replace the aging Northcrest Arena with a multipurpose facility. Possible location: Morrow Park. Possibly to host Agricultural Society's annual Peterborough Exhibition. Two ice pads and support for community and college sports.

Cost C\$27m

PortsToronto Arena

PortsToronto to provide federally owned lands at the foot of Cherry St. for two rinks. Area: 75,000ft². Build/operate developer sought. Working with the city and Waterfront Toronto to ensure the building fits the future vision of the area.

Completion 2018

Oakville: Oakville Arena

First phase of design and construction to update ice arena. Built in 1950, it is one of four remaining arenas in Ontario with a wooden truss roof system designed by Norman Otto Hipel. To include walking track, gymnasium, seniors' centre with a separate entrance, administrative offices, a new Kinsmen Pine Room for public meetings and events, National Hockey League (NHL)-sized ice surface of 85' x 200'. Owner: Council (Town Recreation Services Senior Manager Michael Brennan). Delivery: Integrated Project Delivery - three-party agreement with architect and general contractor at the outset. Begin: 2017.

Capacity 450 (1,100)

Cost C\$36.7m

Completion Q3 2018

Ottawa: LeBreton Flats Entertainment Centre

Arena for Ottawa Senators as part of proposed RendezVous development on LeBreton Flats. For Ottawa Senators, concerts and possibly more. Bids from design/build groups - RendezVous LeBreton Group (arts spaces, community theatre and commercial areas attached to the concourse - Matt Rossetti) and Devcore Candarel DLS Group (BBB Architects plus subsidiary Stadium Consultants International) with hockey and fans focus. Developers: Senators and Windmill Development Group.

Saskatchewan, Saskatoon: Merlis Belsher Place

Twin-pad arena for the men's and women's Huskies at University of Saskatchewan. Funding raising Home Ice Campaign to replace the Dog House (now beyond repair). Finance: donations (Merlis Belsher \$12.25m) - \$34m so far.

Capacity 1,830

Cost C\$41m

Sudbury: True North Strong Event Centre

Proposed downtown multi-use sports and entertainment venue in a mixed-use development area to include a hotel. Tenant: Sudbury Wolves.

UNITED STATES OF AMERICA

AK, Anchorage: UAA Arena

Proposed sports centre for the University of Alaska Anchorage. Possible tie-in with UAA Seawolf ice hockey to replace Sullivan Arena.

Cost US\$80m

AZ: McKale Center

For University of Arizona. Enclosed concourses wrap around 36-year-old McKale Center in a proposed upgrade plan. Improved locker rooms, equipment rooms, showers, offices and lounge areas, concessions areas, bathrooms, air conditioning and premium seating. A new gift shop to be located at the south end of Cherry Avenue parking garage.

Cost US\$155m

CA, Riverside: CBU Events Center

Two-storey facility for California Baptist University athletic events, graduation ceremonies, orientation activities, chapel program. Locker rooms for home and visiting teams, athletics suite and offices. Area: 153,000ft². Construction: Sundt Construction.

Capacity 5,050 (expandable to 6,500)

Cost US\$73m

Completion April 2017

CA, San Francisco: Chase Center

New sports and entertainment center at Mission Bay as part of Golden State Warriors' (co-owners Joe Lacob and Peter Guber) plan to return to San Francisco. In Mission Bay area. COO: Steve Collins. Basketball, concerts, family shows. Retail: 100,000ft². Plazas: 3.2 acres. View deck with vistas to Bay. Office, biotech/lab space. Parking: 950. Bikes: 300. Finance: private. Developer: GSW Arena LLC (President Rick Welts). Updated design revealed. Architect: MANICA Architecture. Senior Design Advisor: Snohetta's Craig Dykers. Interior design architect: Gensler (Ron Turner). Full details at: warriors.com/sf. Construction: JV Clark Construction Group and Mortenson Construction.

Capacity 18,064

Completion 2019

CA: Sacramento State University campus

Proposed expansion of University Union Well includes arena for ceremonies, concerts and special events.

Capacity 5,000-6,000

Cost US\$175m (overall)

CO, Colorado Springs: Edward J. Robson Arena

On-campus hockey arena at Colorado College on the west side of Nevada Avenue, part of a campus master plan the college's Board of Trustees approved in 2015. Replaces Honnen Ice Arena. CC's Division I hockey team will practice in the new facility and continue to play its games in the Broadmoor World Arena. Finance: donations (Edward J. Robson \$8m). Sustainable building practices and materials.

Capacity 900

Cost US\$10m

CT, Hartford: XL Center

In 2015 the consultants, SCI Architects of New York recommended three options for the arena: work with the existing building, embark on a major renovation and expansion; or replace the structure entirely on the present site. The authority settled on the second option because, even at \$250 million, it was half of the \$500 million for a new structure. The project would be spread across several fiscal years and paid for almost entirely by the state but needs the political support from both Gov. Dannel P. Malloy and the state legislature to secure funding - which is not yet forthcoming. If legislative approval is secured, construction could start the following year and be completed by 2019. The plans envision a dramatic change that would essentially create a new arena: a second concourse to relieve congestion and irritating waits at concessions; more "premium" seating lower in the arena; and more amenities and restrooms. Developer: Capital Region Development Authority. Potential to be home to UConn Huskies men's and women's basketball and hockey teams. Architect: SCI Architects.

Mechanical Engineer ME Engineers

ME is providing full MEP design.

