

## Sports complexes that build identity

by Zwarts & Jansma

The era of arenas

The Stadium – a high-tech, high performance operation

The Audi Sportpark

Yas – spectacular racing  
by Asymptote architecture



Ulwe Ditz

The master of thermal baths and swimming pools: Ernst Ulrich Tillmanns founded the office 4a Architekten in Stuttgart together with partners.

# To the point: sport buildings

*pulse* in conversation with Ernst Ulrich Tillmanns, 4a Architekten

**We assume you followed the World Cup in South Africa on TV. How did you like the stadiums?**

With its elegance and lightness, Green Point Stadium in Cape Town impressed me. What caught my attention at Soccer City Stadium in Johannesburg was the interesting skin, which unfortunately does not have the same light touch. In general, I have to say that especially thanks to the stadium architecture South Africa exuded a positive and friendly message.

**Today, sports facilities tend to be covered by the media to a far greater extent than other architecture. What opportunities and risks does this involve?**

Sport is a huge business factor today and is therefore reliant on media coverage. And this requires spectacular images that sear themselves into spectators' minds - be it Günter

Behnisch's Olympic Stadium in Munich or the "Bird's Nest" in Beijing. More money is available for these construction projects today given the scale of sports marketing. The opportunity lies in generating added architectural value with this money. Yet there is the danger of reducing the architecture to media-friendly images and neglecting the details and functional planning.

**What special challenges does sport pose for architecture?**

For sport, write emotion. The architecture must help to enable these emotions to unfold. This is especially true when it comes to the atmosphere in the building. That said, the external appearance of the building must also transport these images to the outside. The new arena in Munich, for example, does this extremely well at night thanks to its unusual lighting.

**Sport and the associated buildings can lend identity to a city or region. How can architecture support this?**

In our case, we always attempt to develop our buildings based on both their function and their environment. In the Spreewald Thermal Springs, for example, we worked with typical local materials such as reed and brick wall panels. In the Lake Constance Thermal Springs, we dramatized the fantastic location on the banks of the lake, as well as the white sails as the formative theme for the ceiling painting in the bathing hall.

**Is there a chance that sporting complexes are also making progress in terms of energy efficiency?**

The same applies to sporting complexes as it does to all other buildings. Energy efficiency and sustainability have to be top priorities.

The era of arenas – The queen of architectural disciplines: building stadiums > p. 04 Shiny racing track in Abu Dhabi > p. 14 The Tivoli stronghold makes a comeback > p. 20 A lot of space > p. 24 Pleasant prospects > p. 28 “We have to build identity” > p. 32 Concrete – a timeless and democratic material > p. 38

- 04 **Macro**  
The era of arenas  
By Hubertus Adam
- 10 **Micro**  
The stadium – a high-performance operation  
By Holger Wallmeier and Britta Tomaske
- 14 **In practice I**  
Shiny racing track – the eye-catching  
Abu Dhabi racetrack
- 20 **In practice II**  
The Tivoli stronghold makes a comeback
- 24 **In practice III**  
A lot of space – the Audi Sportpark
- 28 **Visions**  
Pleasant prospects
- 32 **Visit**  
Interview with Rein Jansma,  
Zwarts & Jansma architects, Amsterdam
- 38 **Material**  
ecdm architects on concrete
- 40 **Insights**  
News and product innovations  
from ABB/Busch-Jaeger
- 42 **Food for thought**  
The competition question for this issue
- 43 **Imprint**



Architectural distinctiveness unites the three World Cup stadiums by gmp: At the Moses Mabhida Stadium in Durban, an arch over 100 meters high supports the roof. A cable car ascends the arch to the viewing point at the top.

# The era of arenas

As a comparatively young field of construction, the building of stadiums has gained incredible significance thanks to the media presence at major sporting events. Since then, modern sports venues have not only been competing for the favor of television viewers, but they can also boost tourism in otherwise largely unknown regions and act as an effective tool of the now en vogue city branding.

