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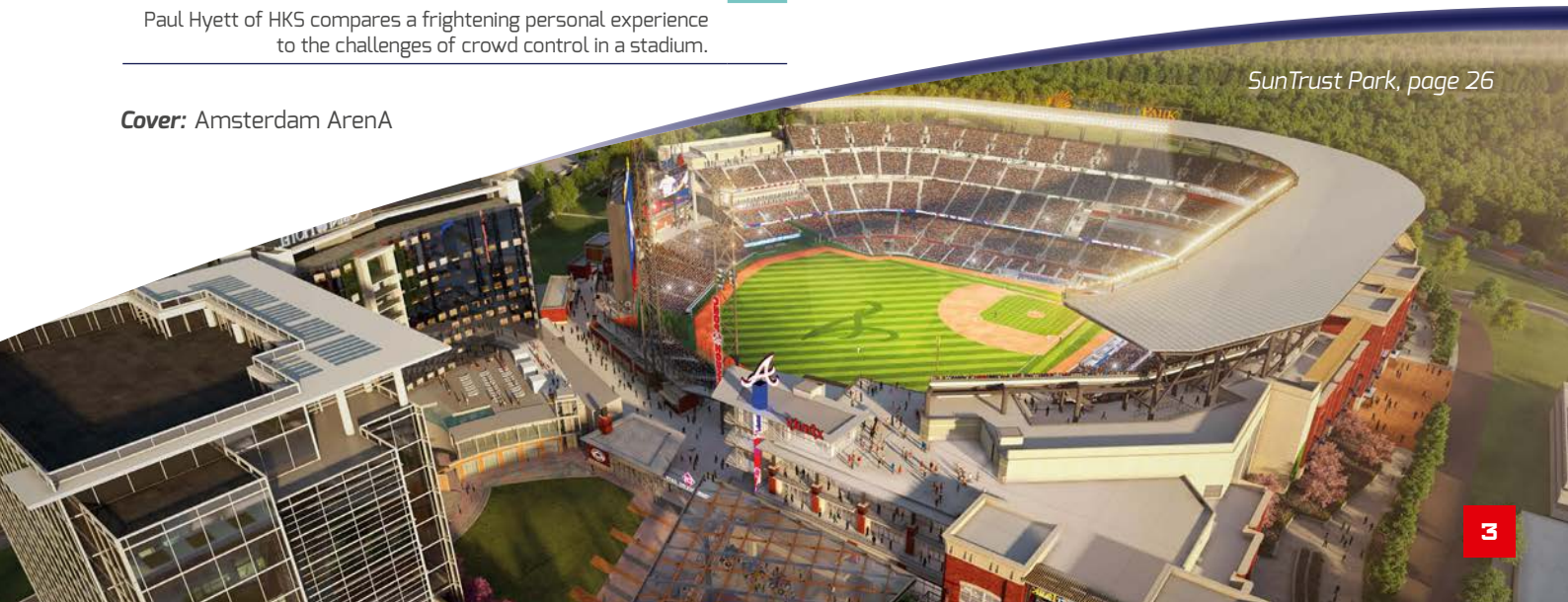
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Cover: Amsterdam ArenA





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Nothing beats being there. Those lucky enough to have been at **Superbowl LI** at the **NRG Stadium** in Houston, Texas, to witness the **New England Patriots'** stunning comeback to beat the **Atlanta Falcons** against all odds will surely testify to that. A thrilling **Six Nations** rugby championship has been filling stadia with Europe's top nations going head to head in some unforgettable encounters.

These events pull in the crowds and the scramble for tickets is ferocious. But away from the top fixtures, venue managers across the globe are now competing more and more with alternative entertainment options, as well as digital offerings available to fans. They need to be at the top of their game to keep the crowds coming back. Fan engagement is the key – how do you keep fans coming back to watch your team?

Putting on a great show is one way to achieve this and that is exactly what the **Amsterdam ArenA**, home of **Ajax** football club, is looking to do with the technology it has installed. The ArenA can now put on a mesmerising audio visual display on match days which will dazzle fans and draw them into an immersive soundscape. In this issue we talk to Amsterdam ArenA's CEO Henk Markerink about the upgrades.

Safety is, of course, the top priority at all sports stadia and arenas and we examine some of the initiatives underway in the US to ensure the wellbeing of spectators.

This spring edition also includes articles on the rise in popularity of temporary stadia and in depth looks at Copenhagen's new **Royal Arena** and **SunTrust Park**, the new home of the **Atlanta Braves**.

All that remains for me to say is please keep me updated with all your latest venue development news at john.s@aladltd.co.uk for inclusion in our Facility Watch section.



John Sheehan
Editor
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TEMPORARY SOLUTIONS

Temporary structures are becoming more and more common at major sporting events, as well as for cost-conscious clubs, as John Sheehan finds out.

Temporary overlay is becoming more commonplace at sporting events as organisers look to save time and money.

From the **Olympics** to the **World Cup**, the use of temporary infrastructure is a key element to the success of any event.

Daniel Cordey, Chairman of the **Association of Global Event Suppliers (AGES)** told *PS&AM* that temporary infrastructure is becoming more important for major organising committees. He said: **"Most organisers of large events are under huge pressure. They have limited financial**

resources and they have to perform complex tasks in a short timeline.

"They have started to understand that this industry of temporary event builders can offer good solutions for them.

"The IOC in particular acknowledges the importance of temporary infrastructure more and more and is pushing the bar and opening up the possibilities for using such solutions."

This was clearly the case at London 2012 and Rio 2016 but Cordey added: **"For Tokyo 2020, the Japanese do not have extensive experience with temporary infrastructure even though they have lots of events. We need to make them aware about the capabilities of the industry and about how to deal with the international supply chain."**

GETTING IT RIGHT

Cordey stressed that a temporary build project is very different from a permanent solution and should be treated as such.

"Today building technology and methodologies are available to build virtually any type of structure on a temporary basis from one to X-number of years. However, to fulfil the client's requirements and to build it cost-effectively, the project owner, the planner and the builder need specific know-how and expertise.

"Technically a lot is possible. You can make large span structures or unique shaped buildings. You can purpose build nearly anything. But to make it really fulfil the client's programme, comply with the building regulations and the time constraints and still be a good deal



Daniel Cordey, Chairman of the Association of Global Event Suppliers (AGES)

Arena was given just over 30 days to turnaround Horse Guards Parade from a blank canvas into a competition venue for the London 2012 Olympics.

for the client, there are a lot of things to consider.

"You need expertise to approach these type of projects because you need to marry different aspects. A target-oriented plan and a good strategy are key to make it work."

Cordey said it is essential to have architects, suppliers and clients working together to find the right solution, sometimes even with the participation of the building authorities.

"The winning formula is a competent team with a good strategy and leadership. It is not a matter of technology. The procedure and way of doing it is more important than the actual features."

He said the process of developing a temporary building is important and is different compared to a traditional building project.

Simplicity, resources, functionality and timing are becoming the drivers to develop a smart temporary building. The larger the building, the more complex the task is.

Cordey said: *"Keep it simple and always fight to keep it simple. Knowing the market place and considering reusable or rental products effectively are important, so that you are not investing more money than needed."*

"Actually a good temporary building is always fit-for-purpose, every item incorporated serves a purpose and has a usage beyond the project. You need to know from the beginning to the end how you are going to do it, so you can better integrate procedures and gain time"

"There must be a lot of preparation ahead of the construction so that once you put your feet on the ground, you are just running."

SERVICE DRIVEN

He said a temporary building is to be looked at as a service delivered for a specific period of time, rather than a product being conceived, delivered and operated the traditional way. The main components of the project must have a usage (legacy) before (precycling) and after the project (recycling). The temporary infrastructure solutions form part of the circular economy.

"You need to be fully aware that what you buy is in fact a service and this service is a fine-tuned package. Project owners often have difficulty in understanding that."

Cordey said that this is where problems arose with the temporary basketball arena for the London 2012 Games.

"The temporary basketball hall for the London 2012 Olympic Games was unique and audacious but unfortunately not a thorough success. The idea to make it a temporary building was good but the strategy did not incorporate all features to make it a good legacy and a cost-effective project."

"It followed a good modular building concept but there was no ownership programme and no post-game plan. The key thing when you are envisaging to build a large temporary building is to involve from day one and to commit in due time to the supply chain or the investors as well as the potential operators. This is what was missing in London."

"But looking at the temporary ice hockey Arena being built in Lausanne, Switzerland now, project owners learn fast.. There will be more and more temporary or hybrid solutions in the future. They offer true and very cost-effective options for large event organisers or venue owners, if planned well," Cordey added. >>





LAUSANNE ICE HOCKEY ARENA

One current project where lessons will certainly have been learnt from recent experiences is the new temporary ice hockey arena **NUSSLI** is building in Lausanne, Switzerland.

Lausanne Hockey Club's interim stadium will be 66 metres wide and 96 metres long. An ice rink and a grandstand system with 6,700 spectator seats are being built in the hall's interior. Athletes and fans will still have all their usual amenities: a hospitality zone, media and press rooms, cloakrooms, offices, equipment rooms, a shop and ticket office will also be built in the stadium.

NUSSLI planned this innovative project with support from **BG Ingenieure Lausanne**.

The reason why it is so innovative is because it will be the first temporary ice stadium ever built. The extensive range of equipment necessary for producing the ice and the resulting humidity posed a thorny, but definitely not unsolvable challenge for the planners.

Bernd Helmstadt, Director Sales Events for the NUSLI Group told *PS&AM*:

"One large project we are working on is a temporary ice hockey arena in Lausanne. The ice hockey club is having a new arena built but in the same place as the old one."

"The total project timespan to demolish the old one and build a new one is about

three years, so in the meantime they decided to build a temporary arena in the city."

"It is a classical construction like an industrial building but it is a combination of our hybrid projects where we have designed elements specifically for the project itself and we are taking the grandstands from stock. The arena should be ready by the end of 2017." »



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« BUDAPEST SWIMMING COMPLEX

Meanwhile, NUSSLI has also been heavily involved with the **Danube Arena** swimming complex, which has been built in Budapest, Hungary and will host the **FINA Swimming World Championships** in July this year.

Helmstadt said it is a very good example of temporary overlay being used to boost the seating capacity for a specific event.

He said: *“This is a very good example. It’s a mirrored example from the London 2012 swimming complex. The requirements for hosting World Championships or Olympics are very high and there is a problem of how to convert a venue into event mode.”*

“Budapest’s new aquatic centre is a huge €125 million investment for the city. It is a huge swimming centre with two 50 metre pools. In the main competition hall there is a 5,000 seat capacity. To host the World Championships there is a requirement for 15,000 seats.”

“There has been a smart solution developed to extend the permanent facility with new grandstands to the right and the left. We came up with a smart solution for the event requirements so the city is not left with a White Elephant when the championships have finished.”

Helmstadt said there have been some special requirements in terms of humidity management and climate locks.

“We had to build the grandstand within the existing hall infrastructure and there was an issue with air conditioning. They decided to incorporate 10,000 holes in the grandstand with each individual seat attached to air conditioning pipes, so we needed to incorporate kilometres of air conditioning pipes in the grandstand.”

“It was a tough schedule so preparation had to be very good. We have launched a new grandstand system of 80 cm with a riser of 50 and 55 cm. The last row is almost about 30 metres above the pool level.”

He said work is continuing on the venue, but that it should be completed by the end of March in time to run test events before the World Championships.

Helmstadt added: *“Once the championships are over, dismantling will start in September and everything needs to be removed in four weeks.”*

“We will put the equipment back into our normal rental stock, most likely

in Germany. We would like to use this perhaps for the next World Swimming Championships or for the Olympics, perhaps in Tokyo, or for some other major projects in central Europe.”

“The system would also perfectly fit the requirements in Qatar for the football stadiums being built for the 2022 World Cup. They have a legacy mode where the stadiums will be half of the size after the World Cup and so the second tiers should be temporary. The upper tier needs to be steeper than the lower one and there is a huge demand for high rise grandstands in Qatar. They could be used either for the Tokyo Olympics or the Qatar World Cup.”

He added that for events like the Olympics or World Championships, temporary arenas are absolutely key and this was laid out in the 2020 agenda for the IOC.

“They do not want to pour too much concrete but think about legacy” he added.

GL BEEFS UP FRENCH RUGBY STADIA

While some temporary structures are built to fulfil a need for a specific project in a set timeframe, others might be in-situ for much longer.

Temporary stadia can be built more for unlimited use by sporting clubs which yoyo between divisions and whose capacity needs can fluctuate.

GL events built a 2,500 seat permanent grandstand in three months for **Stade Rochelais** Rugby club who play in France’s Top 14 league. It includes 2,500 seats, 500m² of VIP sky boxes on top of the stand and restrooms, a boutique and refreshment stalls underneath.

As Guillaume Massard, Grandstands and Stadiums Business Unit Manager for GL events, explained: *“This case study showcases the benefits for clubs and cities using our construction concept: fast to build, meaning speed up of payback, cost effective (50% less than concrete meaning Higher ROI) and modularity, meaning the structure can evolve with the economic and sporting success of the club.”*

RUGBY CLUB (LOU)

In 2011, GL events built an 8,000 seater stadium in between the rugby playing seasons.

This was in order to help LOU rugby club to have a new stadium complying with ligue requirements after being promoted to TOP 14. The seating capacity was then increased to 10 000 seat in 2014.

Massard said: *“We built a brand new stadium in 82 days. It included two grandstands with roofs and concession stands, retail outlets, meeting rooms and a first aid post, all of which were housed in the steel understructure, ensuring space was maximised.”*

“It cost 50% less than a traditional construction in concrete. We are dismantling it now because LOU rugby are moving to another stadium – Stadium Gerland now known as the Matmut Stadium – former home of Olympique Lyonnais football team.”

“It is a permanent stadium but the way it was built gives an opportunity to dismantle or increase capacity in a short time, depending on how your club evolves.”

“The temporary or semi permanent stadium was a 10,000 seater stadium



Stade Gerland: training center (fitness room, staff & medical offices)

LA ROCHELLE

GL events have been working with **La Rochelle rugby club** who were recently promoted to France's top 14.

"In 2014 we built a new grandstand for them with VIP facilities. We also built a two storey hospitality space," Massard said.

"Our construction concept generated a construction cost saving of 50% and the new stand was built in 3 months allowing the club to use this new infrastructure for the first game of the season. If you did the same in concrete it would take a year and a half to build and cost twice as much.

"The temporary structure also gives the possibility of removing it if the club is not doing so well.

"That is very important for a club because it is very difficult for them to

finance their infrastructure. This type of temporary infrastructure is easier to finance because when they go to see a bank, for the bank it's an asset – it can be dismantled and resold. If it is in concrete it can only be destroyed."

We will be starting construction at La Rochelle in May. In 2014 we did one end zone and in 2017 we're going to build the same grandstand but at the other end. We installed a very simple grandstand in 2010 and as they got better we increased the same one from 2,500 to 3,000 seats and in 2017 we're going to increase the same grandstand by another 1,000 seats, add a roof and build VIP hospitality on the top and facilities underneath.

"That is a very good example of how a simple grandstand can evolve over time. Those are the benefits of the temporary structures.

"These structures are becoming more and more popular for three reasons. They cost less, they are fast in terms of construction times and also they are modular."

GL has worked with different rugby/ soccer clubs in France including La Rochelle, Castres, Aix-en-Provence and LOU.



La Rochelle rugby club

with a 3,000m² hospitality village. Part of the hospitality village has been dismantled at the end of 2016 and we have reused some of the structures to be used in the new stadium of LOU Rugby Club.

"The grandstands have not been dismantled yet because the city wants to keep the grandstands with the roof."

He said 5,500m² of new hospitality structures have been built inside **Stade Gerland**. "We started construction

at Gerland in October and we completed everything by the end of December.

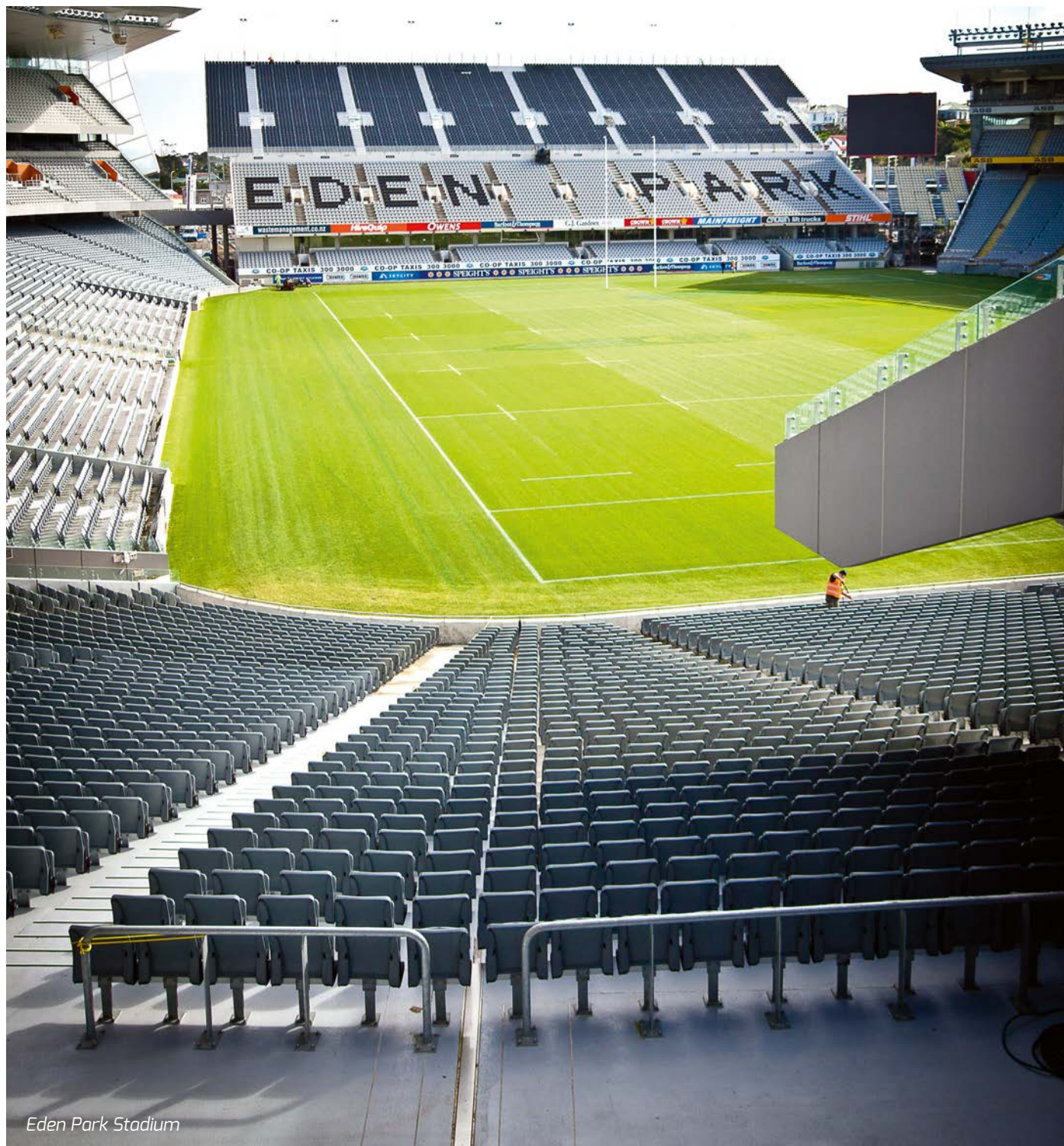
"Now we are building the new training centre for LOU Rugby just behind the hospitality area inside the stadium. In mid-2017 we are planning to renovate part of a stand because as a soccer stadium Gerland is not very rugby friendly. Spectators are a long way from the pitch.

"We are going to build another stand on top of the existing stand to bring

it closer to the pitch. We are planning to start working on it in May and deliver everything by September 2017. They came to us because our system allows us to deliver something in the close season." »



Stade Gerland: VIP Hospitality



Eden Park Stadium

« RUGBY WORLD CUP 2019

GL events has gained a lot of experience working on rugby stadia and extended New Zealand's **Eden Park Stadium** for the 2011 Rugby World Cup.

Massard said: *"If you want to host the final you need a 60,000 seater stadium and Eden Park is only 50,000 so we increased the seating capacity by 12,000. We built two huge grandstands on the endzones. They have now been dismantled and re-used to rebuild Christchurch Stadium which was destroyed by an earthquake."*

He said GL is also planning for a lot of work in Japan for the 2019 Rugby World Cup.

"A lot of stadiums need to increase their seating capacity for the 2019 Rugby World Cup so we are working on different projects in Japan. They will also need temporary infrastructure for the Olympic Games in Japan."

"In Japan the renovations will be extensions of stadiums. Everything is handled by cities so it takes time and it is done by public tender. Right now we are working with local architects."

We are working with them on several stadium projects."

More and more organising committees want to build temporary structures instead of permanent ones.

"Japan is hosting two major events so hopefully we will be able to build temporary structures for the RWC and they can then be reused for the Olympic Games. Maybe after the Olympic Games all those tents and structures and seats can be reused to build permanent rugby or soccer stadiums in the country. That is very good in terms of legacy." ■

TEMPORARY BUILD

FEATURE
TEMPORARY
VENUES

Dave Withey, Sales and Marketing Director Arena UK and Europe, gives his thoughts on the rise in popularity of temporary infrastructure.

Why are temporary stadia becoming more popular at major sporting events?

Sports clubs and organisations can benefit from the greater flexibility temporary stadia offer, and they are increasingly being used for one-off events or whole seasons.

Temporary structures are a more cost-effective approach rather than permanent bricks-and-mortar facilities. The development of permanent-looking structure technology means we have come a long way from the days when the only way to expand or upgrade was to knock part of your stadium down and start again.

The word “temporary” can be misleading in some ways; modern structures can be considered to be semi-permanent installations.

We can offer very flexible, modular seating options that not only offer a great experience for sports fans but can enhance any sporting facility on a permanent or semi-permanent basis.

What are the advantages of temporary stadia and seating?

They cost less, of course, and you save a lot of construction time. We can design and install sports facilities that look superb and meet all safety regulations. Some clubs need the option of being able to expand capacity without breaking the bank while making sure any new facility is in keeping with their current stadium and surroundings which is where we can help.



Fans at Bath Rugby's Recreation Ground

What major projects have you worked on?

One of our most recent projects was expanding and upgrading **Bath Rugby's Recreation Ground**, which is part of a **World Heritage Site** and needed improving while the club waits for permission to build a new stadium.

We also worked on **Saracens' Allianz Park**, supplying new seating and grandstands utilising demountable seating structures which can be installed on a permanent basis.

One of the best examples of what we can do is **Fulham FC's Craven Cottage Stadium**; over the course of seven years we've transformed a stadium that was looking run-down after years of underinvestment.

We worked within strict planning regulations to expand capacity and improve sightlines and we did it for a fraction of the cost of a rebuild.

Our seating professionals help clubs also improve their training facilities, including the installation of new standing terraces at **Newcastle United** and tiered temporary grandstands at **Leicester City FC** for fans watching the home under-21 matches.

Staying with football, we delivered the largest ever temporary structure built in Brazil when we installed 18,000 of our clearview™ seats in the North and South Stands of the **Arena de Sao Paulo** stadium for the **2014 FIFA World Cup**.

What recent advances have we seen in technology for temporary stadia?

Temporary stadia products have evolved to the point where they have a permanent feel to them. We have an in-house team of CAD designers and structural engineers so you're getting a grandstand or seating arrangement that is tailored to your needs rather than a one-size-fits-all approach.

We've continued to invest and develop our products which are reconfigurable and offer a great view from every seat. Perhaps the biggest step forward in seating has been our clearview™ system, a modern, attractive seat on a variable rake substructure to maximise the best possible views.

The seats themselves now come in a range of colours and can be padded for VIP and coaches' areas. We're also able to incorporate hospitality facilities, media studios, bars and toilets into our designs. ■



TACKLING FAN ENGAGEMENT

The Amsterdam ArenA is undergoing major upgrades to improve the match day experience for AFC Ajax fans, as well as concert goers.

The Amsterdam ArenA, home of AFC Ajax, is undergoing a huge makeover to transform it into a sixth generation stadium and improve facilities for fans.

The sound and lighting systems have been upgraded, the seating is being replaced and a host of new facilities are being installed to keep fans coming back.

As Henk Markerink, Amsterdam ArenA's CEO explained to PS&AM, everything is being done to boost the fan 'journey'.

He said: *"The new light system was put in during the winter break in mid December to the end of January and is there to enhance the fan experience."*

The new sound system was installed between September and December."

He said that the new Philips LED lightning system has a range of extra coloured spot lights.



"We can play with different colours. This is the elite version in regards to the rules and regulations of UEFA. We have put extra lights in the goal area compared to the old system because the light requirements of UEFA have increased for television with HDTV. In that sense it is also an upgrade compared to the older system."

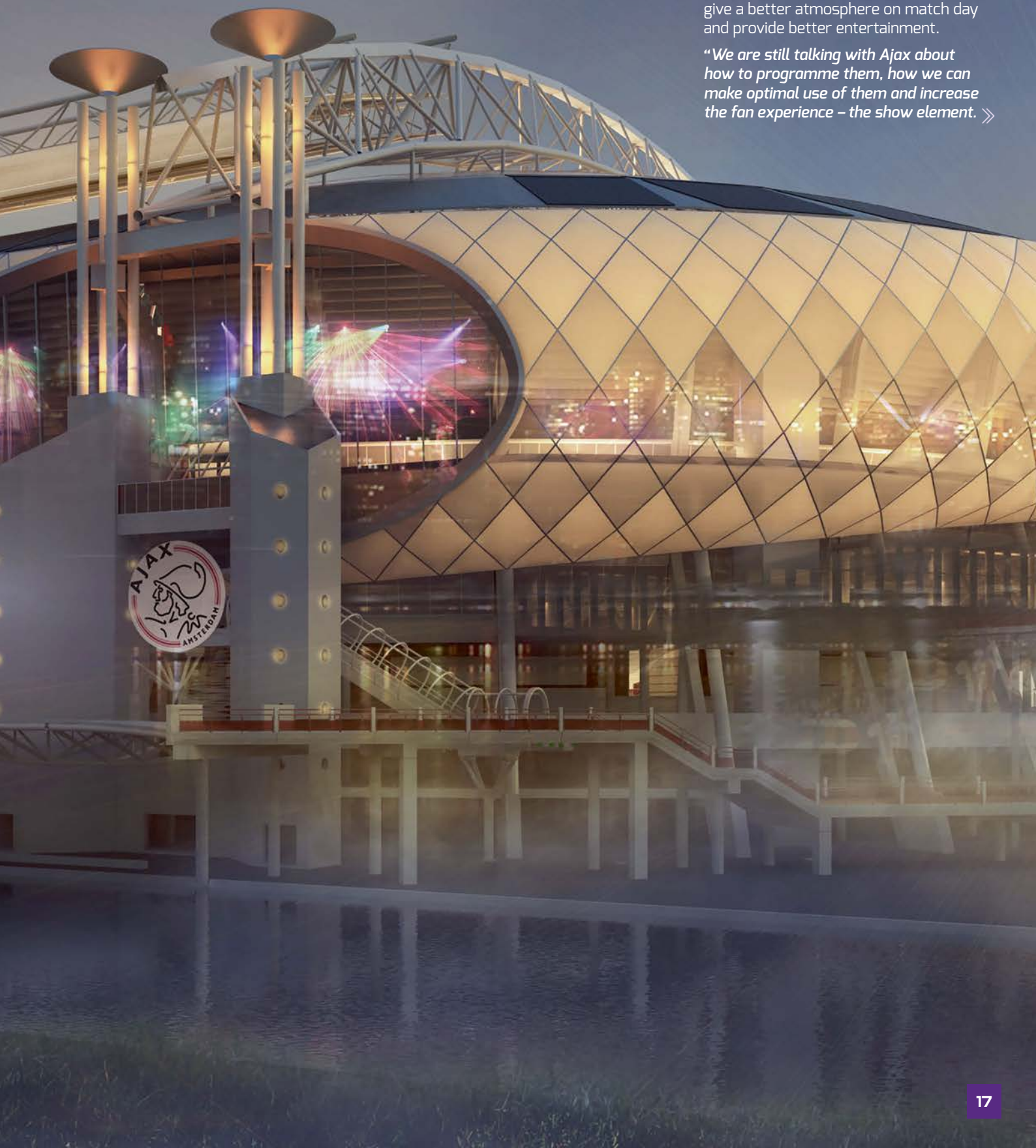
"The number of lights on the field is higher and special spot lights on the stage can be put on. It is better for show lighting."

"On match days we can play with the system. With the old lighting system we couldn't switch most of them on and off because they needed 20 minutes to cool down before you could put them on again."

"With this LED system you can switch it on and off. The team can come out in darkness with just a few spotlights on and for the match you switch on the whole lighting system."

He said the lighting could be set up to give a better atmosphere on match day and provide better entertainment.

"We are still talking with Ajax about how to programme them, how we can make optimal use of them and increase the fan experience – the show element. »



«After the match when the team is doing the rounds of the stadium you can follow them with a spotlight to give an extra atmosphere. All these things still have to be invented because it is brand new. There isn't a standard programme for that.

"We are talking with the experts to see how we can merge the sound and the light before and after the game and during the half time break.

"We are seeing how we can use this not only to raise the fan experience so they have more fun on the day but also maybe by adding a show programme before, so they come earlier to the stadium and stay longer after the game. We are trying to extend the period they are in the stadium which is good for traffic, the crowd flow and the catering."

SOUND SYSTEM

Markerink said the old sound was end of life and also had to be replaced.

He said: "We compared different brands and specifications and we decided on d & b audiotechnik which is a very professional brand. The system can be used in combination with the requirements of big pop concerts as well.

"Making good sound in a stadium is quite a challenge because of the echo in the stadium. In all stadiums you have this problem where big bands are performing. By adding the hung arrays the sound is more spread around the whole stadium. The arrays are very much focussed on the different areas in the stand so you get a very direct sound. This adds something to the fan experience with better music and speech. It is quite a jump in quality. The sound is very pure."

EVERYONE VIP

Amsterdam ArenA is undergoing the major overhaul as part of the 2020 programme to get it ready for the four FIFA Euro 2020 matches it is hosting.

Markerink said: "We are taking the stadium to the next level. When we opened we were a fifth generation stadium and now we're moving on to become a sixth generation venue where everything is fully connected, fully sustainable and we make maximum use of the ICT applications. This is aimed at giving the best possible fan experience and customer journey.

"We are building a whole new shell around the existing building so that the concourses behind the stand are

enormously enlarged. The one behind the second tier will be about 25 metres wide, so there will be a lot of space for people to entertain themselves, to have a drink, to have some food, to come earlier. On all levels behind the stands there will be more space for catering and more toilets.

"We are investing in better service and quality for the spectators. The motto is everyone VIP. We want everyone to have a very comfortable stay so that we will have a full stadium every week."

Markerink said the 55,000-seater stadium is nearly full most weeks, with the majority of matches sold out.

"We said a couple of years ago we're not going to invest in quantity but we will invest in quality. We closed the moat around the field and we have a capacity of 55,000. We did a study to raise capacity to 65,000 but we decided it was more important to be full every time."

AJAX COLOURS

To further engage with fans the 20-year-old stadium seats are being replaced with more comfortable seats with more leg room.

"It is a facelift form outside and inside. It is a total renovation. We tested five different brands of seating.

"We are changing the seat colours as well. We had flames of different colours before and now the whole stadium will be red with white elements. The name of Ajax will be in the stand and the logo of the city of Amsterdam. It will look quite traditional. That was a specific wish of the Ajax supporters to make it more red and white in Ajax colours."

The Amsterdam ArenA also has a seat-serve programme in place where fans can order drinks from an app and pick them up from a grab-and-go counter.

"The number of people using it is still too low, but it is just a matter of what people are used to. We need to make people aware of it and instruct them so more use it," Markerink added.

"There is also free wifi in the stadium and information points around the concourses.

This has been a major investment and there is 4G in the whole stadium. If you want to be fully connected with a lot of ICT apps, the network must be in place. We did a huge project with Huawei to put 800 antennas in the building for wifi. That was another part of the whole 2020 programme.



A rendering of how the new seating arrangement will look

"The Euros in 2020 were a good point on the horizon. We are one of the 12 big stadiums in Europe to host these games and so we want to be one of the best in 2020. Step by step we're getting to our 2020 future."

He said that in terms of fan engagement a whole programme has been rolled out for the customer journey.

"Your fan experience starts the moment you buy the ticket. We are



investing in making it a very smooth trip so you don't have delays. We have installed a mobility centre for every event day. We are in touch with all the people on their way to guide them in the best way."

As far as safety and security goes, Markerink said the arena plans to make more use of technology to keep a watch on crowds and to make sure security staff can act quickly when needed.

The Amsterdam Arena is also working hard on improving its levels of sustainability.

"We have solar panels on the roof, we have wind energy, we have central heating from the city heating.

"We became carbon neutral in 2015 for our complete operation and we are taking this to the next level. We are about to purchase a huge battery to

store our solar energy. This can then run the stadium for two hours without the need for diesel generated back up power. We are collecting rain water from the roof for the toilets and we will also use it to water the field.

"An enormous transformation is going on to get from fifth generation to next generation stadium. I think we are quite progressive in these things and it is giving us a whole new future." »

« DERBY COUNTY – ENGAGING WITH FANS

Championship football club **Derby County** is pushing the boundaries of fan engagement both inside its stadium and through broadcasting and social media.

The club has upgraded its audio system to improve the match day experience for fans, while it is also reaching out to its wider fanbase through its own TV channel and other social media outlets.

Stuart Fisher, Derby County's Chief Technical Officer, said that while it is key to keep fans in the 38,000 seater **Pride Park Stadium** engaged on match day, there are another 250,000 fans who watch on social media each week.

He said: *"The larger fan base is not the guys who come to the stadium, although we want to make sure their fan engagement is as good as possible. We need to try and broaden our horizons so the people who are watching on different means - our larger fan base - really do get that engagement."*

"One of the biggest driving forces for us at the moment is broadcasting. It is no longer down to big broadcasters. We create our own content and are the owners of our own content."

He explained how the **BBC** had put a camera in the dressing room for the FA cup game against Leicester City, so viewers could see the manager's pre-match talk, and that the response on social media had been huge.

"The amount of coverage and engagement with the fan we got was absolutely huge."

"In the stadium world, it's all about fan engagement. It's all about how do we make the fan believe he is part of the club and how do we make the fan that's part of the social media feel that he's also part of the club."

"Traditionally what happened was that broadcasters would broadcast our games, but we are the ones that create our content and if you look across the leagues now, all the clubs have different technical abilities. I would put Derby as being one of the more technical clubs out there."

MANAGER ON BOARD

Derby County manager, Steve McClaren, has also bought into the fan engagement concept.

He told **RamsTV**: *"I think gone are the days when you just pay your money at the turnstile and go in and you're*

there from 3pm to 5pm. That has gone. Supporters want to be entertained. They can get things straight from their phone now and we have to think of different ways we can attract the public."

"We are the football club at Derby. Let's get our message across and our face out there. There's no better way to do that than through your own television company."

"Why be secretive, this is what we are and we want the supporters to know what we are. We want them to know we're working hard here. This is what we do. This is what the players have to put up with during the week."

"The more in depth we go in opening the doors up to the changing rooms and our training pitch the better. I have spoken to a lot of fans who want to know more about the game tactically, about what happened, why did we draw or win a game."

"On social media there are a lot of people out there analysing games and giving supporters and football fans a more in depth look into the game. Getting the news out there for the fans is the most important thing. To have your own TV station where you can broadcast what you want and really go in depth, I think that is something the supporters want to know. It's certainly something the supporters will watch."

Derby also recently installed a d&b audiotechnik sound system at Pride Park to help boost fan engagement.

Fisher added: *"We want fans to be totally immersed in the audio experience that they get in the stadium. It may have opened the door to bring more shows and bands to the ground, but that wasn't really the requirement, the requirement was to completely immerse the fan into that experience. The fans notice the difference and are totally immersed in what they hear."* ■



Fans of **Premiership** rugby club **Bath Rugby** are cheering as they can now order drinks from their phones before a game and for during the half-time interval.

Bath Rugby introduced the app as it looks to provide the best possible match day experience for its supporters from start to finish at the **Recreation Ground**.

Once ordered through the app, the fans were able to pick up their drinks from the Swift Half, Bath Rugby's marquee pub located behind the Dyson Stand.

The app is available both on the Apple App Store and Google Play.

Alex Cohen, head of operations at Bath Rugby, said: *"Bath Rugby is always looking for ways to enhance supporters' experience at games. Having this app will only add to the positive overall journey that they will go through from coming through the gates, to leaving after the final whistle."*

Andrew White, CEO of **Preoday**, which supplies the app said: *"We're proud to be able to help one of the UK's top rugby clubs make their games even better for fans. Long queues at the bar before the game and at half time can spoil the experience for rugby lovers and now that's something they don't need to worry about. Moreover, we're delighted to support another of our partner Ticketmaster's thousands of venues in improving the experience for their customers."*

SAVE THE DATES...

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HASSELL DELIVERS 'FANS FIRST' DESIGN TO PERTH STADIUM

Fans have always been at the forefront of plans for the 60,000 seater multi-purpose Perth Stadium.

The multi-purpose, 60,000 seat **Perth Stadium** on the west coast of Australia will be a world-class venue when it officially opens in early 2018.

The commitment to a 'fans first' stadium has resulted in an innovative design ensuring an exceptional event atmosphere and an unsurpassed visitor experience.

"Western Australian fans will have the opportunity to experience a world-class facility week-in, week-out but most importantly one that has been designed with their needs at its heart," said Terry Waldron, former Western Australian Minister for Sports.

EXCEPTIONAL VISITOR EXPERIENCE

The Perth Stadium design, created by **HASSELL**, with **Cox** and **HKS** as sub consultants, acknowledges Western Australia's unique sporting, cultural and Aboriginal heritage, and the Stadium Park landscape provides a spectacular vista across the Swan River to the city.

Its striking bronze facade uses anodised aluminium to reflect Western Australia's unique geology by day and, with the help of state-of-the-art LED lighting, the home-team colours by night.

HASSELL Principal Peter Dean says the LED lighting system is the largest of its type in Australia.

"There will be no massive light towers impacting on the visual quality of the surrounding landscape, instead 850 LEDs are built into the stadium's 'halo' roof form," he said. *"The lighting technology will also bring sufficient energy savings compared to traditional sports lights."*

The multi-purpose stadium will accommodate a variety of sporting codes including Australian rules football, cricket, rugby union and



league, football (soccer), as well as entertainment events. The coliseum seating 'bowl' configuration ensures maximum atmosphere and gives fans exceptional views from anywhere in the stadium, with the lightweight fabric roof covering 85% of seats.

"When you have 60,000 people in the stadium you need to ensure you are creating the most welcoming and comfortable environment possible. People are expecting an exceptional experience, and it was our job to deliver that in the design," Dean said.

Perth Stadium will also include the widest range of hospitality options in any sports venue within Australia from premium product options including the Locker Room, the Coaches Room, traditional suites, open corporate reserve seating, the Sky View Lounge, three function rooms of different capacity as well as a 1,500 person function room, and 70 food and beverage outlets.

YEAR ROUND ACTIVATION

Stadium Park, open year round to the public, incorporates a covered community harbour linking the Perth

Stadium Station to the Swan River, the BHP Billiton Boardwalk and Amphitheatre, the Chevron Parkland which incorporates children's playgrounds, BBQ and picnic areas and a network of walking and cycle paths. The Community Oval is also available for public use on non-game days.

"Perth Stadium is a gateway to the city and will be an internationally recognisable landmark for Perth and Western Australia. As a result Stadium Park must have long term viability and constantly deliver benefits to the community, city, and state," Dean added.

Landscape design around the Stadium Park and within the Chevron Parklands is inspired by the six seasons of the local Indigenous people and has a significant amount of integrated artwork that celebrates the Western Australian indigenous culture.

"The Government of Western Australia wanted to ensure the delivery of a world class, multi-purpose stadium to the people of Perth. The end result is a 'fans first' venue in a people focused Park – a destination all year round, for everyone." ■

MADISON SQUARE GARDEN

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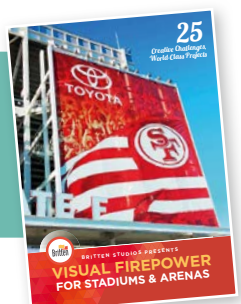
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ESSMA FAN ENTERTAINMENT CASE STUDY



ESSMA organises four workshops throughout the year. Each workshop is then followed by a case study, going more in-depth into the topics covered.

The ESSMA Fan Entertainment Case Study was developed in the aftermath of the Fan Entertainment Workshop, organised at Valencia's Mestalla Stadium in Spain (November 2016) and aims to bring insights in how a meticulously planned Fan Entertainment strategy plays a vital role in filling stadiums and providing a proper experience for all fan segments.

The content of the case study is divided into four main components:

1 ECA – ESSMA FAN ENTERTAINMENT SURVEY

Together with **The European Club Association (ECA)**, **ESSMA** conducted a survey focused on Fan Entertainment. The results of the survey will benefit the clubs not only in better assessing the current situation but also as a source of inspiration for future projects.

The survey was sent out to all ECA Member Clubs and to all ESSMA stadium members. The key results from 126 completed surveys were divided into four thematic categories, as follows:

FAN INVOLVEMENT/ COMMUNICATION

This category focused on the relation between clubs and fans and on the different ways of communication and involvement.

Results showed that 58% of the surveyed clubs communicate at least once a month with their fans or fan representatives. In most clubs (84%) there is at least one dedicated staff member working on fan relations and it was no surprise that social media is the most used online tool for clubs to get in touch with their fan base.

FAN INTELLIGENCE

This section was almost entirely centred on CRM systems and the way clubs effectively gather and use data about their fans. We got insights into how

many of the respondents are using a CRM system and also which information is gathered.

Noticeable was that the vast majority of the respondents still gather a relatively limited amount of data on anything other than personal details from fans.

FAN EXPERIENCE

The fan experience section pertained to the services and facilities available at the stadium for fans.

We saw that mobile applications are growing, but are still not a common practice. Only in 17% of cases was a stadium app available. Clubs are taking apps more to heart, with 60% having a club app.

FAN ENGAGEMENT

The last section focused on Fan Engagement and was mainly related to incentive programmes. 53% of respondents have loyalty programmes to incentivise fans, mostly targeting season ticket holders and members.

FUTURE TRENDS

Video screens (30%), Wi-Fi (30%) and clubs/stadium apps (29%) have been mentioned as the most immediate investments for stadiums. With cashless payments (24%), online F&B ordering and in-seat delivery (28%) next in line.

For more information on the results of the ECA – ESSMA Fan Entertainment Survey, read the full case study online: <https://issuu.com/essmastadium>

2 FAN INTELLIGENCE

Fan Intelligence is about getting to know the fans by gathering data. This data can, and should, be collected during the entire fan journey, as it will provide 360° degree insights to the different procedures fans are going through.