Cost US\$250m-US\$500m

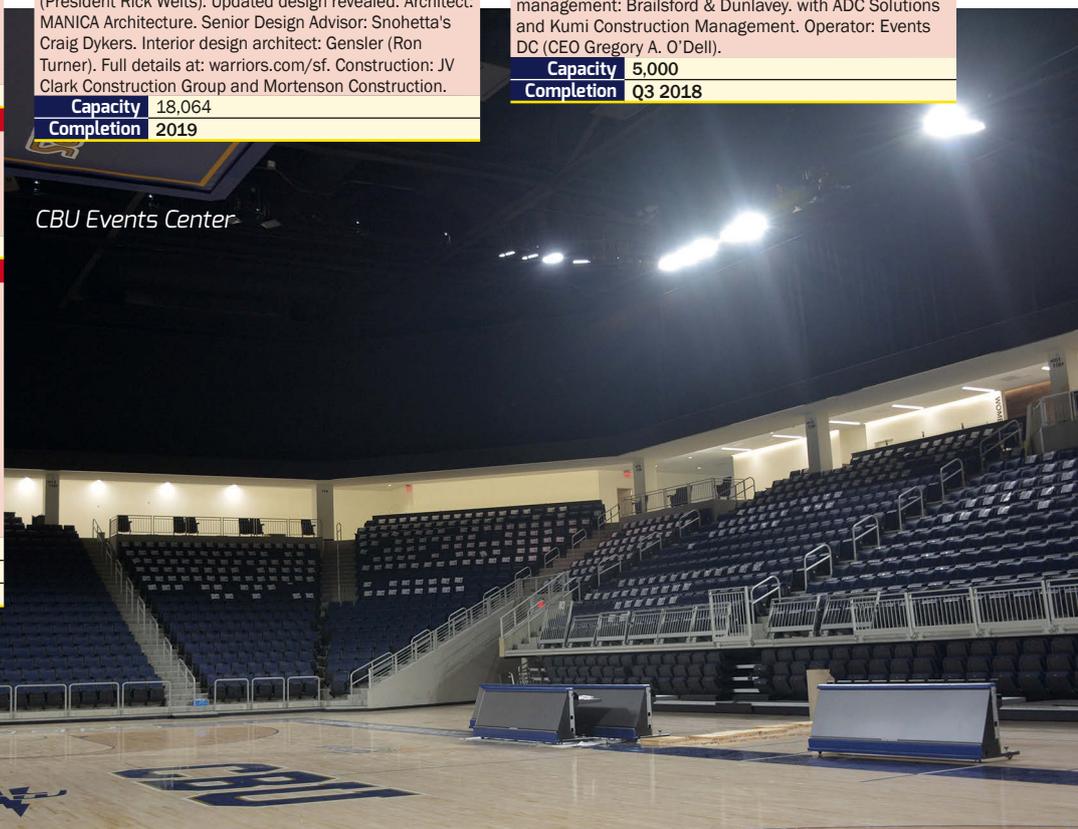
DC, Congress Heights: Practice and Entertainment Arena

Architects developing designs for the Entertainment and Sports Arena in the Congress Heights neighbourhood of Washington, DC. Practice facility for the Washington Wizards, home court of the Washington Mystics Also aiming to drive urban regeneration to the communities east of the Anacostia River. 35% of the work will be performed by Small Business Enterprises. Jobs: 600 (construction), 300 (permanent). Split bowl design for intimate viewing of non-basketball programming. Exterior facing retail bays. Undulating roof and local materials chime with local architecture. Architects: Marshall Moya Design and ROSSETTI (Tony Reiner). Program management: Brailsford & Dunlavy, with ADC Solutions and Kumi Construction Management. Operator: Events DC (CEO Gregory A. O'Dell).

Capacity 5,000

Completion Q3 2018

CBU Events Center



DE, Smyrna: Delaware Sports & Ent Complex

Delaware University and Delaware Civic Center Corp are working on a \$92.1m complex, to include a 14,829-seat football stadium and a 7,500-seat arena, which would house the DSU basketball teams. Finance package sought: \$40m state bond, \$11.6m private, \$3.5m consortium. Management: Global Spectrum. Events: 155 per year including minor league hockey.

Capacity 14,829 (stadium) 7,500 (arena)
Cost US\$92.1m

FL, Tampa Bay: Sun Dome

Renovation for 30-year-old home to USF basketball and concerts. Centre-hung scoreboard, concessions and restrooms in new concourse and club-levels. Finance: \$8.5m cash and 20-year funding.

Capacity 10,000
Cost US\$35m

GA, Atlanta: State Farm Arena

Remodel of home of Atlanta Hawks concluding. Mayor Kasim Reed committed to provide \$142.5 million in funds, with the Hawks funding the remainder, to improve the city-owned facility in order to revitalise the arena as a basketball-first, world-class venue. As part of the deal, the team's lease was extended through the 2047-2048 season. The transformed arena will feature the third-largest centre-hung scoreboard in the NBA and most immersive video experience, new sightlines with 360-degree concourses and new seating and first-of-its-kind in-venue entertainment options with Topgolf Swing Suites, the company's first permanent amenity in a major sports arena, Killer Mike's SWAG Shop (a 4-chair barbershop overlooking the court) and the signature Hawks Bar, the NBA's first courtside bar.

Mechanical Engineer ME Engineers

ME is providing MEP design.

Cost US\$192m

GA: Augusta Arena

The city's Coliseum Authority seeking support for a replacement to James Brown Arena. Seeking SPLOST funding.

Cost US\$110m

GA: Savannah Arena

Recommendation for multi-purpose arena to host minimum 93 major events per year. Possible minor league sport tenants. City consulted on general concept, project scope, site options, and also possible funding sources. Will replace 45-year old Savannah Civic Center. Infrastructure works required, including parking. Finance: SPLOS tax \$120m. Consultant: Barrett Sports Group. Architect: Gensler.

Capacity 9,300
Cost US\$140m

IA, Iowa Arena

Arena and sports performance complex at Coralville's Iowa River Landing. Council reviewing plans March 2016. Architect: JLG Architects (preliminary design \$99,500). Seeking \$12m state assistance.

Capacity 7,000
Cost US\$45m

Completion 2017

IA: Mason City Events Center

City Council supporting pre-application downtown redevelopment project Our River City Renaissance to include hotel, performing arts pavilion, retail outlets, apartments and a multipurpose ice arena. Tenant: North Iowa Bulls. Finance: city, state, private.