By **Hubertus Adam**

There is no doubt about it: Stadiums are considered the real kingpin of contemporary sports architecture. Even though typologically, stadiums are related to ancient Roman amphitheaters, their construction is a comparatively young field, which was actually only revolutionized with Kenzo Tange's Olympic buildings in Tokyo in 1964 and the Olympic complex for the 1972 Games in Munich by Günter Behnisch and Frei Otto. What is remarkable in this context is that Nikolaus Pevsner, the doyen of English architectural history, in his "History of Building Types", first published in 1976, focuses on a typology consisting of theaters, libraries, hospitals and even prisons, but completely ignores sports facilities, despite living in the European home of football. Indeed, most sports initially did not need any special architectural structures, just a playing field in the form of a grassy area. The indoor sports halls of the Baroque era were also simple, functional buildings lacking any original expression. It was not until spectator numbers started increasing that initially temporary, then permanent stands became necessary, inspired either by the elongated Greek stadiums or the oval-shaped Roman amphitheaters. Only during the game itself, when a large number of spectators watches a small

number of players, does the stadium fulfill its purpose. Goethe's comments about the arena in Verona from his Italian Journey are still unsurpassed today: "I had the peculiar feeling that, grand as it was, I was looking at nothing". The architect "by his art creates as plain a crater as possible and the public itself supplies the decoration. (...) The simplicity of the oval is perceived by everyone to be the most pleasing shape to the eye, and each head serves as a measure for the tremendous scale of the whole. But when the building is empty, there is no standard by which to judge if it is great or small."

## **Ancient thermal baths and building blocks**

Following an initial boom in the 1960s and 1970s, over the last 20 years stadium architecture as a field of architecture has increasingly assumed significance, with the starting shot given by Renzo Piano's San Nicola in 1990. Alongside museums (the "Bilbao effect") and opera houses, stadiums act as elements of city branding. However, the crucial factor in this development is not the live event, of which there are generally very few, but its media distribution. Major events like the Olympic Games or European Championships and World Cup in soccer are



enjoying increasing popularity even among previously uninterested viewers. Strangely enough, the ubiquitous medium of television means that the venue itself requires architectural distinctiveness. Whenever we think of the 2008 Olympics in Beijing, we can't help but see Herzog & de Meuron's stadium, dubbed the "Bird's Nest", in our mind's eye. Sports venues are attractive to leading international architects. Toyo Ito built a remarkable, in ecological terms, solar stadium in Taiwan, and Zaha Hadid is currently realizing the Aquatics Centre in northeast London for the 2012 Olympic Games, which is topped by a huge, dynamically curving load-bearing steel structure.

#### **All eyes to the Bird's Nest**

South Africa, which hosted the World Cup this year, was able to boast as many as ten renovated or newly built arenas. The three most important new stadiums were designed by the Hamburg-based studio Von Gerkan Marg und Partner (gmp), which has been working in this field for 40 years. For the 2006 World Cup, gmp transformed Werner March's aging Olympic stadium in Berlin into one that satisfies modern, functional requirements and impresses visitors with its self-supporting roof. The experienced architects were also active in Frankfurt and Cologne at this time. However, even more remarkable in architectu-

ral terms are the three new stadiums in South Africa, realized together with Schlaich Bergermann und Partner, in Port Elizabeth, Durban and Cape Town for the 2010 World Cup. The planners looked towards light construction for the stadiums and thus actively sought to move away from the example set by Herzog & de Meuron's Olympic Stadium in Beijing, which, although it has gone down in the history of 21st-century architecture as a superb building with great symbolic value, having used 45,000 tons of steel it can hardly be considered exemplary. The Cape Town Stadium is like a great, white basket with a gently curving edge. It is situated on an elevated platform in a public park between Signal Hill and the Atlantic. The stands, with a parabolic cross-section, are surrounded by a horizontally structured PTFE membrane façade and the roof consists of a hybrid combination of ring and radial cables and a radial truss structure. The stadium is illuminated in white at night and turns into a major sculpture dominating the city – its links to the Allianz Arena by Herzog & de Meuron are obvious. The architects and engineers chose a different kind of façade shell for the Nelson Mandela Bay Stadium in Port Elizabeth. The ring formation of the roof over the stands consists of girders clad in sheet metal and tensioned membrane fields between them, creating a sculptural structure of ribs and grooves.