Several club related cases are presented in the case study:

CASE: FAN RELATIONSHIP MANAGEMENT – BELGIAN PRO LEAGUE (FRM)

The main goal of the integration of a FRM system at league level was to increase the number of spectators and revenues for all Belgian clubs.

The system allows clubs to get insights in the identity and behaviour of fans; to set up a more personalised communication; carry out targeted campaigns and track and measure responses.

In the end, this resulted in a more than 50% growth of known unique supporters and a growth of more than 150% in email addresses. The total revenue from Ticket Sales has grown

3 FAN EXPERIENCE

As is frequently cited, the biggest competitor for clubs is not a rival club or sport, but rather home entertainment; with the 'couch experience' containing no barriers to entry and being accessible for everyone. Thinking about creating a personalised experience in stadium is therefore key.

by almost €1 million league wide since the introduction of the FRM system.

CASE: DATA GATHERING – STOKE CITY FC

At **Stoke City FC**, the club focuses on 'Comprehensive Supporter Records'; collecting fan and visitor data, and communicating with them on a regular basis. As part of the overall approach, it is important to listen, involve and react on the feedback received from fans.

Doing so, they will feel more valued and display more positive behaviours. Therefore, more tickets are sold at an earlier stage, there are more active secondary revenue streams and retention levels are higher.

CASE: MOBILE APPLICATION – VIKING FOOTBALL

Viking Football was one of the first Norwegian clubs to boast a 'connected stadium'. They wanted to create a platform that provides the opportunity to develop relationships with fans and partners.

The club now can collect knowledge about the fans and provide them with better services.

Creating a personalised experience can be accomplished in several ways. Think about targeted services based on fan data collection, loyalty programmes and customised content.

Read our Fan Experience Cases online:
<https://issuu.com/essmastadium>

4 FAN ENGAGEMENT

Describing fan engagement is not easy. Often this is a personal thing and it can cover a lot of topics. If you question a club or fan, you will probably get different answers and within the surveyed group, you will get a broad variety as well.

In most cases, fan engagement will be described as having a relationship between club and fans, and using technology to strengthen that relationship.

The ESSMA Fan Entertainment Survey covers several cases:

CASE: AUDIOVISUAL EXPERIENCES TO CREATE FAN ENGAGEMENT – VALENCIA CF

Valencia CF invested in the integration of video content to improve the stadium experience in their **Mestalla Stadium**. They identified three main reasons to do so:

- ▶ To improve the fan experience and encourage fans to return
- ▶ To offer new activation models for sponsors
- ▶ To integrate the stadium in the club's digital strategy

CASE: FAN ZONES TO INCREASE FANS ENGAGEMENT – LNR

In order to create a real rugby feeling, the LNR developed a well-defined strategy with the end goal to increase the fan experience and attracting a new public through the non-stadium events planned besides rugby. The LNR organised a variety of events, open to all types of public for the Top14 Final in 2015, putting their strategy into practice.

Fan Entertainment is one of the ESSMA's domains of expertise, providing dedicated:

- ▶ **Content:** case study and in-depth articles
- ▶ **Events:** stadium tours and the ESSMA Summit
- ▶ **Expertise:** key industry experts & ESSMA advisory committee members, Strategic partners and Stadium partners.

For more information, get in touch with ESSMA via contact@essma.eu.

CONCLUSION

We saw that the integration of new technologies enables new opportunities in the whole fan entertainment story and delivers additional revenue streams. It plays a crucial role in interacting with the fans and work upon the current relationship.

Clubs need to think how they can improve the stadium experience in order to beat the one at home and tailor-made services based upon fan behaviour will be key. ■

SAVE THE DATE

ESSMA Workshops 2017

Pitch Management Workshop	10-11 May, Leicester (UK)
Stadium Management Workshop	7-8 June, London (UK)
Fan Entertainment Workshop	3-4 October, Torino (Italy)
Safety Management Workshop	7-8 November, Dortmund (Germany)

SUNTRUST PARK TO SHINE FOR THE BRAVES

All images
courtesy of
Populous

The Atlanta Brave's new ballpark is keystone for The Battery Atlanta mixed-use 'Destination'. Feature writer Steve Traidman gets prime insight from management, owner's rep and architect.



Right-field Entry Gate view with Coors Light Chop House (foreground)

South aerial view with The Battery Atlanta in background



When the **MLB Atlanta Braves** open the new season this April in suburban Atlanta's Cobb County, their new ballpark will welcome fans with 41,000 seats, 32 executive suites and 4,000 club seats throughout the Delta SKY360 Club, Infiniti Club, SunTrust Club & Hank Aaron Terrace Club.

Unique gathering places include the 10,000ft² (929m²) three-level Coors Light Chop House with two party decks; a center-field 40-person Home Depot Clubhouse Suite; the right-field Xfinity Rooftop with patio, lounge, and cabana

areas with concessions served from an Airstream trailer; a 5,000ft² Team Store; and 216 Concession points-of-sale by Delaware North SportService.

Mike Plant, Braves' President, Development, since March 2016, joined the team in 2003 from **Turner Sports** and was instrumental in efforts to secure **SunTrust Park** and its mixed-use development, **The Battery Atlanta**.

He continues to manage the planning and execution of the construction among responsibilities that include overseeing all stadium operations,

security, finance, personnel and special events, as well as the Minor League clubs.

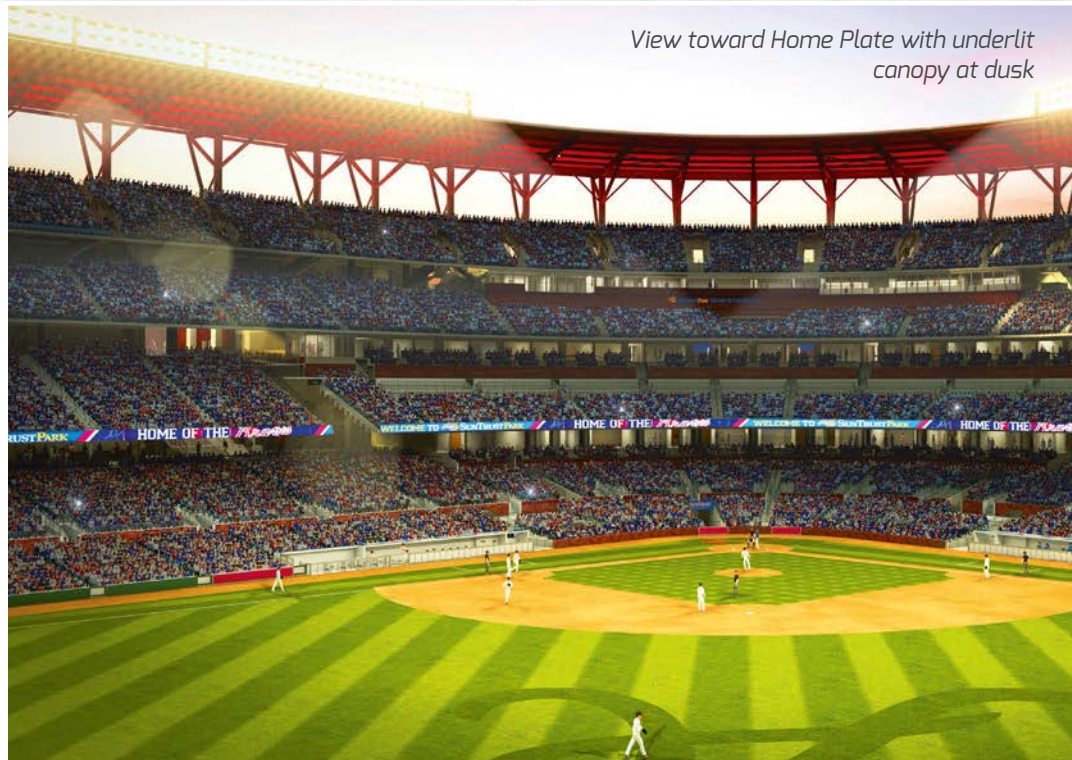
He told *PS&AM*: *"Project inception began back in 2011 and we spent over two years working with the city of Atlanta. We had five years left on the Turner Field lease, and we needed about \$150 million in upgrades. We had been thinking since 2005 and started working with external people on a mixed-use destination district - like L.A. and Detroit - with the ballpark, retail, business and residential elements that*

Exterior Plaza main entry view with Terrapin Brew Pub, Coors Light Chop House, Xfinity Rooftop Lounge



VENUE IN
FOCUS
SUNTRUST
PARK

View toward Home Plate with underlit canopy at dusk



SUNTRUST PARK

Project Team and Fact File

Location	Atlanta, GA (Cumberland Community Improvement District)
Construction Cost	US\$ 492m
Opening Date	April 2017
Owner	Cobb-Marietta Coliseum & Exhibit Hall Authority
Operator	Atlanta National Baseball League Inc.
Architect	Populous
Project Manager	Jones Lang LaSalle
Structural Engineer	Walter P Moore
Services Engineers	ME Engineers, Wrightson Johnson Haddon & Williams
General Contractor	American Builders 2017 (Joint venture: Brasfield & Gorrie, Mortenson Construction, Barton Malow & New South Construction)
A/V/Internet Connectivity	Comcast
Entertainment Booking	Live Nation
F&B Concessionaire	Delaware North SportService
Major Tenants	MLB Atlanta Braves

Amenities

Keystone for The Battery Atlanta, mixed use entertainment and retail district, with 41,000 seats; 32 Executive Suites; 4,000 Club Seats in 18,000ft² Delta SKY360 Club, 15,513ft² Infiniti Club; SunTrust Club & Hank Aaron Terrace Club; Gathering places: 10,000ft² three-level Chop House with two party decks; outfield 40-person Home Depot Clubhouse Suite; right-field Xfinity Rooftop with patio, lounge, cabanas; 5,000ft² Team Store; 216 Concession points-of-sale.

we would control. We did not want to leave Atlanta but could not work out a reasonable agreement with the city.

"In July 2013 we started exploring other options in the Atlanta area and were fortunate to get an economic driver to announce that November we were moving to nearby suburban Cobb County in an exciting public/private partnership.

"With the ballpark as the keystone for about \$492 million construction costs, we created The Battery Atlanta that to date has generated over \$3.5 billion in investments. Included are

more than 5,000 residential units, five Class A office buildings including our own new headquarters, our first 4-star Omni Hotel with at least two others coming soon and two more with major renovations. On our end, we will pay the Cobb-Marietta Coliseum & Exhibit Hall Authority \$6.1 million annually in rent for 30 years, with options to renew."

Plant said they brought **Jones Lang LaSalle** on board for project management and infrastructure development, who he said have done a great job with the total project team.



Coors Light Chop House overlooks field

INTIMATE BALLBARK

He added: “Our key parameters for **Populous** as our architect were simple. We cut down seats by 9,000 from Turner Field to create a more intimate ballpark - about 400,000 ft² smaller; we wanted to upgrade the total quality of the club environment; we committed to adding the largest outdoor canopy to protect about 60% of our fans from the sun and rain; we promised more technology and ‘horsepower’, with Comcast bringing in over 1 TB of speed; and we were committed to crafting a total entertainment-plus destination connected to the new ballpark by an open plaza.

“Corporate and fan response has been excellent, with solid sales of suites, club seats, and season tickets. We’re doing well with Van Wagner assisting on season ticket sales. We’ve been able

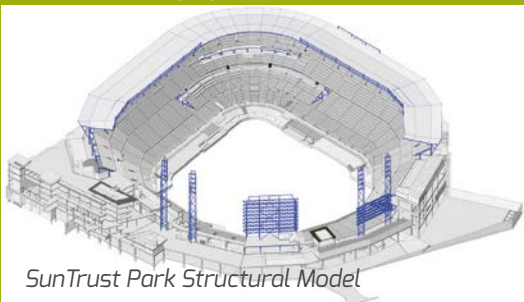
SLICK DESIGN

Ballparks, by nature, are very complex structures, both from a design perspective in their asymmetry and often non-orthogonal geometry, and from a construction perspective in devising efficient fabrication and sequencing.

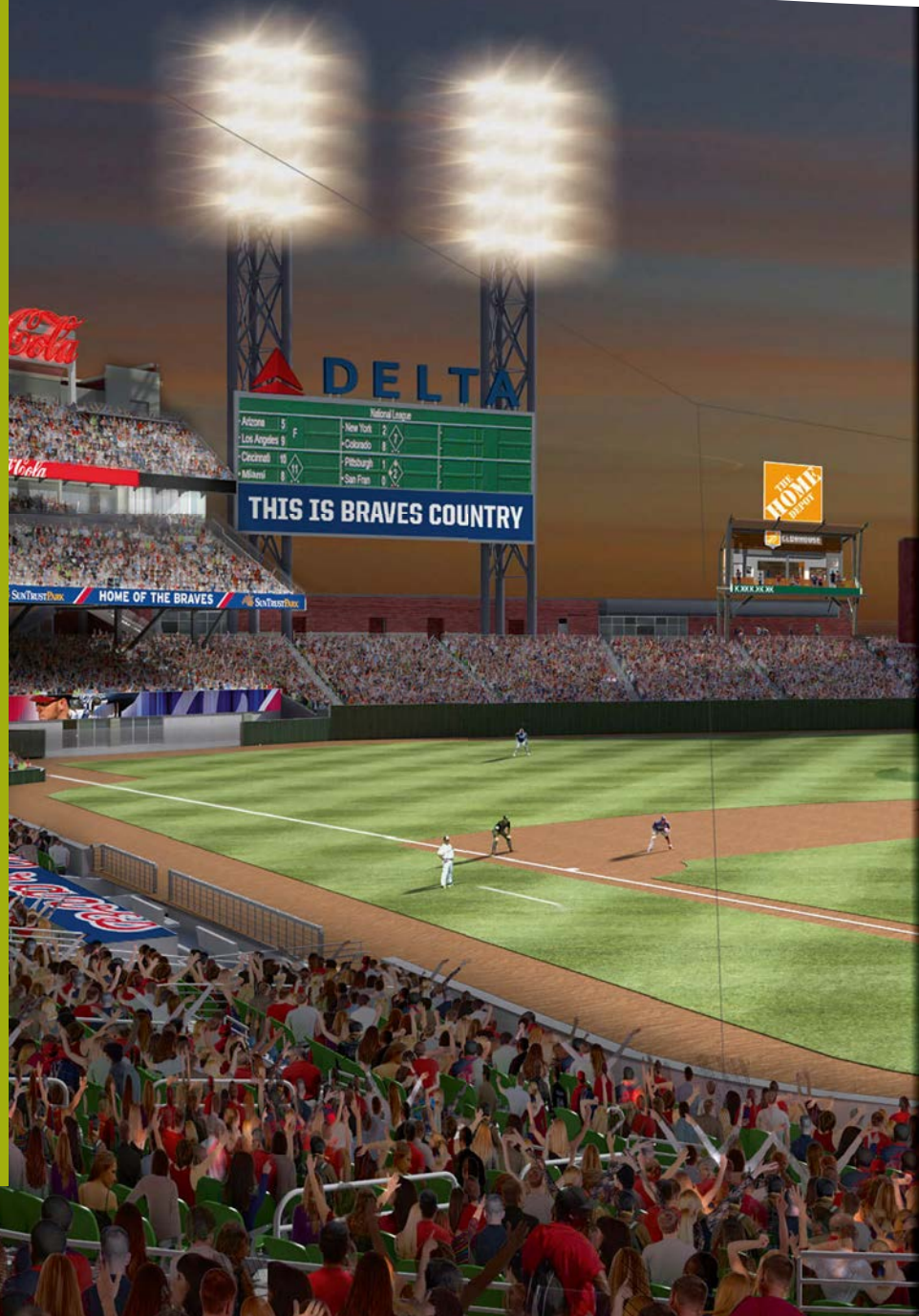
SunTrust Park’s schedule was aggressive, and could only have been achieved through the use of parametric modeling tools, which were key for structural engineer **Walter P Moore** to be able to quickly adapt and study the impacts of various design schemes in a meaningful and accurate way.

We set up conduits of communication between various design and documentation programs so we could easily and quickly manipulate data, translate it back and forth, and virtually auto-generate the final design. We call this interoperability.

All major components of the structural design were designed and implemented in some way through the team’s use of parametric modeling tools. Light towers, scoreboards, main raker ‘bents,’ the seating bowl, and the sunshade canopy were all fueled by auto-generative processes and interoperability programs. And by using digital information parametrically to generate production models, we set the stage for rapid BIM exchanges with the entire design team. Perhaps most importantly, the digital processes we developed precisely documented complex structural framing geometries in a model that was used directly by the steel fabricator.



SunTrust Park Structural Model



to drive premium seats at higher prices with our value-added clubs and suites. This allows us to still sell a \$7 ticket for families with kids who are 55% of our fan base – highest in the majors.

“Overall satisfaction with our project team is excellent for our almost completed stadium. JLL did a great job managing the schedule, general contractors and sub-contractors. We’re driving all the decisions and it’s been very aggressive – but everyone stepped up their respective standard of excellence to build all this in 30 months, on time and on budget!”

GAME CHANGER

“When the Atlanta Braves decided to relocate from Turner Field, they embarked on a game-changing development with an incredibly aggressive timeline,” observed Don

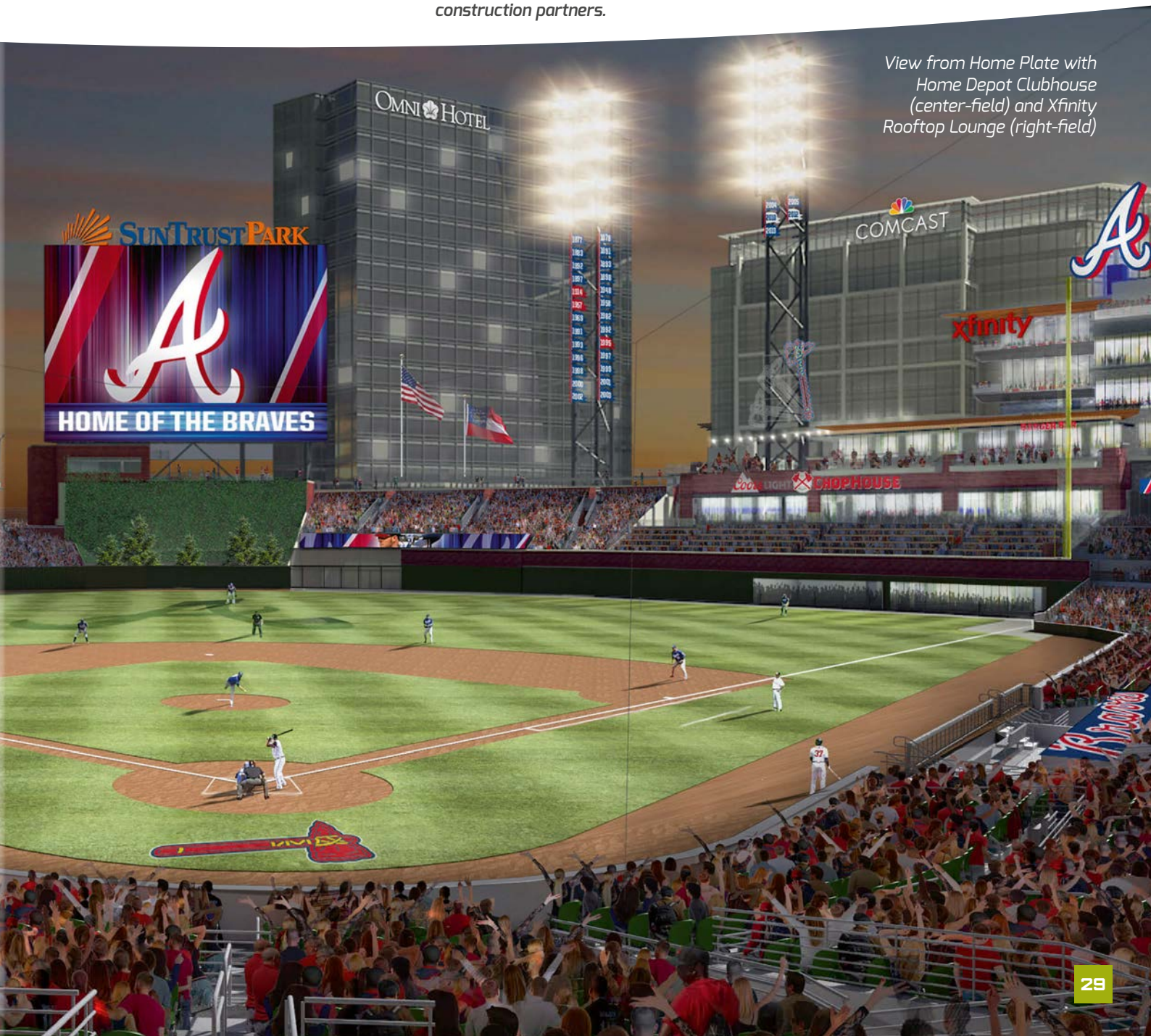
Loudermilk, Senior Vice President, JLL Project and Development Services. *“Within 30 months, their vision was to complete what is typically a minimum of a five-year project.”*

He told PS&AM: *“We understood the goals and objectives that inspired their vision, and because of this, we were able to build a strong partnership and deliver daily expertise and oversight throughout the project.*

“As owner’s representative, we advised on financing, site selection, due diligence, incentive negotiations, revenue opportunities and project management for both the new ballpark and the adjacent The Battery Atlanta. In addition, we were involved in all aspects of the project delivery from the feasibility through to move-in. This included advice on selection of the project team from the design consultants to the construction partners.

“As The Battery Atlanta was an integral component, we were also involved in the site rezoning, infrastructure development and, for the Braves, we helped in identifying the mixed-use development partners. We also helped in supervising the sourcing of the development team to advance all mixed-use elements including retail, office, hotel and residential.

“The Braves have an outstanding organisational structure and we’re pleased they allowed JLL to be extremely involved in this highly technical project. We were able to put on all hats, ensuring the project has been ahead of schedule and on budget.” >>



View from Home Plate with
Home Depot Clubhouse
(center-field) and Xfinity
Rooftop Lounge (right-field)

« EXPERIENCE IS KEY

Bradd Crowley, senior architect and principal, with Populous since 1990, is the project manager for the SunTrust Park Populous design team.

Among his other high profile projects are New York's newest **Yankee Stadium** for the **MLB Yankees**, **Denver's Coors Field** for the **MLB Colorado Rockies**, and **Petco Park**, home of the **MLB San Diego Padres**.

He told *PS&AM*: *"We had worked with most of the key project team before, which was a big element in the thought process for one of fastest-ever major league ballpark projects that needed experienced consultants. Having Walter P Moore, ME Engineers and WJH&W, along with the general contractor joint venture that included Brasfield & Gorrie, Mortenson, Barton Malow and New South, had us off and running from day one in early 2014.*

"With a total 57-acre site to be developed, it helped that we were involved in master planning to site the ballpark with other The Battery Atlanta key elements. Key to design of the park was to tuck home plate into the hill so that the First and Third Base entrances are halfway up in the building – making for an easy trip up to the upper and lower levels. The lower level is a 360-degree concourse and connects to many of the major ballpark features.

"Design of the exterior façade grows taller as the building extends out from the hill – shorter behind home plate and as the grade falls away becomes taller near the foul poles. The large, open plaza abutting the right-field entry is a huge feature. We were able to integrate the right-field corner into Braves' offices and retail areas. There is great interaction between the ballpark and the plaza as the connector to The Battery Atlanta for pre- and post-game fun, with the Omni Hotel and Comcast building blending with the immediate area.

"We had our typical site issues but nothing that serious. A pond in the right outfield area had to have extra loaded compact soil that held up construction for a while in that area. With a high, tall hill at home plate the rock drops off, which led to shallow foundations behind home plate and much deeper ones toward centerfield."

SUNSCREEN

Crowley said the upper deck sunscreen is an **Epic Metals** metal panel construction on steel structure, that is the biggest in Major League

DYNAMIC LIGHTING

ME Engineers provided MEP, technology, sports lighting and architectural lighting design for SunTrust ballpark. Our design-specific solutions contributed to the premium fan experience and sustainability goals while meeting current and future needs.

The premium fan experience includes access to technology and lighting that creates a sense of excitement. Industry leading high density wireless connectivity (DAS and Wi-Fi) allows fans to interact digitally and with supplementary content and services. The security system provides high resolution video surveillance of every seat. Multi-functional LED technology allows dynamic light displays in addition to general and field lighting with programmable controls.

The architectural lighting design promotes the Braves brand and the team history. Floodlighting in white or team colors illuminates the underside of the seating sunscreen canopy. In Monument Garden located behind home plate, accent lighting is used to draw attention to the collection of Braves memorabilia and help tell the story of the franchise. Through reflection and glare studies we determined where sports lighting reflected off glass would potentially impact players' ability to play; we then made recommendations on where to place anti-reflective coating to prevent the light from interfering.

Sustainable design features contributed to the LEED certification effort, helping to achieve a 13.3% energy cost savings. Waste heat from the chillers is used to preheat domestic water. Destratification fans were used in concourses and the seating bowl to passively cool fans during high heat and humidity conditions. SunTrust is also one of the first new construction ballparks designed with energy saving LED sports lighting.



Catwalk above the seating bowl allows access to service and aim the LED sports lights.

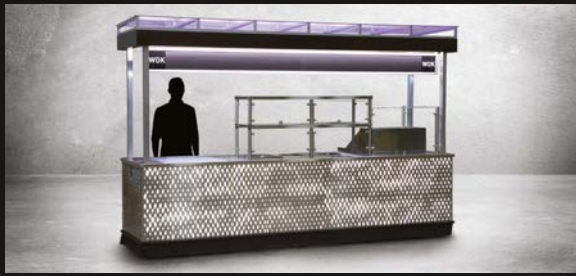
Baseball for sun-shading and rain protection. *"We did extensive studies on sun shading, particularly in right-field. The entire canopy is uplighted with colour-changing LEDs for home run celebrations. We raised it up a quite bit to aid ventilation throughout the ballpark.*

"At old Turner Field the Braves had a large museum with artifacts, so instead of duplicating this, the team wanted the entire new building to be a museum. It is spread throughout the ballpark, with such mementos as famous bats and Gold Glove awards. At the lower level behind home plate there's a terraced area called Monument Garden with history and other baseball memorabilia.

"Fun elements in right-field at the Chop House Gate entry include the Terrapin

Taproom where Terrapin brewers will actually brew onsite in several large tanks. The Home Depot Clubhouse space in center-field on four stilts hosts about 40 fans who keep track of Braves' pitchers and strikeouts – they drop a K for each strikeout, and backward if it's a third strike looking! A Kids Zone in this area offers a zipline, climbing wall, base run area, video batting and pitching simulators. It's a really nice area for about 700 at one time, with a time ticket for zipline use.

"Summing up, we worked well with the whole team. We're really happy with how the team jelled, including the Braves' Mike Plant and his entire group, who were great to work with. We know the team and fans will be very pleased with their new ballpark!" ■



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COUNTERING SECURITY THREATS

The top concern of sports facilities in North America gets a key update on prevention policies and active programs from Steve Traiman, NA feature writer.

Since the November 2015 bombing outside the **Stade de France** in Paris the major concern of every stadium owner, operator, team and league has to be the safety and security of its fans, and the most protective building and grounds programs available.

In North America, among those playing key roles in ensuring public safety are the **US Department of Homeland Security (DHS)**, the **National Center for Spectator Sports Safety and Security (NCS4)** at the University of Southern

Mississippi (USM) in Hattiesburg; the **International Association of Venue Managers (IAVM)** with its **Academy of Venue Safety & Security (AVSS)**; and consulting firm **Venue Solutions Group**.

DEPARTMENT OF HOMELAND SECURITY ROLE

Andrea Schultz, Deputy Director, **DHS Office of SAFETY Act Implementation**, gave one of the key talks at the recent **Stadium Managers Association (SMA)**

conference on 'International Warfare and the SAFETY Act,' with a focus on how stadiums are making the SAFETY Act key to their risk management plan.

As part of the Homeland Security Act of 2002, Congress enacted the Support Anti-Terrorism by Fostering Effective Technologies Act (SAFETY Act) of 2002.

The Act provides incentives for the development and deployment of anti-terrorism technologies by creating systems of risk and mitigation management.

Captain Rusty Keyes of USM University Police, left, goes over plans with fellow participants in a sports safety & security radiological response exercise Jan. 18 on the Hattiesburg campus.



SOFT TARGETS

Steven Fleming – Senior Manager, Safety and Security at the **International Centre for Sport Security (ICSS)** gave his assessment of the current threats to PS&AM.

He said: *“Securing major sport events is a constantly evolving area, with new threats and challenges emerging all the time. Ensuring your security plan is up-to-date and making sure all stakeholders are properly trained and equipped is absolutely key.”*

“Traditional threats like hooliganism and bad behaviour will always exist and need to be mitigated against by local police and stadium security, however new threats like cybersecurity, drones (UAVs), 3D Plastic Weapons, lone wolf attacks and insider threats continue to emerge all the time.”

“This is why, at the International Centre for Sport Security (ICSS), we encourage an integrated and international approach to major event safety and security, as well as ensuring security is factored in across all areas and at the early stages of the major event life cycle.”

He said one growing security challenge to major event organisers, considering the huge commercial growth and public interest in sport nowadays, is now ‘soft targets’ like hotels and fan parks.

As more sponsors and companies are involved and activate around a major sport event, this significantly increases the complexity and risks that need to be identified within a security plan.

Fleming said security technology, both software and hardware, will become crucial in how major sport events are secured in the future.

He added *“Technology like facial recognition, behavioural analysis and biometrics around ticketing are areas that will become commonplace at many upcoming sports events, as well as stronger measures being taken in the area of cybersecurity and data protection.”*

“Nevertheless, applying technology is meaningless without proper training and ensuring that security staff fully understand and appreciate what they are using and why they are using it. Technology should not distract from the fact that security operations should be customer-service orientated but not distract from ensuring the highest-possible standard of safety and security.”

The program is managed by the Office of SAFETY Act Implementation within the Science and Technology Directorate.

Schultz explained that the Act’s purpose is to ensure that the threat of liability does not deter potential manufacturers or sellers of effective anti-terrorism technologies from developing and commercialising technologies that could save lives.

These liability protections have been provided for many aspects of stadium and arena security. These include, but are not limited to; screening, barrier and surveillance technologies, best practices, and even security plans. A full list of protected Technologies is available at www.safetyact.gov.

EFFECTIVE SECURITY

Several stadiums and professional teams have received either a Developmental Test and Evaluation Designation, Designation, or Certification for the deployment of their security plans.

This list includes; **Forty Niners Stadium Management Company LLC (Levi’s® Stadium)**; **Green Bay Packers, Inc. (Lambeau Field)**; **Harris County Sports & Convention Corp. (NRG Park)**; **WFI Stadium, Inc. (FedEx Field)**; **Arizona Sports and Tourism Authority (University of Phoenix Stadium)**; **New Meadowlands Stadium Co., LLC (MetLife Stadium)**; **The New York Yankees Baseball Club (Yankee Stadium)**; **Queens Ballpark Company, L.L.C. (CitiField)**; and **Ilitch Holdings, Inc. (Comerica Park)**.

By achieving SAFETY Act protections, these venues have demonstrated that they have well developed, well documented and effective security operations. To discuss specifics, please email: safetyacthelpdesk@hq.dhs.gov.

Schultz also noted that the DHS is always working to bring the best resources that will assist Critical Infrastructure sports venue owners and operators in evaluating and addressing risks.

To that end, DHS conducts various assessments to identify vulnerabilities, interdependencies, capabilities, and cascading effects of impacts on the Nation’s critical infrastructure to help critical infrastructure owners and operators better prevent, deter, and mitigate risk in an all-hazards environment.

One of these resources is the Infrastructure Survey Tool (IST) – a voluntary, web-based vulnerability survey conducted by the **DHS Protective Security Advisor (PSA)** to identify and document the overall security and resilience of the facility. The resulting survey information is provided to owners and operators and may also be shared with the Sector-Specific Agencies and other Federal, State, local, tribal, and territorial critical infrastructure protection representatives through the interactive Dashboards.

In addition to providing a sector security and resilience overview, the Dashboards highlight areas of potential concern and feature options to view the impact of potential enhancements

to protection and resilience measures. For more information go to www.dhs.gov/hometown-security or any sports venue can contact its local PSA by e-mailing: NICC@hq.dhs.gov.

NCS4 ORIGINS & SUCCESS

“Following the September 11, 2001 terrorist attacks, the DHS identified sports venues as soft targets of terrorism,” NCS4 Director Dr. Lou Marciani recalls.

“The University of Southern Mississippi took the academic initiative to respond to the nation’s emerging security needs by establishing the National Center for Spectator Sports Safety and Security (NCS4) in 2006. The NCS4 is the nation’s only research center focused on spectator sports safety and security. It serves as a cornerstone in representing The University of Southern Mississippi’s innovative approach to research, training, and development.”

“Our goal is to address the evolving security challenges of the ever-growing US\$60 billion sports industry. New challenges emerge every day that increase the complexity of protecting people, property, and information.”

“Through quality training, research, technology assessments, certifications, and professional development, NCS4 provides the knowledge and expertise. We serve professional leagues, intercollegiate and interscholastic athletics, marathons/endurance events, private sector firms, and governmental agencies to protect spectators and other key assets.” >>



*Participants execute USM
radiological response exercise*



« RADIOLOGICAL RESPONSE

For a practical application, NCS4 facilitated a coordinated radiological response exercise on January 18 at **USM's M.M. Roberts Stadium** – first of its kind on any Mississippi university campus.

Focused on building response capabilities for radiological incidents, the scenario allowed participants to discuss local, state, and federal support and expectations.

Response teams then were dispatched inside the stadium to train and build multi-agency collaboration. Participants then discussed lessons learned and areas for improvement.

Marciani observed: *"It's a way for us to study what we should do and create lessons learned. If an incident should occur in a stadium, we want to be prepared. So, we'll take those lessons learned and put them into best practices and hopefully, we can help other major universities in this country."*

He continued: *"We held our first NCS4 National Sports Safety and Security Conference in August 2010 in New Orleans. We had about 250 attendees, and speakers included MLB Commissioner Roger Goodell and Janet Napolitano, then DHS Director. We had doubled that number by last year, and expect a good turnout again."*

The eighth annual NCS4 National Sports Safety and Security Conference and Exhibition is July 11-13, at the JW Marriott Orlando Grande Lakes in Florida.

The theme is 'Building Resiliency in the Sports Safety and Security Industry.' The gathering of top professionals in the field provides a wholesome environment dedicated to security/safety technologies, products, services and education for safeguarding the assets and spectators the industry is charged to protect. To register online, www.ncs4.com/events/national-conference »

« IAVM: VENUE SAFETY NUMBER 1

“Venue safety should be on the top of mind of everyone in our industry,” Brad Mayne, IAVM President/CEO, told *PS&AM*. *“Every venue manager should be kept awake at night to make sure everyone who comes to their facility will be safe.”*

Mayne was formerly President and CEO of **MetLife Stadium**, home of the **NFL Giants** and **Jets** in East Rutherford, NJ. While he came in 2012, two years after the venue opened, he recalls vividly the post-9/11 security concerns.

“Representing managers and partner companies in all venues,” Mayne continued, *“IAVM collaborates with other associations and the DHS to assure that all venues provide ‘Best Practices’ to enhance safety and security. Through various committees we help develop educational sessions to provide these tools through accepted standards, practices, and guidelines that are measurable, practical, and scalable. This is accomplished through our conferences, IAVM’s Life Safety Programs, and our AVSS sessions.*

“IAVM works with federal programs such as the National Preparedness System (NPS), the National Infrastructure Protection Plan (NIPP), and others to assure that all venues have a thorough plan of preparedness in securing their respective environments.

“We seek professionals and subject matter experts to assist us in providing the best operational practices pertaining to Critical Infrastructure Protection in order to protect the millions of Americans attending events at all venues.

“IAVM currently has representation on the DHS Public Facilities Sub-Sector Council and plays a vital role in partnering for critical infrastructure security and resilience. This partnership outlines how government and private sector participants work together to manage risks and achieve security and resilience outcomes in accordance with the NIPP.”

He said IAVM also serves as a conduit for the DHS to provide and share information to its venue members – all essential and critical to infrastructure resilience and to protect public health and safety. This is accomplished through an all-inclusive annual VenueConnect conference.

He added: *“Equally important is our new alliance with the Exhibition Services & Contractors Assn. (ESCA) and the International Assn. of Exhibitions & Events (IAEE). Together we’ve formed the EMSSI – Exhibitions & Meetings Safety & Security Initiative.*



“Our industry has a \$280 billion economic impact in the US alone, with daily deliveries through thousands of doors of boxes, cartons and equipment for these events. Many convention center and sports facilities are open 24 hours with walkways between their venues and nearby public areas. Chicago’s McCormick Place and the new adjacent Wilbank Arena is just one example.

“The new EMSSI is guided by an Industry Security council that includes show managers, producers, insurance firms, convention center, stadium and arena managers. We’ll be working with DHS and the FBI to develop a new template for member venues to apply for the important DHS SAFETY Act certificate of compliance – meeting recently with the Act’s operations director Bruce Davidson.”

Mayne emphasised, *“We’re all about making our venue industry better. DHS has proved its commitment to keep our industry safe – based on the best safety and security standards.”*

VENUE SOLUTIONS GROUP

Based in Brentwood, TN, **Venue Solutions Group (VSG)** was launched in 2011 by three industry professionals bringing 65 years of collective experience in the management and operations of public assembly facilities. All Safety and Security aspects are overseen by VSG Managing Partner and ‘Chief Listening Officer’, Russ Simons. Prior to VSG, he was a senior principal at **Populous**, directing facility operations, evaluation and analysis efforts.

He worked with the firm’s architects to create facilities designed to be safe, efficient, revenue positive and sustainable.

He told *PS&AM*: *“One major issue is the gap between venue owner and the design team. The team wants to listen and understand the owner’s vision, but too often the owner doesn’t focus on key security items like easy vehicle intrusion, protected key systems, full walk-through screening, door sensors with access control. He looks at the design team as professionals who will bring in their own security experts, and they may not feel they have to emphasise security.*

“Consulting firms like ours can be helpful and all of us have to do a better job of ‘best practices’ than we are today. While terrorism is the highest risk, our venues have to prepare for fire, blackouts, weather and, more recently, civil disobedience and protests. Professional and collegiate sports facilities are logical targets – the University of Minnesota football team protest as a recent example – and we have to pay attention to the ‘rhythm of society’ in assessing risk management, vulnerability and response.

“The NBA Sacramento (CA) Kings’ new Golden 1 Center in a dense urban environment is a prime example, with protective techniques including CCTV, motion sensors and other technologies built into the overall design. We worked with the team. AECOM, ICON and local police, fire and EMT responders to create the safest possible venue.

“From Post 9/11’s heavy-handed response – reacting on the fly – we now understand we don’t want our public assembly facilities to look like prisons. They are destinations for entertainment and while in our care, patrons want to be sure they’re safe, so environmental safety and security design makes a lot of dollars and sense.” ■



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Controlled Event Solutions, part of the Controlled Solutions Group, is a specialist provider of safety, security and training solutions.

We provide bespoke solutions to a number of clients in the sports and entertainment sectors, including Manchester United Football Club, possibly the most famous and best-supported football club in the world, with a global following in excess of 385 million. Controlled Event Solutions has provided security services to the club since 1990, and currently provides both match-day and '24/7' safety and security services for the club, including owners, players, staff and partners.

We are proud to have operated at some of global sport's biggest events, including the 2007 ICC Cricket World Cup, the 2010 FIFA World Cup, the 2012 Olympic Games and the 2014 Commonwealth Games to name a selection.

Our commitment to effective training underpins all that we do. By investing heavily in training, we aim to leave a true and lasting legacy for organisations that utilize our services, as we give staff the skills and knowledge to embark on a career in the safety and security industry with confidence. In support of this, we have developed an online learning management system for the delivery of high quality e-Learning.

Our training courses are designed and produced internally, and are bespoke to the client and the target audience. The courses can be produced in any language, ensuring that there are no cultural, linguistic or geographical boundaries to its distribution. This represents the most cost-effective solution for organisations that need to undertake training in large numbers.

Controlled Event Solutions' senior management team draws on over 75 years of British special forces and police experience; we are a globally focused company that adheres to the highest British standards of safety and security. For more information, please visit our website at www.controlledsolutionsgroup.com, or speak to a member of the team at our Manchester head office, on 0044 161 868 8181.



EYE ON THE CROWD

FC Viktoria Pilsen's Doosan Arena uses the latest hi-tec cameras from Dallmeier to make sure crowds are kept safe.

The Doosan Arena in the city of Pilsen, West Bohemia, is where FC Viktoria Pilsen play their home matches, and it has a capacity of about 13,000 visitors.

In order to ensure the fans' safety, the most up-to-date video equipment from Germany has been installed: The Panomera® multifocal sensor system from Dallmeier is used to watch over both the home and away fans' areas in the stadium.

Before the new system was installed in Pilsen, the security managers from the Doosan Arena and the installer carried out acceptance testing in the Dallmeier FAT Centre.

In the FAT Centre, larger video systems including the entire network infrastructure are built full size, and if possible preconfigured - this enables the customer to test his system thoroughly in advance, and on-site commissioning is completed quickly and smoothly.

In Regensburg, the security managers and the installer even received comprehensive training in the operation of the system.

HIGH RESOLUTION

Two Panomera® cameras monitor the home and guest fans' areas in the Doosan Arena. *"The resolution is just unbelievable! Even from 120m away, we can clearly recognise people's faces,"* said Jaromir Hamouz, Business and Marketing Manager for FC Viktoria Pilsen.

In the security control centre at the arena, where the police watch over the matches, the pictures from the cameras are shown on two monitors.



The police use one for overview pictures of the host and visitor stands, the second is used to show close-up pictures of suspicious individuals. The multiuser capability is particularly handy: several police officers can connect to the cameras simultaneously, and carry out their analyses completely independently of each other.

It was not long before the first investigation successes were reported: the police have already succeeded in arresting several people who had lit dangerous Bengal flares, and thanks to the high resolution of the video images, they were able to identify them beyond any doubt.

"The Panomera® systems are an extremely beneficial investment for preventing incidents and most importantly for identifying offenders, particularly with regard to prohibited fireworks, which are unfortunately becoming more and more popular," added Hamouz.

The stadium security managers are thoroughly satisfied with the system - and the installer reports that the cooperation with Dallmeier was positive.

The support for planning and commissioning as well as the after sales service from Dallmeier are just great, and made project execution very smooth for us." said Michal Bures, CEO of the installation company Suptel.

Dallmeier has at its disposal more than 30 years of experience in transmission, recording as well as picture processing technology and is an outstanding pioneer of CCTV/IP solutions worldwide.

This profound knowledge is used in the development of intelligent software and high quality recorder and camera technologies enabling Dallmeier to not only offer stand-alone systems, but complete network solutions up to large-scale projects with perfectly integrated components.

Over the years, Dallmeier has repeatedly given fresh impetus to the market with new developments and extraordinary innovations. The world's first DVR for example, which introduced digital recording to the entire CCTV industry, came from Dallmeier.