Capacity 2,400 (sport), 5,000 (concert)
Cost US\$36.2m

ID, Moscow: Idaho Arena

Stand-alone athletic venue for basketball and volleyball at the University of Idaho, just north of the Kibbie Dome. Area: 70,000ft².

Capacity 4,700
Completion Spring 2020

IL, Rockford: MetroCentre

Exterior façade update, new box office and main entrance, video scoreboard, 11 corporate suites, club boxes, 200-person group terrace, retail centre, additional bathrooms, and new concession stands and food courts. Client: MetroCentre Authority. Renovation to support purchase of American Hockey League franchise, the elevation of the Rockford IceHogs into the American Hockey League, and a 10-year affiliation agreement with the Chicago Blackhawks.

Cost US\$23m

IN, Angola: Thunder Steel Dynamics Ice Rink

For Trine University men's and women's hockey teams. Finance: donations (Steel Dynamics \$1.25m).

Cost US\$8.2m

Completion fall 2017

IN, Buffington: Harbor Arena

Multipurpose proposal. Developer: Majestic Star Casino. Planning request with Northwest Indiana Regional Development Authority (RDA).

IN: Fort Wayne Arena

Proposed west of the Grand Wayne Convention Center. Feasibility studies under way.

Capacity 4,500-6,000

Cost US\$63m

KS, Hutchison Arena

Renovation to sports arena built in 1962 to keep the National Junior College Athletic Association men's national championship basketball tournament for 25 years. More upper-level seating for people with disabilities, undersized practice gymnasium into new home team locker rooms, renovating an existing sports medicine area and weight room into meeting or hospitality space, upgrading heating, plumbing and electrical systems and adding air conditioning to the seating bowl. New main entrance and lobby, concession stands, more restrooms, elevators to reach the upper level, and office and meeting space. Two full-size practice gyms, a new weight room and mechanical and storage space. Architect: Sink Combs Dethlef (Chris Kastelic).

Cost US\$29m

MA, Cambridge: Harvard Multipurpose Arena

New mixed-use facility and basketball venue on the North Harvard Street site of the old Ed Portal. To replace Lavietes Pavilion (2,195). To include graduate housing and ground-floor retail space.

Capacity 3,200

Completion 2020-2024

MD: Baltimore Arena

Various proposals from developers to replace 45-year-old 1st Mariner Arena. Private funding interest from Whiting-Turner. Likely to extend convention center, and add arena. Also suggested for Inner Harbor. Research phase. Maryland Stadium Authority centre suggested a 18,500-seat arena with no major league basketball or hockey franchise, 500-room hotel to create a destination package. Arena income projection: \$48.1m-\$50.3m annually. Arena jobs: 730-760. Parking: 500

Capacity 18,500

Cost US\$900m

MD, Baltimore County: UMBC Arena

University of Maryland, Baltimore County (Joe REXING, director of facilities management) is replacing Retriever Activities Center (1973), home of the men's and women's basketball and volleyball teams. New events and convocation center on campus near the present site of the UMBC Stadium and baseball's Alumni Field and softball stadium, will host sports and community events. University architect: Joe REXING. Area: 170,000ft².

Capacity 5,000

Cost US\$67m

Completion 2017

ME: Bowdoin University Arena

University's future building plans include a new hockey arena. Masterplan: Doug Voigt of Skidmore, Owings and Merrill.

ME, Portland: Forefront Arena

Arena/convention centre as part of the Forefront development at Thompson's Point. Tenant: Maine Red Claws pro basketball team. Tax breaks under discussion.

Cost US\$100m (total development)

MI, Detroit: Little Caesar's Arena

New hockey arena for the Red Wings and 45-block entertainment district driven by Downtown Development Authority. Opened in September. Replaces Joe Louis Arena (20,058), fourth oldest NHL venue. Gondola seating, public plaza with screen, practice and amateur hockey areas. Finance: \$284.5m in property taxes, the rest from developer Olympia Development (Steve Marquardt). Owner: city. Operator: Olympia. Construction: JV Barton Malow, Hunt Construction Group and White Construction. Steel parts: 2,400. Concrete: 45,000 yds³. Detroit Employment Solutions Corp. to develop training programmes to get Detroit residents ready to take construction jobs. Jobs: 5,500 (1,100 permanent). Event space: 650,000ft².

Capacity 20,000

Cost US\$627m (\$450m) (+\$200m other development)

Completion September 2017

MI: Kalamazoo Arena

Proposed downtown arena for WMU and the Kalamazoo Wings as part of mixed use development. Early community meetings taking place. Architect: Eckert Wordell Architecture, Engineering and Interior Design (Jason B. Novotny). Area: 215,000ft².

Capacity 6,800

Cost US\$82m

MN: Crookston Arena

Developer: Crookston Civic Arena, LLC. Construction: Donlar Construction.

MN, Minneapolis: Target Center

Agreement between city's economic development department, Timberwolves, Lynx and AEG to take the arena through to 2032 in 'as new'. The exact construction dates are not yet known, but a timeline of the \$129m renovation project has been released. Phase 1 Summer 2016: Suite Level, Scoreboard, Acoustic Improvements. Phase 2 Autumn/Fall 2016-Spring 2017: Exterior Work Begin, Loading Dock, Marshalling Yard. Phase 3 Summer 2017: New Lobby Built, Locker Rooms, Dressing Rooms, Public Restrooms, Concourse Improvements, Additional Club Spaces, Food and Beverage Improvements. The venue will remain open for the first two phases of construction and then will close down during the summer of 2017 to allow major construction to finish. Finance: Minneapolis \$48.5m, Timberwolves and Lynx \$43m, AEG Facilities \$5.5m. Jobs: 200 full-time, 700 part-time. Incremental annual income: \$100m. Events: 200.

Mechanical Engineer ME Engineers

ME is providing MEP and technology design.