Carefully employed color effects that correspond with concrete that has deliberately been left in its raw state: The swimming pool in Biberach by 4a Architekten (left). Over 8,000 solar panels supply the stadium, designed by Toyo Ito and opened in Kaohsiung, Taiwan in 2009, with energy (right).



But perhaps the Moses Mabhida Stadium in Durban wins in the competition of the three gmp buildings. A 104-meter-high arch that forks in the direction of the city supports the roof, with the pressure ring completing the façade acting as a counter bearing. A tension ring clamped in position gathers together the suspended cables and acts as the outer limit of the roof's membrane skin.

#### **Basic services for the population**

The subsequent use of buildings hosting major events is also a crucial issue for stadiums, with their horrendous construction costs. The concept for the stadiums in South Africa, whose upper sections can be removed, includes soccer, rugby, and concerts. The stadium in Durban has a specific subsequent use in the tourist sector, for there is a cable car that goes up to the viewing point on top of the large arch over the building. The logic is clear: When sports venues serve as urban generators and drivers of city branding, they are also attractive to many visitors, who help maintain the building with their entrance fees. It was for the same reason that a café was included at the top of Zaha Hadid's elegantly curving Bergisel Ski Jump near Innsbruck, which is used all year round, while the jump itself is only in the international spotlight for one day a year during the Four Hills Tournament. The new ski

jump at Garmisch-Partenkirchen by the Munich-based studio terrain: loehnhart & mayr is also accessible to the public. Here, the architects sought to achieve a sculptural structure that references the topography, but that can nevertheless be understood as a sports machine. However, in the field of sports architecture, buildings for major events are only the tip of the iceberg. For a start, sport is a mass phenomenon from which individual outstanding talents develop. Swimming, athletics, and soccer are the most popular sports, and building venues for them is virtually a public service for the population. Swimming pools in particular are often seen by communes as burdens – we are more likely to hear about closures and conversions into water parks financed by private individuals than new swimming pools. One of the rare examples of a new indoor pool is in Biberach, an expressive building designed by 4a Architekten from Stuttgart, in which the load-bearing concrete structure, deliberately left in its raw state, forms an effective contrast to the individual color accents. At the same time as this project, one of the most spectacular pool complexes of recent times was being built in Le Havre, namely Jean Nouvel's "Les bains des docks", a 5,000-square-meter aquatic center that references ancient thermal baths with its various pools, treatment areas and chill-out zones, in the middle of the soon-



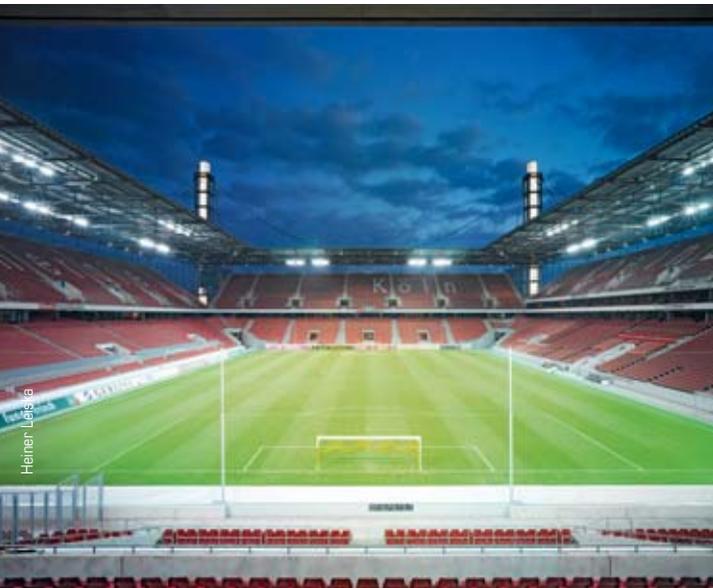
to-be revitalized docks. Black-glazed prefabricated concrete elements form the outer shell of the flat building, while inside everything is snow-white. The individual bathing areas are surrounded by cubes and cuboids, like oversized building blocks. Admittedly, "Les bains des docks" hardly seeks to improve the public's supply of swimming pools. Rather, here the architecture is intended to revamp the port city's battered image. "Perret, Niemeyer, Nouvel - three masters of architecture" boasts the local tourist office.