The introduction of the patented multifocal sensor system Panomera® has had a similarly groundbreaking effect: This revolutionary camera technology has ushered in a new era for the video security industry and is opening up completely new possibilities for securing assets and optimising business processes as well as ensuring public safety. This and the extensive experience in the CCTV and IP field have led to a top position in the international market for digital video surveillance systems. ■

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- Lower costs for infrastructure and maintenance



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ESSENTIAL STEPS FOR SAFETY



Advances in thermoplastics have allowed SVSS to offer longer lasting protection and safer stadium walkways

Maintaining the safety standards in public arenas is becoming harder by the year.

Changes in Health & Safety legislation, reductions in already strained budgets and the added risk of unexpected expenditure as a result of injury claims from accidents, often leaves facilities managers and health & safety officers very frustrated.

Technology has played a very important role in reducing incidents, by way of monitoring all areas and introducing protocol that deals directly with avoiding the potential for injury. Improved standards, such as those outlined in the Guide to Safety at Sports Grounds, more commonly referred to as the 'Green Guide' have also addressed this very topic, by investigating and setting standards that create a free-flow of visitors around an arena.

It is also worth considering that whilst standards exist, the cost of the implementation of these standards can be quite high. They are certainly beyond the realms of most maintenance budgets, and become an annual capital expense.

DISABLED ACCESS

Further financial pressure has been placed on sports grounds recently, by the need to increase accessible space for disabled visitors.

Traditionally, this nosing is provided using paint and an intermixed aggregate, such as silica sand and provides a short to medium term solution.

The process is labour intensive, slow to cure and provides the bare minimum of performance, over a very short period. Routine maintenance is therefore required, to 'touch-up' worn areas, adding further to the expense of this system.

Recent developments in paints have created some better performing systems, but interim maintenance is something that needs to be considered, as the durability of these products does not provide 'whole life' cost effectiveness.

Stadia & Venue Safety Surfaces Ltd (SVSS) has spent several years developing products and installing long-

term solutions in sports grounds, to resolve this very problem, using a non-slip, hard wearing thermoplastic instead of paint. The benefits, in respect of whole-of-life cost, risk reduction and general appearance, using a 'fit and forget' system, are now well and truly proven.

The company had its first break in 2011 when a prestigious stadium, from the top flight of English football were investigating alternatives to the traditional painted system. After a trial of thermoplastic materials, the club invested in a refurbishment programme, initially dealing with all steps and stairways exposed to wet weather.

The project has now expanded to include all public steps and stairways, including gantries for camera positions, using a mix of the company's products.

Further developments in product technology have allowed the company to expand their portfolio of solutions, utilising a range of thermoplastic and liquid plastic products. All materials exceed the requirements of the standards specified in Part M of the building regulations and to those suggested in CIRIA report c652.

Specifiers can therefore be confident that any interventions using the company's products, will have a demonstrable and proven whole life value, and although the capital investment may be high initially, over the course of 5-6 years, the annual cost is much less than the annual cost of refurbishment using the traditional painted system. A second and previously unmentioned benefit of these products is that they retain their good looks throughout the warranty period.

SVSS have recently undertaken projects at **Old Trafford (Manchester United FC)**, **Ricoh Arena (Wasps RFC/Coventry City FC)**, and the **All England Lawn Tennis Club (Wimbledon)**. The works included step nosing works, plus alterations to provide increased disabled access.

Stadia & Venue Safety Surfaces Ltd are members of the **Football Safety Officers Association (FSOA.org)**. ■



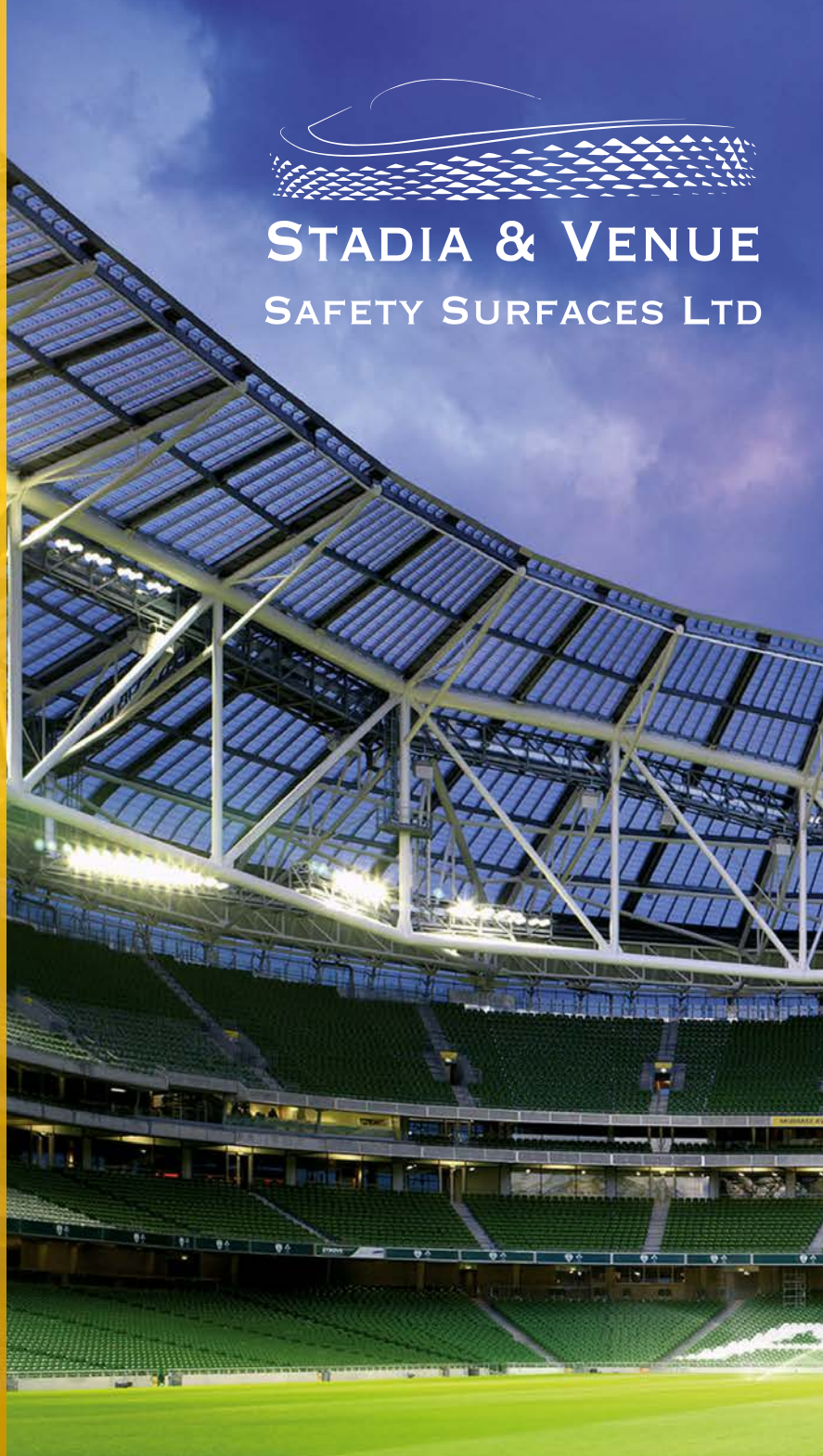
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offer a wide range of off the shelf and bespoke safety solutions for every type of sporting venue. Our focus is on the safe ingress and egress of spectators, providing highly contrasting non-slip step nosing's, non-slip surfaces for vomitories, concourses and toilets and hard wearing non-slip surfaces for players and officials. Corporate branding can also be included into most of our systems.

We are also able to provide a range of maintenance services as part of any installation package.

We are preferred partners of the Football Safety Officers Association and support many grass roots sporting teams and events.



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SAFETY MATTERS

Paul Hyett, Principal, UK Sports Director, with HKS Architects, compares a frightening personal experience to the problems of crowd control in stadia.

Lagos to London: British Airways night flight 078. We were three hours into the journey with cabin lights dimmed and food trolleys stowed, and all was quiet, as the mighty Rolls Royce engines powered our 747 high above the Sahara.

A few die-hards watched films and sipped wine but most of the passengers were asleep. I was laid flat across four empty seats dozing at the very back when a red light began flashing over the far aft toilet.

A surreal scene immediately unfolded as cabin lights flashed on and stewards came running down the aisles. The toilet door was forced open and thick smoke billowed out as I watched in disbelief as a man was dragged to the floor by the well drilled crew.

Meanwhile, shouting had broken out as passengers exited their seats and stumbled forwards only to be restrained by the forceful cabin team: one hundred people on the move – some 10 tons in weight – is a severe threat to airworthiness.

The unfortunate pyromaniac, a schizophrenic overdue on medication, was strapped and taped to a seat near me. Fortunately, panic and fear dissipated as passengers were calmed, controlled and shepherded back to their seats.



LESSONS TO BE LEARNT

Of course, the construction industry can also learn from emergencies and disasters, and lessons learned can be used to inform codes, design proposals and facility management protocols. But we rarely get a chance, as on flight 078, to study conditions of “all out panic”. In consequence our work must be largely anticipatory: we plan for situations that might occur and for cohort behaviours that might result, but we have little ‘hard evidence’ to inform our designs. In this respect highly specialized safety officers can make an invaluable contribution at the design stage in assisting with general planning and negotiating our work through building regulations and code controls.

The US, in particular, has in recent years led the world of safety guidelines and planning for sports facilities but excellent work has also been done in the UK, especially in response to the tragic events of **Hillsborough** where deaths occurred through crowd crushing in the vicinity of locked exit gates in 1989. There, in the country’s worst ever disaster, 96 people died and 766 were injured during the FA Cup semi-final between **Liverpool** and **Nottingham Forest**.

A similar event, but with even greater loss of life, occurred back in 1964 when 328 died and some 500 were injured – many of them seriously – in Lima, Peru.

Other disasters such as **Ibrox** (1902), **Bolton’s Burnden Park** (1946),

Bradford’s Valley Park (1985), **Heysel** (1985), and **Bastia** (1992) all involved structural failures (stand, wall or barrier collapse) or fire related issues, but the most serious events in terms of the scale of injury and loss of life have all arisen through crowd panic and crowd management problems.

PEDESTRIAN MODELLING

This depressing account may offer some reassuring testament to the quality of structure and construction in modern stadium design – such failures are mercifully rare. But it also indicates the importance of pedestrian modelling – a relatively new science which stadium designers now routinely use, especially for emergency escape when planning both the interior and exterior circulation areas of our projects. **Mott MacDonald** are amongst a small number of consultants that offer particularly good services in this area.

But whilst is absolutely essential that the planning of these complex buildings is as right and safe as can be – and in this respect construction professionals are learning all the time – it is critically important that the facility operators are on top of their game.

In particular, the authority of the Safety Officer in charge of any single sports event must never be compromised, and the input of safety officers at design stage, and a closeness of relationship with police and officials during events, should be encouraged to the full. ■





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COPENHAGEN SALUTES ROYAL ARENA

Copenhagen's new Royal Arena will become an important destination in Denmark for sports events and major concerts. John Sheehan talked to the architects and venue owners.

The build features 35m wooden fins

All images courtesy of Realdania

Copenhagen's new multi-purpose **Royal Arena** has opened for business and is set to host a variety of international music stars, concerts and sporting events.

The Royal Arena opened with a sold-out concert by the world's biggest heavy-metal band, **Metallica**.

The 35,000m² venue was designed by **3XN** and **HKS Architects**, with engineering by **Arup** and **ME Engineers** and landscape architecture by **Planit.ie**.

It has a strong Scandinavian style and is located in the new residential neighbourhood of Ørestad South. It features a transparent glass façade topped with wooden fins of up to 35 meters in length.

For music and similar events, the arena will have a capacity of up to 16,000 seated/standing spectators, while at sport events, it will cater for up to 12,500 spectators.

It features a large foyer area and plenty of room for cafés, restaurants and bars. There will also be extensive service areas for performers and athletes. About 100 events will be held annually.

Philanthropic organisation **Realdania** and the **City of Copenhagen** each contributed DKK 325 million (\$46 million) to the DKK 1.4 billion construction cost of the arena.

The pair established a public/private partnership company, **Arena CPHX P/S**, which was responsible for the task of planning and building the Royal Arena. In December 2016, operations were handed over to operator **Live Nation**.

Architectural vision

Kim Herforth Nielsen, founder and principal of 3XN told *PS&AM* about the vision behind the building of the new arena.

He said: *"In Copenhagen there has been no arena the size of something like London's O2 Arena for about 15,000 – 16,000 people."*

"What we needed was a multi-purpose arena for concerts and events and all sorts of sports like handball, ice hockey and swimming as well."

Nielsen explained how the vision was to incorporate the new oval-shaped arena into an urban cityscape in the surrounding area of Ørestad South.

"The arena deviates a lot from ordinary arenas in that it is not just a place on a big parking lot on the outskirts of the city. This is a central cultural building for a new town. It is more like the old arenas found in Rome or places like that."

"The way we designed it is so that it stands on a plinth with restaurants and other amenities around it and it connects to the four surrounding small plazas."

"There are three big main staircases and the lower parts of these can be used for all sorts of activities. It can be a lively place even when there are no concerts going on."

The design team behind the arena put great emphasis on working with the neighbourhood and making sure the area is characterised by great architectural quality and well thought out city planning, making Ørestad South a desirable place in which to live, work and do business.

INSIDE OUT

Nielsen said the arena and bowl itself are designed so that concert goers and sports fans have a view to the outside from the circulation areas, while people outside also get a view into the arena.

ROYAL ARENA

Project Team and Fact File

Location	Copenhagen, Denmark
Construction Cost	US\$200 million
Opening Date	February 2017
Owner	Realdania, City of Copenhagen
Operator	Live Nation
Architects	3XN, HKS
Structural Engineers	Arup, ME Engineers
Amenities	
16,000 seated/standing for concerts; 12,500 for sports events	

"When there is something happening in the arena, the neighbours can see there is something going on. We designed it to be a good neighbour. It is also designed in a very Nordic, Scandinavian, Danish style. It is clad with wood fins, which is quite unusual for an arena, and gives references to a forest."

Inside the venue, the seating aspect can be changed to host concerts or sports events.

Nielsen said: *"The lowest rows can be reconfigured so you can change the size of the bowl. There is partitioning so you can lower the capacity from 15,000 down to 3,500 people. The space can be made more and more intimate in different ways, so it is very flexible."*

The arena is fitted with permanent spectator seating on three sides and »



« a flexible fourth side, which can be either a stage or a seating stand.

The arena will host the European Short Course Swimming Championships in July and the World Ice Hockey Championships in 2018. It is also likely to cater for handball and boxing tournaments.

REALDANIA INVESTS

Jesper Nygard, director of part-owner **Realdania**, explained why his organisation had been keen to get involved with the Royal Arena.

He said: *“Realdania is a philanthropic player and our remit is to increase the quality of life for Danes through the built environment and try to create a better society.*

“For years Copenhagen has been one of the only capitals in Europe without a permanent, high capacity, high quality indoor arena.

“The aim with this new arena is to create something that is beautiful from the outside and beautiful inside, where we have a strong framework to offer experiences where both sound and vision are of a very high quality. A lot of events could not previously come to Copenhagen or Denmark and that is possible now.

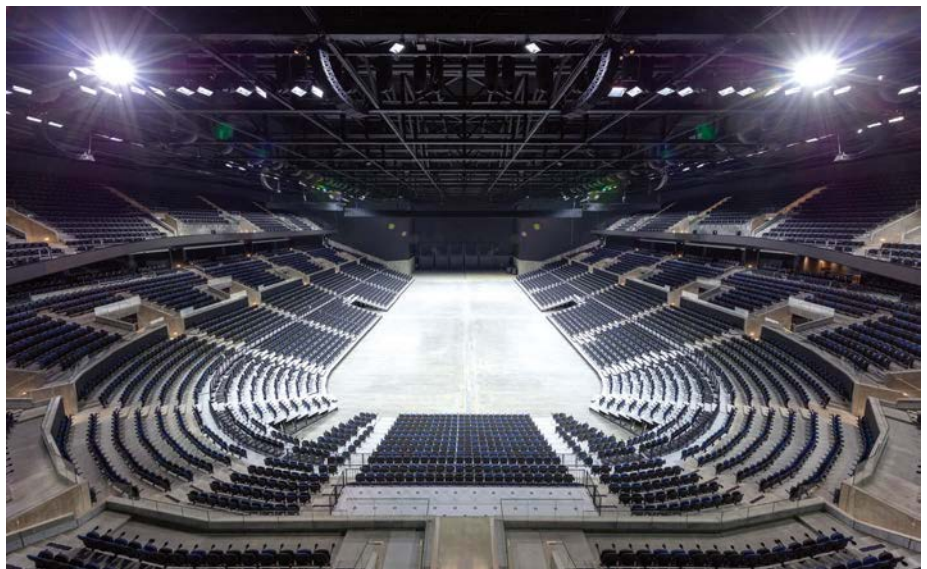
“It is a place where sport and cultural events can go hand in hand and it is a contribution to the local area and Copenhagen, but mostly it is a contribution to Denmark because Denmark can now host a World Cup or European Cup in ice hockey, which will take place next year. These big sporting and music events would not have been possible earlier.”

The European Short Course Swimming Championships 2017 will be the first major sporting event held at the new multi-purpose arena and will host around 800 contestants from 40 different countries and an expected audience of 30,000 during the five days of the championship.

The IIHF Ice Hockey World Championship 2018 will also be hosted at the arena, as will show events such as Disney on Ice, the Appassionata horse show and Cirque du Soleil.

Nygard said Realdania aimed to recoup the 325 million kroner it had put up for the project in the long run.

He added: *“We can see a business case where we can get our money back in five, 10 or 15 years and donate it to something else, instead of just gifting the money.”*



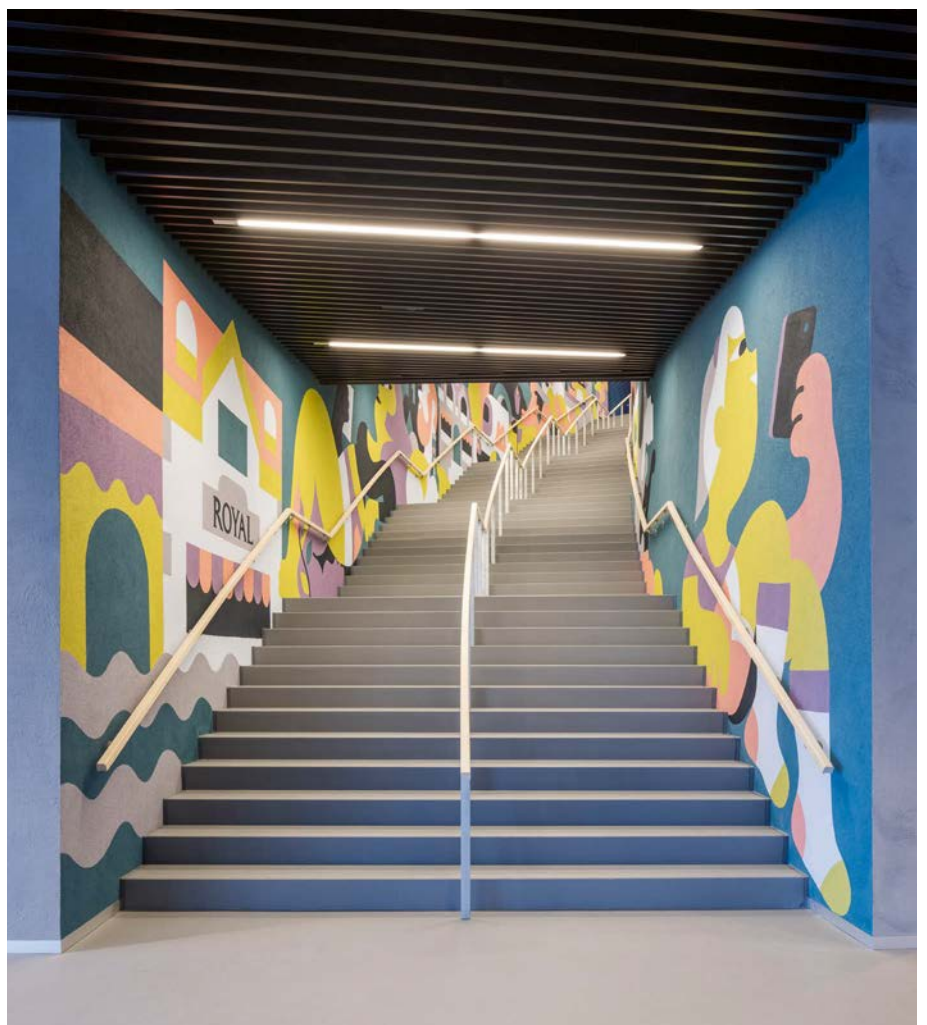
SOUND SYSTEM

The arena has been designed to ensure that as little sound as possible escapes. The lobbies function as open areas while, at the same time, being used as sound locks with absorbent ceilings to prevent the sound from escaping.

The outer walls consist of insulated panels, sound-insulating concrete and

a green roof reducing the noise level while, at the same time, acting as one of many green sites created in connection with the construction. At the higher levels, an acoustical cabinet has been designed around the arena bowl.

The arena walls include high-performance acoustic wall coverings and upholstered seating for added comfort and optimal acoustics.



The roof has been designed as a light upper cassette consisting of several layers of insulation and profile membranes. The roof construction has been designed to make it more than sufficient to sustain the sound of hard rain.

Nielsen said the sound in the venue is enhanced because the bowl is lowered like in a movie theatre.

He said: *"You don't get the big echo that you often get at big public events. It has, to my sense, very perfect acoustics. When you go in you can hear it immediately. Coming from the loading bay into the arena is like going into a living room – a huge living room. It has the same kind of soft acoustics you have in a living room. This is good for amplified music and was part of the design."*

WELL CONNECTED

Royal Arena is well served by public transport with metro stops nearby. There is also parking at a shopping centre in the area, while bicycle tracks will also run to the venue from the city.

Two metro stations (Ørestad and Vestamager) are located within walking distance of the arena as well as the regional train station (Ørestad Station).

In addition, there are exits to and from motorway E20 in close proximity to the arena. There will also be excellent provision for cyclists.

Nielsen added: *"The new town is founded on an idea about public transport. The metro stops right next to it and when there is a concert or event the metro will have double capacity. Close by there is a big shopping centre which has a huge parking lot underneath it. Concerts normally take place when the shopping centre is closed so people can park there and walk over."*

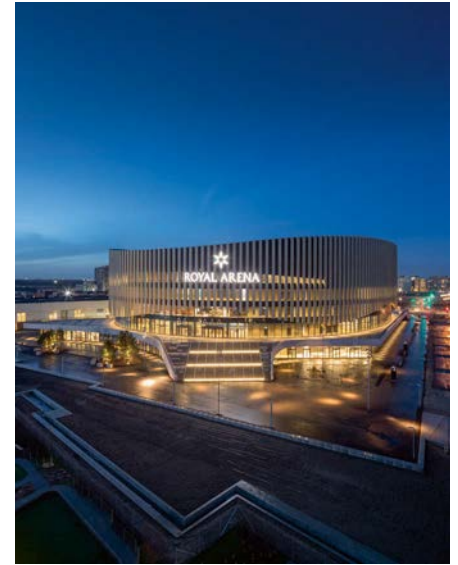
"A lot of people bike and there are a lot of bike stands there. It's designed for public transport and a sustainable way of transporting people to the venue."

The arena includes 18 VIP lounges sponsored by **Audi**, and with their own restaurant, while **Royal Unibrew** is the sponsor of the venue.

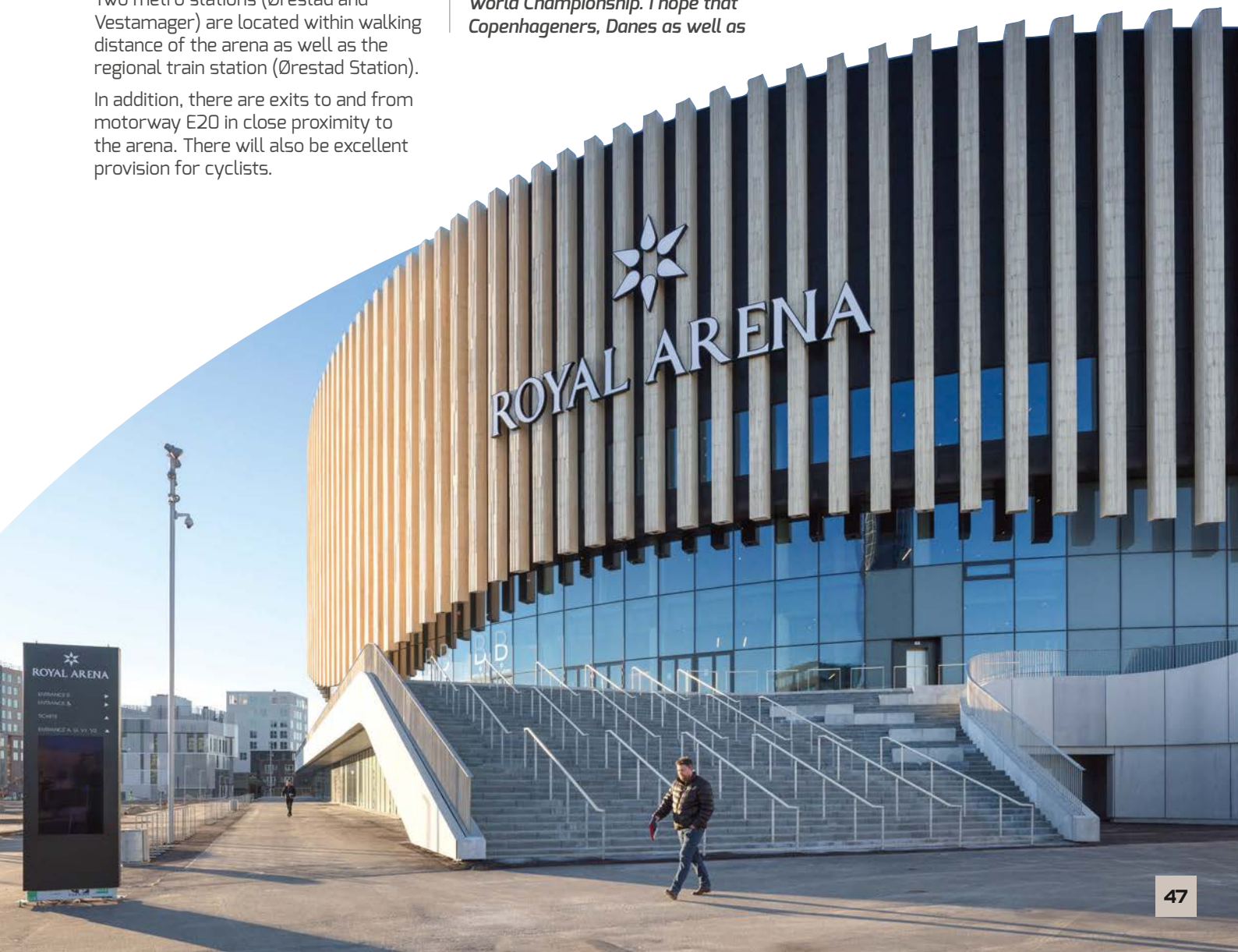
Lord Mayor of Copenhagen, Frank Jensen, added: *"I'm really proud of the new Royal Arena that puts Copenhagen on the map and makes us able to compete with Hamburg, Stockholm and Berlin when it comes to attracting large scale international events."*

"This year several international bands will perform in the arena, and in 2018 we will host the Ice Hockey World Championship. I hope that Copenhageners, Danes as well as

VENUE IN FOCUS ROYAL ARENA



international visitors will enjoy great concerts, musicals and sports events in the new arena." ■



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STADIUMS

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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.

Geelong: Simonds Stadium

Phase 4 of redevelopment for home of Geelong Football Club. Finance: State (\$70m). Additional funding sought from city and AFL Alternative training venue for Cats.

Cost AU\$90m

Capacity 36,000+

Completion 2017

Gold Coast City: Carrara Stadium

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 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: Aquent 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.

Melbourne: Junction Oval

Refurb of landmark stadium in Melbourne's Albert Park to provide a second International Cricket Council-compliant first-class ground for Melbourne, and ensuring cricket and AFL no longer clash at the MCG at the beginning of the AFL season. Victorian nCricket and Community Centre (VCCC) for Cricket Victoria's administration and training facilities, a venue for the Victorian Bushrangers, including women's facilities for Victorian Spirit, and state-of-the-art medical and rehabilitation areas. Finance: Victorian Government AUD\$25m, Cricket Victoria and Cricket Australia. Architect: Cox Architecture. Engineering (structural and services): Arup.

Completion 2017

Parramatta: Multi-purpose Stadium



Lendlease has been named as preferred design and construct contractor to deliver the new Western Sydney Stadium in Parramatta, 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.

Perth: New Perth Stadium

Five tiers. Bronze façade uses anodised aluminium. LED lighting for home team colours by night. Specially written poem celebrating Western Australian people etched into 68 precast panels at podium level. A multi-purpose stadium and sports precinct located on the Burswood Peninsula as part of a Peninsula wide transformation. In State Government entered into exclusive negotiations with Stadium Australia Operations to become operator of the Stadium, following a three-month evaluation period and subsequent approval by State Cabinet. Premier Colin Barnett said Stadium Australia Operations' proposal offered the best value for money and an operating approach which put fans first. First concrete poured in May 2015 – 2,300 piles. Workforce: 5,700. A State Government of Western Australia committed project, with backing of Western Australia Premier Colin Barnett. The design – conceived by Cox Architecture, HKS Architects, Arup and Hassell Studio – was revealed in July 2014 by Premier and Minister for Sports and Recreation – www.perthstadium.com.au/winning-new-perth-stadium-design-revealed – East-west orientation. Field: 165m x 130m (183,000ft²). Pitch contractor: HG Sports Turf. Roof covers 85% of seats. The widest range of seating and hospitality options of any stadium in Australia. Premium facilities: Field Club – a terrace at field level with the ability to view the home team warming up – an Australian first; Coaches Club – patrons positioned adjacent to the home team coaches box; Sky View Lounge and a range of other function spaces to maximise views of Perth. Procurement: Public Procurement Process (PPP) for the Design, Build, Finance and Maintain (DBFM) contract. The State Government finalised the contract with WESTADIUM consortium (led by Brookfield Financial, Brookfield Multiplex and John Laing) in July 2014. Can accommodate AFL, rugby union and league, soccer, cricket and entertainment events. Jobs: 70. Events: 40. Project Director: Ronnie Hurst. VenuesWest appointed as Governance Agency to oversee the selection of the stadium's operator, which will establish agreements with end-users. Operator: VenuesLive Management Services (5 years). Formwork and concrete: CASC (AU\$30m). Steel: Civmec (AU\$73m). The associated transport infrastructure budget is AU\$339.2m.

Mechanical Engineer ME Engineers

ME provided full ICT and ESD scope through DDs and design review of all MEP and technology systems.

Capacity 60,000 (expandable to 70,000)

Cost AU\$820.7m (sport precinct + AU\$81.7m)

Completion 2018

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

Sunshine Coast Rugby Stadium

Council asking for expressions of interest to prepare a feasibility study for the construction a new stadium at Caloundra, Nambour or Maroochydore. Melbourne Storm is active with a rugby league academy and a new netball franchise in the area.

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

Townsville, North Queensland Stadium

Four contenders as principal consultants - Populous, BVN, Cox and Hassell. Winner will be appointed by end of 2016. Contractor tender early 2017. The 25,000-seat stadium will become the new home of the NRL's North Queensland Cowboys. The Queensland government is conducting a two-stage EOI and design tender process for the proposed stadium. Townsville contributing land. Project delivery: Department of State Development. Finance: Queensland AU\$140m, federal AU\$100m, NRL AU\$10m.

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. Tender expected summer 2017. Preconstruction funding approved. Private partners sought. Office, commercial and retail space, public recreation and smaller sports ground (5,000) suitable for school and regional athletics events, and an indoor arena (7,000). 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. Initial non-binding EOIs submitted.

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

Hubei Province: Yichang Sports Centre

Main stadium and other facilities.

Capacity 40,000

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

Shaanxi Province: Xianyang Sports Centre

Outdoor stadium Area: 68,695m².

Capacity 40,000

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)

Zhejiang Province: Ningbo Sports Centre

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

Capacity 46,000

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

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



Kai Tak Sports Park,
Hong Kong



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

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), Kasaragod (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)

Lucknow Cricket Stadium

International cricket stadium and cricket academy project to be 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, Uttarakhand 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: Uttarakhand 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



Above and below: Jakarta Velodrome



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

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



Above and below: Kasumigaoka National Stadium, Japan



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

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

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





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CENTENARY

Mexico's Deportivo Toluca FC is celebrating its Nemesisio Diez Stadium to bring it up to English



Mexico's **Deportivo Toluca Football Club** is 100 years old this year and to celebrate this landmark, the club has begun a revamp of its mythical **Nemesisio Diez Stadium**.

The stadium is also known as the **Mexican 'Bombonera'** - a nickname that comes from its resemblance to a box of chocolates.

The club will be investing about \$80 million into the new Nemesisio Diez Stadium. The design is based on a **Manchester United, Old Trafford** concept with the pitch placed close enough to the stands to provide a vibrant fan experience.

Deportivo Toluca FC has three goals for the new stadium, the first of which is to provide an outstanding fan experience. The aim is to pay homage to the English style stadium and the revamp has added 19,000 new seats, giving a total capacity of 30,000 spectators.

Accessibility was an issue for the old stadium, as it is located in the middle of city, and the newly improved stadium infrastructure includes a parking lot for up to 1,500 cars with two flyovers providing easy access.

NEW BUILDING

The bowl shape of the new stadium has been modified with the construction of four new buildings on the corners that will provide homes for VIP Boxes. The main stands have been upgraded with two and three tiers respectively.

The bowl has also been equipped with four giant 10 metre x 5 metre display

screens, while new speakers provide a surround sound experience.

Additionally, Toluca's fans will enjoy access to broadband internet, an essential item in any venue that wants to be considered world-class.

Security has also been improved and the venue has been equipped with a new surveillance and access control system, which will be also used as data feed for the customer relationship management in order to understand the fans and their expectations.

Regarding the fan experience in the stadium, Executive Vice-president, Francisco Suinaga told *PS&AM* and **Insports** that the new Nemesisio Diez stadium provides the essence of a traditional football club with all the amenities, security and technological advancements available in the world today.

MEDIA COVERAGE

Suinaga said the second goal of the revamp was to improve the media coverage experience and facilitate the media experience and coverage of the team from the venue.

In order to achieve this challenge, the club has relocated the stadium lighting system, installing it within the new roof system.

According to Suinaga, the lightning system surpasses the requirements for an HD broadcast. The second and most important move as far as the media is concerned, was the creation of a dedicated media centre, a totally

new mixed zone and a brand-new conference room.

The media facilities at Latin American clubs are renowned for having serious limitations and Club Deportivo Toluca wanted to make a difference and take a step forward.

VIP ZONES

The third goal for the new stadium was to improve the corporate and VIP hospitality zones. The new buildings at each corner of the stadium have suites on four levels. Combined, these buildings will now offer 69 private boxes with panoramic views.

There will also be multiple fast food concessions to supply these boxes, a restaurant and a bar.

The private box and VIP seats prices will range from \$50,000 - \$150,000 for a five-year contract.

The new stadium also offers a VIP zone close to the benches, emulating the home of Manchester United at Old Trafford.

The revamp of the Nemesisio Diez Stadium was designed by the global architectural firm **Populous** and Mexican architect Jazmin Juarez in collaboration with the Engineer Victor Valencia. The roof work was executed by **Lanik**.

The stadium work was carried out by one of the largest Mexican engineering firms **Ingenieros Civiles Asociados (ICA)**.

The company has carried out a number of important projects in Mexico, including the Sport Hall of Mexico City

CELEBRATIONS

centenary with a revamp of its Premier League standards.

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(Palacio de los Deportes), the legendary Aztec Stadium and the Guadalajara Football Club Stadium also known as the Omnilife Stadium.

INVESTMENT PAY-OFF

The board of directors of Deportivo Toluca Football Club candidly said that it would have been cheaper to build a new stadium but the history of the actual stadium is priceless and they wanted to keep that intact.

The financing funds and the ROI of the stadium revamp are expected to come over the next 10 years from several sources, according to Suinaga.

One of these is expected to be the negotiation of broadcasting rights with Televisa, the TV broadcaster which delivers coverage to a large portion of the football audience in Mexico. The club is also expecting to increase match-day income on the back of the increased capacity, the new hospitality offerings and the new sponsorship possibilities thanks to the new electronic signage and Wi-Fi technology in the stadium.

The future is looking brighter than ever for Toluca FC's Nemesis Diez Stadium as the club's subscription sales to season ticket holders have already quadrupled.

On top of all this, the stadium has been revamped as a multi-purpose venue which can host a variety of entertainment events.

The club is also looking to further expand its infrastructure and build a High-Performance Centre for the first team and academy football. ■



« 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

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

SINGAPORE

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	mid 2017

TAIWAN

Taipei: Tennis Center

Venue for Universiade 2017. Centre court (4,000), first court (1,000), plus 4 indoor and 14 outdoor courts. Construction: Chun Yuan Construction Co.

Capacity	5,000
Completion	March 2017

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'alofa: 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, DVVD, Designer: ABDI, QS: AD economist. Contractors: CRCEG (China).

Capacity	40,000
Cost	€100m (overall €210m)
Completion	2017

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
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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

Bruges: Club Brugge Stadium

Proposed new stadium and training centre in the north of Bruges for Club Brugge soccer team.

Capacity	40,000
Cost	€100m

Brussels: Eurostadium

Build, finance and operate project for the city of Brussels. Early studies suggest infrastructure changes required to manage traffic. RSC Anderlecht and the Royal Belgian Football Association will rent the stadium. Scheduled to host games during Euro 2020. Tenants: RSC Anderlecht + KBVB/URBSFA (Royal Belgian Football Association; Red Devils, Belgian National Team). Developer: Brussels, Royal Belgian Football Association and RSC Anderlecht. Architect: Jaspers-Eyers Architects. Design and build preferred candidate: BAM-Ghelamco consortium.

Capacity	62,613
Cost	€432m (€314m)
Completion	2018

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
Completion	2018

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
Cost	€10m
Completion	2017

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: Andorey Developments.

Capacity	10,000
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Bryanstown: Drogheda United (Vincent Hoey).

Proposed for Drogheda United (Vincent Hoey). Uncertainty over land allocation and rival alternatives.

Capacity	10,000
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Cork: Páirc Uí Chaoimh Stadium

GAA stadium upgrade as part of Marina Park. Roofs on both stands, new dressing rooms, pre-match warm-up area, medical facilities, restaurants, meeting and conference rooms, media facilities and a museum as well as new and additional turnstiles. Developer: Cork County Board. Project manager: Malachy Walsh and Partners. Architect: Scott Tallon Walker. GAA centre of excellence, next to the stadium, full-size all-weather pitch, new gymnasium, dressing rooms, video, performance assessment and rehab facilities. Community access.

Capacity	45,000
Cost	€22m (€78m entire development)
Completion	2017

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)
Cost	€35m (Anglesea Stand €21m)
Completion	2019

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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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

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: Vitality Stadium

AFC Bournemouth have launched a search for a site on which to build a new stadium, as they look to move away from their existing Vitality Stadium. The English Premier League team had been hoping to redevelop the 11,464 capacity Vitality Stadium after winning promotion to the top tier in the summer of 2015. But discussions with stadium owner Structadene and Bournemouth Borough Council's planning department have stalled.

Capacity	14,529 (11,464)
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Bristol: UWE Stadium

For Bristol Rovers FC. To be built on land leased from the University of the West of England at its Frenchay campus. Council permission received. 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 RUFC. Parking: 1,270. However, plans are currently 'on hold' after Sainsbury's withdrew their offer to buy the old Memorial Stadium. Bristol Rovers have since been sold 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
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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
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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	2018

Dunsell: Community Stadium

In East Riding to house a new supporter-owned community club, East Yorkshire Carnegie - football and rugby league. Consultations with the council, ahead of submitting a planning application. Seated grandstand (850) behind one goal and two side terraces (2,880, 4,224). Developer: Jamie Waltham. Design: Griffin Toomes Consulting Engineers.

Capacity	9,200
Cost	£3.1m
Completion	2017

Exeter: St James Park

Planning application for a partial development of Exeter City Football Club's St James Park, including demolition and rebuilding of the Stagecoach Family Stand on the Well Street side of the ground has been submitted. However, the St. James Forum have approached the Department of Communities and Local Government (DCLG) asking the Secretary of State to intervene in the planning process for the Stadium Improvements. The effect of which is to stop the City Council confirming Planning Permission until it has been decided whether the DCLG will take over responsibility for the decision. Other developments include relocation of and improvements to the player and referee changing facilities beneath the main stand. Significant improvements to other parts of the ground including the replacement and enhancement of the toilet facilities for the Big Bank Stand. Enabling development of approximately 320 student beds. Commercial partner: Yelverton Properties

Forest Green Rovers Stadium

Two finalists - Glenn Howells Architects and Zaha Hadid Architects - in contention after international design competition held by Chairman Dale Vince. Competition oversight: Frank Whittle Partnership. Results awaited. 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	2017

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

Leeds: Headingley Stadium

Planning has been 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	£39m
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

Keighley: Cougar Park

In early 2013, Keighley Cougars formed a Steering Committee to look at and promote the redevelopment of the main stand in conjunction with their neighbour Bradford League Cricket Club, Keighley CC, an ECB Focus Club, to provide a main stand fit for purpose and compliant with current safety regulations and standards. The redevelopment will also improve changing and classroom facilities, as well as providing a new gym, all as a first phase of an overall masterplan to provide a multi-sports and education solution for the local community. Phase 1 Stand re-clad, new seating and ancillary accommodation GBP£1.2m. Artificial pitch and associated lighting £400,000. Planning awarded by Bradford Council. Finance being put together. Architect: Riverside Design Studio Architects.

Cost	£1.6m
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Liverpool: Everton Stadium

Everton FC (Chief Executive Robert Elstone) is once again looking for new stadium sites after latest option at Walton Hall Park was deemed too financially ambitious by club and council. Everton's major shareholder Farhad Moshiri has taken an Everton delegation on new stadium site visits to Bramley Moore dock, the club's preferred option on the Mersey waterfront, and Stonebridge Cross in Croxteth. A new stadium is being tied to Liverpool's Commonwealth Games bid.

Capacity	50,000
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Liverpool: Liverpool FC Training Ground

Liverpool FC is planning a major redevelopment of the Reds' Academy site in Kirkby. Club wants to bring first team and Academy football training operations and facilities together on one site. The £50 million proposal includes the construction of a new combined training centre, the redevelopment of the existing facilities at the Academy and designs to convert the main pitch into an indoor pitch. Public consultation being held. Architects: KSS.

London: Craven Cottage Stadium

Riverside stand rebuild to open up river walk, add spectator facilities, taking advantage of river views and passing trade, and increase capacity. Planning permission received. River works licence obtained from Port of London Authority. Fulham will release a full timescale for the development following the design stage. Architect: Heatherwick Studio.