Cost US\$129m

Completion 2017

MS: Jackson Arena

Study commissioned by Downtown Jackson Partners and the Central Mississippi Planning and Development District. Consultant: Populous (Russ Simons).

Capacity 15,000-18,000

Cost US\$100m

NC, Charlotte: Time Warner Cable Arena

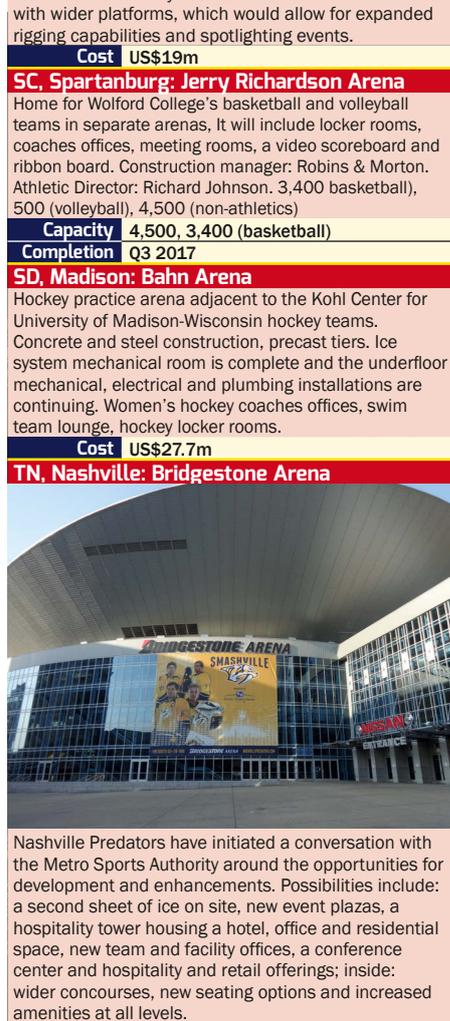
Updates to keep the arena competitive and to bid on hosting the 2017 and 2018 NBA All-Star Games. Home of Charlotte Hornets. Restaurant renovations, bathroom improvements, new lighting, visitor locker room upgrades, moving the ticket office and scoreboard improvements, lower bowl reconfigure +600. Finance: city. Owner: city. Operator: Charlotte Bobcats.

Cost US\$27.5 (US\$44m)

NC, Charleston: Carolina First Center
North Carolina Center for Health & Wellness and multipurpose convocation centre, Kimmel Arena at College of Charleston. For intercollegiate basketball teams and student health and recreational programmes. Architect: Betsch Associates. Area: 270,000ft ² . Finance: Naming gift \$2m and college budget.
Capacity 5,000
Cost US\$35m
NC, Elon: Schar Center
For Elon University. Fourth biggest arena in the CAA. Renovations just completed in summer 2018. The new multipurpose Basketball Arena for Elon University is a state of the art facility for basketball and volleyball. WER was the lead architect, in association with Gensler Sports division. The arena has seating for approximately 5,500. In addition to the championship main court, the seating bowl in the facility includes eight luxury suites, a President's suite and club seating. The event centre also includes a Hall of Fame lounge for smaller gatherings and presentations, athletic offices, men's and women's basketball and volleyball locker room/shower facilities, training and media/communications spaces. In addition to the main arena, the Schar Center contains two separate full size practice courts.
Capacity 5,500
Completion 2018
NC, High Point: University Basketball Arena
High Point University (HPU) plans to build a \$100m basketball arena, conference centre and hotel. The new building will become the home of HPU's men's and women's basketball programs, as well as a venue for major events, speakers, concerts, entertainment, academic symposia, and recreational activities. The 4,500 seat arena will include suites, locker rooms, staff offices, concession stands and a merchandising area. There will also be a media suite, film room, press conference room, weight room, athletic training room, hospitality area, high tech audio and video equipment, ticket office and practice gym. There will be 2,500 conference centre seats and a small, executive hotel will be located adjacent to the conference centre to support a proposed hospitality management programme. The university is selecting a site location from several campus-owned possibilities as architects finalise plans. Construction will begin during the 2018-2019 academic year.
Capacity 4,500
Cost US\$100m
ND, Jamestown: UoJ Arena
Basketball court on the east side of the Larson Center at University of Jamestown. Finance: donation - Harold Newman.
Capacity 2,200
Cost US\$16m
NJ: Monmouth University MAC
Multi-Activity Center of 152,400ft ² . Anchor arena. Architect: Ewing Cole Cherry Brott.
Capacity 4,800
NV, Las Vegas: All Net Arena
All Net Arena and Resort nongaming hotel project on the former Wet 'n Wild site (total project cost \$1.4bn). Needs development agreement with Clark County. Developer: Jackie Robinson. Could be the first ever arena with a retractable roof. Architect: Cuninghams Group (Brett Ewing). Consulting: HKS, Walter P. Moore and Uni-Systems.
Capacity 22,000
Cost US\$690m
Completion 2017
NV, Henderson: Silver State Arena
Proposed as part of the planned Las Vegas National Sports Complex in Henderson on a 485-acre site in West Henderson. Finance: International Development Management and China Security & Surveillance Technology.
Cost US\$650m
NY, Le Ray: Mall Arena
Proposed multi-purpose arena near Fort Drum's main gate off Route 11 in LeRay. Destination element in 600,000ft ² outlet mall.