City branding à la Jean Nouvel: With "Les bains des docks" in Le Havre, the architect references ancient thermal baths and creates a fascinating interplay of cubes and cuboids.



### The vertical sports center

However, sports buildings should not always dominate their surroundings with their huge dimensions. The Croatian architecture studio 3HLD successfully integrated a partially sunken handball arena into a suburb of Rijeka by means of a structure that took its cue from the local topography and featured overlapping strip-like elements. The vertical stacking of sports facilities is being tested with two very different concepts in Caracas and Marseille. Urban Think Tank has built a vertical sports center in the La Cruz district of the Venezuelan capital. As the former soccer pitch is surrounded by the slum's dense mass of houses, the studio decided to expand upwards and relocate the soccer pitch to the roof. The other stories provide space for other sports. One of the more important goals was to offer the children and young people of the area a meaningful pastime. Finally, the multi-story soccer building "Le Bloc", designed by MOA architecture from Marseille, looks bizarre. Opposite a multiplex cinema in the sprawling southern French city, the architects have built a raw-looking four-story structure whose ground floor serves as a parking lot. Located above it is a hip restaurant and, finally, arranged over two stories, boxes for "street soccer", together with stands. "Street soccer" is a reduced form of soccer, with four players playing on a pitch measuring 10 x 3 meters. There is now even a league for it. It remains to be seen whether this sport will catch on. That said, a few decades ago no-one had thought of squash halls or halfpipe parcours either.



**Hubertus Adam** is editor of the specialist magazine "archithese" and works for various daily newspapers and other magazines. He has published numerous books, articles, catalog essays and magazine texts on 20th-century architecture. Hubertus Adam was recently appointed the new Director of the Schweizerisches Architekturmuseum (Swiss Architecture Museum) in Basle.





Modern stadiums must also be visually attractive. At the Rhine Neckar Arena the 400 fluorescent lights under the roof create a special attraction at the onset of dusk.

# The stadium – a high-tech, high-performance operation

Sports stadiums are highly emotional places of identification and devotion. At the same time they are modern locations which have to function extremely precisely and efficiently. Our author describes how all these factors come together under a single roof, with an example of his own, the Rhine Neckar Arena in Sinsheim.

By **Holger Wallmeier** and **Britta Tomaske** Photos **Christian Richters**

"Eco sells", green labels and certificates may be all the rage and journalists and amateurs are supposed to accord attractive-sounding and highly complex solutions great acclaim per se, but the best, most economical and most effective solutions tend to be unspectacular. Often it is the interaction of many small measures which makes a technical concept successful long term, for example, along all the different stages of the energy supply chain (primary energy supply, conversion and use) along with user-friendliness and ease of maintenance. After all, what use is the best technology if there is nobody who can operate, optimize and maintain it, if replacement parts are expensive or not used? The example of the Rhine Neckar Arena, which was completed in 2009, highlights the importance of security, media and electronic technology for a semi-public building. First, specific special factors have to be accommodated when building a stadium: Floodlights and sound systems for large areas, large media screens, digital advertising strips, or CCTV surveillance of spectators. DFL and UEFA regulations play an essential role, too. There must be a high-performance floodlighting system, fail-proof energy supply, a modern and efficient public communications system, a surveil-

lance system including a control center, modern media technology and permanently available workstations for journalists and TV studios. Nevertheless, by relying on efficient materials, components and technologies and an optimized building automation and system operation, resources can be saved in the process.