Capacity	30,000 (25,000)
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London: Tottenham Hotspur Stadium

Construction work under way. Spurs working with Haringey council to get optimum development for club and community. 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 Warming 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. The H Club, an exceptional Members' Club, will offer a range of Michelin star calibre dining experiences including the opportunity to dine at the chef's table or with Club legends on a privately hosted table. One year out at another stadium in 2017-18, probably Wembley. 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 £400m

Completion 2018

London: Twickenham East Stand Extension

The London Borough of Richmond upon Thames has granted planning consent for the major new 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.

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

London: Lionel Road Stadium. Brentford

New community stadium for Brentford FC (Chairman Cliff Crown) after sale of Griffin Park to residential homes builder (Regen). Council, London major and GLA permission received. Land purchase hold-up. For both soccer and possibly rugby (London Welsh/London Irish). Architect: AFL. Development partner: Willmott Dixon.

Capacity 20,000

Cost £70m

Completion 2017

London: Lords Cricket Ground

In 2014, MCC received planning permission from Westminster City Council to replace the Warner Stand. Construction began on 2 September 2015. Funding: MCC resources and borrowing. Architect: Populous. (Philip Johnson). Construction: BAM. Separate project: refurbishment of the J P Morgan Media Center (cost £4m (US\$6.2m)) for the 2017 season when Lord's will host the ICC Women's Cricket World Cup Final. Modernisation of spaces, technology and sightlines. Architect: David Miller Architects. Project Manager: Gardiner Theobald.

Capacity 32,000 (29,500)

Cost £180-200m

Completion 2022 (second phase) 2027 (entire)

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

London: Chelsea: Stamford Bridge

Chelsea Football Club's planning application for an expanded 60,000-capacity, cathedral-style stadium has been given the go-ahead by planners and the Mayor of London, Sadiq Khan. The new stadium will be built within the grounds of Stamford Bridge on Fulham Road, and require the demolition of the existing 41,600 seat 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

Macclesfield: Town Stadium

The stadium links a regeneration plan in South Macclesfield with residential, retail and employment facilities. Approved by Cheshire East cabinet. Planned as zero carbon by incorporation of sustainable energy sources at the design stage.

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)

Scunthorpe: Iron Arena

Masterplan issued for out of town football and leisure development on a site near the Scunthorpe United's present Glanford Park ground. All-seater stadium with club and executive facilities, a gym, office space and areas for commercial development as well as a club venue and supporters' bar. A sweeping curve on the main stand designed by FWP is enhanced by a striking truss which pays homage to Scunthorpe's steelwork history. Plan also includes a 120-bed hotel, a multi-use indoor arena, community sports pitches, indoor and outdoor crown green bowling facilities and a potential transport interchange hub with a new rail station. Architect: Frank Whittle Partnership (FWP).

Capacity 12,000

Cost £25m

Completion Q1 2017

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

Move from Plainmoor to Barton area. Council to sell existing stadium for housing development. Truro City sharing while building a new stadium. Pitch: synthetic 4G.

Capacity 6,000

Truro Stadium

Stadium and retail enabling project both given planning permission. At Langarth, Threemilestone, near Truro for soccer and rugby. 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

New stadium for AFC Wimbledon on their old Plough Lane ground (now Greyhound Stadium). 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 £16m

Wimbledon, AELTC: No.1 Court

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

Worcester City FC Stadium

Plans with City of Worcester for approval of multipurpose stadium at Perdiswell Sports Centre site. Working committee in new council likely to seek a different site but council will pay for extra planning costs involved. Pitch: synthetic. Standing and covered stands. Community use and pool. Club playing at Aggborough, home of Kidderminster in the meantime.

Capacity 4,130

Completion 2017

Workington Stadium

Proposed stadium for Workington soccer and rugby league and possibly a speedway. Requires council funding from sale of land.

Cost £12m

York Community Stadium

All-seater for York City FC (Jason McGill) and York Athletics Club. York City Knights Rugby League Club now on board. 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: ISG.

Capacity 8,000

Cost £44m

Completion May 2018

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

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

Evry-Esson: National Rugby Stadium

Development of Le Grande Stade on site 25km south of Paris has been cancelled. It was considered too expensive. Architects: Populous and Ateliers 2/3/4. Construction: Ibelsys (JV Icade, Besix, Ineo, Axima). Structural, civil, MEP engineers: Egis. Retractable roof consultants: Uni-systems. Lighting engineers: ME Engineers. Acoustic engineers: Vanguardia. Security: Casso. Pitch consultant: STRI. Landscape architect: Vogt.

Capacity 82,000 (76,000-100,000 concert)

Cost €600m

Completion 2020

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: 87,000m². Parking: 1,000 Architect: Bahadır Kul Architects (BKA).

Capacity 20,000

Cost 25m Iari (US\$10m)

Completion 2019

GERMANY

Darmstadt: Merck Stadion

SV Darmstadt 98 (President Rudiger 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

Proposed by city council in Wolfswinkel. City to vote on project. Operation: SC Freiburg. Finance: public, including infrastructure, club €15-20m.

Capacity 35,000

Cost €70m

Completion 2018

Hanover: Eilenriedestadion 96

Training centre for youth teams. New covered stands at historic stadium. Two natural and two artificial turf fields. Architect: Schulze & Partner.

Capacity 5,000

Cost €15m

Completion 2017

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)

Munich: Bayern Munich Youth Academy

Bayern Munich's new youth academy will open on the outskirts of the city this summer, following two years of construction work. The new facility will boast eight football pitches, including one with a 2,500-seat stand, a youth academy, offices and a multi-purpose sports hall..

Cost €70m



Bayern Munich Youth Academy

Munich: TSV 1860 Munich Stadium

Discussion taking place about separate stadium (head of stadium committee Christian Waggnerhauser). Club is looking at location in the Olympic Park.

Capacity 30-35,000
Cost €70m
Completion 2017

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: 635m². VIP terrace: 170m². Alternative stadium required from January 2016. Architect: GMP. Structural engineer: Schlaich Bergmann. ME: Paul GmbH. Transport: WSV/PCE.

Capacity 20,400
Completion 2017

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**Europa Point Football Stadium**

Proposed national football stadium, UEFA Category four, at the southernmost point of Europe. Also for tourism, retail and community. Project public exhibition and presented to the Development and Planning Commission. UEFA support because Victoria Stadium is unsuitable for competitive international football. Next: environmental impact assessment. Architect: RFA Fenwick Ibrarben.

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 65,000m². Finance: €20m Attica Regional Authority; €50,000 Ecumenical Patriarchate of Constantinople (symbolic).

Capacity 32,500-34,000
Cost €65m
Completion 2017

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

Budapest 2024 Olympic Stadium

Athletics stadium with legacy mode of 15,000. Velodrome and a tennis complex with a 10,000-seat main court. A feasibility study for all 2024 venues came up with costs of HUF Ft1.1 trillion (\$3.7 billion/£5.3 billion/€4.9 billion).

Capacity 60,000

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 Diwaniyah: Al Sunbula Stadium**

Main stadium plus hotel 3 floors (75 rooms), indoor hall (2,500) secondary stadium (2,000) and training field. Area: 250,000m². 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

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

Babil, Al Hillah

Owner: Ministry of Youth and Sports. Area: 350,000 m². 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

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: Football Stadium

UEFA Category 4 stadium for Italian Serie B club Cagliari. Cagliari City Council has approved planning permission. Sant'Elia stadium due to be demolished in May 2017. Fanshop, museum, ticketing centre, kids area, offices, conference centre, rooms for Cagliari Calcio youth players, luxury rooms for first team players and one restaurant included in the hospitality area. Finance: €55m (£44.5m/US\$62.6m) club - retains naming rights. Hospitality: 4,000m². Skyboxes: 15. Roof-top restaurant with pitch views and one club (skybar) with sea views. Area commercial development: 15,000m² - shopping mall, Cagliari Calcio-branded sports bar, sports medical and physiotherapy centre with wellness area and a sports centre. Training area with full-size and cut-down pitches, two multifunctional sporting grounds for basketball, tennis, volleyball, and a boxing and martial arts gym. Consulting: B Futura (Lorenzo Santoni) and partners - The Stadium Consultancy, McDermott Will&Emery, Repucom, Larry Smith, Eos Consulting Spa and Iniziatiava.

Capacity 21,000
Completion June 2019

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: Enegan.

Capacity 17,300 (expandable to 20,000)
Cost €11m

Florence: Fiorentina Stadium

Club working with city to develop plan for new stadium.

Capacity 40,000
Cost \$340m

Milan: Internazionale Stadium

Proposed new stadium as part of investment from a Chinese consortium. Developer: China Railway Construction Corporation.

Completion 2017

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 2017

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

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 Ingenieuresellschaft mbH, Berlin. Project commissioned by: Masterplan Libya, Tripolis, Kronberg. Client: Lidco – Libyan Investment and Development Co. Tripolis. General contractor: Porr Libya.

Capacity 71,000

LITHUANIA

Vilnius: National Stadium

Ministry of Finance given the job of reviving national stadium project. Financial aid sought from EU.

Cost €50m

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

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: ArenA 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 ArenA 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 ArenA 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 ArenA 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. Development team has identified preferred locations of a new stadium and a development 'Feyenoord City'. 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: Ballymoor 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 Arkitektur. Area: 4,500m².

Capacity 7,582 (expandable by 2,023)

Cost NOK150m (€16m)

Completion 2018

Valerenga Stadium

New football stadium at former velodrome site. 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: Valerenga IF.

Capacity 17,500-18,000

Completion August 2017



Valerenga Stadium, Norway

**OMAN****North A'Shargiyah: 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 Tański & Associates (design competition winner). Developer: Jaworzno City.

Capacity 1,000

Cost 10m zloty (US\$2.5m)

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 Architekci.

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

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**

Modular seating being installed. Construction at the 60,000-seat stadium, which is designed like a traditional Arabian tent, is now in full swing with the commencement of installation of the first fix of approximately 2,500 seats at the north stand of the stadium. Possible semi-final venue for the 2022 FIFA World Cup. 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 (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.

Capacity 40,000

Completion Early 2019

Al Thumama Stadium

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.

Capacity 40,000 (20,000 legacy)

Mechanical Engineer ME Engineers

ME is providing MEP design.

Capacity 32,000 (70,000 for World Cup)

Completion September 2018

Al Rayyan Stadium

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 Naqish 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.

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Capacity 40,000 (20,000 legacy)



**Al Wakrah Stadium**

Soccer stadium 15km south of Doha for the 2022 FIFA World Cup™. 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.

Capacity 40,000 (World Cup) 20,000 (legacy)

Completion 2018

Doha: Sport City Stadium

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.

Capacity 47,560

Foundation Stadium

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.

Capacity 26,000 (40,000 for World Cup)

Completion Q3 2019

Khalifa International Stadium

Refurb for 2022 World Cup. Also 3-2-1 Qatar Olympic and Sports Museum. New building that will be added to the stadium's east wing, and which will contain 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.

Capacity 40,000

Lusail City: Lusail Stadium

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.

Capacity 80,000

Ras Abu Aboud Stadium

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).

Capacity 40,000

ROMANIA**FC Botosani Stadium**

New stadium proposed for Liga I club. City support in seeking funding.

Capacity 11,000

Cost €18m

Bucharest: Ion Oblemenco 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.

Capacity 30,000

Cost €50m

Completion 2017

Bucharest: Dinamo Stadium

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.

Capacity 30,000

Targu Jiu: Targu Jiu Stadium

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.

Capacity 15,000

Cost €20m

RUSSIA**Ekaterinburg: Ekaterinburg Arena**

Some parts of Tsentralny Stadium dismantled. Contractor: Sinara Development. Construction cost: 12,721bn RBL. One of the twelve stadiums to be used for the FIFA World Cup 2018, all of which require construction or refurbishment. Developer: Ministry of sport. Technical construction arm: Sport Engineering.

Capacity 35,000

Cost US\$320m

Completion end 2017

Kaliningrad: Stadium Kaliningrad

On Oktyabrsky island. Groundworks under way. Probable home for Baltika FC. The design is currently undergoing a government audit. Construction contract expected to be signed in November 2015. Site preparation: AO Crocus International and FGUP "Sport-In". Design and construction manager: Crocus International. Design cost: 523.86m RBL. Construction cost 18.5bn RBL. Area: 140ha. Jobs: 88. One of the twelve stadiums to be used for the FIFA World Cup™ 2018. Developer: Ministry of sport. Technical construction arm: Sport Engineering.

Capacity 35,000 (25,000 legacy)

Cost US\$287m

Completion end 2017

Krasnodar: FC Kuban Stadium

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 Lissitzky. Plates of solid and perforated metal peel away from the bowl. Facade material: TECU Gold. Architect: AFL Architects, Tecnon, Syntesis Rus.

Capacity 45,000

Moscow: Luzhniki Stadium

Remodelling of the 60-year-old stadium is almost complete. Virtually all of the seating has been installed and the finishing touches are now being made to the venue's interior. The grass on the pitch, sown in August 2016, has survived the harsh Moscow winter. Jobs: 1784. Tear up and start again to create a new stadium. Construction manager: Big Sports Arena Luzhniki (Moscow Department of Construction). Pitch: SIS. Will host opener and final of FIFA World Cup 2018.

Capacity 81-88,000

Cost US\$550m

Completion February 2017

Moscow: VTB Arena

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 Management Company. Architects: MANICA Architecture and SpeECH. Construction: Codest International (US\$707m).

Mechanical Engineer ME Engineers

ME provided LEED, sustainable design and energy modeling in early design stages.

Capacity 27,000 (stadium)

Completion 2017

Nizhny Novgorod: Volga Arena

For 2018 FIFA World Cup. Developer: Town (planning department Alexander Bodrievsky). Prime Ministerial decree signed. Tenant team: FC Volga Nizhny Novgorod, moving from Lokomotiv Central Stadium (17,850). Stands will have gas infrared heaters. Green: BREEAM standard (Jones Lang Lasalle). Developer: Ministry of sport. Technical construction arm: Sport Engineering. Construction: Stoitransgaz (Director Vadim Gurinov).

Capacity 35,000 sport

Cost 19bn rubles (US\$388m)

Completion September 2017

Novosibirsk: Sibir Football Stadium

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).

Capacity 15,000

Cost €11.2m

Saint Petersburg: Saint Petersburg Arena

On St. Petersburg's Krestovsky Island. Fit-out and pitch preparation continues with first event planned for March 2017. Roof area: 70,000m². Jobs: 2200. Construction cost: 34.9bn RUB (US\$550m). New home for Zenit on Krestovsky Island, north west of the city. 'Space ship' facade taking shape. For 2018 FIFA World Cup. Will be only Eastern European stadium with a removable field and sliding roof to allow it to host sporting or cultural events in all conditions. Height: 75m. Diameter: 289m. Area: 287,000m². Commercial: 50,000m². Architect: Kisho Kurokawa. Construction (for most of job): Transstroy. Glazing (120,000m²): AGC.

Capacity 68,000 sport, 77,000 concerts

Cost US\$1.1bn

Completion February 2017

Rostov am Don: Rostov Arena

Membrane roof being installed. Jobs: 1733. Client: FGUP "Sport Engineering". Contractor: AO Crocus International. One of the twelve stadiums to be used for the FIFA World Cup 2018, all of which require construction or refurbishment. Developer: Ministry of sport. Technical construction arm: Sport Engineering. Construction: Crocus. Roof: Ferrari membrane.

Capacity 45,000

Cost US\$320m

Completion December 2017

Samara: Samara Arena

Ground-floor ferroconcrete structures are under construction. Jobs: 1391. Contractor: PSO Kazan (under review following halt in construction in May 16). Groundbreaking ceremony attended by Russian President Vladimir Putin. Located in Radiotsentr (Radio Centre) region in the north of the city. Cosmos theme featured throughout (area is heart of Russia's aviation and space industries). Tenant: Krylia Sovetov (Wings of the Soviets) football club. One of the 12 stadiums to be used for the FIFA World Cup 2018. Green: BREEAM standard (Jones Lang Lasalle). Developer: Ministry of sport. Technical construction arm: Sport Engineering.

Capacity 45,000

Cost US\$320m

Completion December 2017



Moscow's
VTB Arena

ESSMA WORKSHOPS 2017



PITCH MANAGEMENT WORKSHOP

10-11 May, Leicester (UK)



SMART STADIUM WORKSHOP

7-8 June, London (UK)



FAN ENTERTAINMENT WORKSHOP

3-4 October, Torino (Italy)



SAFETY MANAGEMENT WORKSHOP

7-8 November, Dortmund (Germany)

ESSMA TOURS 2017



EUROPEAN STADIUM TOUR

2-5 July, Moscow - Saint-Petersburg (Russia)



GLOBAL STADIUM TOUR

4-8 September, Minneapolis - Miami (USA)

ESSMA SUMMIT 2018

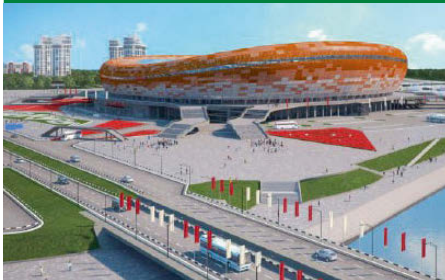


ESSMA SUMMIT 2018

16-18 January, Dublin (Ireland)



Saransk: Mordovia Arena



Concrete structures going up. Jobs: 1085. Client: FGUP "Sport Engineering". Contractor: PSO Kazan. New stadium for FC Mordovia Saransk, recently promoted to the Premier League, on the eastern edge of the small city of Saransk. One of the twelve stadiums to be used for the FIFA World Cup 2018, all of which require construction or refurbishment. Developer: Ministry of sport. Technical construction arm: Sport Engineering.

Capacity 28,000 (45,000 for World Cup)

Cost US\$320m

Completion December 2017

Sochi: Fisht Stadium

Pitch installed, new seats going in. Conversion from Winter Olympics mode to be one of the twelve stadiums to be used for the FIFA World Cup 2018. Remodelling of the stadium has proceeded according to an approved construction and installation time-schedule. Jobs: 177. Roof removed. Additional tiers and sports infrastructure added. Developer: Ministry of sport. Technical construction arm: Sport Engineering.

Capacity 45,000

Cost US\$100m

Completion end 2016

Vladivostok Stadium

Proposed soccer stadium as part of sports and leisure development by local authority.

Capacity 16,000

Volgograd: Volgograd Arena

Old stadium demolished, and preparatory work is in progress on the site. Old utilities are being removed. Concrete structures under way. Jobs: 766. One of the twelve stadiums to be used for the FIFA World Cup 2018, all of which require construction or refurbishment. On site of Central Stadium. Part of sports complex. Basketball to be added. Green: BREEAM standard (Jones Lang Lasalle). Developer: Ministry of sport. Technical construction arm: Sport Engineering. Construction: Stoitransgaz (Director Vadim Gurinov).

Capacity 45,000

Cost 15-20bn rubles (US\$431-575m)

Completion November 2017

SCOTLAND

Aberdeen FC Stadium

Stadium and training facility at Kingsford, situated adjacent to the A944. Planning permission submitted. Club has full control of the site and extensive site diligence has been carried out to establish the feasibility of the land area and also the requirements for the planning process. Training facilities operational by 2018. 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.

Capacity 21,000

Cost £40m (£38m)

Completion 2019

Dumbarton: Community Stadium

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.

Capacity 4,000 (1,000 standing)

East Kilbride Stadium

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.

Capacity 4,000

Edinburgh: Academicals Rugby Club

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.

Capacity 5,000 (2,500 seated)

Cost £8m

Completion 2017

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

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

Paisley: St Mirren FC

New in Ferguslie area. Seeking buyer of Love Street ground.

Capacity 10,000

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 Slovak 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

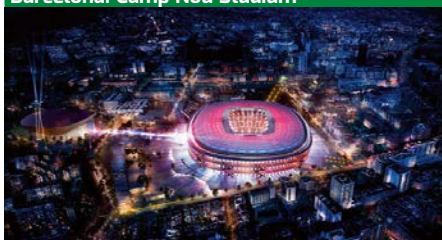
Proposed, revised and stalled new stadium project for Kaizer Chiefs. Developer: Lefika.

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-upgrade 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: New Miniestadi

Training stadium for FC Barcelona at the Ciutat Esportiva training ground. UEFA category III with covered terraces. Parking: 600. Architect: Batlle i Roig Arquitectes.

Capacity 6,000

Cost €12m

Completion June 2017

Madrid: Wanda Metropolitano

FCC has started elevating the roof of the new stadium of Atlético Madrid football club. Differing from other recent European sports facilities, the modern roof design is formed of a steel structure weighing around 6,336 tons. It is tensioned with radial cables bound by a membrane that occupies a surface area of 83,053 m². Multi-business stadium with local transport (metro) links. Tenant and operator: Atletico Madrid. Club moving out of Vicente Calderon. Area: 85,000m². Suites: 94 (1,500). Developer: City of Madrid. Architect: Cruz y Ortiz. Construction: Fomento de Construcciones y Contratas. Roof: Schlaich Bergermann.

Capacity 67,000

Cost US\$270m

Completion 2017

Aberdeen FC Stadium, Scotland



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

Valencia Foundation has sold a stake to Meriton Holdings (Peter Lim) so a scaled back version of the stadium may now go ahead once other club debtors are satisfied. Abandonment and demolition is an option. 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 (AFEC) to create plans. 500 seater pavilion, protected perimeter fence, modern dressing rooms, boardrooms, stores.

Capacity	15,000-20,000
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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
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WALES**Ebbw Vale: Circuit of Wales**

Work beginning on motorsport circuit with a green theme. Council positive but Welsh parliament involved. Funding: Public/private partnership. £2m loan from Welsh government so far. 3.5 mile track for all kinds of auto sport, hotel, retail and commercial. 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: Gleds. 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
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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
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AMERICAS**ARGENTINA****Buenos Aires: Mary Teran de Weiss Stadium**

Redevelopment of tennis stadium with retractable roof. In Parque Roca.

Capacity	14,000
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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)
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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

Regina, Saskatchewan: Mosaic Stadium

Construction of the stadium began in June 2014 with substantial completion achieved in August 2016. Keystone project and the first of three phases of the Regina Revitalization Initiative. PTFE fixed roof (123,300ft²) tension fabric. 68% of seats in sunken lower bowl. LED floodlighting. Funding: province \$80m, city \$73m, team \$25m (with help from 12 founding partners), loan from province \$100m. Construction manager: PCL Construction Management Inc. (Construction and Finance Team Lead); HKS Sports & Entertainment (Lead Design Engineer and Sports Architect); B+H Architects (Architect of Record); and TD Securities (Financial Advisor). Roof: FabriTec. Floodlighting: Ephesus.

Capacity 33,000 (expandable to 40,000)

Cost C\$278.2m

Completion 2017

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

MEXICO

Mexico City: Los Diablos Rojos Ballpark

In Magdalena Mixhuca sports complex. Steel and PTFE roof structure resembling devil trident. Architect: JAHN, ADG (Alonso de Garay). Green: passive systems, water use reduction.

Capacity 16,000 (13,000 seats, 3,000 berm)

Completion 2017

Toluca Stadium

Expanded stadium to celebrate centenary of Toluca FC. Parking: 1,500.

Capacity 30,000

Cost 800m pesos (US\$43m)

Completion 2017

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. Architect: Gould Evans and HNTB. Construction: Hunt/Sundt Construction. Finance: real estate project University Athletics Facilities District.

Cost US\$256m

Completion 2017

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 2017

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



For the Rams (owner Stan Kroenke) and NFL west coast operations on the former site of Hollywood Park racetrack and casino. City council has approved. Demolition has begun. 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 100,000 (70K fixed, expandable to 80K)

Cost US\$2.5bn

Completion August 2019

CA, Los Angeles: LAFC Stadium

Soccer stadium in Exposition Park for the newest MLS team (and most expensive franchise), Los Angeles Football Club (LAFC). Approval obtained from Park Commission. Planning permission granted by LA City Council. Restaurants, offices, a conference center and a soccer museum in 15-acre complex on site of old Sports Arena. ETFE roof for shade and to retain fan noise. Demolition scheduled for summer 2016. 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, Oakland: Cisco Field

Proposed stadium for MLB team to replace McAfee Coliseum. Planning on site in suburban Fremont purchased from Cisco. City looking at other land parcels, possible environmental impact report for a proposed 39,000-seat ballpark near Jack London Square. Architect: HOK (formerly 360 Architecture) and Gensler.

Capacity 32,000-36,000
Cost US\$300-\$400m

CA: Sacramento Republic FC Stadium

Soccer specific stadium for franchise with MLS ambitions. Planning commission approval given, council vote imminent. Suites: 36. Party suites: 3. Premium seats: 3,100. Standing: 500. Finance uncertain and development requires spot in MLS. Architect: HNTB.

Capacity 25,000
Cost US\$180m
Completion 2018

CA, San Diego: Chargers Stadium

Proposed San Diego Stadium and Convention Center. June 22 vote by the city council to approve or reject a study that would examine the viability of extending the redevelopment spending cap for the Centre City Development Corporation (CCDC). Design inspired by the rich nautical history of San Diego. High-tech fabrics and sustainable natural materials. Achieves a world-class NFL stadium and convention centre on the same piece of downtown land. Outdoor terraces throughout, panoramic views, rooftop garden. Ability to host other major sporting events and concerts ranging from 20,000 to 61,500 in capacity. Cutting-edge video boards. Restaurants, outdoor dining experiences and premium clubs and suites. 260,000ft² of exhibit hall space, including 100,000ft² of open-air, pillar-less exhibit space, 63,000ft² ballroom. A 100,000ft² Sky Garden with cabana-style meeting rooms, above and beyond the exhibit hall and ballroom space. Operable roof canopy. Architect: MANICA. 61,500 (expandable to 72,000 for the Super Bowl). Other options include new NFL stadium on city-owned site in Mission Valley. The stadium would be home to the Chargers, the San Diego State Aztecs, the Holiday and Poinsettia Bowls, various concerts and music festivals, and other special events. San Diego paying for consultants to take project to environmental study. Finance: \$200m NFL, \$300m Chargers, \$173m bonds secured by future rent from the Chargers, county and city taxpayers \$121million each (30 years), sale of 166-acre Qualcomm Stadium site (\$225m). Surcharges \$111m (30 years), personal seat licences \$120m, sports venue rent increases \$43m (30 years). Focus sharpened by imminent change in Los Angeles NFL market. Chargers officials have met with a stadium task force created by San Diego Mayor Kevin Faulconer. They have also teamed with Oakland Athletic franchise to propose joint stadium in Carson if individual stadiums should fall through.

Cost US\$1.1bn
Completion 2020

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

CO, Colorado Springs: Falcon Stadium

Refurb for home of US Air Force Academy teams. High-definition scoreboard, remodelled locker rooms, removing the aluminium bleachers that form the upper bowl on the east side and replacing them with enclosed suites, updating restrooms and concessions, meeting the guidelines set forth by the Americans With Disabilities Act and paving the parking lot. The academy will add a Memorial Garden and a fence where each post includes looks at Air Force history. Finance: donation. Athletics Director: Jim Knowlton.

Capacity 40,000 (47,000)
Completion 2017

CO, Fort Collins: CSU football stadium

Privately funded replacement of the 32,500-seat Hughes Stadium for Colorado State University. The groundbreaking ceremony took place September 2015, halfway point celebrated August 2016. Stadium planning/visioning committee: Rick George, athletic director; Amy Parsons, vice president for University Operations. Traffic planning: Kimley Horn and Associates (Dave Bradford director of CSU Parking Services). Multipurpose sports facility. Classroom space: 55,000ft². Finance: donations, bonds. Bar feature: New Belgium Porch (\$4.3m from New Belgium Brewery). Project Manager: Icon Venue Group. Construction: Mortenson Construction. Architectural consultant: Populous.

Mechanical Engineer ME Engineers

ME provided full MEP and technology engineering.

Capacity 41,200
Cost US\$220m (\$226.5m)
Completion 9 June 2017

CT, Hartford: Dunkin' Donuts Park

Developer failed to make construction deadline and legal dispute began with council, leaving ballpark unused. In negotiation with city. Team playing in Norwich until ballpark ready. AA minor league ballpark on Main Street to house the Rock Cats in downtown and to propel economic regeneration. After public consultation the city sought proposals from developers interested in building the ballpark as well as other retail and residential development. City donating land. Suites: 18. Two party decks, two picnic areas. Upkeep: US\$250,000 fund and \$150,000 annual. Rent: \$100,000 pa. Finance: bond sale (total to pay \$117m to 2042). Owner: Stadium Authority. Developer: Centerplan Construction (part of DoNo Hartford LLC). Overall project cost \$350m.

Capacity 6,000
Cost US\$63m (US\$56m)

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

Ground broken in Feb 2017 on new 'contemporary industrial' style stadium for soccer team DC United (COO Tom Hunt). 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. Environmental study completed. Suites: 32. Architect: Populous. Associate: Marshall Moya Design. Construction: Turner Construction.

Mechanical Engineer ME Engineers

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: McKethan Stadium

Masterplan for facility renovation upgrades to baseball and softball complexes and a standalone football complex at University of Florida at north end of James G. Pressly Stadium. Area: 100,000ft². Team locker room, weight room, training room, team meeting rooms, offices, recruiting lounge, open foyer area. McKethan Stadium (\$25-30m) will get a central canopy to cover about two-thirds of the seats. Extra four rows of seats behind home plate, about 400 club-level seats and the stands in left field will be elevated to same height as Disney Plaza. Architect: HOK.

Cost US\$107m

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

ME is providing full MEP and technology design.

LAFB Stadium, Los Angeles, California





FL, Lakeland: Publix Field at Joker Marchant Stadium

Improvements to spring training home of the Detroit Tigers. New vending areas, an expanded press box, an extended grandstand in left field and new artificial surfaces. Naming rights: Publix (\$3m, 20 years). Construction: Barton Malow and Rodda Construction. Finance: \$20m state, \$14.6m Polk County bed tax, \$2.4m city.

Cost US\$37m

Completion March 2017

Miami MLS Soccer Stadium

Miami Beckham United has MLS backing for franchise in Miami. Site secured in Overtown neighbourhood - mixture of county and private land. Close to transport and River District. PortMiami scheme rejected and various other sites considered. Developer: David Beckham group (Beckham exercising option on MLS franchise, Simon Fuller). Finance: private. Architects: Arquitectonica (Principal Bernardo Fort-Brescia) and HOK.

FL: Orlando, Camping World Stadium

Construction under way at new soccer-specific stadium for Orlando City SC MLS expansion team and The Orlando Pride that play in the Citrus Bowl). Third largest in MLS, 360-degree lower bowl, three-stand upper tier, bar in scoreboard, midfield club lounge. Safe standing 'wall'. Plans for pregame fan zone. In January 2016 the Orlando City Commission approved a deal for the club to purchase the nearly 12-acre site for just over USD 2 million. Orlando City SC Founder and President Phil Rawlins said that stadium construction was taking a little longer than anticipated and therefore they had taken the decision to play the entire 2016 season in the Orlando Citrus Bowl, and concentrate their construction efforts on being fully prepared for opening in 2017. Stadium general manager: Scott Neal. Transport: public. Team took over finance and full ownership after city finance was delayed. City contributing land. Finance: Orlando City SC. Waste service: Waste Pro. Construction manager: Barton Malow. Architect: Populous. Club seats: 5,000. Suites: 31 (300). Area: 290,000ft² (120,000 bowl).

Mechanical Engineer ME Engineers

ME is providing full MEP, technology, and sports lighting design.

Capacity 25,500

Cost US\$155m

Completion 2017

FL, Sarasota, Braves Spring Training Ballpark

Spring training facility in North Port, Sarasota for Atlanta Braves. Finance to be decided. 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, The Ballpark of the Palm Beaches

Spring training facility for the Houston Astros and Washington Nationals has opened. Design goal is an immersive experience, including landscaping and shading, bridges, entrance plaza (34,000 ft²) 20-foot-tall logos and a lake. Architect: HKS (Fred Ortiz). Developer: Palm Beach County. 360-degree concourse 20 feet wide. Two team clubhouses. Suites: 6. Covered party decks down each line. Large canopy installed over the grandstand. Baseball facilities are designed to be used year-round for player development (extended spring training, Gulf Coast League rookie ball) and rehabs. Also for concerts, soccer matches, marathons or festivals. General Manager: Brady Ballard.

Capacity 7,400 (6,400 seated)

Completion January 2017

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)

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: Mercedes-Benz Stadium

Octagonal retractable-roof stadium downtown for the NFL Atlanta Falcons and MLS debut team (first game 2017). Curtain system to reduce capacity for soccer. Sky bridge for downtown views and standing to watch game. Replaces Georgia Dome. Premium seating and other amenities to drive revenue. Screen: 62,000ft². Developer: Georgia World Congress Authority. Operator: AMB Sports and Entertainment. General Manager: Scott Jenkins. Costs: design services \$73m, systems and equipment \$71m, preconstruction \$102m, construction \$948m. Funding: hotel tax \$200m, NFL \$200m, personal seat licenses, Falcons. In a deal making its way through government channels, \$50m in stadium-related infrastructure improvements are included. The Arthur M. Blank Family Foundation has pledged \$15m to be invested in the communities surrounding the stadium - Vine City, English Avenue and Castleberry; and that is being matched by another \$15m from Invest Atlanta's Westside Tax Allocation District. (The Westside TAD currently has \$53m). Study: Populous. Architects: HOK, Goode Van Slyke Architecture, Stanley Beaman & Sears, tvsdesign. Food and beverage: Levy Restaurants. Geotechnical construction: Hayward Baker.

Capacity 60,000 (expandable to 80,000)

Cost US\$1.4bn (1.2bn)

Completion June 2017

GA, Cobb County: SunTrust Park

The Atlanta Brave's new ballpark, which opens this autumn, is a keystone for The Battery Atlanta mixed-use 'Destination'. It includes 41,000 seats, 32 executive suites and 4,000 club seats spread throughout the Delta SKY360 Club, SunTrust Club & Terrace Club. Unique gathering places include the 10,000ft² (929m²) three-level Coors Light Chop House with two party decks; a centre-field 40-person Home Depot Clubhouse Suite; the right-field Xfinity Rooftop with patio, lounge, and cabana areas with concessions served from an Airstream trailer; a 5,000ft² Team Store; and 216 Concession points-of-sale by Delaware North SportService. Ballpark nestles into hillside, trees around parking. Intimate configuration with higher percentage of seats close to field than any other MLB ballpark. Mini-field kids' zone. Aircon on every level. Roof: 90ft. Owner's rep: Heery. Architect: Populous. Construction manager: American Builders 2017 (JV between Brasfield & Gorrie, Mortenson, Barton Malow and New South Construction). Braves' project manager: Jones Lasalle. Owner's rep: Heery International (\$1.5m).

Mechanical Engineer ME Engineers

ME is providing MEP and sports lighting design and energy modeling.

Capacity 41,500

Cost US\$672m

Completion 2017

GA, Marietta: Atlanta United Training Centre

Home to the club's youth academy, first team players and club staff. 30,000ft² headquarter building and six fields. Area: 33-acres. Jobs: 80. Architect: TVS Design.

Cost US\$60m

Completion April 2017

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: 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: DAQ 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.

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: 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

IN, South Bend: Stadium

Campus Crossroads Project is three buildings (750,000ft²) that will surround the Stadium. The vision is to group community facilities and to beautify the stadium's facade. The 33-month construction will begin after the conclusion of the 2014 football season. The project is designed so that new premium seating (3,000 to 4,000 additional club seats) will help fund the project. Rebuild of the field from base. Turf: Fieldturf. In-stadium broadcast infrastructure and possibly big screens.



Cost US\$400m

Completion Q2 2017

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 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	9,000 (expandable to 20,000)
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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
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LA, Ruston: Joe Aillet Stadium

New press box at Louisiana Tech, with more spacious, multi-level structure that will include private suites and media seating. Athletics Director: Tommy McClelland. Suites: 14 (including a presidential suite). Also bathroom, ticket office and aesthetic improvements.

Cost	US\$18.6m
Completion	2017

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
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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
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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
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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: 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
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MN, Saint Paul: Minnesota United Stadium

Ground broken on roofed stadium at the Snelling-Midway site. Team owner William McGuire and Saint Paul Mayor Chris Coleman have confirmed that the MLS team and city will work together – along with key partners at the state and local level including a community advisory committee. 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	2018

Mechanical Engineer

ME is providing full MEP design.

MO, Columbia: Mizzou Softball Stadium

University of Missouri's new softball stadium located east of the Hearn 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 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

On existing Dudy Noble Field site for Mississippi State University baseball (athletics director Scott Stricklin). Open-air concourse with a two-tiered grandstand. Design team: Wier Boerner Allin Architecture, Populous, Janet Marie Smith. Finance: \$20m donations, \$20m ticket sales and premium seating. 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\$40m

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

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: Football Stadium



Consortium of investors wants to build a stadium for the football team of the University of Nevada. Five main and two secondary locations under consideration. Possible training camp in Reno. Vote required for hotel taxes financing. Developer: Las Vegas Sands Corporation (LVSC). Bringing NFL franchise to Vegas in mind. NFL is conducting a feasibility study with Oakland Raiders. Finance: \$780m tourism taxes, Majestic \$385m.

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)

NY, New York: NTC Flushing Meadows

Multi-year 'Sports Spectacle' project to redevelop the Billie Jean King National Tennis Center (NTC). Phase one complete: retractable roof on Arthur Ashe Stadium, Grandstand Stadium and South Tournament Courts renewed. Architect: ROSSETTI. Construction: Hunt. Developer: USTA. Next phase is new stadium to replace the Louis Armstrong Stadium (14,000) in its current location and completion of public realm improvements.

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, New York: Yankee Stadium

Hunter Roberts Construction Group has won a contract to carry out structural and interior modifications, including the construction of the new Bullpen Landings. Enhancements include several new social gathering spaces to improve the guest experience at New York Yankees and New York City Football Club games. Construction is due to be completed prior to the start of the 2017 Major League Baseball season.

All obstructed-view seats in the bleachers will be removed. The scope of work includes deconstructing the bleachers and installing new structural steel and concrete, building scaffold overhead to support temporary roofing and existing utilities while installing the new decks and light fixtures.

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 task force continues to examine the potential for a new stadium to house its football and basketball teams. Studies on a stadium in the Kennedy Square area or on renovation of Carrier Dome. State funding would be required. Consultant: Irwin Raji.

Capacity 40,000

Cost US\$500m

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, 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, Portland: Providence Park

MLS team Timberwolves planning capacity increase.

Capacity 24,644 (21,144)

Completion 2018

PA, Harrisburg: Skyline Sports Complex

Upgrade of player and public amenities in soccer stadium at the north end of City Island to help revitalise downtown Harrisburg. Also for rugby, lacrosse and field hockey, concerts and community-related activities. Tenant: City Islanders USL PRO team (CEO Eric Pettis). Consultants: R.S. Mowery, By Design Consultants and K&W. Finance: Redevelopment Assistance Capital \$5m, team matching public funds. Stadium design tentatively set for August.

Capacity 5,000 (7,000 concerts)

Cost US\$14m

Completion May 2017

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 I-195 land near the intersection of Dyer and Dorrance streets in Providence. Plus parking garage (\$10m). Concept design: DAIQ and Populous. Economic consultant: Brailsford & Dunlavy.

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

TX, Abilene: Anthony Field at Wildcat Stadium

On campus football stadium for Abilene Christian University (Athletics Director Lee De León). Finance: ongoing donations \$30m (for both football stadium and the new Elmer Gray Stadium). Construction: HOAR Construction.

Capacity 12,000
Cost US\$50m
Completion September 2017

TX, Amarillo Ballpark

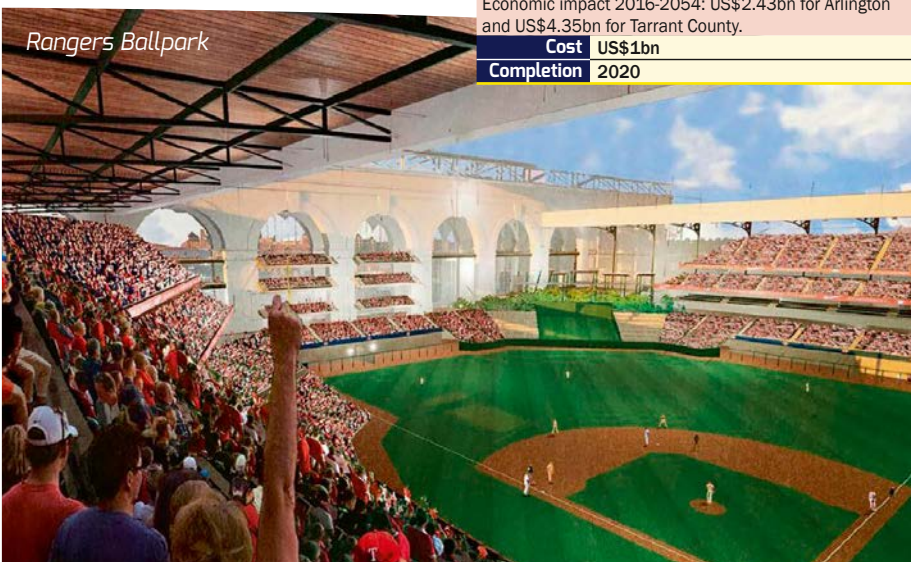
Property swap between Coca-Cola and Amarillo Economic Development Corp. likely to allow go-ahead on downtown baseball stadium/multipurpose event venue. City council sorting out zoning and finance. Developer: Local Government Corp. Original developer failed. Development partner and operator sought. Possible tenant/partner: Southern Independent Baseball.

Cost US\$45.5m (US\$30.3m)
Completion 2017

TX, Arlington: Rangers Ballpark

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.

Cost US\$1bn
Completion 2020



**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 6,744ft² 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, 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**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, Frisco: Toyota Stadium**

Multiple upgrades to the 10-year-old stadium. More than 100,000ft² 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. 7,000ft² 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, San Antonio: Alamodome**

Expansions and exterior modifications moving forward. 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, Blacksburg: English Field**

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 considering options, having initially rejected construction magnate Stephen Ballard's unsolicited proposal to demolish three sides (not south end) of Foreman Field and replace it with a 25,000-seat football stadium to open in 2018 - in time for the Monarchs' first home game against Virginia Tech. No disruption to schedule. Five cost points suggested. Discussion with ODU in June. Suites: +20. Club seats: +1,000. Larger and improved restrooms and concessions. Design elements of the existing Foreman Field to be incorporated, including the brick exterior and arched entrances. Parking: 1,600. Bidders - Construction S.B. Ballard Construction. Design team: Clark Nexsen and AECOM. ODU has previously looked at different sites (consultant Populous US\$1.3m).

Capacity 27,479 (expandable to 35,000)**Cost** US\$124m**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

Metro Parks Tacoma studying the potential of a full-time stadium as a centerpiece for a soccer field complex. Tenants: Sounders (USL, currently at Starfire Stadium) and Rainiers teams.

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 but 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 (UDeCOTT). Consultant: NLBA Architects.