OH, Cincinnati: Fifth Third Arena
Renovation of the Bearcats' basketball arena at University of Cincinnati is in the home stretch - UC architect Beth McGrew, University of Cincinnati department of Planning, Design and Construction. Interior and exterior of the 26-year-old facility to receive a new look. A 360-degree seating bowl, adding more comfortable seats and better spectator sight lines. Permanent seating to replace rollaway bleachers. East plaza will be renovated with a new main entrance, centralised ticketing and guest services. New luxury suites, bathrooms and concession areas will be added. The arena will get a new fan lounge and sound system, in addition to upgraded locker rooms. Contractor: Skanska and Megan Construction (\$70m). Upgrades to restrooms, HVAC, lighting, A/V, fire protection systems. Athletic Director Mike Bohn. Architect: Populous.
Capacity 11,500 (13,176)
Cost US\$87m
Completion November 2018
OH, Cincinnati: US Bank Arena
Proposed extensive renovations. Owner: Nederlander Entertainment (CEO Ray Harris). Operator: AEG Facilities. Seeking some public contribution with support of city, Hamilton County, and regional tourism leaders. Modernising interior and exterior, expanding venue seating. The 40-year-old arena has not undergone a major renovation since 1997. Multiple points of entry, new façade, continuous walkable concourse around the arena's base, which will connect the plaza level to the riverfront and The Banks. Better locker rooms to attract collegiate sports programming. Escalators and elevators, exterior video boards and freestanding video signage elements. Suites: 40-60, new level closer to stage. Club seats: 1,750. Project design: MSA Architects.
Capacity 18,500
Cost US\$200m-US\$250m
OH: Cleveland: Quicken Loans Arena renovation
The Quicken Loans Arena has closed for the summer as work continues on The Q Transformation, the renovation project to update and modernise the almost 24-year-old arena. The initial phase of construction began on the exterior of the arena last February, and now that the Cavaliers NBA season has concluded, crews have been working on interior areas of the facility as well. The Q will re-open in the fall for the 2018-19 Cavaliers and Cleveland Monsters seasons along with a regular event schedule, beginning with the Justin Timberlake concert on October 2. Gensler & ROSSETTI are the architects and Whiting-Turner is contractor.
Completion 2020
OH: Columbus: Covelli Multi-Sport Arena
On North Campus to host competitions for six of Ohio State University's sports programmes. Combined with Jennings Family Wrestling Practice Facility. Finance: \$10m donation (Covelli).
Capacity 3,700
Cost US\$49m
Completion 2019
OH: University of Dayton
University of Dayton Arena to undergo a \$72 million renovation in three phases from 2017 to 2019. Phase 1 from 2017-2018 will include: Upgrade court-side and press seating areas; New four-sided, center-hung video board; New LED ribbon boards on the fascia of Spectrum Flight Deck and suites; Move TV broadcast area from Southeast to Northeast corner of Arena; Upgrade Arena bowl audio system and broadcast infrastructure. Phase 2 from 2018-2019 includes: New concourse and 300/400 level seats; New Southside and Westside entrance and elevator and stairs to event level; New renovated event level locker rooms and training room. Phase 3 from 2019-2020 covers: New concourse and 300/400 level seats; New Club Seats between 200/300 levels and addition of concourse clubs; New four-corner Terrace Suites; Complete 360-degree concourse renovation with updated finishes and branding.
OH: Dayton Arena
Proposed for Dayton Bombers hockey team and community teams and skating.
Capacity 5,500
Cost US\$30m
OH, Columbus: Schottenstein Center
The board of trustees has approved renovations to the home of the basketball and ice hockey teams. Expanded concourse and add more natural light to the building, improved access to ticket offices and team store.
Cost US\$31.5m
Completion February 2018

OR, Portland: Viking Pavilion and Ed Center
Massive renovation of the Peter W. Stott Center, Portland State University, which has served as a health, physical education and athletics facility since it was built in 1966. For public events, including lectures, concerts and athletic events, including PSU basketball games. Finance: OHSU \$7.5m, state bonds \$24m, donation \$5m. Study space: 30,000ft ² . Contractor: Fortis Construction (\$32m).
Capacity 3,100
Cost US\$45m
Completion Q1 2018
PA, Philadelphia: Villanova Basketball Arena
The Villanova University Board of Trustees has formally approved a comprehensive renovation plan for the 31-year-old Pavilion basketball arena on Villanova's campus. The significant renovation, which will be funded entirely by donor support, will transform the existing Pavilion—creating a high-quality, game-day experience for Villanova students, faculty, staff, alumni and fans. The renovation of the Pavilion is scheduled to begin in June 2017. The arena will officially be named the Finneran Pavilion when it is reopened.
Cost US\$60m
SC, Charleston: North Charleston Coliseum
Proposed upgrades to keep the 12,000-seat arena modern and competitive for at least the next 15 to 20 years. Two easy-access food courts on opposite sides of the building. Deeper and larger suites, a new arena bowl sound system and the addition of catwalks with wider platforms, which would allow for expanded rigging capabilities and spotlighting events.
Cost US\$19m
SC, Spartanburg: Jerry Richardson Arena
Home for Wolford College's basketball and volleyball teams in separate arenas. It will include locker rooms, coaches offices, meeting rooms, a video scoreboard and ribbon board. Construction manager: Robins & Morton. Athletic Director: Richard Johnson. 3,400 basketball), 500 (volleyball), 4,500 (non-athletics)
Capacity 4,500, 3,400 (basketball)
Completion Q3 2017
SD, Madison: Bahn Arena
Hockey practice arena adjacent to the Kohl Center for University of Madison-Wisconsin hockey teams. Concrete and steel construction, precast tiers. Ice system mechanical room is complete and the underfloor mechanical, electrical and plumbing installations are continuing. Women's hockey coaches offices, swim team lounge, hockey locker rooms.
Cost US\$27.7m
TN, Nashville: Bridgestone Arena
Nashville Predators have initiated a conversation with the Metro Sports Authority around the opportunities for development and enhancements. Possibilities include: a second sheet of ice on site, new event plazas, a hospitality tower housing a hotel, office and residential space, new team and facility offices, a conference center and hospitality and retail offerings; inside: wider concourses, new seating options and increased amenities at all levels.