## **Fail-proof security**

Video surveillance technology is an important part of the DFL statutes as a means for enabling early detection of any disturbance potential. In the Rhine Neckar Arena, the seating for local and away fan groups as well as the entrance areas and car park spaces are monitored by color-image cameras featuring rotating-tilting technology. An additional camera in the stadium area can cover individually defined areas. All cameras are linked to the security center and can be individually controlled via a total of nine TFT monitors. Thanks to freeze-frame recording and high-quality rendition people can be recognized and compared. Security technology, of course, also includes fire protection. In a building destined for large public crowds, such as a stadium, fire alarm systems have to monitor all areas of the stadium without



exception, including between decks. In addition to the dimensions, volume and complexity of the Sinsheim complex, the fire matrix (i.e., the chronology and interfacing of all measures in the case of fire) presented the planners with an additional challenge: In this case ten different fire control sections interact and act parallel to one another.

#### **Switch station building automation**

Building automation, that is, the totality of surveillance, management, regulation and optimization equipment in buildings, generates efficiencies and increased comfort particularly in intensely technical sporting complexes. In the construction of the Rhine Neckar Arena in Sinsheim the requirements included easy-to-operate technical systems, consistent maintenance of operating data, high operational safety, system availability and energy efficiency. It proved possible to meet these requirements by consistently interfacing the different technical disciplines, which makes it possible to have a central visualization with alarm management and a system that can be easily operated at any time. The interplay between the

different disciplines could also be utilized in this way. The integrated building control systems allow for efficient and centralized parameterization, operation and programming. The tasks of the facility management technology (to which the overwhelming majority of technical security, building and communications systems are connected) encompass surveillance, alarm systems and status enquiries for the connected sub-systems such as heating, ventilation, electric- and energy management systems. The facility management system enables all alarms and signals to be processed uniformly according to priority.

#### **Media technology**

Thanks to the intelligent building automation concept, media technology and building automation (lighting, sun protection, regulation of air circulation etc.) can be controlled individually or in combination. Even individual scenes and moods can be produced, saved, highlighted and recalled at the push of a button. For example, at the end of a game the lights can be dimmed, the sun protection lowered and chill-out music played with a replay

Functions such as surveillance and media technology have to work perfectly. With efficient materials, components, technologies and building automation, resources can be saved.



of the game highlights. Another requirement of the UEFA/DFL concerns LED display advertising which plays commercials and digital advertising banners from a computer - while this tends to be a real exception anywhere else, it has been achieved in Sinsheim.

#### **Media technology**

An electronic access control system is becoming increasingly important in large business, administration and entertainment buildings. No only does it ensure user-friendly and maintenance-free locking and access but also enables individual locking authorization for specific keys and control of all closing procedures - each and every closing procedure is recorded with date, time and key-holder. A stadium is a large building with correspondingly large dimensions and consumption levels. Energy consumption for a game, for example, totals some 2,500 kilowatt hours per hour – or roughly the equivalent of the annual energy consumption of a two-person household. In Sinsheim there are more than 1,400 data connectors in the whole building and separate data networks (internal/club, catering, press, safety person-

nel/police). To achieve maximum operational security, the entire electric circuit is planned so that it is widely diversified – all current distribution for catering, lighting, general consumers, floodlighting and safety-related energy circuits are separated. All lighting is designed to be energy-saving; for example, energy-saving downlights are used and these can be dimmed in the public areas.

In many respects there can be no compromising in the design of a stadium. Security, transmission quality, international competition regulations, guidance and support for spectators etc. all require high building and energy inputs, but also offer the chance to make use of saving and efficiency potential. A building does not require certification to this end, but it does need planning geared to life cycles and efficiency, with simple pragmatic and cost-effective concepts as regards the technology if a lot of energy and resources are to be saved. This can then be achieved, and achieved sustainably into the bargain.