Cost TT\$90m (US\$13.5m)**Completion** 2017



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Brisbane: Live Precinct

Arena and entertainment precinct proposed for the Roma Street rail yards. Developer: AEG Ogden.

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/Peddie 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

Nathan: State Netball Centre

Home for Queensland Firebirds at the Queensland Sport and Athletics Centre. Courts, training centre and administration offices for Netball Queensland. New plaza to connect with athletics facility. Indoor courts: 8. Developer: Queensland state government. Architect: BVN (Paolo Frigenti).

Cost AU\$30m
Completion 2017

Perth: HBF Arena



New basketball and football facilities. New function areas, new player amenities, football development services and administration/member facilities for the West Perth Football Club. Four court basketball stadium at the front of arena for the Wanneroo Basketball Association. As well as new courts, the basketball development will also include an administration area and player amenities. Operator: VenuesWest. Owner: City of Joondalup. Construction: EMCO Building. Architect: Jones Coulter Young Architects.

Completion September 2017

Port Macquarie Indoor Stadium

New PCYC facility, three additional courts, a kiosk and spectator seating. Upgrades to supporting infrastructure and additional parking.

Cost AU\$6m

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.

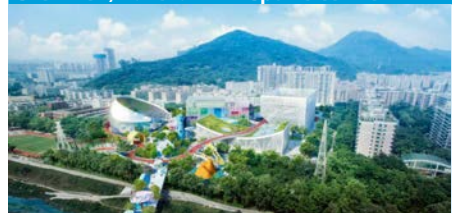
Capacity 6,000

Shantou: Shantou University Sports Park

Basketball arena (6,278), a natatorium with Olympic-sized swimming pool, a conference centre, sport and fitness training facilities, a flexible grand conference hall, a 200-room boutique hotel and an underground car park. The entire structure covered by a roof garden fully accessible to pedestrians and with dramatic views of the campus and surrounding countryside. Grid: Star Events. Area: 60,000m². Building area: 52,000m². Architect: MANICA Architecture. Finance: Li Ka Shing Foundation of Hong Kong.

Capacity 6,278
Cost RMB560m
Completion end 2016

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 Zhuhao 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

Pyeongchang: Gangneung Oval

New speed skating facility for Winter Olympics 2018.

Capacity	8,000
Cost	Won 131bn (US\$130m)
Completion	March 2017

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
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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
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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
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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)
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DENMARK

Copenhagen: Royal Arena



Multipurpose arena in Ørestad South opened in February 2017. Plinth containing recreational spaces for urban setting, platform and semi-transparent top featuring wooden fins. The European Commission checking state funding element is not against competition law. Planning and financial procurement: Davis Langdon, AECOM (James Clark) with IPW. 25 year operator lease, no city subsidy. Operator: Live Nation. Green: BREEAM. Architects: 3XN, HKS. Engineers: Arup, ME Engineers. Landscaping: Planit. Area: 35,000m². Finance: City of Copenhagen and investment fund RealDania. Naming rights: Royal Unibrew.

Mechanical Engineer ME Engineers

ME Engineers is providing full MEP, technology systems and lighting design.

Capacity	12,500 (sport), 16,000 (concert)
Cost	Dkr650m
Completion	January 2017

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 Bam 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
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Dublin: National Indoor Arena

National Indoor Athletics Training Centre, National Gymnastics Training Centre and National Indoor Training Centre opened in January. Synthetic pitches catering for over 20 multi-disciplinary sports. The 44,500sqm facility includes IAAF track and training centre for athletics, gymnastics training centre, a 12 court sports hall and 3G synthetic pitches for football and rugby training, backed up with elite conditioning, sports science and education facilities. Covered synthetic pitches with ancillary changing and conditioning facilities. Developer: National Sports Campus Development Authority (NSCDA). Design and build: Heron Buckingham JV and KSS.

Capacity	1,900
Completion	December 2016

ENGLAND

Bristol Arena

Plans for the long-awaited Bristol Arena have hit another roadblock after contractor Bouygues pulled out of a deal to build the new venue. Multipurpose arena on 'arena island' in Temple Quarter Enterprise Zone on site of old diesel depot. Part of city centre regeneration near Temple Meads station. Encouraging public transport, new footbridge to come. RIBA international design competition winners: Populous, working with local architects Fellden 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. Construction: Bouygues (£79.5m). Finance: council borrowing £53m. Operator/parking: £38m.

Capacity	12,000
Cost	£91m (€80m)
Completion	2019

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: Ioan South Cambridgeshire District Council (25 years).

Capacity	1,000
Cost	£1.85m
Completion	2017

Hull Venue

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.

Capacity	3,500
Cost	£36.2m
Completion	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.

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
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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	€49.2
Completion	2017

Dunkerque Arena

New mayor has confirmed more modest arena than previously.

Capacity	5,000-6,000
Cost	€15-20m
Completion	2017



RUTGERS ATHLETICS RE-IMAGINED

With Rutgers University Athletics basketball team flying high, architect Sink Combs Dethlefs is helping its facilities keep pace.

Rutgers University in New Jersey is at a major crossroads for the Athletics programme. With recent admission to the **Big10**, one of the **Power 5** conferences, expectations are very high.

Yet, in regards to facilities, their admission did not come from a position of strength. The established members of the Big10 have been in a building boom for years. Prior to its admission into the conference, Rutgers had been improving their facilities at a much slower pace. That is about to change.

Sink Combs Dethlefs, in association with **Perkins Eastman**, is playing an instrumental role in addressing the current facility deficiencies. The centerpiece of the improvements is the new \$130 million **Athletic Performance Center**.

The project will be the new home for men's and women's basketball, women's gymnastics, and the wrestling programme. Each sport will have dedicated locker room suites and state-of-the-art practice facilities. Technologies specific to each sport will be integrated throughout their practice and training environments. The facility's design also includes shared strength and conditioning and nutrition amenities as well as a wellness, hydrotherapy/recovery and active care suite. The 150,000ft² of athletics performance space is combined with a 540-space parking garage, providing a critical bank of parking to serve the RAC, the University's neighbouring arena.

MULTI-USE VENUE

Two other ongoing projects will have a significant impact on **Scarlet Knight** athletics. With the basketball programmes moving out of the RAC, the



Sink Combs Dethlefs/Perkins Eastman team is conducting a study to reinvent the arena as a multi-use event venue with updates to the seating bowl, new premium seating options, improved spectator amenities, and a new image that, when combined with the Athletic Performance Center, will create a new gameday plaza bracketed by landmark architecture.

The proposed improvements will greatly increase the revenue-generating capability of the arena. A strong emphasis on the patron's experience will create public spaces that reinforce the academics and athletics stories that distinguish the University.

Finally, several sports programmes will benefit from the former basketball spaces. Student-athletes on the field hockey, track and field, baseball, and softball teams will enjoy new, dedicated locker rooms, sports medicine, and laundry/equipment facilities. Additionally, they will benefit from the nutrition and recovery/hydrotherapy spaces being developed in the neighbouring Athletic Performance Center.

For the soccer and lacrosse programmes, a new practice/training facility is being developed. The new



facility will house four teams: men's and women's lacrosse and men's and women's soccer. Each team will have a dedicated locker room and coaches' offices that overlook the practice fields. Strength and conditioning, sports medicine, film/meeting rooms, student-athlete lounges, a dedicated recruiting room, and nutrition will be shared among all the student-athletes. The complex will also play a prominent role on football gameday, with upper level hospitality terraces overlooking the festival environment along Scarlet Knights Way.

The drive to compete within one of the elite **NCAA Division 1** conferences is the impetus for Rutgers' vision and commitment to produce high performing student-athletes. Progressive facilities that anticipate the continued evolution in sports performance are a cornerstone of the Rutgers' vision. Sink Combs Dethlefs is proud to join the Rutgers leadership team in translating vision into reality. ■



« 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

Paris: Arena 92

Multi-use arena that will be the home of Racing Métro 92 in Nanterre in the western suburbs of Paris. Has secured funding. Spectators 5m from the touchline. Includes office accommodation. Turf: synthetic. Transport: 80% public. Multipurpose for concerts (38-tonne truck door). Jobs: 500. Architect: Atelier Christian de Portzamparc (competition winner). Sound design: Jean-Paul Lamoureux. Conference rooms (100-500), clubs, restaurants. Loges: 100. Business seats: 3,000. Technology: e-ticketing, RFID and Bluetooth access control, TV network, Wi-Fi, smart purse. Developer: Racing Arena. Engineering: Egis. Construction: Vinci.

Capacity 32,000 (rugby), 41,000 (concerts)

Cost €351m

Completion 2017

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 Jordan 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

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 Miniestadi, 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

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

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 & Dunlavey. with ADC Solutions and Kumi Construction Management. Operator: Events DC (CEO Gregory A. O'Dell).

Capacity 5,000

Completion Q3 2018

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: Amalie Arena

Tampa Bay Lightning adding 160 loge seats at the north end, new concession stands, remodeled restrooms and a larger outdoor deck. Two club level lofts doubling to 80 people, rebuild stair tower in the northwest corner to allow access to the terrace level and the Bud Light Party Deck from the club level. Modernise locker rooms, performers and media spaces, IPTV, digital menu boards at concessions and a master system for controlling the arena's video monitors.

Mechanical Engineer ME Engineers

ME provided mechanical design for the Ice chiller replacement.

Cost US\$25m

Completion 2017

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: Philips Arena

Remodel of home of Atlanta Hawks, possibly moving bank of VIP accommodation. Funding: public \$100-150m.

Cost US\$250-300m

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, Chicago: McCormick Place Events Center

Multi-use arena for the DePaul University (Athletic Director Jean Lenti Ponsetto) basketball team at McCormick Place. Owner: Metropolitan Pier and Exposition Authority (MPEA). Funding: MPEA and DePaul \$70m each, city \$33m for land. Architect: Pelli Clarke Pelli Architects - Fred Clarke (\$7.2m).

Capacity 10,000

Cost US\$173m

Completion 2017

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 Kastelie).

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. 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: 270,000ft². 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.

Capacity 5,400

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 152,400ft². 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 600,000ft² outlet mall.

NY, Long Island: Nassau Veterans Memorial Coliseum

Will be relaunched after revitalisation programme. Long Islanders hockey team will move to Barclay Center in 2015. Developer: Nassau Events Center plc. Events: 300.

Completion 2017

OH, Cincinnati: Fifth Third Arena

Renovation of the Bearcats' basketball arena at University of Cincinnati - 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: 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: 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: 192,500ft ² 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, 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.
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 building 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
TX, Irving: Entertainment Center
Re-start of public/private project in Las Colinas, 18 acre "Music Factory" project. 100,000ft ² 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
Renovation plan for home of Utah Jazz. Interactive social and viewing platforms, new fresh food options. Architect: Brisbin Brook Beynon and SCI Architects (Murray Beynon).
Cost US\$125m
Completion fall 2017
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: 195,000ft ² . 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: Bucks Arena
Wisconsin State Assembly voted to approve a bill that will earmark \$250 million in public money to help fund the construction of a new downtown arena for Milwaukee Bucks. Intimate basketball experience with majority of seating in lower bowl, but also support for loading in and out a variety of event types. BMO Harris Bradley Center unsuitable for NBA team and new arena required to begin by November 2017. Just north of the BMO Harris Bradley Center. Area: 714,000ft ² . Plaza: 60,000ft ² . 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

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TOTTENHAM HOTSPUR'S NEW STADIUM IN LEAGUE OF ITS OWN

Tottenham Hotspur chairman Daniel Levy has set out to create something truly unique at the new White Hart Lane stadium. John Sheehan joined Populous' managing director EMEA, Christopher Lee, for a tour of the stadium site.



Tottenham Hotspur's new £750 million stadium at **White Hart Lane** is continuing to take shape and when it is opened in 2018, the ground will offer a match-day experience to rival anything in the world.

It will become London's largest capacity football club ground with 61,000 seats and will feature a retractable grass field for Spurs' home fixtures, with an artificial surface underneath that will be multi-use and capable of hosting NFL matches, concerts and other high-profile events.

Spurs believe the world's most technologically advanced stadium will offer an unrivalled fan experience and be at the heart of the regeneration of Tottenham.

Daniel Levy, Chairman of **Tottenham Hotspur**, said: *"We believe our new stadium will redefine sports and entertainment experiences. We have*

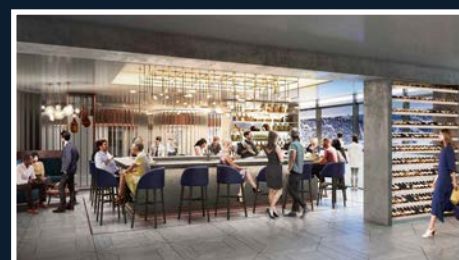
travelled to some of the best venues in the world to ensure no stone is left unturned in order to deliver experiences that are unparalleled for all our visitors.

"It will provide the world-class facilities our players and fans deserve and bring much needed regeneration to the local area."

CREATING INTIMACY

Christopher Lee, **Populous'** managing director EMEA, who is in charge of the stadium design team, told PS&AM: *"Daniel wanted to create a stadium that is unlike any other. He really did want to create something that is totally unique and that has character and personality.*

"I think one of the things he was scared of was creating a generic stadium. White Hart Lane is such a lovely stadium, it is so quirky in its nuance and he wanted to incorporate that. He wanted the best bits of traditional >>





« English stadiums to be brought in, so that drove the thinking around the single tier, the steepness, the proximity, all of the great things about old stadiums that he didn't want to lose.

"Intimacy is atmosphere and creating atmosphere is a really important thing for the club.

"We have been working on this now for four years. Daniel texts me about six times a day to say have you seen this, or thought about that? The process has been great and we have had lots of freedom. Daniel continues to push. Is that good enough? Can we change this? Should we improve that? It has been great fun."

A 17,000 single tier stand, the largest in the UK, will generate 'a wall of sound' coupled with a tight atmospheric bowl ensuring spectators are closer to the pitch than at any other comparable ground in the UK, with uninterrupted views for all at every event.

Lee said that to create the best atmosphere, the front of the stands at the sides would be just seven metres from the touchline while the north and south stands would be just five metres from the action.

He added: *"The single tier came in quite early and we were very focused on this idea of referencing what we*

thought made great old stadiums. The Kops and the Dortmunds are fantastic. Atmosphere was really important for us and the client and the idea of the single tier really drove that atmosphere."

The stadium has six cores wrapping around the building and not eight. The significance of this is that a typical stadium would have eight cores, but because of the phasing challenges associated with building around the existing White Hart Lane stadium, Populous were able to make the stadium work with only six cores, with each of them being constructed as part of the phase two construction works.

This allows the single tier south stand to be constructed extremely quickly and without any cores.

Lee also said the permanent NFL pitch will be on a concrete base 1.5 metres below the football pitch.

"We will build a sliding pitch on top of the NFL field. We spent a lot of time on the two pitches. We're designing an amazing system for the growlights on this one, where the lights are actually suspended about two metres above the pitch, which allows the groundsman to do everything he needs to do to the pitch without having to take the lights out."

Lee said the roof is another interesting feature of the new stadium.

"It is wrapped around by eight cores which provide the primary structural stability in the building and then the roof is actually a cable roof, unlike Wembley or the Emirates which are made up of big steel trusses.

"The whole thing is like a bicycle wheel with cables on the outside, a compression and tension ring in the middle."

FAN EXPERIENCE

Tottenham is aiming to revolutionise the matchday experience and set a new benchmark for premium offerings in sports and entertainment venues.

There will be a wide choice of premium suites, new style lounges and seats available including the first purpose-built glass-walled Tunnel Club in the UK.

This 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.

The H Club, an exceptional Members' Club, will offer a range of Michelin star calibre dining experiences including the opportunity to dine at the chef's table or with Club legends on a privately hosted table.

The new stadium will have:

61,000 CAPACITY

– the largest Club ground in London;

17,000 SEATS IN THE HOME SOUTHERN STAND

– the largest single tier stand in the UK

16 NON-FOOTBALL EVENTS MAXIMUM WILL TAKE PLACE PER YEAR

(likely to be six concerts and 10 other sporting events);

3,500 JOBS CREATED

(an increase of 1,700 new jobs);

LESS THAN SIX METRES FROM THE PITCH TO THE SINGLE- TIER 'HOME END'

– with no front row seat being any more than eight metres away from the touchline across the stadium;

86.8M

– the length of the general admission bar;

10,000

– the number of pints per minute that the new beer delivery system will enable staff to deliver;

£750 MILLION

– the investment the stadium project is expected to represent upon completion;

60,000+

– the number of people currently on the Club's Season Ticket Waiting List;

£293 MILLION

– the amount the development will pump into the local economy each year (an additional £166 million);

£211 MILLION

– the amount of additional local spending the four-year construction phase will generate.

NFL FIGURES

£120 MILLION

– the direct economic impact on the tri-borough area (Haringey, Enfield, Waltham Forest) of bringing the NFL to Tottenham over the course of the 10-year partnership, while the economic impact on the London economy as a whole will be in excess of £400 million during the same period;

180,000

– the anticipated number of additional spectators per year, and the estimated spending will be £21.4m;

WITH NFL BEING PLAYED IN TOTTENHAM, THERE WILL ALSO BE SIGNIFICANT EXPOSURE OF THE TOTTENHAM AREA TO A "NEW" AUDIENCE

– with over 80% of NFL London Games season ticket holders coming from outside the Greater London area.

Two tickets in the H Club will cost £30,000 per season, plus a £30,000 membership fee.

For those looking for something truly bespoke, suite holders will be able to define their experience and design their private suite to their own personalised requirements.

Use of these suites will not just be confined to matchdays, with all the required technology available for these spaces to be used as a London work base on non-event days.

Contemporary Super Loges will feature for the first time in a UK stadium and are expected to be extremely popular as they provide the intimacy of a private dining experience with access to a members' lounge bar.

Situated on level nine of the stadium, the Sky Lounge will offer a relaxed and informal experience surrounded by panoramic views both within and outside the stadium.

Premium guests will enjoy state-of-the-art stadium seating with heated seats and USB ports for ultimate comfort and connectivity.

LONG BAR

In addition, the new development will be home to what is believed to be the

longest general admission bar in a UK stadium at 86.8 metres.

The venue will also include the world's first stadium micro-brewery and in-house bakery. The brewery will allow for the production of one million pints of craft beer a year. A new beer delivery system will also enable delivery of up to 10,000 pints per minute.

The onsite bakery will produce artisan breads and pastries for every food outlet in the stadium, ranging from general admission areas to boxes.

The club is also working with one of the world's top acousticians, who also manages the acoustics of U2's concerts, to optimise the sound within the stadium bowl and ensure the club maintains its tradition of having one of the most atmospheric homes in British sport.

The stadium has been designed with technology within the fabric of the building enabling a truly connected experience for all visitors. Alongside the inclusion of geo-location technology, Tottenham said this will open up endless possibilities to enhance service and tailor experiences for each guest.

Ticketless entry will ensure swift access at turnstiles and fast payment options will enhance service at refreshment kiosks. ■

UK VENUES IN THE SPOTLIGHT

A number of sporting venues are under construction or going through design and planning stages across the UK.

CHELSEA FC STADIUM, LONDON

Chelsea FC is pushing ahead with plans to build a new **Herzog & de Meuron** designed stadium at Stamford Bridge after winning planning permission from the local council.

Hammersmith & Fulham Council approved Chelsea's planning application to build the new 60,000-seat stadium in Fulham.

The new stadium will be built within the grounds of Stamford Bridge on Fulham Road, and require the demolition of the existing 41,600 seat stadium.

The plans also include 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, the same firm which created the iconic **Bird's Nest** stadium for the **2008 Beijing Olympics**.

Chelsea FC said in a statement: *"More than a year ago, a planning application for a new stadium at Stamford Bridge with an expanded seating capacity was submitted to our local council, Hammersmith & Fulham.*

"Over the past 12 months we have consulted widely with neighbouring residents, local businesses, statutory authorities and continued to work closely with the council.

"The council's planning committee considered the application and we are grateful that planning permission was granted for the redevelopment of our historic home.

"The committee decision does not mean that work can begin on site. This is just the latest step, although a significant one, that we have to take before we can commence work, including obtaining various other permissions."

Chelsea FC were founded in 1905 and have always played at Stamford Bridge. The long-running works to the current 42,000-seat stadium were begun in the Seventies but were only completed in 2001. Chelsea FC now have three years to begin work on the site before the approval expires.



CASEMENT PARK, BELFAST, NORTHERN IRELAND



Ulster GAA has unveiled scaled-down designs for a new provincial stadium at **Casement Park** in Belfast, Northern Ireland for gaelic games.

The new scheme presented by Ulster GAA and developed by **Populous**, plans to transform Casement Park with an enhanced atmosphere and iconic new stadium bowl.

The design, which was informed and shaped by feedback received from the local community and wider stakeholders during Stage One, has a proposed capacity of 34,500 inclusive of standing terracing for about 8,500.

The new height, scale and capacity are all reduced from the previous design, with the Stadium envelope also being further restricted.

Uniquely to Belfast, the complete bowl design will ensure that terracing supporters have the same level of protection from the weather and concourse facilities as all other spectators within the ground.

The proposal also sets out plans for sustainable travel options with dedicated traffic and travel operations, including supporter coach travel and off-site park and ride transportation.

The mixed use facility proposes a range of resources to advance the economic, cultural and heritage opportunities for the local community.

The announcement follows an extensive Stage One community consultation process with 91% supportive of the project.

FOREST GREEN ROVERS, GLOUCESTERSHIRE

Zaha Hadid Architects are designing a wooden football stadium for **Forest Green Rovers FC** in the UK.

Rovers announced the competition in March last year, and quickly received over 50 entries from around the world, including Sweden, Germany, France, Britain and the US.

Following a seven-month international competition, the club shortlisted nine entries, and gave them all two months to work up their concepts, which were reviewed over two days, leading to the selection of two finalists.

The final two were given another two months to take their concepts further, including a scale model.

Dale Vince, Ecotricity founder and Forest Green Rovers chairman said: *"Zaha Hadid have built some fantastic sport stadia around the world, including one at the Olympic Park in London; they've designed one of the five stadiums for the next World Cup in Qatar, and now they've designed one for Forest Green."*

"The really standout thing about this stadium is that it's going to be almost entirely made of wood – the first time that will have been done anywhere in the world. The importance of using wood is not only that it's a naturally occurring material, it has very low carbon content – about as low as it gets for a building material."

"And when you bear in mind that around three quarters of the lifetime carbon impact of any stadium comes from its building materials, you can see why that's so important – and it's why our new stadium will have the lowest carbon content of any stadium in the world."

The Zaha Hadid designed stadium will be the centrepiece of the £100 million Eco Park development – Ecotricity's 100 acre sports and green technology business park proposal, beside junction 13 of the M5 in Gloucestershire.

Half of Eco Park will consist of state-of-the-art sporting facilities, including the new stadium, grass and all-weather training pitches, publicly accessible multi-disciplinary facilities, and a sports science hub.

The other half will comprise a green technology business park with sustainably built commercial offices and light industrial units, giving Eco Park the potential to create up to 4,000 jobs, including room for the continued expansion of green energy company Ecotricity.



ABERDEEN FC, SCOTLAND

Detailed plans for the creation of a major, multi-million pound football and community sports hub for the north-east of Scotland have been lodged by **Aberdeen FC Community Trust** and **Aberdeen Football Club**.

The planning application to Aberdeen City Council for the 24.5 hectare site at **Kingsford** includes community and sports facilities; a football academy comprising outdoor pitches, pavilion and ancillary buildings; and a 20,000-seat capacity stadium along with associated access roads, parking, landscaping and engineering works.

Subject to planning approval, the proposals will see more than £40 million invested to create a new home for the Dons; provide a base for the significant expansion of the award-winning work of Aberdeen FC Community Trust on social inclusion, participation in sport and healthy lifestyles for all ages across the region; and create a focal point for footballing excellence in the north of Scotland.

The project would be delivered in two phases, with the community and sports facilities and football academy constructed first and the stadium in the second phase.

The restrictions of the Club's no longer fit for purpose **Pittodrie Stadium** site, including the inability to develop co-located and dedicated training facilities, are an increasing barrier to its sustainable future. ■

LUTON TOWN FC, ENGLAND

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.

The initial capacity of the stadium, designed by **AndArchitects**, will be 17,500, rising to 23,000 as the club grows.

Chief executive Gary Sweet said: *"Purchasing Power Court land is a major, major step forward and takes the amount of land in our control to over 70 acres. That includes the Newlands Park site at Junction 10 and The Brache, our new training ground location, which is on a long-term lease with a purchase option in our favour."*





All images courtesy of Saracens RFC

KEEP ON THE PITCH

Saracens Rugby Club have been using an artificial surface at their Allianz Park with great success for a number of years, as Stadium Director Richard Gregg explains to John Sheehan.

Premiership rugby club **Saracens** was so pleased with its artificial pitch that it has had an updated version installed.

The new SISTurf system was put in three-and-half years after the original installation at **Allianz Park**. During this time Saracens have won the **Aviva Premiership** twice and **European Champions Cup** and **LV Cup**.

The pitch features a new, larger sized recycled infill, which helps promote better drainage and less compaction than the previous pitch, and helps provide a fast and safe playing surface, perfect for top level rugby and mid-week community use.

The new surface at Allianz Park weighs in at 38kg per m² making it the heaviest synthetic rugby pitch in Europe, and another big step forward in synthetic turf technology.

Allianz Park Stadium Director Richard Gregg said: *"We can't fault it. We had an inspection recently from SIS who installed it and it is in great condition. We have got a fairly rigorous maintenance programme on it – rigorous in the sense that we maintain it as we're supposed to – three to four times a week for two hours brushing it in various directions and then we have SIS come in frequently over the season to make sure they're happy with it and*

happy with the level of compaction. If it is compacted they will uncompact it.

"We're in a pretty good place at the moment and it is performing very well."

Gregg said the lifespan of the old pitch was eight years but that Saracens was offered a newer, better product at an affordable rate.

RECYCLED

The old pitch saw over 350 matches, an estimated 7,750 hours of community use and close to half a million spectators walking on it after matches, but still has plenty of life left in it. >>

FEATURE
PLAYING
SURFACES





« Gregg said: “The old one would have been fine for rugby for another five years as it still met World Rugby standards. We were looking at schools and clubs who would like to utilise it, but in the end we have worked with a partner at a golf driving range on the same estate as us. It has been put in there, which works really well. It will be there for 10-15 years.”

Gregg explained that the new pitch has an eight-year warranty but that Saracens have an agreement with SIS that if pitch technology evolves after four or five years then the club has the option of replacing it again.

He said: “The lifespan still remains at eight but we have an option to upgrade the quality every four or five years.

“The new one has more fibres per square metre and that allows the fibres to support each other rather than relying on the rubber infill to keep the fibres straight. Once the rubber gets compacted down, the fibres start to fall over and that’s when you start picking »

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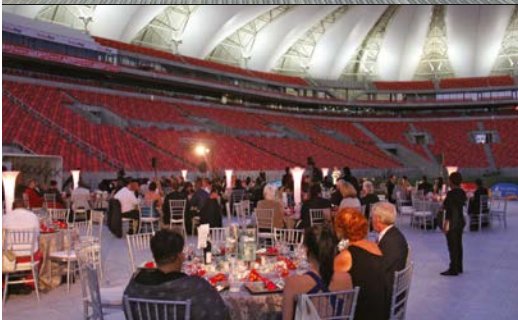
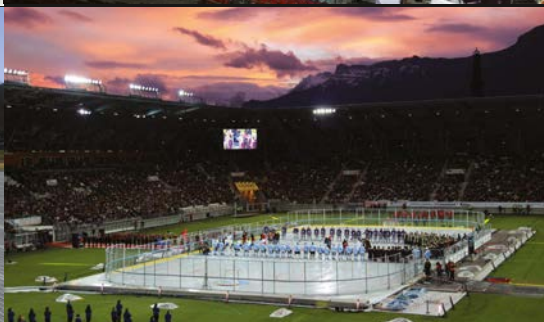
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«up burns and abrasions. With this one the fibres are less likely to fall over and the technology allows us to ensure that the players are picking up less burns.»

Gregg said that most teams that encounter the pitch are used to playing on an artificial surface because they have them at their training grounds.

“Most of the teams are so used to playing on it because Worcester have got one, Newcastle have got one, we’ve got one, Cardiff have one, Zebre have one in pro 12 so they are more common.

“A lot of the guys will have one at their training ground already – not to the same quality as we have – but they have definitely got access to train on and play with the similar sort of pitches.

“When we started with it four years ago we did get a few murmurings of it being an advantage, but four years in and other clubs are starting to lay it and you have got to start look at that as a success. There is no evidence that injuries are any more common or less common on the surface. We believe having a flat, firm surface allows us to play better rugby throughout the winter as well as in the warmer months.

“We have the fibre with the rubber infill and there is an impact mat underneath. It has a bit of a bounce and with players of 120 kilos crashing down on they are not

hitting a firm, concrete surface, they are hitting an absorbent material. It allows us to play a better brand of rugby.”

COMMUNITY USE

Gregg said the pitch is not just there to be used for Saracens home games 15 times a year.

“What is really good for us is that every Monday to Friday the pitch is being used. Whether that is for our academy on a Monday night, or on Tuesday night when we accommodate athletics followed by our women’s team who train here along with some local rugby clubs. “On Wednesday we have another local rugby club who bring their Under 6s all the way through to their first, second and third team players. Thursday is athletics again and on Fridays we have touch rugby for over 50s or we accommodate local schools for fixtures.

“We’re very much not ‘keep off the pitch’ we’re about ‘keep on the pitch’ so we have got a team in our sports events division who drive pitch use to make sure we get a revenue and that we also achieve our community objectives as an organisation.”

Gregg said there is a bigger picture for Saracens to engage with local clubs and fans. He added: *“In terms of growing as a club off the pitch, we have seen our*

season tickets grow year-on-year for the past four years, so we’re going in the right direction.”

He said the club gets a lot of visitors who come to check the pitch out. *“We have got arguably the best artificial pitch you can buy, so SIS often use us as their demo site and bring people down to show what we’ve got. A lot of local schools are investing like Harrow and Haileybury. We don’t mind people asking us about our pitch, we’re quite proud of it.”*

SIS Pitches has installed rugby fields for **Newcastle Falcons, Rosslyn Park, Loughborough** and **Durham Universities** and other clubs and schools around the UK. It’s natural turf hybrid system was trained on by Argentina and Ireland at **St George’s Park** before last year’s Rugby World Cup.

Bryn Lee, Managing Director at SIS Pitches said: *“We’re delighted to be working with the best Rugby Union team in Europe. Since the first surface was laid at Allianz Park four years ago Saracens have achieved huge success domestically and in Europe.*

“The current pitch meets World Rugby’s vigorous performance standards and the new surface will be even more advanced. I am sure the club’s successes will continue and spectators will see many fine tries scored on the fast new surface.” ■



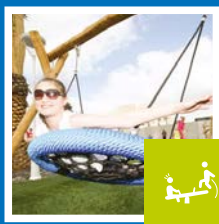
Action from Saracens v Wasps

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Dutch King Willem-Alexander opening the 2015 World Homeless Cup on a synthetic turf pitch with ProPlay Inside

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SHOCKPAD PROTECTION

Schmitz Foam's Managing Director Wiebe van Terwisga tells *PS&AM* the benefits of shockpads for artificial sports surfaces.



Can you outline the importance of using shockpads in synthetic turf projects?

A shock pad offers many advantages to athletes and pitch owners. Adding a shock pad to a synthetic turf pitch system increases safety and playability.

Shock pads provide a comfortable natural cushioning to a synthetic turf pitch. This increases player performance, comfort and safety.

They help to ensure safety for athletes as the pitch absorbs the impact of ground contact. Protecting the human brain from impact injuries and lessening soft tissue joint injuries is crucial. That protection starts at the turf level.

Better sport can be played throughout the year on synthetic turf pitches with a good shock pad. This means excellent shock absorption and a good, predictable bounce of the ball.

From a long term financial point of view pitches with a shock pad remain in top condition much longer than pitches without one.

Because of the cushioning and shock absorption of the shock pad, fibers are supported to come up again and stay in their original position, thus increasing the life expectancy of the pitch. Also, shock pads protect the backing of the surface from the abrasion caused by hard surfaces such as stones and asphalt.

ProPlay shock pads are extremely age resilient and under certain circumstances can be re-used, even when the existing pitch needs to be replaced or moved. ProPlay offers 25 years warranty on sports functional properties.

In properly designed systems, pitches with ProPlay shock pads do not even need crumb rubber infill. Sand will do! Savings on infill and maintenance will decrease the total costs of ownership. Having no crumb rubber infill also

avoids the whole discussion about possible health risks.

What projects have you worked on recently involving the installation of shock pads and how were they a success?

Our reference list is extensive. In 2016 we installed surfaces equivalent to almost 300 soccer pitches in over 60 countries worldwide.

One special project I would like to mention is the 10,000m² rugby field in Windhoek, Namibia. It meets the most recent World Rugby standards for the two upcoming international tournaments.

Which sports benefit most from a shock pad under synthetic turf?

Sports benefiting most from a system with a good shock pad are full contact sports such as American football, rugby, Australian rules football, Gaelic games; semi contact sports such as soccer; and no contact sports such as padel, hockey, tennis.

The higher the contact risk the more the pad has a safety function and helps prevent injuries. For the non-contact sports its main function is to increase comfort for athletes.





Students symbolically rolled out the first synthetic turf roll of their brand new rugby pitch at Windhoek Gymnasium Private School in Namibia

ProPlay products are also used in equestrian sports (jumping, dressage and racetracks), fall protection for playgrounds, multi-sports fields, ski slopes and landscaping.

What are the advantages of shock pads?

Above I explained about shock pads increasing player performance, comfort and safety. Especially in non-professional pitches maintenance is a point of attention/concern. Lack of maintenance can create the idea a pitch is worn. A good shock pad puts less emphasis on the maintenance, guaranteeing longtime performance.

Synthetic turf pitches with shock pads offer the owner the opportunity to create the best conditions for the type of sport played on that pitch. The pitch can be adapted to community/amateurs/professional use and to the local climate conditions (temperatures, rainfall intensity) and requested lifetime.

In certain conditions installing a shock pad can decrease the costs of the sub base. Excavation often is a large factor in the total costs of a new pitch.

The type of infill and quantity gets less relevant with a good pad. Because the shock pad 'does the work' a good pad gives the client more and better choice in type and quantity of infill used.

Using a shock pad brings the STP closer to the feeling of a natural turf pitch. We always adapt the quality of our products to the increasing demands of the sport associations. For example in rugby the critical fall height increased recently. Also FIFA has increased the demands in their new rules.

What are the barriers preventing clubs from installing shock pads with new synthetic pitches?

Barriers have to do with 'health' and 'costs'. We all know the discussions around crumb rubber infill. No one has proven without any doubt it is affecting human health, also no one can prove it does not. Every few years this discussion returns. There are alternatives, such as plastic and cork infills. But also, a good shock pad can help clubs to get around that risk.

Of course, there are different athletes playing on the same pitch. They all have

their personal preference. Remarks such as the pitch being too hard or too soft could prevent the clubs from installing; presuming soft tissue joint injuries.

Some say installing shock pads increases costs compared to systems with higher piles and more infill. The initial investment might be higher in some specific situations but the total costs of ownership, especially after turf resurfacing, will be much lower.

How can you better educate end users about the need for shock pads?

As a manufacturer we are in close contact with architects and sports associations to design the best available products. They are the ones who decide what works best and inform and educate end users about the best available materials to protect athletes.

Recently, a collaboration between the **National Football League (NFL)** and the **Texas Medical Center (TMC)** awarded startups focused on innovations to athlete safety. This is a great start and more can be done to reach a broader audience. ■

SOUND INVESTMENT

We asked four leading audio experts to give their views on the challenges involved in creating a dynamic sound in stadiums and arenas.

PS&AM: Large open stadia and closed-roof arena environments pose challenges and opportunities to create a dynamic sound. What do you see as the particular challenges and opportunities to design and create an audio experience for the spectator with the final remit to deliver clarity and intelligibility?



FUNKTION-ONE FOUNDER, TONY ANDREWS

The major obstacle to achieving vocal intelligibility in large enclosed spaces is the typically long reverberation time, which leads to intelligibility-destroying secondary arrivals reflecting off surfaces. This is a natural result from diffraction of frequencies whose wavelength is larger than the mouth dimensions of typically used loudspeaker waveguides.

Typical waveguides are only large enough to control female vocal frequencies. Deeper male vocal and low mid frequencies from music are

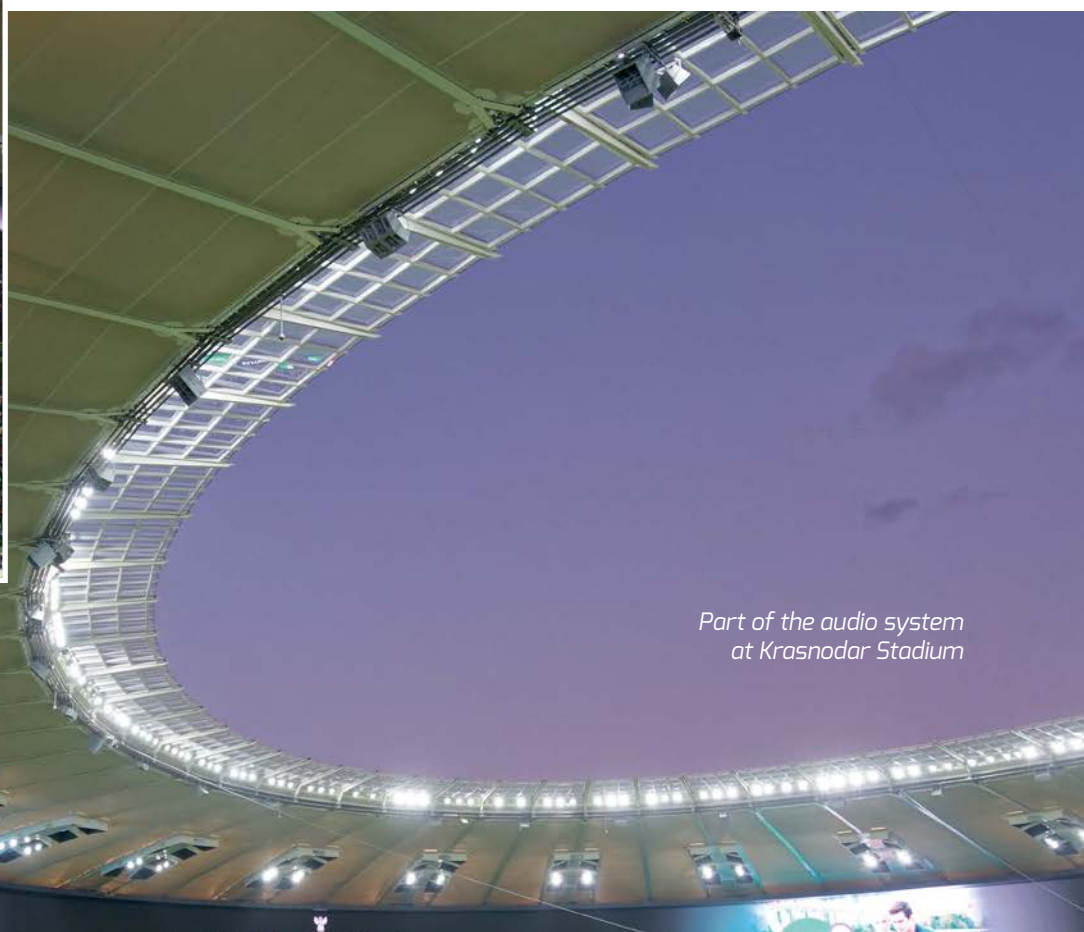
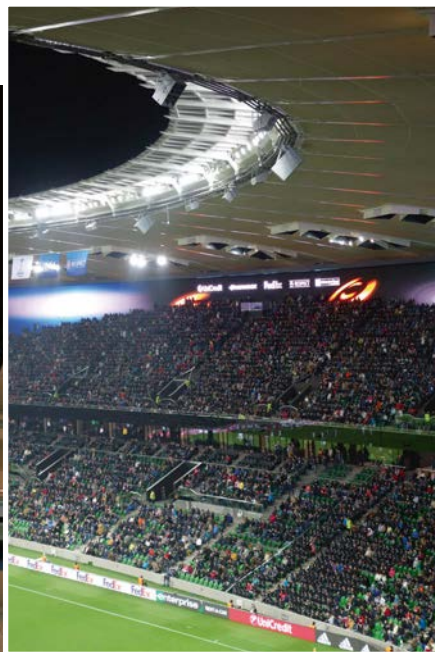
not controlled and so are diffracted in all directions giving rise to reflections. Therefore, the answer to highly reverberant spaces is to employ sufficiently large waveguides to control all relevant frequencies including low mid, enabling audio to be directed solely to the audience areas.

A fairly typical challenge when specifying a system for a new stadium is finding a route around the demands of the architect.

While audio has undoubtedly become a more pressing consideration for stadium owners, it doesn't seem to have filtered through to the architects. We experienced this recently at Krasnodar Stadium with our Russian distributor **Edelweiss Audio**.

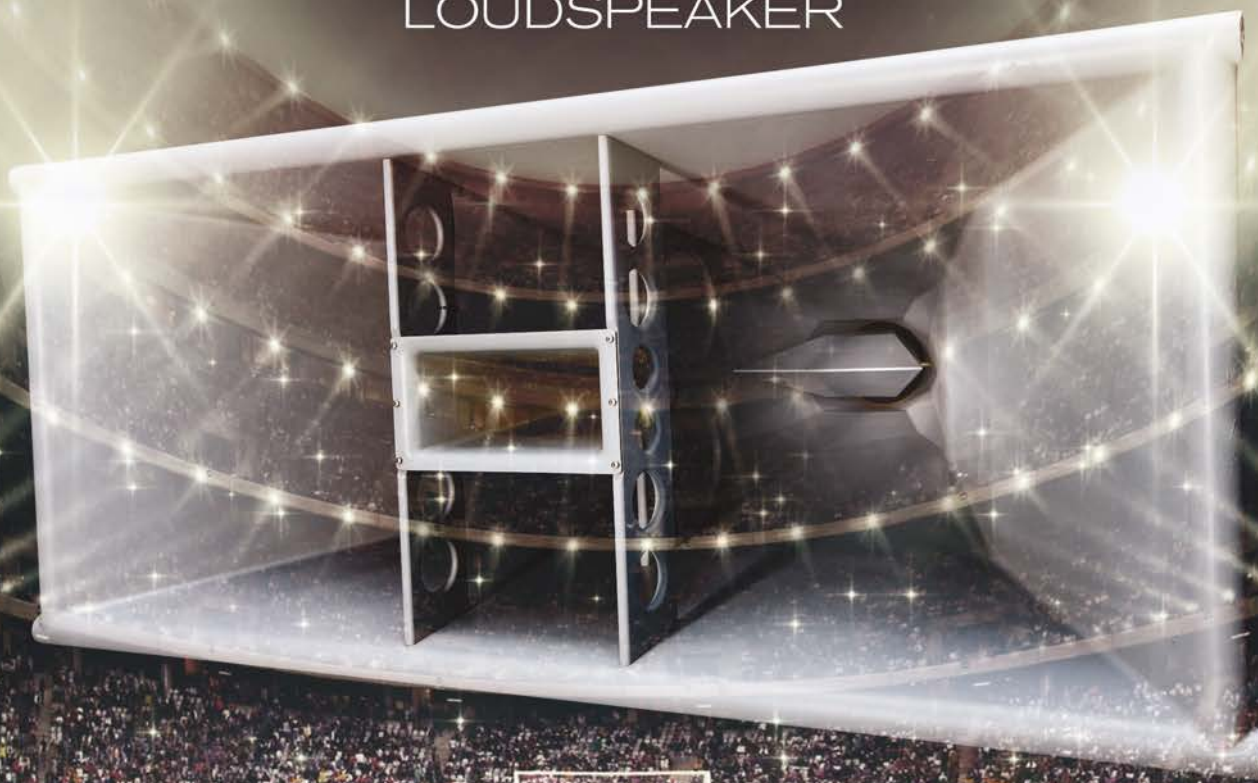
The roof has two layers, which are split by a cavernous space and the architect originally wanted the loudspeakers to be positioned between these layers. Obviously this would have a serious effect on clarity and intelligibility, so we fought pretty hard against it. In the end, we actually developed a custom enclosure called the Evo 6EHQ.