TN: University of Memphis Center

Student recreation and fitness centre. Area: 192,500ft² along Southern Avenue. Four-court divisible gym, two-court gym, multi-purpose fitness centre with climbing wall, six racquetball courts, a quarter-mile indoor track, a lane pool, a recreational pool, an outdoor leisure pool, training facilities, large group exercise areas, classrooms, offices, a juice bar and a wellness and nutrition area. Three full-size turf fields, basketball and tennis courts will make up the outdoor component of the center. Three phases of construction. Finance: student fee increase.

Cost	US\$62m
Completion	2018

TX, Austin: University of Texas

The next home for Longhorns basketball at the University of Texas at Austin will be a new, on-campus arena easily accessible to student-athletes and fans. UT at Austin is considering a plan to build the arena south of Mike A. Myers track stadium but has not yet determined the precise footprint, scope or cost of the facility, which will replace the Frank Erwin Center in the next five to seven years.

TX, Dallas: Robson & Lindley Aquatics Center

Robson & Lindley Aquatics Center/Barr-McMillion Natatorium as part of Phase 1 of Southern Methodist University Athletics' Facilities Master Plan. A new 42,000-square-foot facility that will feature an Olympic-sized, eight-lane indoor pool with a platform diving area, four springboards, a 10-meter tower, coaches offices, locker rooms and a classroom and meeting area. In partnership with AT&T and the city of Dallas,

Mechanical Engineer	ME Engineers
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ME is providing MEP and technology design.

TX, Edinburg: Bert Ogden Arena

Publicly-owned basketball arena for the Rio Grande Valley Vipers near Interstate 69C/Expressway 281 and Alberta Road. City of Edinburg and Vipers have signed memorandum of understanding. Four month timetable to contract. Basketball-specific for great fan experience. Screen: 40x20ft. Restaurant, lounges, suites, concessions. Jobs: 150. Finance: Vipers \$25m, city \$30m (special tax zone). Annual rent \$350,000, 30-year lease. Investment group will donate land to a city-established corporation before construction begins. Design and build: Cantu Construction and Development Company.

Capacity	8,500
Cost	US\$68m (\$55m)
Completion	October 2017

TX: El Paso Arena

Council has chosen to acquire 12-acre site south of the El Paso Convention Center for multipurpose arena. Consultants: HKS Urban Design Studio, International Facilities Group (\$4.8m). Events: 120. Finance: public and private \$60-\$70m.

Capacity	12,750
Cost	US\$180m
Completion	early 2020

TX: Fort Worth Arena

Voters approved taxes towards a new multipurpose arena adjacent to the Will Rogers Memorial Center. Land purchase under way. Finance: city half, private donors led by businessman Ed Bass half. Events: annual Stock Show Rodeo, equestrian and livestock events, concerts, sporting events and family shows. Operator: Event Facilities Fort Worth (not-for-profit) - 30years, 4 x 10-year options. Finance: bonds and reserves.

Capacity	15,000
Cost	US\$450m
Completion	December 2019

TX, Huntsville: Propst Arena

Makeover of the Von Braun Center. Construction manager: Jeffords Associates. Construction: Vratsinas Construction. Finance: City and \$5m donation (Propst).

Cost	US\$24.5m
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TX, Irving: Entertainment Center

Re-start of public/private project in Las Colinas, 18 acre "Music Factory" project. 100,000ft² amphitheatre. Operator: Live Nation. Developer: ARK Group (Noah Lazes). Construction: Skanska.

Capacity	8,000
Cost	US\$165m
Completion	June 2017

UT, Salt Lake City: Vivint Smart Home Arena

The home of the NBA's Utah Jazz has re-opened in Salt Lake City after a \$125 million upgrade project.

The plaza greets people with a supersized J-note as the centerpiece, while a new 12,000ft² America First Credit Union atrium has been added with a 76ft long video screen on top of the foyer for outdoor watch parties. Another substantial upgrade for the arena is the formation of the Toyota Club with gathering space for 1,700 guests. Located on level two behind the lower bowl seats, the club wraps around nearly two-thirds of the arena. The open floor layout has comfortable social spaces for a quick bite to eat or a full-service meal from an array of live cooking stations and new restaurant offerings.

The club is open throughout Jazz games with eight portal entrances along with a members only main entry from the arena lobby.

The WCF Insurance Club and the Silicon Slopes Club are additional speciality spaces that have been remodeled. With its top-to-bottom approach for improvements and desire to implement sustainable practices, the renovation started on the roof with the installation of 2,700 Vivint Solar panels, covering 80,000ft² and producing the energy equivalency worth two seasons of Jazz home games.