**Holger Wallmeier** is manager of signet GmbH, a 100-percent subsidiary of agn Niederberghaus & Partner GmbH.

# Shiny racing track

Grand Prix racing has gained another attraction in the form of the Yas Marina track in the emirate of Abu Dhabi. New York architects Asymptote contributed a landmark to the newly created complex on the Yas Peninsula: the Yas Marina Hotel.

By **Lasse Ole Hempel**

The images that went around the world in November 2009 could easily have been from a dream: The finest-tuned racing cars hurtle in the dark of night through a brightly lit, sparkling, glittering landscape. They pass through a tunnel, skim the periphery of a chic port complex before – driving the visual fascination to the limit – disappearing under a bridge that unites two unusually curving building wings glittering seductively in the colors red and blue. With the first Grand Prix of Abu Dhabi on Yas Island the United Arab Emirates have joined the Formula 1 business. The track designed by the German Hermann Tilke is definitely more spectacular than that in neighboring Bahrain, which proved back in 2003 that Grand Prix races can be held in the desert. Given the high temperatures special heat-resistant asphalt was needed in Abu Dhabi and the races cannot start before early evening. This means the final section of the race is during the night. It is not so much the floodlighting that makes the race such an exciting visual experience but more the buildings such as the five-star hotel Yas Island that opened its doors on the Yas Peninsula two days before the debut race.







### **A veil wrapped around the building**

Designed by New York-based Asymptote, the hotel with its two twelve-storey, futuristically curving volumes makes the ideal backdrop for the Abu Dhabi Grand Prix. The hotel is the architectural heart of the ambitious, 36-billion-dollar master plan for the Yas Peninsula. Around the 5.5 kilometer-long track there are six other luxury hotels, a 60-meter-tall VIP stand and a Ferrari theme park. The New York architects enveloped the Yas Hotel in a gently undulating second skin that wraps itself around the building's core like a loosely worn veil. Also on the complex: two hotel towers and the bridge since photographed for so many media events, which was designed using all-round shuttering, and joins the two complexes with one another. The building's skin is based on a grid structure, which consists of 5,800 swivel glass panels, styled to recall diamonds. The unusual skin structure

functions visually as a unifying element, lends the complex a touch of lightness, and thanks to the glass panels makes for interesting-shimmering light reflections that incorporate the sea's surface, the sky and the surrounding desert landscape. Architects Hani Rashid and Lise Anne Couture, who set up Asymptote in 1989 and initially made a name for themselves with bold urban computer-generated visions, set out to create a modern landmark in Abu Dhabi. The result is a backdrop that is highly distinctive, responds to the Grand Prix media spectacular and simultaneously, in several references to Arab culture, exudes harmony and elegance. In addition, the two architects cite the marina in the immediate vicinity, for example by opting for an undulating roof and by lending the two building sections the silhouette of a fish. In this maritime setting, the Yas Hotel remains a fixed star of this new ensemble on the Arabian Gulf.

Exclusivity meets Formula 1: The unusual grid structure consisting of 5,800 glass swivel panels characterizes the connecting element that towers over the racetrack (right). Inside, the design element is taken up again (left).