Generally speaking, positioning loudspeakers can be quite a challenge, especially when you consider the minimum SPL of 110dB set by football's governing bodies. **Funktion-One** is in a strong position to face these types of challenges due to our loudspeakers having such high-efficiency. We've also got a dedicated speaker range for stadia in the MST (Modular Stadium Technology). >>

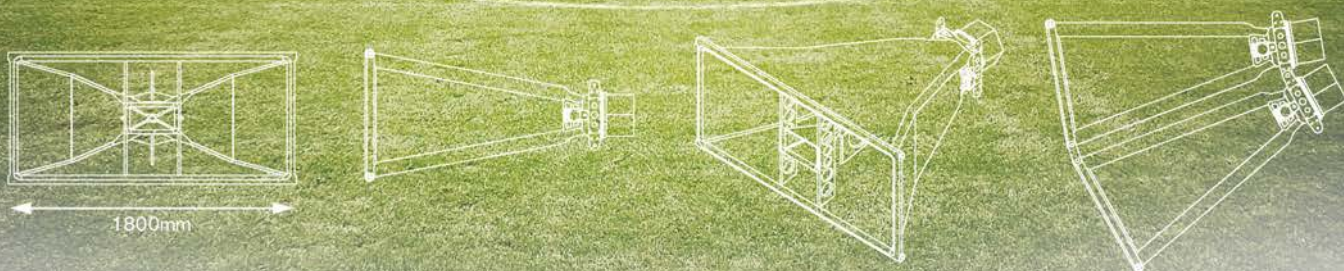


Part of the audio system
at Krasnodar Stadium

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Sound is often taken for granted; its influence on our experience unacknowledged – unless it's bad. Only then do we really notice it. In many ways, achieving clear, intelligible sound is a given; with professional products satisfactory results can be realised.

The real opportunity – this being the chance to enhance the fan experience, passion and atmosphere – is in choosing technology that faithfully reproduces the strength, quality and musicality of sound. This is when spectators feel the difference, in a way that can't be replicated on the sofa at home.

Before choosing such a system, venues must establish its benefit to their expectations and long term ambitions. Moreover, grounds that host multiple event formats depend on sound reinforcement that's highly flexible – setups that adapt easily, with the same high quality results each time, without compromising public safety.

Furthermore, the technology must be quick and easy to operate and maintain and this requires complete controllability and integration. Defining these parameters is both a challenge and an opportunity, where the combined expertise of venue management, consultant and manufacturer brings great clarity and advantage to a project.

INTELLIGIBILITY

For the acoustician, the size of a venue is often inversely proportional to intelligibility, though it's important to

recognise reverberation contributes to the atmosphere; for example the **Wembley** roar, the intimidation generated by home fans in Turkey, or The **Seahawks 12th** man on defence in Seattle.

By design, modern sporting arenas can build in more reverberation, heightening the connection between the fans and the field of play – thus increasing the acoustic challenge. What it means to sonically 'enhance' the atmosphere will be unique to every situation, it could be adding musicality, or preserving a historic echo.

Nevertheless, intelligibility is always a priority. Whether it's an announcement, advertising, or an emergency situation, the voice must be clear and dominant; tinny, telephone-like speech won't engage the crowd. We also know that poor, incoherent audio, particularly in people dense environments, negatively impacts on stress and behaviour, so it stands to reason that clear, dynamic sound is both comfortable and easy for the listener – albeit often subconsciously. Easy listening keeps the individual connected to the subtleties of their environment – a phenomenon magnified a thousand-fold in stadiums and arenas where passionate emotions run remarkably high.

Crucially though, voice alarm standards can lead to a minimum compliance requirement; with this often becoming the performance target, budgets are then set accordingly. As a result,

consultants are asked to compromise on quality and time just to get the project over the line.

CUSTOMER EXPERIENCE

In a world where customer experience is everything, and technology expectations grow by the minute, shortcuts in quality and the scope of audio reproduction inevitably disappoint downstream.

Recently, we've been privileged to see what happens when sports venues consider both their current needs and future aspirations. The results have been game changing, for the venues and for fans.

The best entertainment should be emotional. We're deeply influenced by our feelings in large scale, collective situations; high quality, dynamic sound is key to stimulating our emotions.

This is what is meant when we talk about creating an immersive experience – an atmosphere flooded with and driven by united sentiment.

Thus, it's critical sound reaches every member of the audience, in a timely manner and with the same quality.

At **d&b audiotechnik** technological advances now enable venues to deliver the 'same sound in every seat' regardless of the challenges. Several recent installations play testament to what can be achieved, and suggest that audio – and its crucial role in spectator sports – will return to the forefront of investment decisions. »



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« JOHN MONITTO, DIRECTOR OF TECHNICAL SOLUTIONS, MEYER SOUND

In stadia and arena sound systems, the fundamental challenge remains that of delivering consistently high vocal intelligibility, whether for game information or marketing messages, with uniform coverage in all seating areas.

To a great extent this is accomplished by applying the latest iterations of familiar technologies, including precisely controlled high-Q loudspeaker systems that exhibit low distortion and linear response even at the high output levels required to overcome ambient crowd noise.

Sound system design must deal effectively with reverberant effects produced by high interior volume and reflective surfaces – including windows on skyboxes, exposed concrete and hard seating – typical of stadia and arenas.

SOUND SPILLAGE

Again, designing coverage to reduce sound spillage outside seating areas is critical, and in addition systems should be configured into multiple zones so

that loudspeakers serving unoccupied seating areas can be turned off.

Most current systems are called on not only to produce excellent voice intelligibility, but also to reproduce the high-energy music tracks accompanying video programs. Systems must be designed and engineered to reproduce full bandwidth program with high dynamic range without introducing distortion at levels that could hamper intelligibility.

Recent advances in digital signal processing have introduced new possibilities for aiming sound with high precision while also maintaining a slender loudspeaker profile that is aesthetically compatible with the stadium architecture.

As one example, **Meyer Sound's** CAL-96 column array loudspeakers with digital beam steering technology have been used on the rear rim of stadia, positioned vertically, but with the sound digitally steered downward precisely as needed to cover the seating. At **Bank of America Stadium** in Charlotte,

North Carolina, the loudspeakers are integrated into flagpoles for minimal visual intrusion.

Powerful DSP systems such as Meyer Sound's D-Mitri also introduce new opportunities for creating a higher level of game excitement. The same multi-zoned and distributed loudspeakers used to provide crisp announcer intelligibility also can be used as a surround system to enhance ambient sounds – basketballs hitting backboards or hockey pucks striking dashboards, for example – to create a more intimate sense of fan involvement in the event.

Also, active acoustic systems like Meyer Sound Constellation offer the ability to enhance both ambient game sounds and crowd response to further heighten excitement and fan satisfaction as a stadium with livelier physical acoustics would do naturally. This gives the stadium a wider flexibility for multi-use events. »





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THINKING SOUND

« JULIEN LAVAL, APPLICATIONS ENGINEER – INSTALL AT L-ACOUSTICS

Historically, safety and crowd management have been the major priorities for stadia and arenas and it's safe to say that venue management is well-versed in the concepts of intelligibility and clarity and that the safety of patrons is still the must-have for all sports sound systems.

But for modern sports venues, the goal is to create unforgettable events, which means they are branching out into sound systems that can handily cover safety issues while also providing stunning audio experiences on the same level of the biggest live concerts.

Because stadia and arenas pose specific and tricky acoustic challenges, management teams are turning more and more to high-end professional audio manufacturers like **L-Acoustics**.

For example, large stadium systems need to achieve even, powerful coverage over big, long open spaces. And they often need to do this with minimal weight, as rigging points may have limited load capacity.

SPORTS VENUES

Interestingly, sports venues have a reputation for terrible acoustics, due to the materials like concrete and steel used in their construction, which are highly reflective.

But conversely, many of the newly constructed venues are making a valiant effort at curing the issue, using damping materials to absorb sound. The catch-22 is that while this improves intelligibility of reinforced sound, it dampens the dynamics of the crowd noise, eliminating some of the thrill and the tension that are the hallmarks of a well-played sports match!

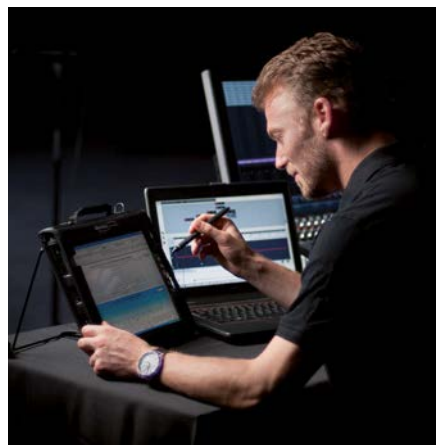
This puts engineers in a battle to find a smart AV solution that can rapidly adapt to the antagonistic situation of a match where lively sound exposure improves audience emotions versus a state of emergency that requires maximum intelligibility for an efficient Voice Evacuation procedure.

To do this, engineers need a system that can be fully controlled by 3rd party control platforms in order to automatically adapt the processing over different zones in order to reach the perfect mix in the right situation.

L-Acoustics' constant and variable curvature line arrays have been developed over decades to meet the rigorous demands and restrictions of

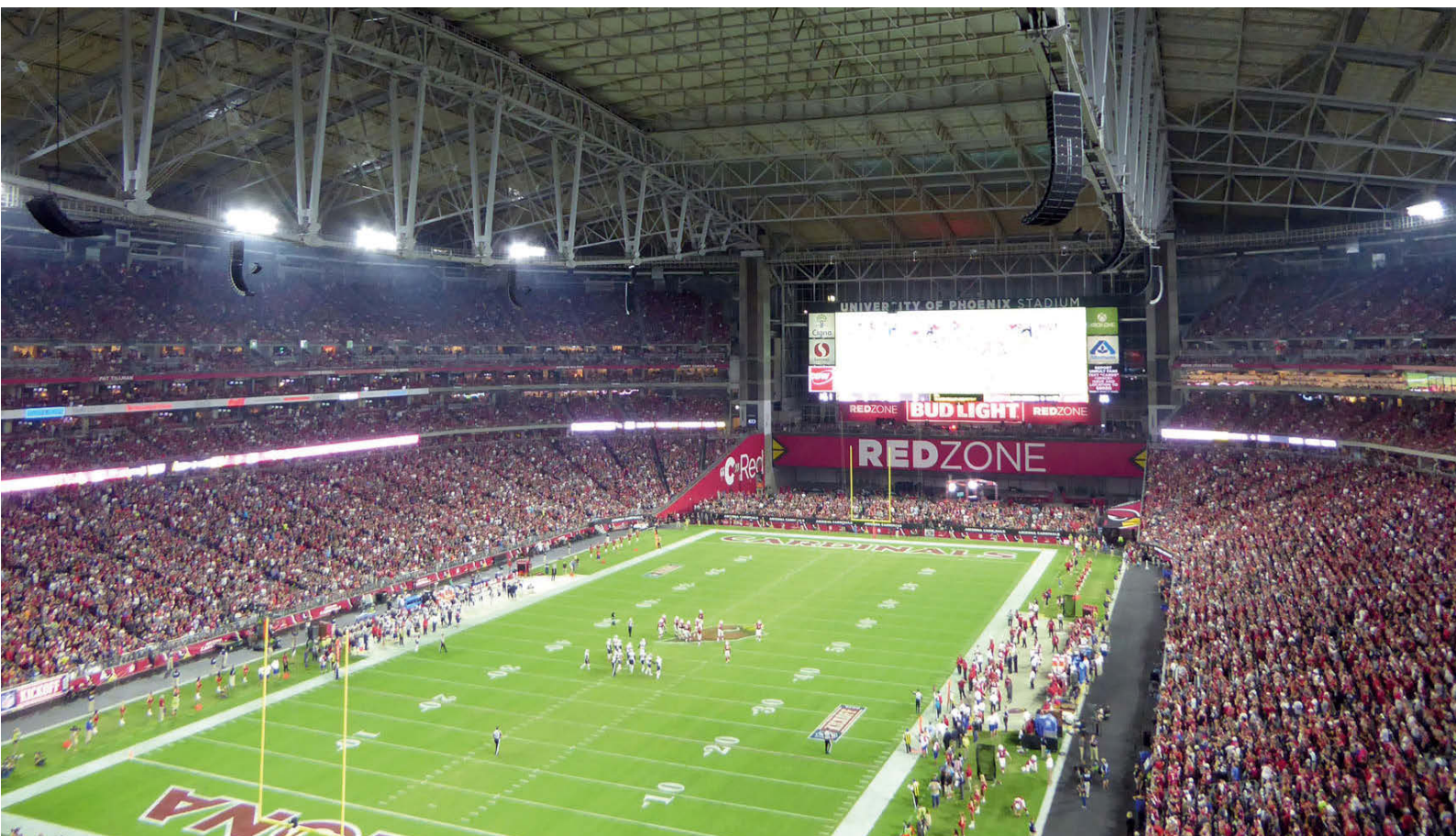
the world's highest profile tours, and sports venue managers are finding that they are uniquely adapted to their requirements.

Their controlled directivity over the wide frequency range needed for concert music, allows to focus the sound only on the audience area, avoiding the reverberant surfaces which so often cause intelligibility problems for stadia and arena. The benefits are twofold: maximising clarity and safety for voice announcement and maximising dynamic sound pressure levels for music and entertainment. ■



Lexington's Rupp Arena, home to the University of Kentucky Wildcats basketball team, is home to a new L-Acoustics K2 loudspeaker system





NFL Cardinals - University of Phoenix Stadium - Phoenix, AZ



RAPID ROI

SOUND SOLUTION FOR SPORTS VENUES

L-Acoustics systems are renowned for their uniform, full-range, natural sound. Our flexible, lightweight systems project crystal clear sound onto your audience. From top to bottom, your fans will hear great sound that puts them into the heart of your sports action. Their flexibility allows your venue to alternate seating configurations and event types and still achieve flawless sound. Let our systems help you achieve maximum ROI for your sports venue. www.l-acoustics.com

THINKING BIG

AFC Fylde's big ambitions show that it is not just clubs like Liverpool and Tottenham Hotspur that are looking at how to create modern stadiums to maximise income and give fans a 21st Century sporting experience.



AFC Fylde have been settling into their new 6,000 seater stadium at **Mill Farm Sports Village** in Lancashire, UK, this season.

And it is so far so good as they are the runaway leaders of the Vanarama National League North.

The aim for the football club was to create a "Premier League set-up", scaled to suit the dimensions of the new stadium and its ambitions.

The project includes a modern 2,000 all-seated main stand with supporters' bar, restaurant, nursery, executive boxes, offices and a function room.

Architect, design and masterplanning practice the **Frank Whittle Partnership (FWP)** has been involved in Mill Farm from day one – working with the club and owner David Haythornthwaite both to shape the plans for the £25 million (£31 million) mixed-use development on the site and to create the new home for AFC Fylde.

FWP's experienced design and project management experts have a strong record of delivering vibrant and modern community-minded sports developments for clubs across the country.

And the ambitious Mill Farm Sports Village project on the Fylde coast in the

North West of England, which has been delivered from concept to completion by FWP's specialist sports multi-disciplinary team, is a striking example of that approach.

The original vision for the 32-acre site just off the M55 motorway and on the outskirts of the town of Kirkham was unveiled back in 2013. It included community sports facilities as well as new retail, leisure and commercial developments.

The masterplan also included a foodstore, a distribution centre with associated office space, a 63-bed hotel, petrol station and a public house.

AFC Fylde is an ambitious National League North club with a stated intent to achieve Football League status by 2022. The landmark main grandstand created by FWP has delivered a striking visual theme for the overall development.

The bold structural form rises from the solid base at ground floor level, the sweeping curve of the lightweight roof structure flows along the length of the playing surface, with the slender roof canopy appearing to float over the building below.

The building is of steel frame construction with concrete terrace

units to the pitch side seating areas. The steel frame and bracings are expressed above the roofline to emphasise the sweeping curve of the roof.

Semi enclosed terrace areas are created at each end of the building accessed from first floor level and sheltered by the main roof floating above.

The seating and standing areas within the four stands will satisfy **Football League** entry requirements and will effectively future proof the stadium design should the club be successful in securing promotion in line with its current aspirations.

A mix of cladding, glazed curtain walling and render has created a modern, robust and attractive elevational treatment to all facades of the buildings.

The Mill Farm Sports Village development has also been designed so that buildings, structures and landscape will be sustainable and durable and they are also adaptable and flexible in operation.

Brad Grime at FWP, led the design team that created the Mill Farm vision, and with it the prospect of hundreds of new jobs.

He spelled out the idea behind the project as: "A high-quality mix of



employment, sporting and leisure facilities. It is a well-thought out and considered plan, creating fantastic facilities for local people and bringing much-needed employment to the area."

The stadium also includes a 290 capacity cutting-edge sports bar, which will house 35 TVs across five distinct areas so every type of sport can be followed by fans simultaneously, an 80-seat restaurant with roof terrace, a 40 seat café and conference and event facilities across nine rooms.

David Robinson, managing partner at FWP, said the practice has worked closely with the football club throughout the process to create a vibrant and modern development that will be a real asset to the community and its economy.

He said: *"In all our sports sector work our aim is to deliver real destination venues for sport, leisure and entertainment for the whole of the local community, with real benefits for clubs and their supporters."*

"Our expertise is in developing modern facilities that will be used by members of the community seven days a week, throughout the year, something we believe is vitally important for modern day sports venues to provide."

"We first started working on the vision for a new home for AFC Fylde with David and the club a few years ago, originally looking at another site in the area."

"We then worked with the club and the local authority to identify other potential sites and came up with the vision for Mill Farm that you are now seeing being created."

More than 80 sports clubs throughout the country have benefitted from FWP's advice, with many of them going on to design and build modern new facilities. It also has a strong track record in the commercial and leisure sector.

The team is now working with **Scunthorpe United** to create a striking 12,000 capacity all-seater stadium for the Football League club.

It is part of the masterplan for a £25 million out-of-town football and leisure development for the club on a site near its present Glanford Park ground.

At **Forest Green Rovers**, FWP is working with the National League club's owners and green energy company Ecotricity to deliver a new 5,000 capacity stadium as part of a GBP£100m eco-friendly sports and green technology development. ■

SMALLER ARENAS

ME Engineers has designed more than 60 smaller scale stadia for communities, universities and minor league franchises. Our approach to designing smaller arenas takes lessons from all our previous experience and follows that of larger arenas. This is because the elements, systems, and needs are generally very similar, but with a few key challenges.

It can be more challenging to fit all of the same systems in the smaller spaces as the systems themselves, for the most part, don't get proportionally smaller. With the playing surfaces remaining constant and only the associated seating bowl capacity and associated support space requirements reduced, a smaller scale arena may require only half the cooling capacity of a full-scale arena with triple the seating capacity.

Lighting systems and controls are typically not as elaborate in smaller venues, but the sports lighting needs to support broadcast at the same quality as larger arenas. Because of the smaller seating bowls, lighting fixtures are mounted at lower heights and it's more challenging to prevent uncomfortable glare for players and spectators.

Finally, the uses of the venue determine a lot about capacities and maintenance needs. The types of events in smaller arenas vary more widely and it can be difficult to verify and accommodate requirements for all the events that will be hosted. All of these factors must be balanced to determine design choices.



The PPL Center in Allentown Pennsylvania seats 8,800. ME Engineers provided MEP, technology and sports lighting design.

STEADY AS SHE GOES

By adopting a phased approach, smaller sized sports venues can fulfil their dreams.

When embarking on, or even only considering, the possibility of a stadia or sports venue development, Clubs and/or stadia developers must have ambition and aspirations for the future, but these must be tempered by practicality and reality.

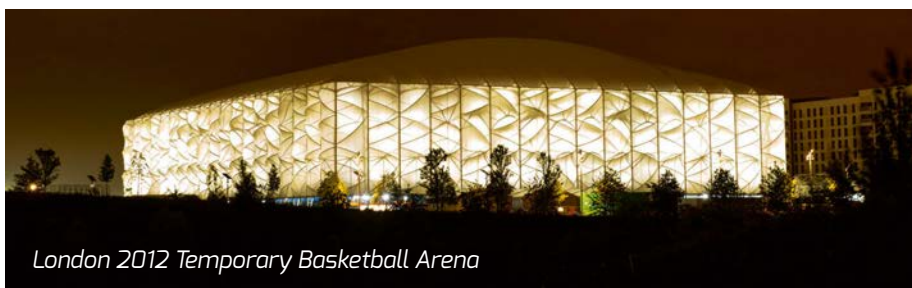
They must not be led solely by unrealistic fan driven ambition without a solid understanding of the underlying business case required.

That is not to say that the overall dream project cannot be achieved, but on occasion, it may require a stepped or phased approach.

Not every Club can have a wealthy benefactor to fund a new stadium or a developer incorporating one in a mixed use development.

McLaughlin & Harvey have been involved in the Design and Construction of more than 50 stadia projects over more than 20 years.

While these have included significant new stadia on brownfield sites such as **St Mary's** (32,500) for **Southampton FC** and **Langtree Park** (now known as the **Totally Wicked Stadium**) (18,000) for **St Helens RFC**, as well as the design of the **Kirkby** proposal (60,000) for **Everton FC**, the majority of the 300,000+ seats



London 2012 Temporary Basketball Arena

“We bring decades of experience to stadia design and construction, delivered with a passion to help clients achieve their goals and to the delight of their customers, without whom there is no business”

Barclay Chalmers, MD

provided to date have been in smaller stadia or individual stands within a large scheme developed on a phased basis.

As well as permanent sports venues they also have experience of temporary venues, in particular, the design and construction of the

London 2012 Temporary Basketball Arena, and have prepared designs for Euro Championships and World Cup bids. This allows an understanding of what can be delivered to suit the long term core business while recognising what can also be achieved by phased development or temporary overlay to suit specific events.

PHASED APPROACH

The scale of a project, large or small, should not diminish aspiration or invention. It is always possible to achieve an exciting or 'iconic' stadium so long as it is affordable and sustainable. This may necessitate a phased approach whether it be development of a new stadium or re-development of an existing one.

The new **Weston Homes Community Stadium** in Colchester (10,100 capacity) was completed in a single phase and awarded the RICS East of England Award and the Galvanisers Association Award. This stadium has the possibility to infill the corners in the future.



Langtree Park (Totally Wicked Stadium)





Weston Homes Community Stadium, Colchester



The Redevelopment of **Franklin's Gardens** for **Northampton Saints RFC** (12,000), however, was completed over several phases to a unified design. Phased development does not necessarily mean four individual stand-alone grandstands.

Often piecemeal redevelopment within an existing stadium means that the programme of development is longer because inevitably the sequence is dictated by the need to maximise

occupancies and business streams during the construction and therefore one area cannot be demolished until an equivalent new area has been completed.

This requirement to maximise revenue at all stages means that often parts of the ground are redeveloped sequentially rather than simultaneously.

Consequently, this can not only impose design and/or functional constraints on the scheme but also creates significant challenges for the construction team having to keep the remaining existing facilities operational at all times and not compromise safety of players, spectators or staff. »



« The most recent project in the McLaughlin & Harvey portfolio is the redevelopment of **Ashton Gate Stadium** for **Bristol Sport** to increase the capacity to 27,000.

This involved the demolition and reconstruction of two stands plus redevelopment and extension of a third, all during two playing seasons to provide a unified ground level concourse, allowing free access around three sides of the ground; extensive hospitality areas; players accommodation and a new upper tier.

As anyone preparing a business case for a stadium project should do, **Bristol Sport** researched their market and understood the competition in their catchment area while ensuring that the new facilities met their requirements, not only for their current market, but for a changing market in years to come.

FLEXIBLE SPACE

A range of different sized flexible spaces were provided which are capable of adaption, including the judicious use of movable partitions, for a multitude of different uses on a matchday, but more importantly non-matchday.

Stadium operators need to capitalise on the natural affinity businesses and the general public have towards sporting venues, and the Clubs they support, to host their business or personal events, whether that be concerts, weddings, dinners, conferences, trade fairs, product launches or demonstrations, team building days or training. Nothing should be out of bounds.

People want to support their Team or Club but the facilities and service provided needs to meet or better their expectations, and those of the local

competition, if they are to attract and maintain repeat business.

All areas of the stadium or venue should be reviewed for potential alternative uses, particularly for the playing area which can include concerts, ground sharing with other sports (football with rugby/rugby league) and/or clubs (lower league clubs hosting U18, U 21, U 23 or Ladies for other more senior Clubs).

This may require an enhanced pitch specification (fibre sand, Desso or 3G/4G) to cope with the additional usage. 3G/4G would also allow community use which is important in the context of revenue and potential grant aid.

In most cases, following redevelopment of a venue it is a much different business entity and requires a wholly different attitude and expertise to run it successfully. It is no longer a small operation run by a few staff, possibly on a part time basis, but a sophisticated facility which needs the appropriate commitment and calibre of staff to market it and run it efficiently as a 365 day business. It needs to become a 'must visit' venue in the local or regional area and be promoted as such.

GOOD BEGINNINGS

In order to achieve the best results from the outset the appropriate expertise needs to be brought on board, preferably the person who will operate it, to develop the brief and influence the design.

All too often the Hospitality/ Conferencing and Retail Managers, are appointed at the end, or at best, during the build when it is too late and they then have to compromise what can be done because of the facilities or accommodation available.

Attention to detail at the briefing stage ensures that the delivered project is the best it can be, whatever the procurement route. That extends from type, size, quantity and quality of accommodation through to kitchen/catering design, IT infrastructure and media facilities. This includes defining zonal control and servicing to ensure areas can be closed down when not required.

Unlike large stands or stadia where the geometry of the seating decks required to achieve the seating capacity generates floor area, small stands or stadia may only create limited floor space within the footprint or supporting structure.

As a consequence, the required concourse areas and other ancillary accommodation may need to be located in extended footprints with a net impact on costs.

Larger stands, however, may generate volume and potential floor space greater than initially required, consequently, these areas can be fitted out later when there is demand or sub-let to generate third party revenue.

Phased development over several years, unless procured as a single contract, as at Ashton Gate, risk never achieving the final goal. All too often the first phase is completed but the latter phases are cancelled or postponed and, as a result, the grand scheme remains unfinished.

If the business model is sufficiently robust for all phases of the development then the full development can be delivered, especially if the non-matchday facilities are successful then the scheme is less reliant on performances on the pitch and matchday revenue. ■



Ashton Gate Stadium

SITTING PRETTY

Stadia & Venue Safety Surfaces Ltd (SVSS) put the colour back into faded seats at Leicester City's King Power Stadium.

There is nothing better than sitting in your favourite sporting venue, watching your favourite team, in full sunshine.

However, when you are not there, a strange transformation occurs. Positively, the grass grows more quickly and more lush, but negatively, the permanent fixtures and fittings deteriorate.

This is definitely the case with stadium seating. Modern day seating incorporates chemicals to delay the effects of UV fade, however, every seat will succumb to colour fade eventually. Alterations in stadium design have resulted in a reduction of the effects, closing the aperture in the roof to focus the daylight on the pitch, rather than the seats, but even in low light levels, the process still occurs.

Traditional cleaning methods offer very little improvement and over the years the entire stadium changes colour. Historically, the only solution is replacement. This is costly and unfriendly to the environment.

As contractors within the stadium and arena environment, **Stadia & Venue Safety Surfaces Ltd (SVSS)** have seen these effects first hand, and after many years of research & development, can now offer a 'Real' solution, with 'Like-New' results. The restoration process has some common elements, to other similar solutions, but with the exception

of the specifically developed chemical treatments that restore the colour, sheen and elasticity of the plastic itself. No other system offers the same results!

Several projects have been undertaken over the last three years, with improvements in the speed of restoration, final finish and maintenance free durability. It is without a doubt the most affordable solution on the market, offering the same results.

LEAP FORWARD

The closed season of 2016 saw a major leap forward, with SVSS being appointed by **Premier League** Champions, **Leicester City**, to treat over 27,000 blue seats in the **King Power Stadium**.

The seats had been originally installed when the stadium was opened in 2002, but had faded from their original bold royal blue colour, to a pale blue/white shade.

The seats were treated in-situ, without any disturbance to other site operations during the closure, and the project was completed fully for the start of the 2016/17 season.

Visitors to the stadium during the summer were surprised at the



www.svssltd.co.uk

dramatic difference between old and refurbished seats.

Stadium management have remarked on the 'Like-New' appearance and subsequent television viewings provide an up-to-date review of the performance of the treatment.

SVSS are now pleased to offer this solution to the wider stadium operator audience, with several 'test' trials currently underway. The company is currently investing in several R&D ideas, thereby improving durability and colour fastness, along with process times, leading to even lower costs. ■

Stadia & Venue Safety Surfaces Ltd invite interested facilities to contact them, for a trial and demonstration of the system. This is provided nationwide and free of charge.

Tel: +44 (0) 1244 794105

Email: info@svssltd.co.uk





Amsterdam Arena
Credit: Jorrit Lousberg

NEXT LEVEL AUDIO

d&b audiotechnik helps deliver next level entertainment experience to the Amsterdam Arena

Home to **AFC Ajax, Amsterdam ArenA** is a world-class stadium and the preferred venue for the Dutch national football team's international fixtures.

As part of its ongoing upgrade, a new audio system has been installed.

Production Manager at Amsterdam ArenA, Tim Oosterop, said: *"Like our LED screens, or escalators, audio investment is not something you can charge for, it doesn't translate directly into revenue, but it does see the audience come earlier and stay longer. If they're here that's good for revenue, and makes best use of the facilities."*

"Ajax already has its own video production department and puts a lot of work into the pre-show environment. Entertainment is the key component and quality audio is a big part of delivering that experience."

Looking toward a new audio installation, Oosterop and Head of Technology Martin Wielaart defined three main objectives:

1. Compliance, specifically to **UEFA/FIFA** regulations for performance and intelligibility, and adherence to national and international safety standards for evacuation systems;
2. Addressing the atypical acoustics, difficulties that could not be solved – in realistic financial terms – through current construction techniques;
3. Enhance the stadium's reputation as a host of other entertainment events – especially concerts – with an acknowledged leading audio brand.

To address the requirements of safety and conformity the arena engaged the services of **RH Consulting**, a specialist practice that advised **LOCOG** for the **London Olympics in 2012**.

"Initially we created a specification document to cover both performance of the system, and compliance with the regulations, including Dutch national regulations," explained Roland Hemming of RH Consulting.

"The document was written in a manner suitable to a project as large and complex as this venue. We created three versions, one for the local safety authority, a second for the bidders so they knew how to comply, and a third for FIFA and UEFA."

Oosterop added: *"As far as the challenging acoustics of stadium venues are concerned, we wanted a system in place that allowed us to clearly show concert organisers, band managers and event promoters, that we had invested in, and made serious inroads to making it possible to achieve the highest quality sound."*

"For us that meant it was important to have an installed audio system from a brand name that is recognised as superior by the touring industry. Through our research we observed that for a significant number of years d&b audiotechnik has been identified as number one in the industry, with three other close contenders, all of whom were invited to tender."

Oosterop said the fact d&b's ArrayProcessing software interfaces



invisibly with the arena's existing MediaMatrix management system facilitated a simple and easily executed route to accommodating a variety of event formats, without compromise to safety standards.

"With what we have now, we can present acoustic models and predictive scenarios to provide those planning to bring their shows here. We have an audio infrastructure that allows them to plan for best sound. By having all the modelling software and associated data, we enable them the time and space to plan accordingly."

"The old system, in order to comply with evacuation regulations, had to be on 24/7 so that if you hit the evacuation button the response of the system was immediate."

"With the new d&b solution it can be off when not in use. At any time, 24 hours a day, 365 days a year, if you hit the evacuation button the system responds in half a second. Not only that, for smaller events where perhaps just part of the stadium is in use, the system is zoned, so we have default programmes within the evacuation control customised for us by Flashlight, that trigger the evacuation system to move people out zone by zone." ■

MAXIMISING FOODSERVICE OPPORTUNITIES



The Vollrath Company, LLC, based in Sheboygan, Wisconsin, has a reputation for the design, development and manufacture of the foodservice industry's finest smallwares, equipment and serving systems.

From community entertainment venues to collegiate and professional sports arenas, concessions are growing as facilities discover that an initial investment in foodservice equipment can pay off incredibly quickly.

In fact, concession profit margins in the NFL can reach 77%. But you don't have to manage a billion-dollar stadium to profit from guests' cravings. If it's time for an overhaul of your facilities – or you have the opportunity to design for a new venue – keep these tips in mind to make the most of your foodservice equipment.

Go Modular – Flexible modular equipment allows you to maximise a tight footprint and quickly make changes throughout the day. Have a Saturday double header? Switch your menu from one game to another with ease, and double your opportunity to catch fans with what they're craving.

Explore Portable Units – Movable units can allow you to adjust to crowd flow and alleviate backups at built-in concession stands. Perfect for multi-use venues, they give you increased flexibility and can help temporarily extend your concessions to outdoor areas.

Think Beyond the Hot Dog – Sure, a lot of sports fans will always look forward to a hot dog and a beer at the game, but many of today's fans are looking for the fresh and tasty options they experience outside the stadium as well. Explore serving systems that allow for fresh-built sandwiches, slow-cooked barbecue and local favorites. The **White Sox's** stadium serves Chicago pork chop sandwiches, while the **Seattle Mariners** delight with salmon sandwiches.

Bring in Existing Brands – From Andrew Zimmern's Canteen at the **Vikings Stadium** to David Chang's Fuku stand at the **Met's Stadium**, celebrity chefs are

making a big appearance at professional stadiums. Yet you don't need to play at this level to make the most of existing brand power. Look to partnerships with local restaurants and breweries that have an existing customer base and can attract your guests with branded carts and kiosks.

Seek an Experienced Guide – The most important tip to setting up your concessions – from a premium look on the club level to a simple beer and soda cart in the concourse – is to look at the whole picture and get input from a team that has built successful concessions facilities for others. With more than 30 years' experience building custom-designed carts, kiosks, serving lines and retail merchandising systems, Vollrath can share what's worked for other facilities and guide you through the process from initial concepts to installation. ■

www.weavingarchitecture.com

CEILING DESIGN WITH ARCHITECTURAL MESH

More than 10,000 m² of Haver & Boecker stainless steel wire mesh elements have been installed in the ceilings and walls of the new stadium in Krasnodar, Russia.

FC Krasnodar's new stadium in Russia, **Arena FC Krasnodar**, was designed by **gmp architects** from Germany and Russia's **Speech Architecture**.

The monumental façade of the elliptical stadium is a total of 43 metres high and covered with light-coloured travertine.

Still under construction, the stadium has already been nicknamed the "Krasnodar Coliseum", because its columns spread over three levels of the façade, which strongly resembles the ancient Roman Coliseum.

For the interior and exterior areas of the stadium the architects chose HAVER Architectural Mesh EGLA-MONO 5031, which appears, due to having one flat side, as a uniform metal veil on large surfaces.

6,800 m² of wire mesh was used on the 12-metre-wide partition in the outdoor area, which separates the public area from the stadium ground.

The up to 4.7-metre-long ceiling elements, made of stainless steel wire mesh, were folded by 90° and attached to painted frame elements.

The elements are removable and have different cutouts for various installations such as lamps, video cameras and loudspeakers.

In total, **Haver & Boecker** produced 1,627 wire mesh elements in 60 different element types with 916 individual cutouts for the outdoor area.

For the access balconies and the interior of the stadium more than 3,300m² of the HAVER Architectural Mesh EGLA-MONO 5031 have been used. 1,560 mesh elements with 202 different types of elements cover these areas.

DESIGN CONCEPTS

HAVER Architectural Mesh allows prestigious and at the same time functional ceiling design that can creatively be designed due to the structure, type of installation and illumination – from shimmering, via translucent to opaque, from cool and elegant to warm and discreet.

A comprehensive range of coarse and fine mesh, flexible and rigid mesh types as well as a wide range of different mounting possibilities offer options

for individual plans and exclusive design concepts.

HAVER Architectural Mesh, made of stainless steel, meets the highest demands for fire safety and due to the semi-transparency the function of ventilation systems, air-conditioning and sprinkler systems remains without restrictions. The wire mesh elements can be realized straight or wavy, in strained tracks or in removable elements. Also technical components such as lighting fixtures or sprinklers can be integrated into the mesh ceiling.

SINGLE SOURCE

The requirements for HAVER Architectural Mesh are as varying and individual as each project itself. Therefore Haver & Boecker offers comprehensive services in each phase of a project – from the first draft, to production and installation.

Based on expertise and more than 125 years of successful company history, today they are able to offer customers the benefit of their unrivalled experience, technology and know-how about wire mesh – and beyond. ■

Sitting well together...

Kotobuki Seating Group in Asia Pacific

KOTOBUKI SEATING CO., LTD. (Japan)



Tokyo Dome

KOTOBUKI KOREA CO., LTD. (Korea)



Cheongju University

TAIWAN KOTOBUKI CORPORATION (Taiwan)



National Stadium

KOTOBUKI SEA CO., LTD. (Vietnam)



Canadian International School

FERCO SEATING SYSTEMS (M) SDN BHD. (Malaysia)



Maracana Stadium

KOTOBUKI SEATING APAC PTE. LTD. (Singapore)



Singapore Sports Hub

K•O•T•O•B•U•K•I

www.kotobuki-seating.co.jp

Wherever you are, **whatever your venue.**

SITTING COMFORTABLY IN THE TOKYO DOME

Tokyo is a fast-changing city and in the run-up to the 2020 Olympics, Kotobuki is helping to change the face of the Tokyo Dome.

Japan's capital city Tokyo has a population of 13.6 million, which is equal to 10% of the national total, resulting in it being known as the city with the largest economy in the world.

At the same time, it is a historic city in which the unique culture and customs that sprang up during the pre-industrial period that lasted until 150 years ago, still thrive to this day.

As the **2020 Olympics** approach, Tokyo is reassessing its identity, preserving its past while remodeling the city and infrastructure at a rapid pace.

During the Edo period (1603–1867) the area that is now known as Bunkyo-ku was the site of numerous samurai mansions, an official academy (Yushima Seido), a herb garden, a sanatorium, etc., all of which were built by the shogunal government and after the westernisation of the country, these were turned into parks, universities, botanical gardens, etc.

Among them are scenic spots, such as the Koishikawa Korakuen and Koishikawa botanical gardens, and it was on a site next to these that Japan's first all-weather multipurpose stadium, the **Tokyo Dome**, was born in 1988.

Commonly referred to as the 'Big Egg', this stadium has a maximum capacity of approximately 55,000 (depending on the event).

Home to the popular baseball team, **Yomiuri Giants**, it is a mecca to baseball fans while also serving as the venue for numerous other large-scale events, including both sports and concerts, and has fostered people's dreams for over 30 years.

SEATING UPGRADES

Starting in January 2016, the Tokyo Dome began its first major refurbishment since opening for business. With a budget of approximately 5 billion yen (\$44 million), all the infield seating is to be upgraded, 481 new seats added behind the backstop, the arena lighting

converted to LED, the latest sound system introduced and the surrounding environment improved in a project to be carried out over a three-year period.

This major project is being undertaken to commemorate the 80th anniversary of the foundation of the operating company, the **Tokyo Dome Corporation**, but also it reflects the call to remodel the whole city of Tokyo in the run-up to the Olympic Games in order to better provide *omotenashi* (hospitality) to visitors from around the world.

The spacing between the new general admission seats that were installed in 2016 has been increased by 50% to provide more legroom, relieving the spectators from their cramped positions and facilitating access.

In order to achieve this without reducing seating capacity, new seats were designed with thinner, contoured backrests, providing room for the knees of the person behind while also offering firm back support.

Each individual is provided with 30% more space to improve comfort for a wide range of spectators, from families to westerners, who tend to be larger.

Thought has even been given to the small details; for instance, a knitted fabric has been applied to the seat and backrest to appeal to the rising numbers of women fans. In addition, the backrests are taller to prevent the movement of people in their seats during a game from distracting those sitting behind.

VIP TREATMENT

It is important to provide an environment in which people can concentrate on the most hotly contested games.

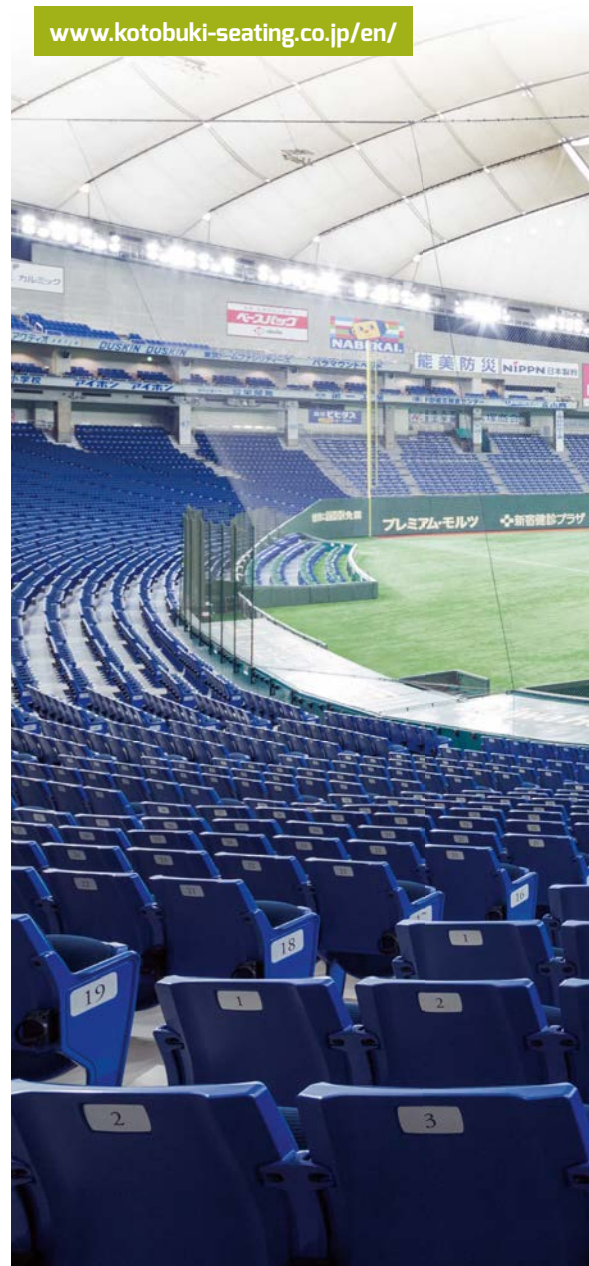
The area behind the backstop, which had previously been devoted to the press, has been opened to the public and fitted with seats that are one rank above the others. Upholstered in black leather cloth with orange stitching, the armrests utilise natural wood and

feature electrical sockets to cater for the recharging of mobile appliances. Special care has been taken with the cushion of the seats and backrests producing the same degree of comfort as theatre seats, making it possible for elderly fans to enjoy long matches.