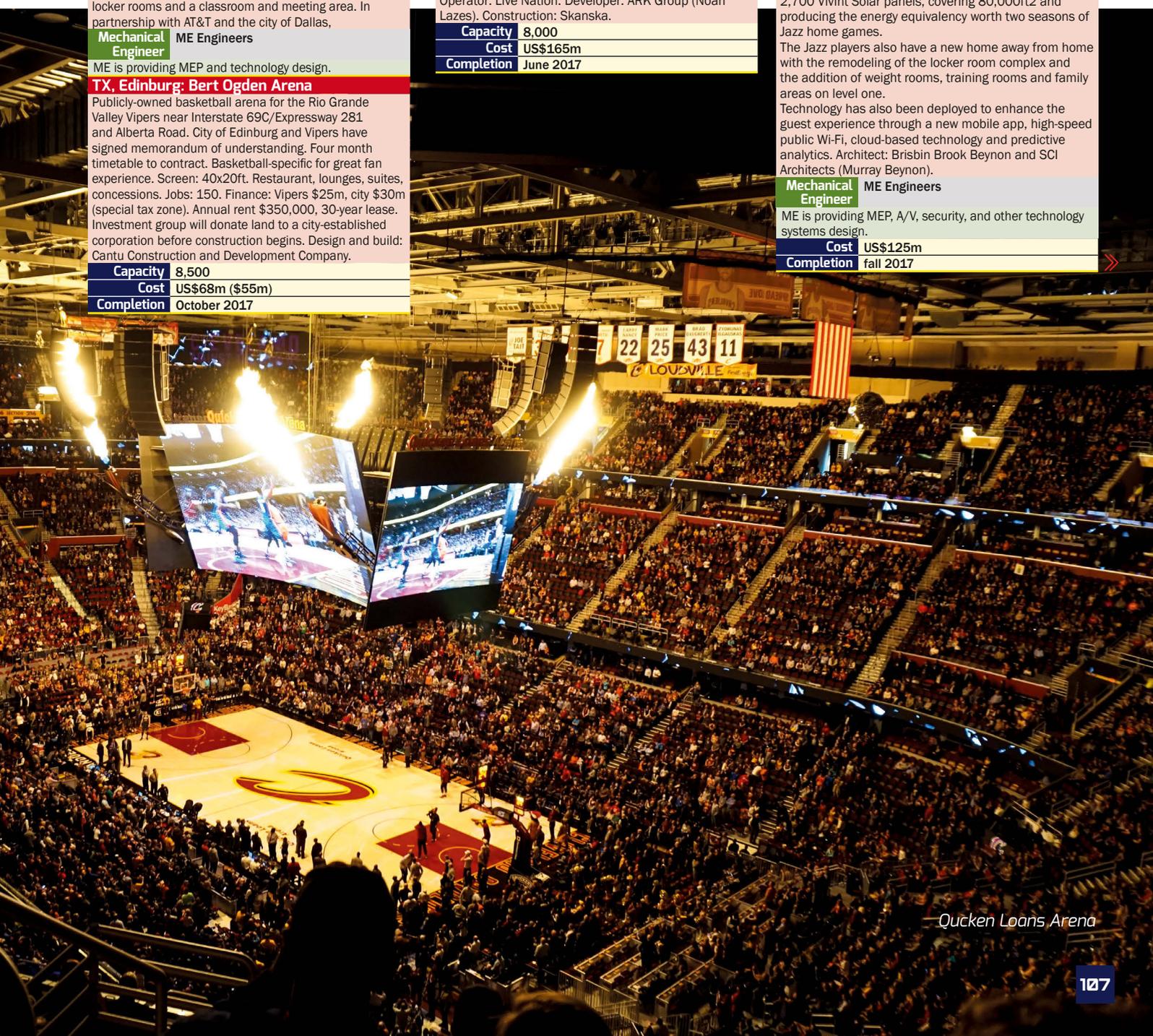
The Jazz players also have a new home away from home with the remodeling of the locker room complex and the addition of weight rooms, training rooms and family areas on level one.

Technology has also been deployed to enhance the guest experience through a new mobile app, high-speed public Wi-Fi, cloud-based technology and predictive analytics. Architect: Brisbin Brook Beynon and SCI Architects (Murray Beynon).

Mechanical Engineer	ME Engineers
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ME is providing MEP, A/V, security, and other technology systems design.

Cost	US\$125m
Completion	fall 2017



Quicken Loans Arena



VA: Richmond Arena

Proposed new arena and redevelopment of the existing Coliseum site. Big enough to attract minor league hockey, professional women's basketball, and early-round NCAA men's basketball tournaments plus concerts. Consulting team: Barrett Sports Group, Populous, Weston Sports & Entertainment.

Capacity 15,000

VA: Virginia Beach Arena

Plans for unnamed NBA or NHL team to re-locate to Virginia Beach. City council requires workable financial plan from the developer. Proposed sports authority and multi-purpose sports and entertainment venue. VB permitted to issue bonds for finance. Jobs: 3,944 during construction, 55 permanent and 322 part-time employees post-construction. Developer group: United States Management. Finance: private (city to pay for infrastructure).

Capacity 18,500

Cost US\$210m

VT, Burlington: UVM Multipurpose Arena

Both Burlington and South Burlington would like to have a long-anticipated multi-purpose arena that would host the University of Vermont hockey and basketball teams. South Burlington and UVM: replacement of the University Mall or the Rick Marcotte Central School. Burlington: new arena on Main Street at the current site of Memorial Auditorium. Reports commissioned, decision expected early 2017. Events: 60.

Cost US\$50-60m

WA, Tukwila: Northwest Arena

Proposal for an NBA and NHL arena just south of I-405 and near the Green River adjacent to the Sounder commuter rail station. Consulting stage, renderings issued. Area: 195,000ft². Height: 140ft. Green: LEED Silver. Ownership group: Russell Group.

Capacity 17,500

WI, Ashwauberon: Brown County Veterans Memorial Arena

County considering renovation or reconstruction of 60-year-old arena that stands in the shadow of Lambeau Field.

WI: Milwaukee: Fiserv Forum

Fiserv Forum, Milwaukee's much anticipated sports and entertainment venue, has officially opened its doors to the public. The venue is the new home of the NBA's Milwaukee Bucks and Marquette men's basketball team. It will also host a variety of programming – 24 events have already been announced for the venue's first year – including major concerts, family shows and other sports and entertainment events. Fiserv Forum will seat 17,500 for basketball and up to 18,000 for concerts with incomparable sightlines from all vantage points. The arena has three clubs including the BMO Club, Mezzanine Club and Panorama Club, which is on the highest level of the building and features an outdoor terrace with sweeping views of Milwaukee's skyline. Premium seating in Fiserv Forum includes 34 private suites, West Bend Lofts and more than 800 club seats. Just north of the BMO Harris Bradley Center. Area: 714,000ft². Plaza: 60,000ft². Also, state-of-the-art practice facility as soon as possible on Park East land just east of The Brewery development. Metropolitan Milwaukee Association of Commerce hired Hammes Co. to provide advice on whether a new, multipurpose sports arena should be built, or whether the BMO Harris Bradley Center should be renovated. Bucks' lease ends 2017 and NBA wants arena to league standards by then. Demolition of the Bradley Center for hotel and additional commercial or office space. Architect: Populous, HNTB and Eppstein Uhen. Finance: .Finance: owners \$250m, public \$250m.