### **New superlative**

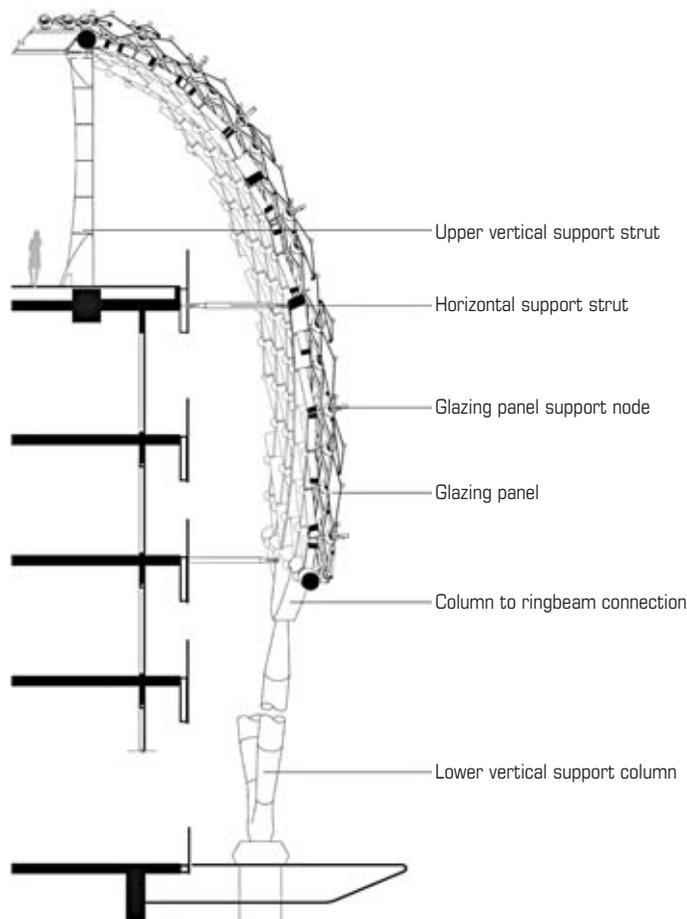
The construction of the Yas Hotel saw the renewed bundling of international engineering know-how on the Arabian Gulf: Stuttgart-based civil engineering firm Schlaich Bergermann, which supports almost all stadium projects handled by gmp Architekten, was involved in creating the grid structure. International engineering office ARUP had a decisive influence on the hotel's sophisticated lighting technology. Inside the hotel, modern applications for greater comfort and energy efficiency come into play: For instance, in every room the guest can choose between special light scenarios (either using switch elements distributed throughout the room or via remote control) which can also be used to regulate the temperature and draw the curtains. In the suites, Busch-ComfortTouch® panels permit comprehensive control of the room functions, while guests can also select the music

of their choice via the operating element. The Hotel has 13 units equipped for guests with special needs. In an acute emergency situation KNX technology transmits a special signal from several spots in the room to the reception desk. The Hotel's entire room management system is equipped with 14 KNX routers and visualization software that ensures Hotel management can query the status of each room at any time. Staff can see whether a room is occupied, being cleaned, or whether a guest does not wish to be disturbed – all this information is readily available at a central location.

### **The future of Formula 1**

It is no exaggeration to say the complex around the new racing track is a project of superlatives – how could it be otherwise in an emirate spoilt for oil reserves: The 5.5-kilometer-long track of the Dubai Grand Prix is the most

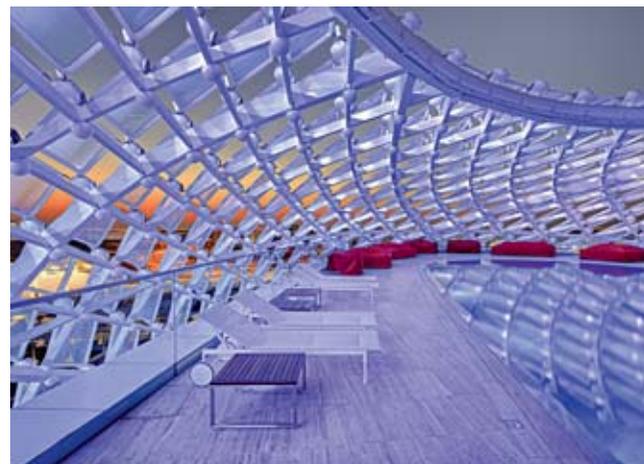




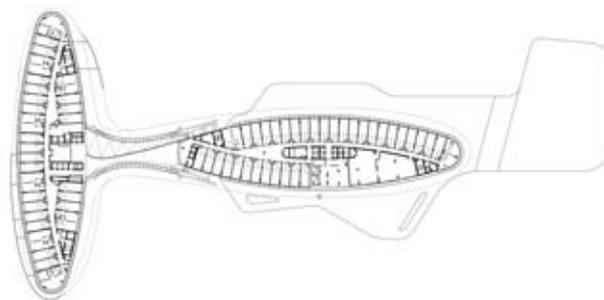
Detail

The highlight of the Abu Dhabi Grand Prix is driving through the curving bridge built in shell construction, which connects the two wings of the five-star hotel Yas Island (left).