From the 2017 season, the seats on the second-floor stand will be renewed, introducing seats with backrests 10 cm taller than in the past.

In addition, the number of popular 'Excite Seats', that are set in the field allowing the spectators to enjoy the game from

www.kotobuki-seating.co.jp/en/





approximately the same height as the players, will be increased to meet demand. A space has been set aside and surrounded by netting to prevent stray balls and allow people to bring their children with them without worry.

All these new seats embody **Kotobuki's** 'design for humans' concept. They are made to cater to a wide variety of spectators and embody of the traditions of the Kotobuki Seating Company, the first company in Japan to specialise in the production of furniture for public facilities.

With a history of over 100 years, their long experience and seat production technology have developed together with Japan's schools, theatres and stadiums, and it is no exaggeration to say that the current refurbishment has allowed Kotobuki to create 'a theatre-like stadium unequaled throughout the world'. ■



A NEW ERA BEGINS

Musco Introduces Total Light Control—TLC for LED™ Technology

Total Light Control – TLC for LED™

Prior HID Light Source

Musco's Total Light Control – TLC for LED technology allows athletes to track the ball better, while reducing glare in the surrounding environment.



For more than 40 years Musco's spirit of innovation has created an ability to control light in a way that's transformed sports lighting – responsible to the needs of facility owners, players and spectators, broadcasters, and the environment.

The company's industry-leading solutions have lit some of the most iconic venues, events, and moments in sports history, from **Super Bowls** and **Olympic Games** to **Little League World Series** and **Major League Baseball's All-Star Game**.

Now, with the introduction of Musco's Total Light Control – TLC for LED™ system, sports lighting around the world will never be the same.

CONTROLLING LIGHT AND PRESERVING DARKNESS

Musco has been designing LED systems since 2008. Its LED solutions have been installed at prominent landmarks like the White House and Mount Rushmore, as well as sports facilities such as the 567-hectare LakePoint Sporting Community, **Emirates Stadium**, **Twickenham Stadium**, and the training grounds for the **Premier League's Arsenal FC**, **Liverpool FC** and the **Championship's Fulham FC**.

"This new system achieves a level of light control never before possible,"

said Jeff Rogers, president of Musco World. *"It creates a special atmosphere, improves the experience for players and spectators, and brings an unmatched ability to eliminate glare and preserve darkness surrounding the venue. We're confident that when you see the performance of TLC for LED you'll be impressed."*

A PROVEN SYSTEM FOR SUPERIOR PERFORMANCE

This new system represents a visionary evolution of Musco's LED technology that achieves superior on-pitch lighting in a way that's cost effective and responsible to the distinct needs of everyone being impacted.

Coupled with Musco's system approach to lighting – which delivers streamlined installation and long-term reliability with surge and lightning protection, critical for the LED's sensitive electronic components – TLC for LED is ideal for retrofits, or as a complete solution in the form of the company's Light-Structure System™.

"This has been my first experience with LED lighting and seeing the functionality up close. All our interactions have been positive from the immediacy of which it powers up to the players' response on the playing surface,"

said Butch Thompson, Head Baseball Coach at Auburn University. **Samford Stadium – Hitchcock Field at Plainsman Park**, which is the home of Auburn University's baseball team, recently became the first venue to install Musco's TLC for LED system. *"This is my 25th year in coaching and this is far and away the best lighting I have ever seen at a baseball stadium. We feel like Plainsman Park now possesses the best lighting system in America and that is a big deal to us."*

ZERO MAINTENANCE COSTS OR CONCERNS

Musco backs TLC for LED with a long-term warranty – 25 years in the US, Canada, and Puerto Rico, and 10 years globally – that covers parts and labour, ensuring that customers won't have to worry about maintenance concerns or costs. And the company's Control-Link® system monitoring service provides 24/7 support and remote on/off controls via a website, call centre, and the Musco app.

"When you step onto a pitch with TLC for LED, it just looks better," Rogers said. *"With our knowledge of the science of controlling and applying light, this new system provides the best possible lighting in a way that's now affordable for typical recreational facilities."* ■



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



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FOOTBALL ACADEMIES: A KEY ASSET

A conference in Madrid will highlight the latest technology available to help support the smart management of football academies.



director11

TECHNOLOGY, GRASSROOTS & TRAININGS CENTERS
March 23 2017. Madrid



RAÚL PELAEZ
Head of Technology
FC Barcelona



ANTONIO JIMÉNEZ
Head of Technology
Real Betis Balompie



JOSE LUIS GARCÍA
Training Performance Manager
Villarreal CF



MATTEO CAMPODONICO
CEO
wyscout



LUIS VICENTE MATEO
Academy Manager
Valencia CF

One of a football club's most valuable and strategic assets is their football academy. This area of a club not only represents its values and history, but can also be the keystone for sustainable results club-wide.

Many have successfully managed football academies for years in regions where sports governance has a strong focus on children, but in other places there has been a deficit of best practices and productivity-increasing tools.

With the globalisation of the football industry, awareness of the importance of football academies has increased and become a top concern, right up there with fan experience in stadiums and television rights.

But football clubs have traditionally followed classic, procedure-focused manuals that are often misaligned with real life experiences.

Results have often failed to meet expectations, and academy opportunities have failed to materialise. Management of academies has become complex as data-driven decisions become imperative.

Spain is leading the management revolution by using technology in training centres.

It is no secret that the football talent attracted by this region is unparalleled.

In the last few years we have enjoyed a renewed international focus on the football academies of Spain, underscoring the fact that fundamental tactics employed by our teams are working properly.

Clubs around the world are starting to get interested in the infrastructure and technological needs to replicate the Spanish experience.

To this end, **Director11** is hosting a conference in Spain, to introduce

the latest technology available to support the smart management of football academies.

'**Technology and Academies**' will take place in Madrid on **March 23, 2017**, with more than 60 training centre directors, specialists, and technology providers in attendance. Five **LaLiga** clubs will present on their current experiences and future expectations.

'Technology and Academies' is supported by **INsports Europe**, the innovation lab agency based in Barcelona. It promises to be a unique opportunity for football clubs to share and discuss the impact that technology can have on data-backed academy management. ■

If you are interested in participating as a club or as a technology solution please contact oscar@insportsmanagers.com

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YOUR NEXT ISSUE

NEXT ISSUE
ADVERTISERS'
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The next issue of *PanStadia & Arena Management* magazine, our 2nd quarter (Q2) 2017 issue will include:

- **Collegiate projects under the spotlight**
- **LEED and sustainable stadia:** A showcase of LEED certified sports projects from around the globe
- **APAC projects showcase:** Leading industry suppliers explain about their role in key projects from around the region
- **Smart operations:** What operational changes can sports venues look to implement to improve efficiencies and reduce unnecessary spending?
- **Ticketing and access control up close:** The latest developments in stadium ticketing and access
- **The connected stadium model:** How to monetise your venue's technology investments
- **Roundtable, roofing solutions:** The latest approaches to fit all venue redevelopment and new build budgets
- **LED in focus:** The growing importance of LED technology in stadiums and arenas
- **F&B special:** From hospitality area design through to new ideas to maximise your fan experience and increase your bottom line
- **Venues in focus will look at Mercedes Benz Stadium:** A retractable-roof, multi-purpose stadium in Atlanta, Georgia; Diablos Rojos Baseball Park, Mexico – the new 13,000-seat home stadium will feature a lightweight steel roof with three pointed ends.
- **Bound in supplement:** *Playing Surface Buyers Guide* – Our guide to the leading service and product suppliers in all aspects of both natural and artificial turf projects.

Stadia&Arena



ASIA PACIFIC
12-14 SEPT 2017

Official Preview of Stadia & Arena Asia Pacific 2017



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WALTER P MOORE

ARCHITECTS
ENGINEERS
CONTRACTORS
PROJECT
MANAGERS
SPECIALIST
CONSULTANTS

“Sports structures are community cathedrals that demand uncommon experience, creativity, and personal commitment. Walter P Moore’s sports practice is focused to provide that on every project.”

Lee Slade P.E.
Senior Principal



Headquarters
Houston, Texas, USA

International offices
18 worldwide

Walter P Moore is a global practice of 600+ engineers, consultants, and creative people in 18 offices working worldwide as a single team to support the stadium and arena industry at the professional, collegiate, and municipal level. They offer a comprehensive suite of services in the fields of structural engineering and parking consulting for venues of all types. They focus on the structural design and stewardship of stadiums, arenas, and practice facilities for sport, with world-leading expertise in retractable roofs, long span structures, and multi-purpose venues. Walter P Moore also provide a comprehensive suite of solutions in parking and traffic engineering for venues to improve operations, revenue generation and fan experience.

By thoughtfully collaborating with owners, architects, and builders, they leverage our 85+ years of experience to create beautiful and cost-effective venues that open on time and stand the test of time. Their diagnostics specialists assess and solve the most challenging structural problems, including structural deterioration, failures, vibration, terrorist vulnerability and project litigation.

Major venues include **SunTrust Park**, **Daytona RISING**, **Kyle Field Redevelopment**, **University of Phoenix Stadium**, **Amway Arena**, **AT&T (Cowboys) Stadium**, **KFC Yum Center**, **Target Field**, **Marlins Ballpark**, **Reliant Stadium**, **Sports Authority Field**, and many more. They are active members of the International Association of Venue Managers (IAVM), and Stadium Managers Association (SMA) and founding members of the Association for Retractable Roof Operators Worldwide (ARROW.)

SERVICES

STRUCTURAL
ENGINEERING

PARKING
AND TRAFFIC
ENGINEERING

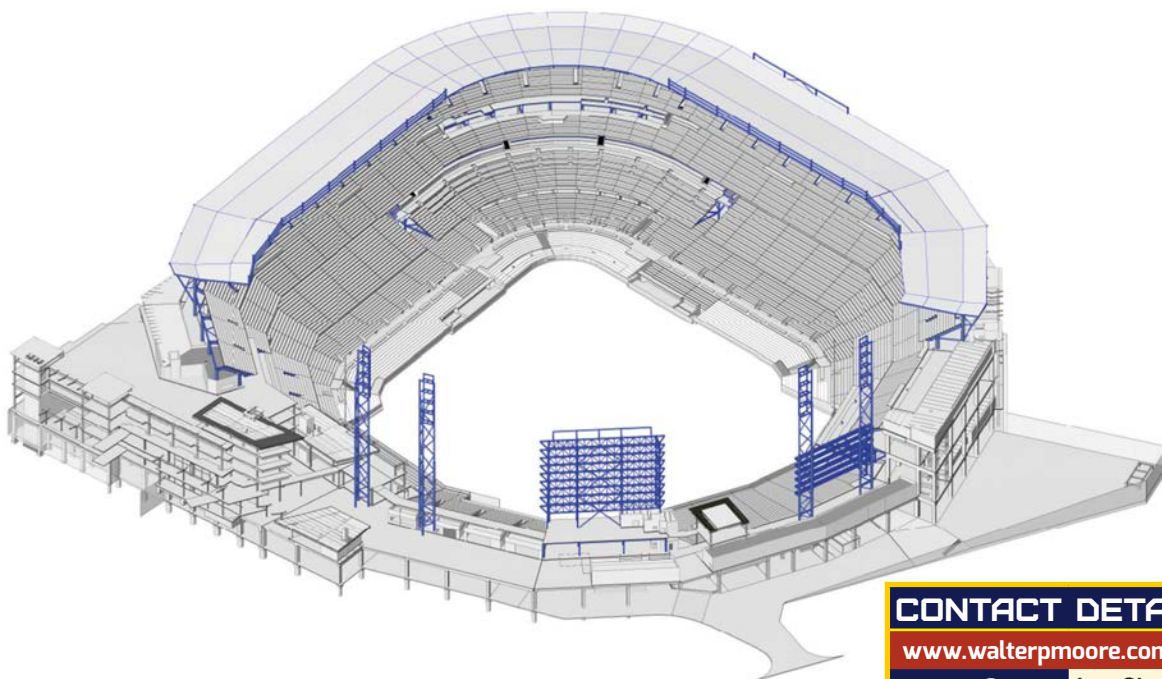
RETRACTABLE
ROOFS

LONG SPAN
STRUCTURES

MULTI-
PURPOSE
VENUES

Walter P Moore is providing structural engineering services for **SunTrust Park**, the new 1.2 million-sf home of the **Atlanta Braves**. The ballpark has 41,500 seats and is situated in the Cumberland/Galleria area of Cobb County, Georgia, USA.

The ballpark features the largest canopy in **Major League Baseball**. The large sunscreen above the upper deck enhances spectator comfort by providing significant shading during hot summer days. ■



CONTACT DETAILS

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TURNER & TOWNSEND

“ We create the community, not just the venue — we help clients successfully deliver programs and projects around the world, while strategically improving the surrounding infrastructure including: urban development/master planning, hotel & hospitality, residential & commercial development, retail, rail and airports. ”

Peter J. Ferzan,
Principal
New York/Global Sector Lead - Sports,
Leisure & Hospitality



Headquarters
London, UK

Sector headquarters
New York, NY, USA

Turner & Townsend provides expert programme management, project management, cost & commercial management and project controls & performance services to sports, leisure and hospitality clients.

Turner & Townsend is proud to have worked on many of the world's most prestigious sporting venues and events including the **Aberdeen Exhibition and Conference Centre (AECC)**, the **2012 London Olympics** and **Summer Paralympics Games (London)**, the **2015 Pan Am Games** and **Parapan American Games (Toronto)**, among many others.

With a wealth of experience in the sector, Turner & Townsend provides technical due diligence for new acquisitions, strategic event planning for new projects, management of the design & construction for new builds and the repositioning/renovation of existing venues.

Not only do they provide services for the actual venues/events, they uniquely provide the required expertise for the development of the surrounding and supporting infrastructure including airports, rail, urban development, retail, hotel & hospitality and new residential and commercial development.

SERVICES

PROGRAMME MANAGEMENT

PROGRAMME STRATEGY &
SET-UP

PROJECT MANAGEMENT

COST & COMMERCIAL
MANAGEMENT

PROCUREMENT AND CLAIMS

CONTROLS & PERFORMANCE

HEALTH, SAFETY &
WELLBEING

TECHNOLOGY & DATA

ADVISORY

Turner & Townsend is currently working with **Henry Boot Developments**, to deliver the new **Aberdeen Exhibition and Conference Centre (AECC)** in Bucksburn, Scotland. The 150-acre site will accommodate the new AECC along with substantial hotel, leisure and office accommodations, which they are also managing. The new AECC facility will be a flexible venue, hosting world class exhibitions and a wide variety of entertainment events. Hotels will provide much needed accommodations and a municipal park will be created with new recreational facilities for the public. ■

CONTACT DETAILS

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Turner & Townsend

30 stadiums

21 arenas

9 golf courses & sports clubs

8 major sporting events

8 rail, roads & airports supporting sporting events

7 conventions & performing arts centres

5 masterplans

We are an independent professional services company. The team behind the creation, operation and delivery of many of the world's largest projects and programmes in infrastructure, real estate and natural resources.

www.turnerandtowntsend.com

making the **difference**

SINK COMBS DETHLEFS

“ I continue to be grateful for the opportunity to work with great individuals and organisations where, together, we create state-of-the-art facilities that fulfill their vision and meet their individual needs. ”

Donald R. Dethlefs, FAIA
Chief Executive Officer



Headquarters
Denver, Colorado, USA

Regional offices
Chicago, USA; Los Angeles, USA;
Ann Arbor, USA;

For over 50 years, **Sink Combs Dethlefs** has been recognised as a leader in collegiate and professional sports facility and event centre planning and design. The 54-year-old sports architecture firm has worked closely with hundreds of organisations to create designs that meet the specific needs of the owners and users.

As a sports architecture firm, Sink Combs Dethlefs is unique. SCD's sports work encompasses a wide variety of project types (arenas, stadiums, athletics centres, competition venues, and training and practice facilities) for a variety of client types (colleges and universities, professional sports teams, municipalities, special districts and private developers).

The firm's diversity allows its principals and staff to transfer operational models and innovative design ideas between project and client types. With this diversity of knowledge as a resource, the firm focuses very specifically on the objectives and characteristics of each client and each project. From seating configurations and training rooms to luxury clubs and concourse configurations, the knowledge and expertise of Sink Combs Dethlefs is unparalleled.

With 250+ sports/athletic projects and 60+ event centres world-wide, the firm represents the best of sports architecture planning and design. Sink Combs Dethlefs is large enough to have designed some of the most successful college and professional sports facilities in the world and small enough to give each individual project the highest level of dedication and personal service, regardless of the size.

SERVICES

ARCHITECTURAL DESIGN
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RENOVATION DESIGN
3D GRAPHICS AND RENDERING
CAMPAIGN ASSISTANCE/
FUNDRAISING
INTERIOR DESIGN
MASTER PLANNING
PROGRAMMING AND SPACE PLANNING
LEED/SUSTAINABLE DESIGN
PEOPLE WITH DISABILITIES COMPLIANCE

Sink Combs Dethlefs has a number of unique and exciting collegiate sports facilities in the planning and design phase. **The Portland State University Stott Center Renovation & Viking Pavilion** project is being developed with **Woofter** to address the aging building, as well as modernise spaces throughout and add a multipurpose arena (Viking Pavilion) with modern fan amenities suitable for basketball, volleyball, academic symposiums, concerts, trade shows, dinners, graduations and other campus events. The Viking Pavilion will replace the rooftop tennis courts which will be relocated.

The High Point University Nido & Mariana Qubein Arena, Conference Center and Hotel, being designed by Sink Combs Dethlefs with Architectural Partners **CJMW** and **Mercer**, will be a new focal point on the prestigious campus. 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. ■



CONTACT DETAILS

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SINKCOMBSDETHLEFS
ARCHITECTURE DESIGN

outstanding sports architecture



“ Our passion for good design is unwavering and we have always been excited to work with architects who are pushing the boundaries to help them realise their most ambitious projects.”

Dan Harvey,
Executive Director,
Ramboll UK Ltd



Headquarters
Copenhagen, Denmark

Ramboll is a leading engineering, design and consultancy company founded in Denmark in 1945. The company employs 13,000 globally and with more than 300 offices in 35 countries, Ramboll combines local experience with a global knowledge base to create inspiring and exacting solutions that make a genuine difference to their clients, end-users and society.

Ramboll has experience that encompasses major sport stadia, leisure venues and entertainment destinations. Concentrating on delivering their clients' ambitions they maximise the value of new and reconfigured schemes through collaboration. Focused concepts minimise programme and maximise useable area, delivering exciting schemes that wow any crowd.

At Ramboll they recognise that the design of sport and entertainment venues has changed significantly over recent years. With a growing need to maximise revenue, venues require flexibility to host a varying cross section of events in addition to their primary use.

Sports venues can often be the catalyst for wider urban regeneration and hence need to be an iconic symbol or gateway to a wider development. The legacy of the venue is paramount; sports venues that deliver a shorter-term solution need to be designed responsibly to allow future adaption.

The need for innovative designs and solutions in this fast-changing market is stronger than ever. Ramboll's engineers and designers relish opportunities to innovate and remain committed to responsibly delivering exciting world class solutions – making Ramboll a winning partner.

Ramboll works across the areas of; Buildings, Transport, Planning and Urban Design, Water, Environment and Health, Energy, Oil & Gas and Management Consulting.

SERVICES

STRUCTURAL
ENGINEERING

MECHANICAL
ENGINEERING

ELECTRICAL
ENGINEERING

ENVIRONMENTAL
SERVICES

SUSTAINABILITY
SERVICES

FACADE ENGINEERING

FIRE ENGINEERING

ACOUSTICS

GROUND ENGINEERING

PLANNING & URBAN
DESIGN

TRANSPORT PLANNING

DISTRICT ENERGY

Ramboll is working on the **Tampere Arena** in Finland with **Studio Liberskind**, **Aihio Architects**, **City of Tampere** and **SRV Construction**. This high profile city centre mixed use development includes a 13,500 seat multi-purpose arena, 300 hotel room and 5 office and residential towers. Ramboll is the design partner in the development group led by SRV Construction providing multi-disciplinary design and consultancy services including arena concept design. ■

CONTACT DETAILS

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Ramboll is currently working closely with SRV Construction Ltd on Tampere Arena, a new urban development in Tampere, Finland. The stadium comprises 13,000 seat multipurpose arena, 10,000m² commercial space and 300 room hotel. The development also includes two 21 storey office and residential towers.

INNOVATION AND COLLABORATION (CREATING WINNING ENTERTAINMENT AND SPORTS VENUES)

Read more about Ramboll's experience and expertise in sport, entertainment and leisure venues. www.ramboll.com/sports

RAMBOLL

WITH 13,000 ENGINEERS, DESIGNERS AND CONSULTANTS, WE CREATE SUSTAINABLE SOLUTIONS WITHIN BUILDINGS, TRANSPORT, PLANNING & URBAN DESIGN, WATER, ENVIRONMENT & HEALTH, ENERGY, OIL & GAS AND MANAGEMENT CONSULTING.

PFEIFER SEIL UND HEBETECHNIK

“The Client is at the heart of our business. Our target is to win our customers' confidence by offering reliable service. Our performance to the Client is based on quality through competence. We are striving for innovation and new solutions. New solutions mean change. With the change we will shape the future.”

Thomas Hermeking
Senior Sales Manager/Senior
Proposal Manager



Headquarters
Memmingen, Germany

International offices
Dallas, USA; Doha, Qatar;
Shanghai, China; Singapore;
Madrid, Spain; Schifflange,
Luxemburg; Sateins,
Austria; Wroclaw, Poland

PFEIFER – The single source solution. Your creativity is in the best hands with them: You deliver the ideas, and they take them from concept to reality, efficiently and as cost effectively as possible without compromising design or engineering. The amount of knowhow and problem-solving expertise found at PFEIFER cannot be found anywhere else. Because at PFEIFER they bundle the knowledge from every single area of lightweight construction and funnel it into the implementation of your project. Whether stadium roof, façade or bridge, every lightweight construction is unique and should, therefore, be individually planned and executed. Their tailor-made solutions build the foundation for your project by utilising their abundance in services and skills.

PFEIFER Cable Structures Group is the result of a merger between its German parent company and internationally active experts from different disciplines of lightweight architecture. Cable systems from Germany, complex steel and tensile membrane from North America, membrane systems from China and well-engineered movable structures from Austria, are combined and aligned to work seamlessly with each other. Experienced project managers and their on-site technicians complement their international engineering skills. Altogether, this results in a turnkey offer with a one-of-a-kind exceptional quality in consulting and manufacturing found nowhere else on the market.

SERVICES
ENGINEERING
**SUPPLY &
INSTALLATION**
MAINTENANCE

As an expert for lightweight architecture the team of **PFEIFER** loves to be challenged by time-critical projects. PFEIFER has recently finished the roof upgrade for **San Mamés Stadium** in Bilbao in summer break, but also the refurbishment of the membrane envelopment of **Kuala Lumpur Aquatic Center**.

The next big challenge for the whole team at PFEIFER will be the refurbishment of **Mercedes-Benz-Arena** in Stuttgart. A new membrane envelope shall be installed on the roof within summer break of the German football league in August 2017, the cable net is still fine and will be used furthermore. ■



CONTACT DETAILS

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→ more information
cablestructures@pfeifer.de

PC SPORTS

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ENGINEERS
CONTRACTORS
PROJECT
MANAGERS
SPECIALIST
CONSULTANTS

“ Our purpose is to provide professional consulting services with passion and integrity, to help build a better world for our employees, their families, our clients and the communities we serve. ”

Paula Portz,
President



Headquarters
San Antonio, Texas, USA

PC Sports was founded in 2001 to provide owners with a single source of responsibility for oversight and management of the budget, schedule and development process for all types of modern sports/multi-purpose venues and entertainment districts, including arenas, stadiums, convention centres, hotels, parking structures and supporting infrastructure needs.

Every project managed by PC Sports over the last 15 years has finished on or ahead of schedule and on or under budget — PC Sports has never failed to complete a project assignment. The foundation of our firm is built on the over 39 years of experience of their parent company, **Project Control**, which pioneered project and program management services on all types of commercial projects from coast to coast. As an objective, third-party advisor they assist their client in evaluating and making decisions on a variety of issues involved with a complex project of this nature.

PC Sports/Project Control is a subsidiary of **Raba Kistner, Inc.**, a Texas based multidisciplinary firm with services encompassing project/program management, infrastructure consulting, facilities engineering, environmental, geotechnical engineering and construction materials testing, operating across the US and in Mexico. This provides PC Sports with a wealth of in-house engineering consulting and technical resources to address high-risk areas of a project.

SERVICES

PRE DESIGN PHASE

SCHEMATIC DESIGN
PHASE

DESIGN
DEVELOPMENT
PHASE

CONSTRUCTION
DOCUMENT PHASE

BIDDING &
NEGOTIATIONS
PHASE

POST
CONSTRUCTION
PHASE

CITY OF REGINA EXHIBITION DISTRICT EXPANDED WITH THE NEW MOSAIC STADIUM:

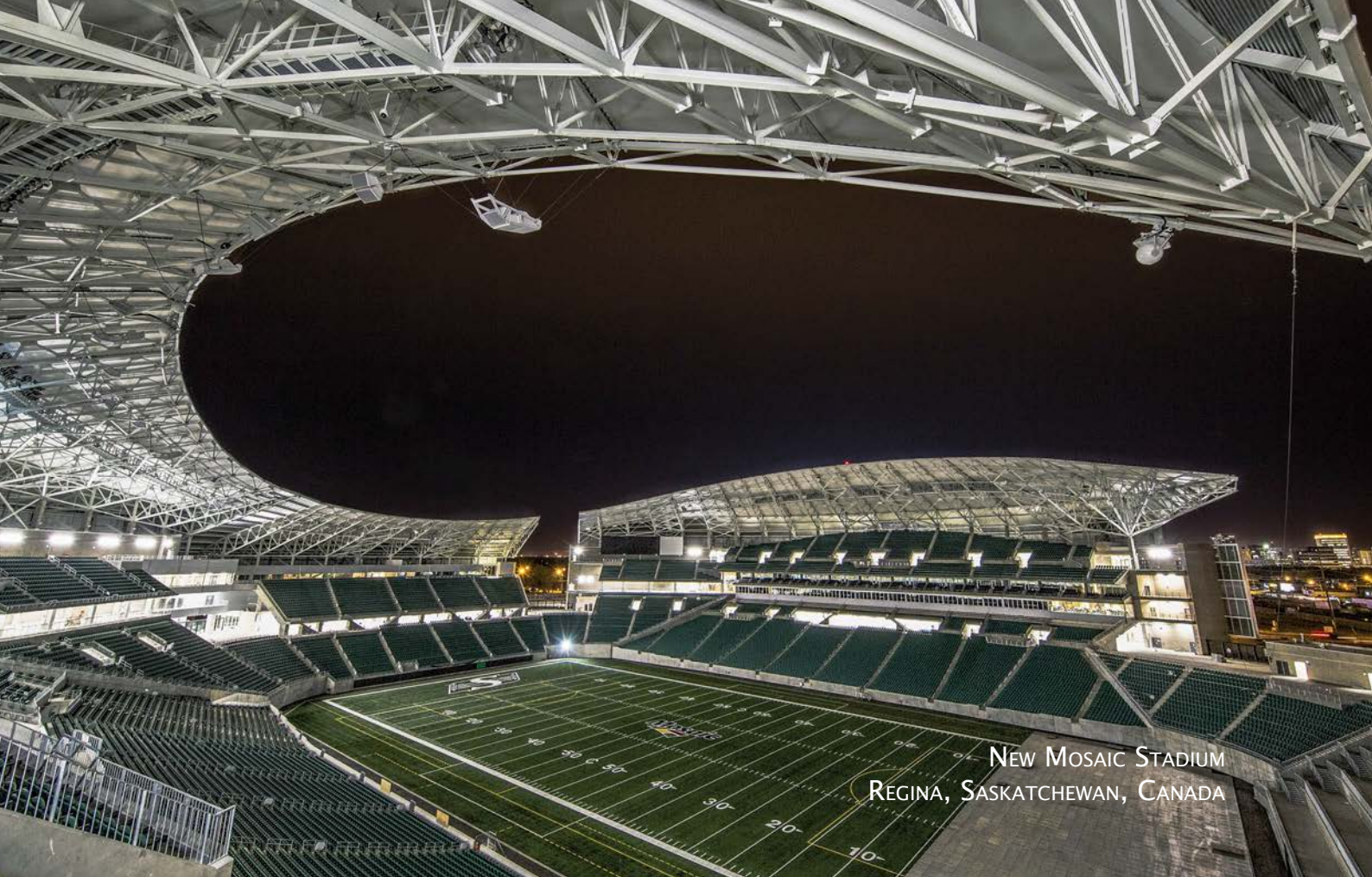
PC Sports, teamed with ZW Group, served as Owner's Representative on the new Mosaic Stadium, home of the Saskatchewan Roughriders of the CFL. PC Sports with ZW Group worked with the City of Regina throughout the design selection and P3 financing phases. The open-air stadium is located at Evraz Place, the city's exhibition site with multiple additional sports and event venues. The Manager of Stadium Development for the City of Regina stated, "The ZW/PC Sports team have represented our interests with a high level of knowledge, expertise and passion that was critical in the success of our project." ■

CONTACT DETAILS

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Contact Dawn Revell

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NEW MOSAIC STADIUM
REGINA, SASKATCHEWAN, CANADA

RC SPORTS

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KYLE FIELD REDEVELOPMENT
TEXAS A&M UNIVERSITY
COLLEGE STATION, TEXAS, USA

MOTT MACDONALD SPORTS BUSINESS

“ A core aim is to make a sustainable difference to the world we live in. That translates into a focus on understanding our clients and their customers, to deliver outcomes that add value. ”

Keith Howells,
Group chairman



Headquarters
London, UK

International offices
180 worldwide

Mott MacDonald Sports Business understand the key challenges many clubs and stadium owners face today: ageing facilities, increasingly demanding broadcast requirements, operational constraints, and changing demographics and social trends.

Their team can work closely with you to overcome these challenges and turn them into successful outcomes by identifying ways of enhancing match day and non-match day revenue generating opportunities.

In short, you can reinvent your stadium, cover the investment costs and secure new sustainable income streams to improve success on the field of play, whilst providing an improved fan experience.

A leader in this field

Mott MacDonald have an industry-leading approach to revenue-based design, which can also be used as an audit option when a new build project is already underway.

They begin by defining potential enhancements to a stadium that will match the vision of the club or owner and offer attractive returns to investors and developers. Next, using their in-house benchmark database and targeted market research and analytics, they assess the technical viability of upgrades against consumer demand and potential payback periods to create a strategic business plan.

Then they prepare a detailed business case that strikes optimum careful balance between revenue, operation and capital costs against community and elite sport requirements, ensuring the scale, affordability and delivery of a project will be 'right first time'.

SERVICES

FINANCIAL ADVISORY
ECONOMIC VIABILITY STUDIES
BUSINESS CASE SERVICES
REVENUE BASED DESIGN
REVENUE BENCHMARKING
SERVICES
VALUE MANAGEMENT SERVICES
OPERATIONAL ADVISORY
TECHNICAL ADVISORY
HOST CITY SERVICES FOR MAJOR
EVENTS & GAMES
MASTER PLANNING SERVICES
PROJECT MANAGEMENT
COST MANAGEMENT
RISK MANAGEMENT
PROCUREMENT ADVICE,
CONTRACT ADMINISTRATION

2018 ASIAN GAMES VELODROME, JAKARTA

Mott MacDonald and ES Global are innovating velodrome delivery in Jakarta to deliver more in less time. ■

Credit: Cox Architecture

CONTACT DETAILS

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“ To deliver a world-class velodrome building in half the typical time and budget, we had to look at the challenges from a fresh perspective. Our innovative temporary structure approach to the design and delivery of this permanent venue not only provided a rapid build programme but also reinvented the components of the water polo venue from the London 2012 Olympics. It has proven to be low cost, very fast and highly sustainable. ”



MOTT MACDONALD DESIGN SERVICES

“ A core aim is to make a sustainable difference to the world we live in. That translates into a focus on understanding our clients and their customers, to deliver outcomes that add value. ”

Keith Howells,
Group chairman



Headquarters
London, UK

International offices
180 worldwide

As an employee-owned management, engineering and development consultancy, **Mott MacDonald** have the independence and freedom of mind to see and do things differently.

Their design specialists and building engineers approach problems from a fresh perspective and think beyond conventional disciplinary boundaries to help architects and developers turn their imaginative and ambitious aspirations into reality.

They collaborate with clients from the earliest phases of a project to create detailed cutting-edge designs tailored to their specific requirements and providing optimum whole-life financial, environmental and social performance.

Heritage of sporting excellence

Mott MacDonald's pedigree in sport goes back more than 70 years. In-depth knowledge and experience, along with technical skills covering all aspects of stadia design and development, makes them the ideal partners to deliver world-class facilities and dynamic spaces.

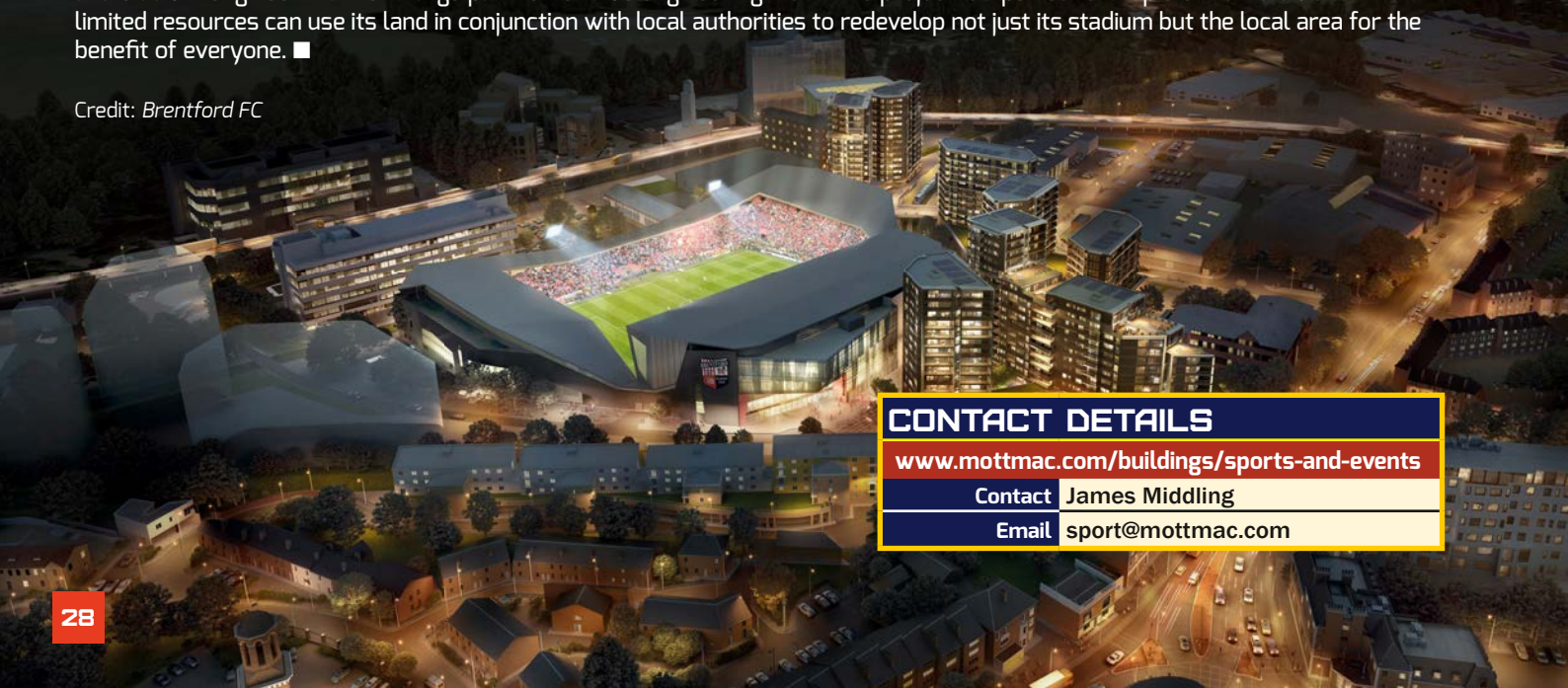
Their solutions provide world class experiences for the players, coaches and fans alike. By understanding what makes a great sports venue really work and the detailed needs of each user group they deliver amazing results. Their designs have built-in flexibility to accommodate variable fields of play for multi-sports venues and overlay designs for concerts, exhibitions and other events, adding value and enhancing the revenue generated and legacy of projects.

SERVICES

ENVIRONMENTAL AND SOCIAL
MASTER PLANNING
INTEGRATED TRANSPORT
CIVIL & STRUCTURAL
MECHANICAL & ELECTRICAL
BUILDING INFORMATION
MODELLING
TRAVEL & TRANSPORT
FEASIBILITY STUDIES
PROJECT MANAGEMENT
COST MANAGEMENT
RISK MANAGEMENT
TECHNICAL ADVISORY
VALUE ENGINEERING
PROCUREMENT ADVICE,
CONTRACT ADMINISTRATION

Brentford FC has been working on plans to deliver a new stadium in Brentford for the past 15 years and is currently collaborating with project partners to build the stadium and maximise the facilities around it. **Mott MacDonald** has been retained as cost adviser and stadium engineer thanks in large part to its value engineering work. The project is a perfect example of how a club with limited resources can use its land in conjunction with local authorities to redevelop not just its stadium but the local area for the benefit of everyone. ■

Credit: Brentford FC



CONTACT DETAILS

www.mottmac.com/buildings/sports-and-events

Contact James Middling

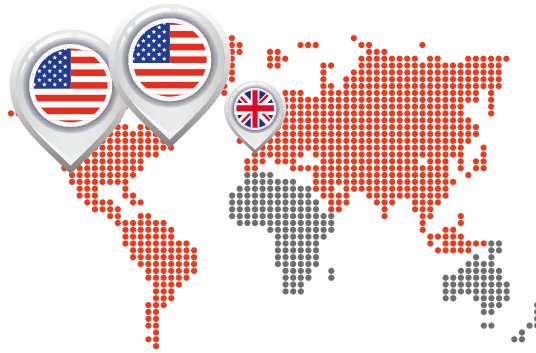
Email sport@mottmac.com

MEIS ARCHITECTS

ARCHITECTS
ENGINEERS
CONTRACTORS
PROJECT
MANAGERS
SPECIALIST
CONSULTANTS

“ Our practice thrives on a passion for innovation. We look for clients who want their projects to stand out from the competition and recognise the power of design to significantly enhance both revenue and fan experience. ”

Dan Meis, FAIA,
Principal & Founder



Headquarters
Manhattan, NYC, USA
Venice, LA, USA

International offices
London, UK

MEIS is a boutique design practice with offices in Los Angeles and New York that has specialised for years in the design of “experience and spectacle.” MEIS are led by Dan Meis, FAIA; an award-winning architect recognised as one of the leading innovators in the design of civic, urban, entertainment and sporting venues. With a focus on leveraging improved fan experience to generate additional revenues, their practice brings together some of the world’s most experienced and creative designers of this building type with a specific focus on regenerative transformation for urban environments, arenas, stadia and ancillary developments. They are out-of-the-box thinkers with an exploratory design mantra — always pushing the edge of what the notion of fan and player experience means to the events held within these spaces.

MEIS design buildings, spaces and experiences that become symbolic to their particular location; the postcard or “billboard” for their client and their clients, immersing visitors in a visceral and engaging experience of the brands they work with in order to maximise their clients’ partnership activation efforts. MEIS design buildings that are financially and environmentally sustainable and incorporate experiences that ensure ultimate flexibility and an annual, year-round, 24/7 place of destination.

With a focus on innovative design to both reduce cost and significantly improve the revenue potential of these spaces MEIS has been able to distinguish both itself and its clients, from the competition and can ensure unique and evocative design that will provide legacy, community and revenue to facilities across the globe.

SERVICES

ARCHITECTURE

INTERIORS

BRAND & SPONSOR
ACTIVATION

MASTER PLANNING

URBAN DESIGN

FAN EXPERIENCE

REVENUE MINING

With a focus on both intimacy and ‘home pitch advantage,’ **Stadio Della Roma** will be amongst the world’s most state-of-the-art football stadiums, integrating one of international football’s most tightly organised seating bowls with world-class amenities and technology. Intended to evoke one of Rome’s most beloved and iconic landmarks, the Colosseum, the design incorporates an ultra-modern, steel and glass stadium, wrapped in a stone ‘scrim’. This modern colosseum will anchor a 365-day-a-year destination of shops, restaurants and bars, including a Team Superstore and an interactive **AS Roma** Hall of Fame. Situated just north of the stadium will be a state-of-the-art training and wellness facility dedicated to AS Roma’s first team training. Working together as a cohesive and synergistic sports and entertainment complex, Stadio Della Roma will take its place as Rome’s newest iconic destination and a dynamic new home to the world’s most passionate football fans. ■

CONTACT DETAILS

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STADIUM DESIGN



REVENUE MINING



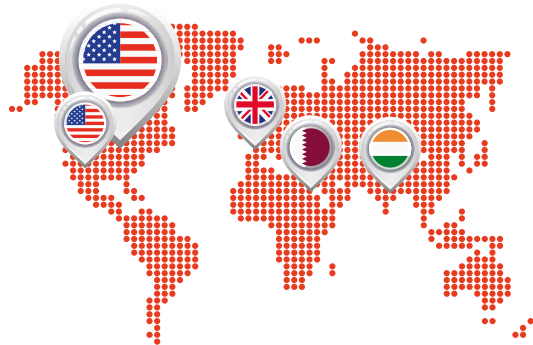
CLIPPERS SEASON TICKET CLUB



ME ENGINEERS

“ At ME Engineers we blend cutting edge technologies with proven delivery and service to look for solutions that respect and learn from the past yet help push our buildings to new levels. ”

Michael Hart PE
Principal and CEO



Headquarters
Denver, Colorado, USA

Regional offices
Colorado Springs, Colorado USA;
Dallas, Texas USA; Houston, Texas
USA; Kansas City, Missouri USA; Los
Angeles, California USA; New York,
New York USA; San Diego, California
USA; Tucson, Arizona USA

International offices
Chennai, India; London, UK;
Doha, Qatar.