Mechanical Engineer ME Engineers

ME is providing MEP, technology and lighting design.

Capacity 17,000

Cost US\$500m

Completion 2018

WI, Milwaukee: Marquette University Sports Center

University refining design concepts and budget for athletic performance research centre. Study: Cannon. The centre will provide locker rooms and office space for several athletic programs and combine indoor playing fields for Marquette's lacrosse and soccer programs. It will also feature an indoor track and a world-class athletic performance research facility. Architect: Sink Combs Dethlefs.

Mechanical Engineer ME Engineers

ME is providing full MEP design.

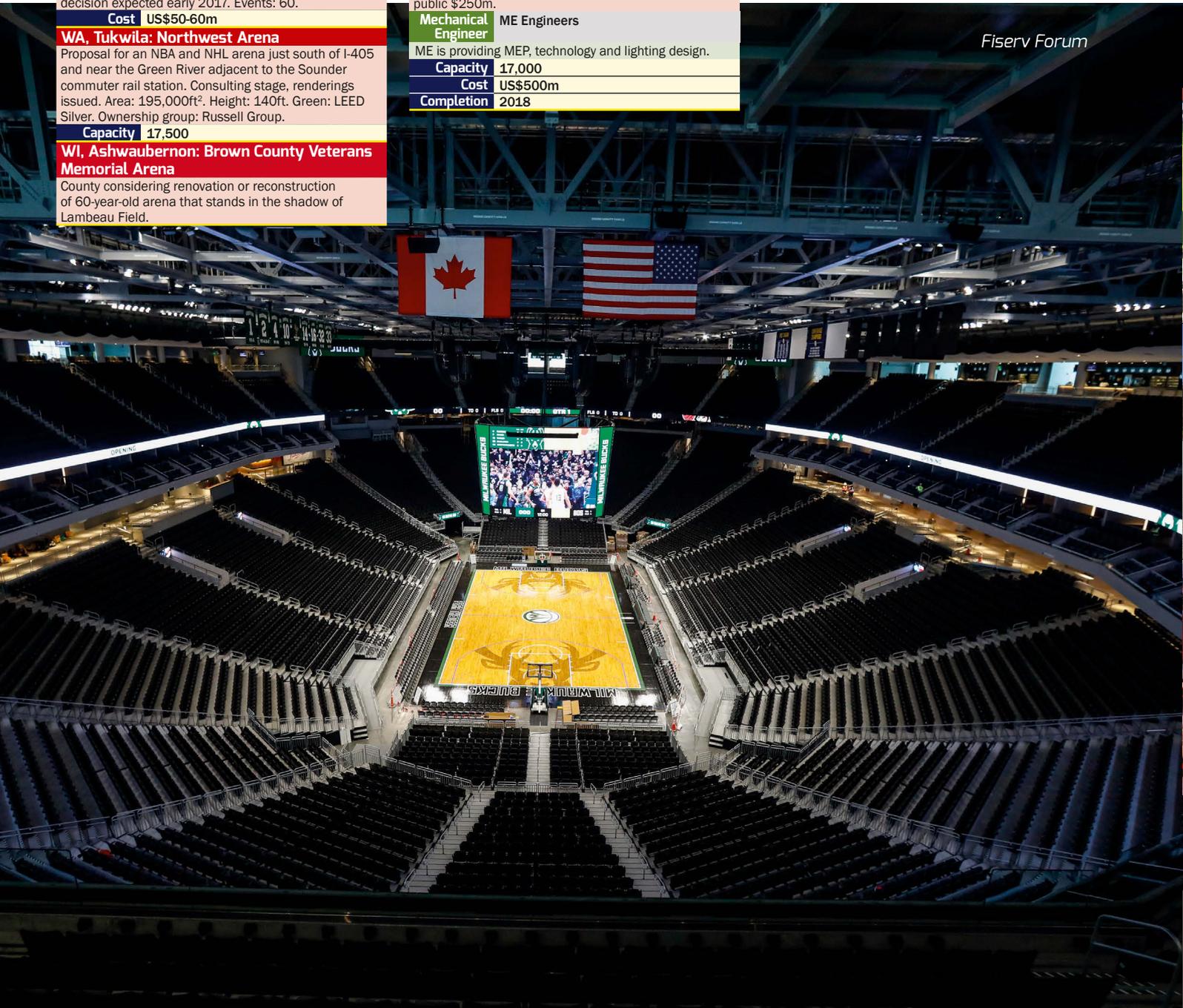
WY: University of Wyoming Arena

Two-phase renovation for Arena-Auditorium. Phase one complete. Phase two includes new grand entrance to the Arena on the east side of the building, the creation of a new ticket office to serve Cowboy and Cowgirl fans, Club Area, UW Intercollegiate Athletics Hall of Fame and renovation of concession and rest room areas. Club seats: 500. Separate high altitude performance centre approved next to Rochelle Athletics Center (design: Lime Green Design). Finance: 36 private donors \$10m, Wyoming State \$15m. Construction (phase two): Sletten Construction (\$13.28m).

Cost US\$30m

Completion October 2017

Fiserv Forum





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The next edition of *PanStadia & Arena Management* magazine, our 4th quarter (Q4) 2018 issue will include:

VENUE IN FOCUS

Will look at the renovation of **State Farm Arena**, home of the **NBA's Atlanta Hawks**; the East Stand expansion at **Twickenham**, home of **England Rugby**.

FEATURES

A post-match review of major sporting events from this year including the **FIFA World Cup** in Russia and the **Asian Games** in Jakarta and Palambang, Indonesia and the success of their stadia and temporary infrastructure.

A preview of the most exciting 2019 sports venue openings in North America.

The issue will also include an array of in-depth articles from our advertisers and supporters, covering everything from architecture and design to fit-out and emerging technologies.



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