ME Engineers is a global mechanical and electrical engineering design firm, founded in 1981, whose portfolio includes some of the most recognised buildings in the world. They draw from their rich experience and deep knowledge base to develop extraordinary solutions to common and emerging design issues. What sets them apart is a collaborative approach that is scalable from small projects to complex domestic and international commissions. They assemble teams made up of their sector experts and local talent and resources, to deliver projects anywhere in the world.

ME Engineers are consistently ranked among the greenest firms in the industry. Their commitment to sustainable design goes beyond specifying the most energy efficient systems; they are energised to work proactively with other project consultants to develop design strategies and a framework for bringing them into practice.

ME Engineers is continually innovating techniques and working to improve their results with each project. They seek the optimal balance of performance, value and cost. Their greatest satisfaction comes from helping you to achieve your objectives and exceeding your expectations.

ME provides a full range of mechanical and electrical consulting services as well as LEED consulting, technology systems design, commissioning services and lighting design.

SERVICES

ENGINEERING
MECHANICAL
ELECTRICAL
PLUMBING
ARCHITECTURAL
LIGHTING
SPORTS LIGHTING
LOW-VOLTAGE/TELE
DATA SYSTEMS
SUSTAINABILITY
CONSULTING
COMMISSIONING
ENERGY MODELLING

In Spring 2017, **ME Engineers** is celebrating the openings of two major venues: **Royal Arena** in Copenhagen and **SunTrust Park** in Atlanta USA. **Royal Arena** follows the Scandinavian design tradition of quality and functionality, with an extremely flexible event space for hosting a wide variety of events and public spaces that activate the surrounding community. **SunTrust Park** features state of the art fan amenities, with seating closer to the action than at any other ballpark and a canopy with air circulation to keep fans cooler during the hot Atlanta summers. ■

CONTACT DETAILS

www.me-engineers.com

Contact Laura Schindler

Email laura.schindler@me-engineers.com





PERFORMANCE	175	14	5	130
INNOVATION				
EXPERIENCE				
	SPORT STADIUMS	COUNTRIES WORLDWIDE	OLYMPIC GAMES	MM YEARLY SPECTATORS

McLAUGHLIN & HARVEY

ARCHITECTS
ENGINEERS
CONTRACTORS
PROJECT
MANAGERS
SPECIALIST
CONSULTANTS

“ We bring decades of experience to stadia design and construction, delivered with a passion to help clients achieve their goals and to the delight of their customers, without whom there is no business. ”

Barclay Chalmers, MD



Headquarters
Paisley, UK

McLaughlin & Harvey (McL&H) have a long and successful track record in the design and construction of stadium projects with more than 50 projects successfully completed over more than 20 years. While these have included significant new stadia on brownfield sites such as **St Mary's** for **Southampton FC** and **Langtree Park** (now known as the **Totally Wicked Stadium**) for **St Helens RFC**, as well as the design of the 60,000 seater Kirkby proposal for **Everton FC**, the majority of the 300,000+ seats provided to date have been in small stadia or individual stands developed within operational stadia. As a result, McL&H are acutely aware of the issues and demands of stadium operators, the impact upon the construction activities and the need for cost-effective solutions while delivering the client's aspirations.

As well as permanent sports venues they also have experience of temporary venues and temporary overlays, such as the design and construction of the **London 2012 Basketball Arena** plus **Scotstoun Stadium**, home of **Glasgow Warriors** and the **Tollcross International Swimming Centre**, the main aquatic venue, in Glasgow for the **2014 Commonwealth Games**.

Their considerable experience allows McLaughlin & Harvey to understand what can be delivered to suit the long-term core business while recognising what can also be achieved by phased development or temporary overlay to suit specific events.

McLaughlin & Harvey welcome the opportunity to be involved in the early stages of projects to offer advice on buildability, programme and costings to help save potential clients abortive costs.

SERVICES

EARLY
CONTRACTOR
INVOLVEMENT

DESIGN

BUILDABILITY
PROGRAMMING

COST ADVICE
CONSTRUCTION

CONTACT DETAILS

www.mclh.co.uk

Contact David Stobie

Email David.Stobie@mclh.co.uk

Langtree Park, St Helens

THE WINNING TEAM IN STADIA CONSTRUCTION



The experience gained from over fifty completed schemes in the sector provides our clients with confidence and reassurance in our ability and expertise

www.mclh.co.uk | 0141 848 8000



McLaughlin & Harvey

“The KSS philosophy is to deliver truly unique, bespoke sports projects, which put the fan experience first whilst delivering sound commercial advice and design to our clients.”

Andy Simons
Founding Director



Headquarters
London, UK

KSS are a 95-strong chartered architects, interior design and graphics practice, formed in 1991 and based in Central London and Sevenoaks, Kent.

The company is one of the leading sports architecture practices, at the forefront of innovative design research and technology in stadium design and other sports and training buildings. They have a reputation for providing high quality design backed by sound commercial judgement and a client focused professional service.

Their work covers a full range of sports design consultancy services, from strategic master planning, architecture, interior design and brand development through to specialist advisory consultancy. They continually research best practice and evolving technologies across the globe to ensure that their projects continually improve.

With over 25 years of working within the sporting environment to maximise revenues, they have accrued a valuable knowledge of the peripheral activities that support a stadium's long term viability.

Currently, they are working on a range of projects both domestically and internationally including a **Qatar 2022 FIFA World Cup** stadium in Al Rayyan.

KSS were recently voted 'Best Professional Business Serving Football' at the prestigious **Football Business Awards 2016** for a second year running.

SERVICES

MASTER
PLANNING

ARCHITECTURE

FULL DESIGN
SERVICE

INTERIOR
DESIGN

GRAPHIC DESIGN

3D
VISUALISATION

PROJECT
DELIVERY

SPECIALIST
TECHNICAL
ADVISORY

ANFIELD STADIUM EXPANSION, LIVERPOOL

The expansion of **Liverpool FC's Anfield** stadium sits at the heart of a new master plan which links Walton Breck Road to the historic Stanley Park, and forms part of a much needed wider regeneration of the Anfield area.

The phased expansion has increased the stadium capacity to just over 54,000. The premier Main Stand is now one the largest single stands in Europe, with a full range of facilities for general admission and premium seat hospitality.

The design reflects the owners' request to maintain the traditional four stand configuration, capture the unique spirit of the venue using club and historic references, and reinforce the intense Anfield spectator experience. ■



CONTACT DETAILS

www.kssgroup.com

Contact Dominic Fleming

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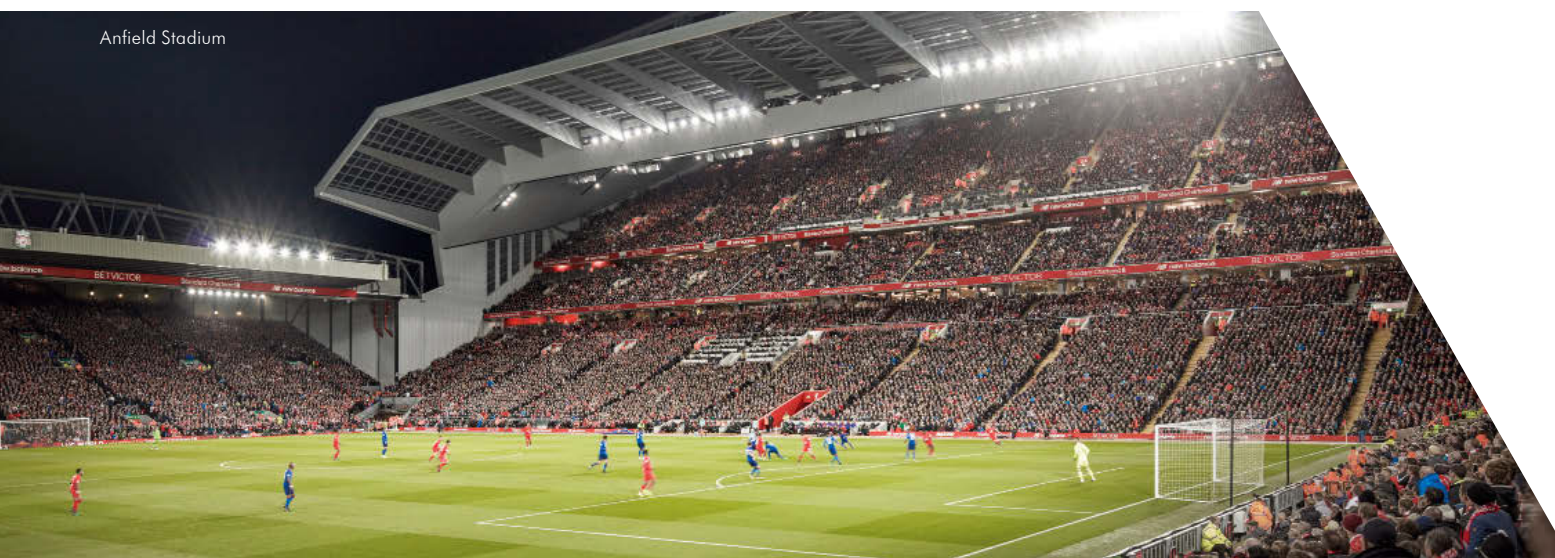
National Indoor Arena



Wimbledon No. 1 Court



Twickenham Stadium



Anfield Stadium

KSS

STADIA
ARCHITECTURE
HOSPITALITY
MASTERPLANNING
TRAINING CENTRES
DESIGN
TECHNICAL ADVISORY
ARENAS
KSSGROUP.COM

“ We are a creative practice, but ours is a value proposition. We are passionate about creating the highest value projects of their kind each time we have the opportunity to work with a client. ”

Bryan Trubey, *Principal*



Headquarters
Dallas, Texas, USA

International offices
25 worldwide including
Los Angeles, New York
Mexico City, London,
Dubai, New Delhi,
Shanghai

Venues of distinction that reflect the unique characteristics of both the location and the people who use them.

HKS create imaginative, engaging environments for sports, entertainment and leisure. For 78 years, we have nurtured a culture that reveres both invention and client focus.

The company has internationally known and recognised for the establishment and continued development of the modern day sports venue into an Entertainment Destination Project. This innovative approach to design has broadened the game-day experience for all patrons and uniquely addresses the specific needs of clients and their respective markets.

HKS's unique approach to Sports and Entertainment Architecture places it at the “cutting edge” in terms of transforming this major sector into a multiple revenue-generating industry. HKS and their clients are setting new standards and benchmarks for success in terms of venue performance. The **HKS Sports and Entertainment** design team consists of a diverse pool of professionals from the Sports, Entertainment, Hospitality, Environmental Graphics, Commercial and Urban Design fields. They are a highly motivated and dedicated group of individuals whose innovative design skills are matched by a sophisticated delivery capacity.

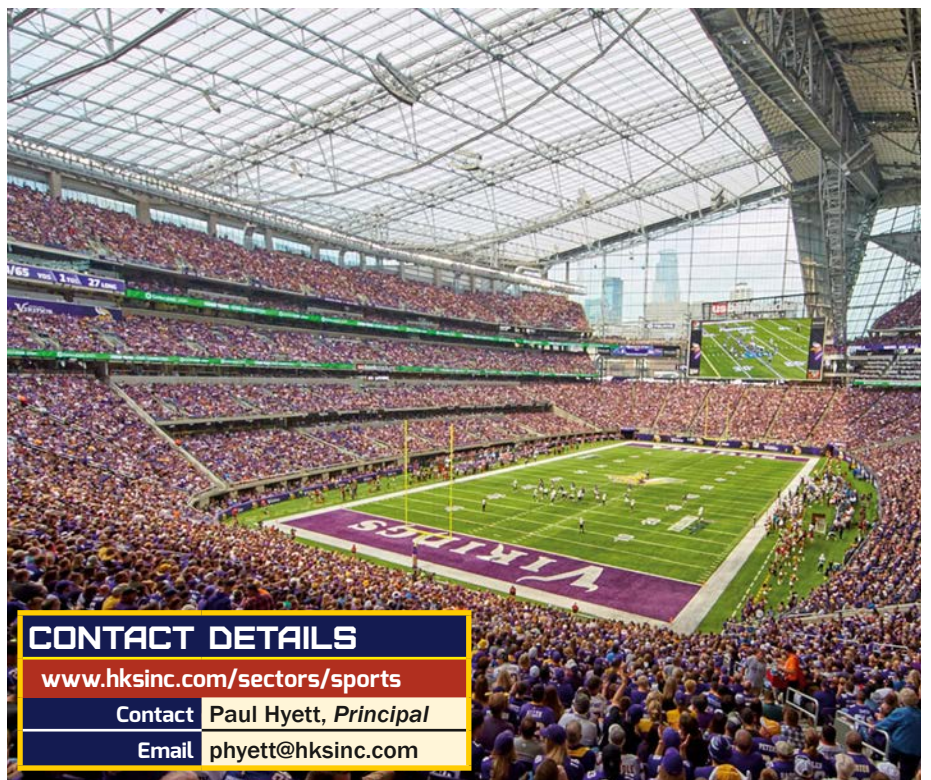
HKS is ranked by **BD&C** as the 12th largest architecture firm in the US. They have completed 36.2 million square meters of **LEED** registered and certified buildings including the world's first **LEED** Platinum certified new build collegiate football stadium. Headquartered in Dallas, HKS has a global reach with nearly 1,300 employees in 25 offices worldwide including Los Angeles, New York, Dubai, London, New Delhi and Shanghai.

SERVICES

ARCHITECTURE
INTERIORS
BRANDING
MASTERPLANNING
URBAN DESIGN
GRAPHIC DESIGN

MINNESOTA MULTIPURPOSE STADIUM, MINNEAPOLIS, MINNESOTA

The goal of the **Minnesota Multipurpose Stadium** is to create a building that welcomes all the people of the Twin Cities and the state of Minnesota. All of its patrons, its users and its neighbours can see themselves reflected in the design and materials – their climate, their character, their history, their experience. It provides an iconic venue for sporting and cultural events, while also offering plazas, parks and an observation platform that embraces the surrounding urban environment and can be used year-round. Within the stadium, the fan experience is heightened by a design that balances protection from the elements with a connection to the outdoors: operable doors providing views of the Minneapolis skyline and surrounding plazas. ■



CONTACT DETAILS

www.hksinc.com/sectors/sports

Contact **Paul Hyett, Principal**

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The top half of the image is a wide-angle, high-angle architectural rendering of the interior of a large sports stadium. The stadium is filled with spectators in the stands. The field is green with white yard lines and numbers. A large, curved, blue-lit structure hangs from the ceiling, resembling a giant's foot or a modern architectural element. The ceiling is a complex, glass-and-steel structure. The overall atmosphere is bright and modern.

HKS sports & entertainment

**LOS ANGELES NFL
ENTERTAINMENT
DISTRICT**
INGLEWOOD,
CALIFORNIA

CREATING PLACES THAT **ENHANCE** THE HUMAN EXPERIENCE

MARK A. WILLIAMS

AIA, LEED BD+C
MWILLIAMS@HKSINC.COM
+1.214.969.5599

PAUL HYETT

PPRI BA HONDART
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PHYETT@HKSINC.COM
+44 (0) 20 7292 9494



WWW.HKSINC.COM

HASSELL

ARCHITECTS
ENGINEERS
CONTRACTORS
PROJECT
MANAGERS
SPECIALIST
CONSULTANTS

“Contemporary sports and entertainment venues and recreation precincts require specialised, multifunctional design to cater for diverse events, participants and audiences. There is not a one-size-fits-all approach.”

Glenn Scott,
Principal and Global Sports and Entertainment Sector leader



Offices

Melbourne, Australia; Sydney, Australia; Brisbane, Australia; Adelaide Australia; Perth, Australia; Singapore; Beijing, China; Shanghai, China; Hong Kong; London, UK; Cardiff, UK

At HASSELL they believe the success of any modern sport or entertainment venue is about delivering ‘a great atmosphere which drives people to come back again and again’. To achieve this involves maximising the project's unique opportunities to amplify the greatest event experience possible.

Their holistic approach considers the integration of every detail to deliver a great event experience; it starts with travelling to the event which needs to be considered as part of the whole, the design of the approach and public spaces builds the event anticipation, the form of the seating bowl to amplify the event atmosphere, integration of the latest digital experience technology, the design and placement of food & beverage concessions along with diverse corporate hospitality options all act together to provide a multi-layered entertainment experience for all.

HASSELL judge the success of the venues and places they design by the way people use and enjoy them. For them the way people feel when they experience it, creating a sense of meaning, connection and belonging is what drives a successful venue.

HASSELL is a leading international design practice with studios in Australia, China, South East Asia and the United Kingdom. Their design values are shared globally across all the HASSELL studios, by the talented people who work in them: architects, interior designers, landscape architects, urban designers, planners and specialist consultants.

SERVICES

ARCHITECTURE
INTERIOR DESIGN
LANDSCAPE
ARCHITECTURE
URBAN DESIGN/
PLANNING

The multi-purpose 60,000 seat **Perth Stadium** on the west coast of Australia will be a world-class venue.

The commitment to a ‘fans first’ stadium has resulted in an innovative design ensuring an exceptional event atmosphere and home ground advantage that delivers an unsurpassed visitor experience.

The **HASSELL** design, in collaboration with **COX** and **HKS**, acknowledges Western Australia’s unique sporting, cultural and Aboriginal heritage, and the Sports Precinct landscape provides a spectacular vista across the Swan River to the city.

The multi-purpose stadium accommodates both sporting and entertainment events with the ‘bowl’ seating configuration maximising the atmosphere and increasing guest views from anywhere in the stadium. ■



CONTACT DETAILS

www.hassellstudio.com

Contact Glenn Scott

Email gscott@hassellstudio.com

HASSELL

Designing places people love.

www.hassellstudio.com



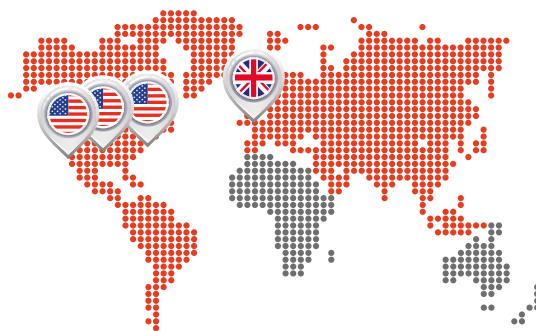
Perth Stadium, Australia
Stadium designed by HASSELL, in collaboration with COX and HKS

GENSLER

ARCHITECTS
ENGINEERS
CONTRACTORS
PROJECT
MANAGERS
SPECIALIST
CONSULTANTS

“A successful sports venue reflects its community, inspires participation, stirs emotion, and turns the home field into a home field advantage; Gensler believes in the power of design to engage the passion of sports.”

Ron Turner FAIA, LEED AP
Principal and Director of Gensler's
Sports + Recreation Practice



Headquarters
Los Angeles, USA
Washington, DC, USA
Dallas, USA
London, UK

International offices
46 global locations

Gensler Sports is grounded in the belief that great design optimises business performance and human potential. Networked across 46 offices worldwide, they use global perspective and local presence to innovate at every scale.

Gensler Sports is an industry leader committed to creating unparalleled experiences through collaborative venue design and placemaking. From stadiums and arenas to sports-anchored districts, Gensler achieves this by integrating their collective strength in mixed-use entertainment, creative media, hospitality, branding and graphic design to deliver project success, and never forgetting their foundation of functionality and flexibility.

Drawing on over 40 years of sports design experience, Ron Turner, FAIA, founded Gensler Sports to bring together a unique team of senior sports experts to deliver industry excellence. While headquartered in Los Angeles, these recognised thought leaders reside in their Dallas, Washington DC and London offices, bolstering their ability to deliver world class sports and recreation projects both regionally and globally.

Gensler's team counts the **NBA, NHL, NFL, MLB, MLS** and **Olympic** communities as long-time clients. Their practice is rooted in the drive to think differently about the design of sports venues and their surrounding districts, as well as the experience of each individual fan, athlete, and employee who passes through the gates. They don't just design great venues – They create places for great experiences.

SERVICES

ARCHITECTURE

INTERIOR
DESIGN

MASTER
PLANNING

BRAND
STRATEGY
& GRAPHIC
DESIGN

SUSTAINABILITY
CONSULTING

Gensler Sports is proud to be a driving force in the ongoing evolution of one of North America's fastest growing leagues, **Major League Soccer**. Following successful renovations to **BMO Field** for **Toronto FC**, **Gensler Sports** was selected by the **Los Angeles Football Club** to realise their new best-in-class **MLS** facility, **Banc of California Stadium**. Closer proximity to the field will create an engaging, European-style game day experience for fans. Currently under construction, **LAFC's** new home also breathes new life into **Los Angeles' Exposition Park**, creating a 365-day entertainment destination to support **USC** students, neighbourhood residents, and museum visitors beyond game day with new restaurants, clubs, conference space and retail elements. ■

CONTACT DETAILS

www.gensler.com/sports

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**THE PASSION
OF SPORTS.**
THE POWER
OF DESIGN.



Gensler

S P O R T S

ARCHITECTURE · INTERIOR DESIGN · BRAND STRATEGY & GRAPHIC DESIGN
MASTER PLANNING · SUSTAINABILITY CONSULTING · www.gensler.com/sports

GEIGER ENGINEERS

“ Our depth of experience and specialised expertise allows us to focus quickly on appropriate materials and systems to economically realise the architectural and programmatic goals of any arena project. ”

David M. Campbell PE
President



Headquarters
Suffern, New York, USA

Geiger Engineers has achieved international recognition for its innovative engineering of tensile structures, long-span roof structures and sports facilities. Geiger Engineers has unparalleled expertise in tensile membrane structures of all sizes, with a significant concentration of the firm's practice in long-span roof structures, both conventional and tensile membrane. In the specialised field of tensile structures, the firm provides membrane patterning for fabrication; erection and stressing engineering for construction; as well as design.

The firm has invented and developed a number of long-span structural systems renowned for their economy and has demonstrated its ability to optimise more conventional structural systems. They also consult to the entertainment industry, engineering stage rigging and special effects for entertainment events. This aspect of their practice keeps them abreast of the ever-changing technical demands these events make on arena and multi-purpose live entertainment facilities.

Their main office is located in Suffern, NY. They have successfully completed significant projects across the United States as well as in Taiwan, Japan, Canada, Germany, Korea, England, Malaysia, Australia and Saudi Arabia.

SERVICES

PUBLIC ASSEMBLY
SPORTS
ENTERTAINMENT VENUES
EVENTS

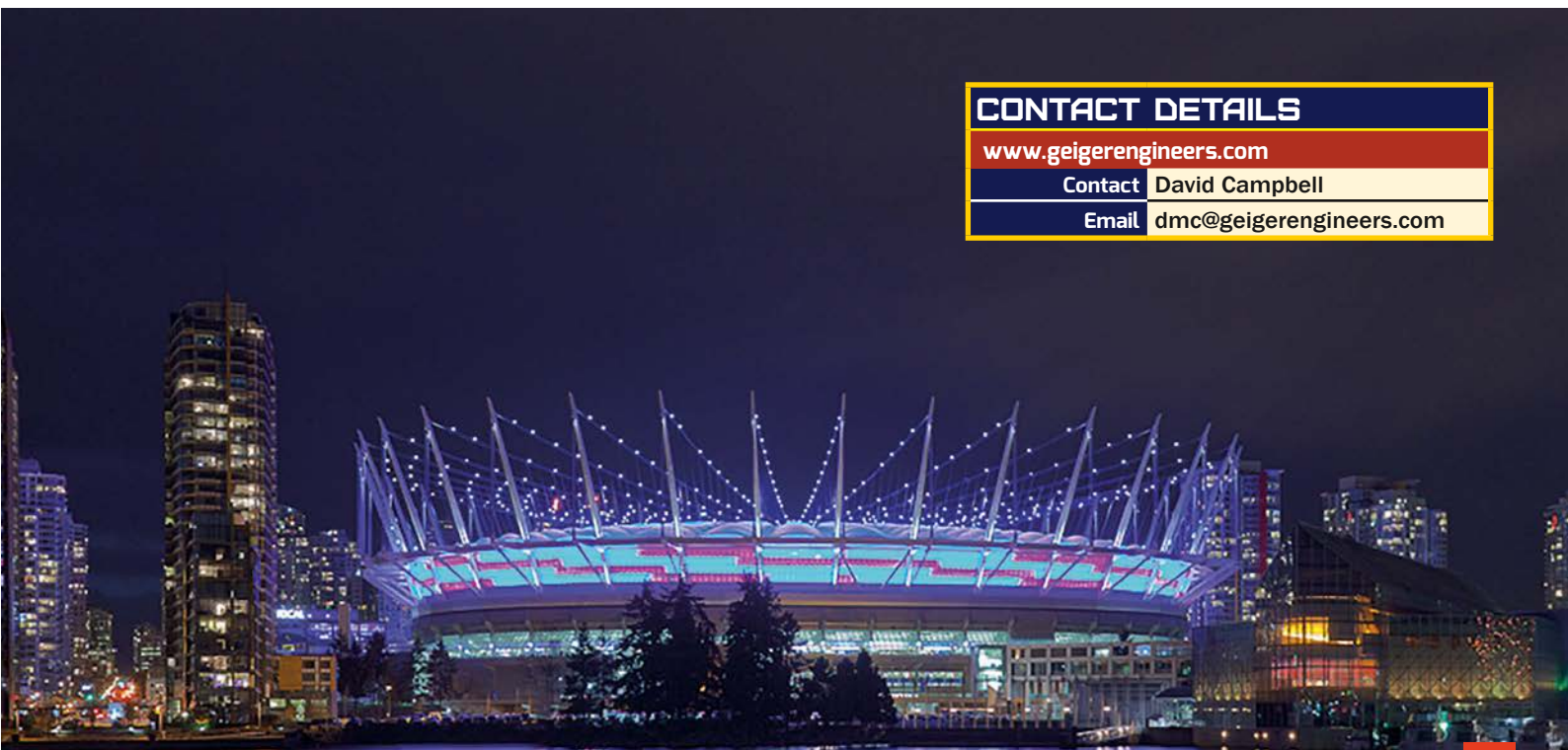
Geiger Engineers designed the mechanical systems that operate the new retractable roof on **Arthur Ashe Stadium**, the **USTA's** center court for the **US Open**. The roof consists of two retractable panels each covering an opening nominally 232 feet wide. These two panels move along parallel tracks mounted on the north and south edges of the fixed roof. The tracks are curved to match the roof's slightly arched profile which has a maximum slope of 20 degrees. Wheeled bogies sitting on the parallel tracks support and move the retractable roof panels. Closing and opening of the roof is achieved with a pull-cable winch system with cables operating between the winch and roof panels. Four sets of brakes can lock the roof panels at any point in their travel. ■

CONTACT DETAILS

www.geigerengineers.com

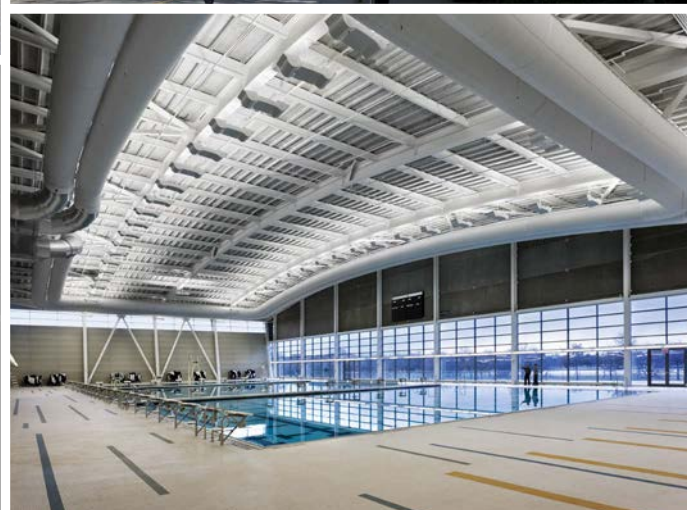
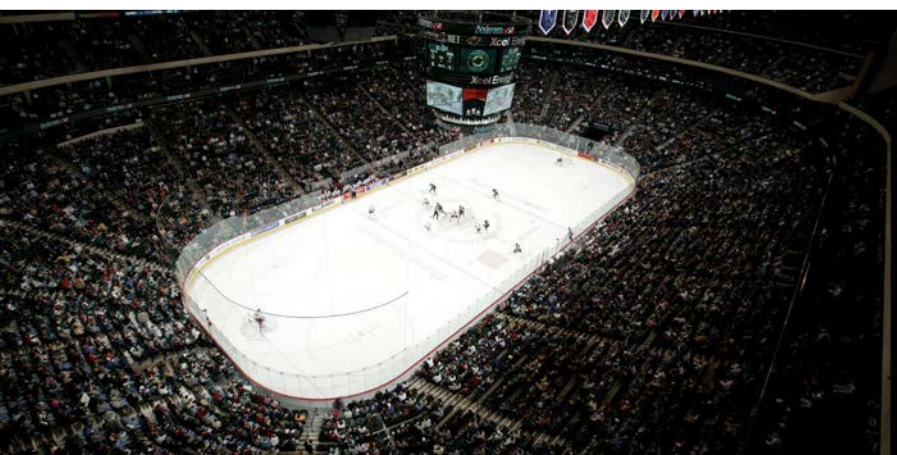
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Engineering Structures & Mechanisms for Sports and Entertainment



GEIGERENGINEERS

www.geigerengineers.com

COX ARCHITECTURE

ARCHITECTS
ENGINEERS
CONTRACTORS
PROJECT
MANAGERS
SPECIALIST
CONSULTANTS

“Great public buildings are intrinsically linked to the experience economy. The key factor to creating architecture of the experience economy is good design.”

Alastair Richardson
Sports Director



International offices
Australia (Melbourne, Adelaide, Brisbane, Canberra, Perth, Sydney) United Arab Emirates (Abu Dhabi, Dubai) and Malaysia (Kuala Lumpur)

Cox Architecture is at the forefront of design for the experience economy, delivering the next generation of stadia that will redefine the fan experience in ways never seen before.

They design buildings as destinations, like **Adelaide Oval**, **AAMI Park**, and **Rod Laver Arena** which bring people together to share experiences that are unique to each event, venue and precinct. What they bring to each of their projects goes beyond sports architecture — their innovative technology and structural design solutions place emphasis and value on the design of core elements.

Their dedicated sports team draws on their experience in hospitality, workplace and transport design to inform their public venue buildings with the latest thinking in connection and engagement. Currently working on a number of Australia's premier venues, including the **Eithad Stadium**, **North Queensland Stadium** and **Perth Stadium**, Cox Architecture is leading the way in delivering new facilities to re-energise venues and their opportunities for generating revenue. These venues exemplify the future of stadia, providing a connected and integrated technological environment while honouring the grounds' traditions and unique heritage.

Their innovative approach is recognised through prestigious awards including the World Architecture Festival Awards (National Maritime Museum of China), the AIA National Award for Public Architecture (AAMI Park), and the AIA Public Architecture Award (SA) (Adelaide Oval Western Grandstand).

Cox Architecture is one of the largest architectural practices in Australasia with over 400 staff working across the globe on projects of international significance. This experience is brought to each of their new projects to continually evolve stadia design and the experience economy.

SERVICES

ARCHITECTURE

INTERIOR
DESIGN

MASTER
PLANNING

URBAN DESIGN

Cox Architecture's design for the new **North Queensland Stadium** project in Townsville builds upon Cox's national and international stadia expertise and its recently completed **Queensland sports** projects, the **Anna Meares Velodrome** and the **Gold Coast Aquatic Centre**.

The North Queensland Stadium will deliver a world class facility that creates fantastic opportunities for growth and development in the region. Cox Architecture is proud to be leading the project team with local partners **9Point9 Architects** for what they know will be a 'game changer' for Townsville and the North Queensland community. ■

CONTACT DETAILS

coxarchitecture.com.au

Contact Alastair Richardson, Sports Director

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“WE CONGRATULATE ROD LAVER ARENA AND MELBOURNE PARK ON THE MOST SUCCESSFUL AUSTRALIAN OPEN YET”



total attendance at the 2017 event: 728,763

*Cox Architecture are leading
the Architectural team with
HKS to deliver the new Rod
Laver Arena Refurbishment*

contact - sports@cox.com.au
www.coxarchitecture.com.au

COX | **SPORT**

CORE FIVE

“ Since our inception we have created a business that is 100% focused on its clients and their projects. We have established a strong reputation for accuracy in our cost planning and the tenacity with which we engage the market when procuring construction work. Coupled with this, James and his team’s extensive relevant experience and expertise enables us to offer a truly unique and best in class service to our clients in the sports sector. ”

Stephen Pickersgill,
Founding Partner



Headquarters
London, UK

Headquartered in London, **Core Five** is an independent cost consultancy which was established in May 2012, founded by five former Partners of Davis Langdon. Core Five was established in response to feedback from their clients who were looking for an independent firm of construction and property consultants focused on giving a personalised, hands-on, commercially focused service. Seeing their role as creating certainty, Core Five ensures successful delivery by adding value to the project, managing risk and controlling cost whilst maintaining a strong focus on time and design quality. The firm are experts in sports & leisure, art & culture, residential, commercial and corporate real estate sectors, and has successfully delivered on numerous schemes with significant challenges and constraints. This proven track record and relevant experience makes Core Five well placed to make a substantial difference towards the way in which schemes are completed. Core Five are winners of **Building’s Construction Consultant / Surveyor of the Year** (fewer than 100 staff) for 2015 and 2016.

SERVICES

FEASIBILITY ESTIMATES AND COST
MODELLING
BENCHMARKING
COST PLANNING AND ESTIMATING
TENDER DOCUMENTATION
TENDERING
COST + BUDGET CONTROL
PAYMENTS + CASHFLOW
FORECASTING
FINAL ACCOUNT
EMPLOYER’S AGENT
FUND MONITORING / AUDITS
VALUE AND RISK MANAGEMENT

Core Five Sports Team has worked on a wide range of projects, from local and elite training and leisure facilities such as the **Lee Valley Ice Rink**, large multi-sport and concert venues such as the **Royal Arena** in Copenhagen, football ground redevelopment such as **Craven Cottage** and numerous new stadiums. The Core Five team has worked on worldwide sporting events such as the **FIFA World Cup 2002, 2006, 2010 and 2022**, and the **London, Rio and Tokyo Olympic & Paralympic Games**. ■

CONTACT DETAILS

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Core Five Sports Team

Expert stadium, arena and
leisure cost management



This dedicated sports team has over 50 years of stadium, arena and leisure experience. Core Five is an independent firm of cost consultants, focused on delivering exceptional client solutions.

ARUP SPORTS VENUE DESIGN

“ Our approach to design innovation intensifies the event experience, digitally, spatially and emotionally, creating outstanding venues for people and an inspiring stage for performers and athletes. We bring a great depth of venue expertise and design quality at every scale, from the seat to master plan, to create incredible stadiums and arenas for sport and entertainment. ”

Paul Brislin,
Director



Headquarters
London, UK

Regional offices
Worldwide

Arup's Sports Venue Design specialists have a proven track record in the design and delivery of major sports venues throughout the world. Their team has been an integrated part of the design of many iconic sports venues, where they have provided expertise ranging from specialist bowl and sports venue architecture, through numerous sport engineering disciplines to the design of the field of play itself.

The team's extensive experience offers organising committees, architects, contractors and event operators a range of integrated multi-disciplinary solutions that resolve the complex relationships specific to major event venues.

Their holistic design approach has the power to transform people's sports experience. They believe in solutions of intelligence, elegance and substance, which generate value from the interdependent and diverse challenges they face in sport today.

With sports venue and event specialists based in the London, Doha and Shanghai offices, their core team integrates with the global Arup network of 14,000 staff located in 92 offices, within 42 countries, to bring global knowledge to locally delivered projects.

SERVICES

SPORTS
ARCHITECTURE
SPORTS VENUE
DESIGN
SPORTS
ENGINEERING
ENGINEERING
SPECIALIST
ENGINEERING

The New Doha Tennis Stadium is central to an integrated, world class sport and leisure complex that combines sporting excellence and functional efficiency, captures the imagination of the world's greatest tennis players, and creates a legacy that inspires Qatari players of all ages.

The design of the stadium is a fluid and dynamic response to the site, to local environmental conditions and to the functional requirements of a multipurpose stadium, focussed on tennis.

The intention is to provide an enduring building that clearly expresses its tennis-focussed nature - but which is unique. This is a building unlike any other tennis stadium in the world.

Their aspiration is that this venue and its surrounds will lift the spirit and inspire the highest levels of attainment, whether in the professional sportsman, or the youngster taking his or her first sporting steps. ■

CONTACT DETAILS

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ARUP HOST CITIES AND MAJOR EVENTS

“ In an age of austerity and uncertainty, the successful delivery of a global scale event is strategically, physically and politically challenging, get it right and an event of this scale has the capacity to instil confidence in the city and a competitiveness to accelerate investment and transform pre-existing ambitions with a new clarity of purpose. By adopting an integrated approach, and deploying a range of new tools and tactics, cities can attract fresh streams of investment and opportunities to deliver lasting success long after the event has finished. ”

Nick Merridew,
Director



Headquarters
London, UK

Regional offices
Worldwide

Arup's Host Cities and Major Events group specialises in supporting cities, organising committees and international federations to bid for, plan and deliver major sporting and cultural events globally. Their team have over 25 years' experience in the field having delivered projects for the **Olympic Games, Commonwealth Games, European Games, World Expo's** and **FIFA World Cups** amongst many others.

Their team brings an integrated approach to the physical infrastructure, commercial strategies and legacy planning that are required to not only host an event, but ensure that there is meaningful benefit to the city authorities, residents and visitors.

SERVICES

MASTERPLANING
EVENT OPERATIONAL
DESIGN
OVERLAY DESIGN
HOST CITY BID
CONSULTANCY

For the **Tokyo Olympics** in 2020, **Arup** was commissioned by the **Tokyo Olympic Organising Committee** (TMG and TOCOG) for a wide range of services, working in partnership with **NEC** who are a key member of the Japanese technology sector and a major sponsor of the Olympics.

Arup worked with TMG and TOCOG to develop the Tokyo 2020 Foundation plan, and is currently working on the master plan of the Olympics, the design review for all Olympic sports facilities, IBC and other facilities, as well as the athletes' village. Arup are providing strategic consulting services such as: security, transport and sustainability, along with various other specialised consulting services and assurance. ■



CONTACT DETAILS

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FROM CITIES TO VENUES

Innovation, inspiration and intensified experience at every scale



Singapore Sports Hub
Arup + DPA + AECOM
© Christian Richters



London Legacy Masterplan Framework



New Doha Tennis Stadium



Abacus Seat

ARUP Sport Venue Design
ARUP Host Cities & Major Events

www.arupassociates.com



Singapore Sports Hub
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Sports Category

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YOUR AREAS OF INTEREST

Please send me the latest information on these aspects of sports venue design, finance, management, operations and technology:

- | | | | |
|------------------------------------------------------|-----------------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------------|
| <input type="checkbox"/> Access control | <input type="checkbox"/> Customer relationship management (CRM) | <input type="checkbox"/> Membrane systems | <input type="checkbox"/> Suite management |
| <input type="checkbox"/> Acoustics/audio systems | <input type="checkbox"/> Electronic displays | <input type="checkbox"/> Merchandising/novelties | <input type="checkbox"/> Systems integration |
| <input type="checkbox"/> Adhesives | <input type="checkbox"/> Engineering: electrical/mechanical | <input type="checkbox"/> Naming rights | <input type="checkbox"/> Temporary flooring |
| <input type="checkbox"/> Architecture and design | <input type="checkbox"/> Event management/planning | <input type="checkbox"/> Point-of-sale products | <input type="checkbox"/> Ticketing systems/services |
| <input type="checkbox"/> Athletics/sports equipment | <input type="checkbox"/> Facilities management | <input type="checkbox"/> Practice/training facilities and systems | <input type="checkbox"/> Timing/scoring systems |
| <input type="checkbox"/> AV systems | <input type="checkbox"/> Fan attractions | <input type="checkbox"/> Project management | <input type="checkbox"/> Transport planning and operations |
| <input type="checkbox"/> Broadcast/TV technologies | <input type="checkbox"/> Feasibility studies | <input type="checkbox"/> Retailing: concepts/systems | <input type="checkbox"/> Turf management/maintenance |
| <input type="checkbox"/> Catering/concessions | <input type="checkbox"/> Financial management/services | <input type="checkbox"/> Retrofit and refurbishment | <input type="checkbox"/> Turf natural |
| <input type="checkbox"/> CCTV | <input type="checkbox"/> HVAC/insulation/energy management | <input type="checkbox"/> Rigging systems/fall safety | <input type="checkbox"/> Turf synthetic |
| <input type="checkbox"/> Cleaning products/services | <input type="checkbox"/> Ice-rink systems/products | <input type="checkbox"/> Roof systems | <input type="checkbox"/> Waste management/recycling |
| <input type="checkbox"/> Computer systems/networks | <input type="checkbox"/> Interior design/theming | <input type="checkbox"/> Scoreboards | <input type="checkbox"/> Wi-fi/4G coverage |
| <input type="checkbox"/> Concert/production services | <input type="checkbox"/> Internet services | <input type="checkbox"/> Seating: fixed/temporary/retractable | Others (please list) |
| <input type="checkbox"/> Concession carts | <input type="checkbox"/> Lighting: sports/emergency | <input type="checkbox"/> Security | <div></div> |
| <input type="checkbox"/> Construction | <input type="checkbox"/> Loyalty programmes | <input type="checkbox"/> Signage/advertising | |
| <input type="checkbox"/> Consultants | <input type="checkbox"/> Luxury suite design/services | <input type="checkbox"/> Signage/wayfinding | |
| <input type="checkbox"/> Coverings: pitch/floor | <input type="checkbox"/> Marketing/advertising | <input type="checkbox"/> Smart cards | |
| <input type="checkbox"/> Crowd management/barriers | | <input type="checkbox"/> Sports floorings | |
| | | <input type="checkbox"/> Structural engineering | |

YOUR DETAILS

(please complete ALL sections)

Full name	<input type="text"/>		
Organisation/company	<input type="text"/>		
Job title	<input type="text"/>		
Address	<input type="text"/>		
	<input type="text"/>		
Post/zip code	<input type="text"/>	Country	<input type="text"/>
Telephone	<input type="text"/>	Fax	<input type="text"/>
Email	<input type="text"/>		

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In this issue of *PS&AM* we are delighted to reprise our comprehensive AEC Directory, which spotlights a selection of leading Architects, Engineers, Project Managers and Specialist Contractors in the sports venue sector.

This invaluable reference guide will give readers an insight into some of the most prominent companies working in the sector. Each company lists contact information, important details of the services they offer and the regions in which they are active, as well as highlighting some of the key projects they are involved in.

The listings provide an extremely useful tool for everyone in the stadium and arena venue sector. The AEC Directory will also be available on our website www.psam.uk.com for free reader access with live links to all of the organisations websites.



John Sheehan
Editor
PanStadia & Arena Management Magazine

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For more information contact: sports@mottmac.com



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Your new guide to sports venue and
major sporting event specialists