expensive in the history of Formula 1 racing. The rulers in the emirate that has also taken a battering in the financial crisis can not only boast having the tallest building in the world, namely the Burj Kalifa, as in future Abu Dhabi will invite the world to its luxurious Yas Marine racing track. Critics of the new track, that is initially to be included in the Grand Prix circuit for seven years, argue that despite spectacular effects Yas will never match the myth-laden racing locations such as Le Mans or Monte Carlo. But Formula 1 functionary Bernie Ecclestone sees things totally differently. "Now we're seeing the future of Formula 1" he shouted enthusiastically while watching the night race from Yas Island. On 14 November, the last race of the 2010 season will be held on Yas Island.



The glass panels in the second skin create interesting shimmering light reflections that also incorporate the blue of the sky and the pool.



Layout

## Project partners

### Client

Aldar Properties PJSC, Abu Dhabi

### Architect

Asymptote Architecture, New York

### Civil Engineering

Dewan Architects & Engineers, Abu Dhabi  
ARUP, New York

### Integrated products by ABB/Busch-Jaeger

KNX sensors, KNX dimmers, KNX room temperature controllers, Busch-ComfortTouch® panels and Busch Infoline as an emergency call system in rooms for people with special needs.

# The Tivoli stronghold makes a comeback

The venerable Tivoli Stadium where Aachen's revered Alemannia football club offered its spectators exciting matches was past its best. However, when the ribbon was cut on the new stadium in 2009 it did not need fear comparison with its famous predecessor. Architects have skillfully transferred the charm of the cult Tivoli arena into a modern-day structure.

By **Ralf Johnen**

A prestigious advertisement, a concept for efficient use of space, modern comfort for players and spectators and not least of all greatly increased capacities for fans and sponsors. These are generally the factors that motivate a soccer club to build a new stadium. But above all for hard-core fans a piece of history and a lot of identity was lost. Moreover, the one or other venerable stadium has established itself as a kind of fortress: Between 2004 and 2007 the Alemannia from Aachen was able to bring the great FC Bayern to their knees on three occasions in the old arena.

## **Alemannia branding**

What made taking leave of the Tivoli arena such an emotional affair was the fact that Alemannia's arena had been in operation since 3 June, 1928. However, dilapidated stairs and fences, changing rooms that no one really wanted to step into any longer, a general impression of neglect and the lack of a business lounge so vital today for generating turnover combined to oblige the club to act. In 2007, when the boys from Aachen after a seemingly eternal barren period at long last managed to gain

promotion to Germany's premier Bundesliga the office "agn" from Ibbenbüren was awarded the commission to design the new Tivoli. Project manager was Stefan Nixdorf, whose design got a 58 percent approval rating from interviewed Alemannia fans in an internal evaluation. With seating for 32,900 the arena was realized by the Hellmich group, which alongside numerous other stadiums was also responsible for the Veltins Arena of Schalke 04. Stephan van der Kooi represented the interests of the club. The 50-million-euro stadium finally went into operation in the 2009/10 season. Just a stone's throw away from the old Tivoli, it is visible from afar thanks to its Alemannia branding: the club colors of black and yellow feature prominently in the outer shell. From exposed concrete via two glass belts through to the troughed sheeting of the roof construction, the facade is also a combination of the customary materials employed for functional stadium architecture. Notwithstanding all this functionality the stadium's creators did not want to forgo including a characteristic from the preceding building so beloved by fans: The new Tivoli does not try to give the impression of standing in a metropolis. Instead, it relies on the tried-

Black-and-yellow: The club colors dominate both the stadium facade and the stands. A high recognition value is guaranteed.





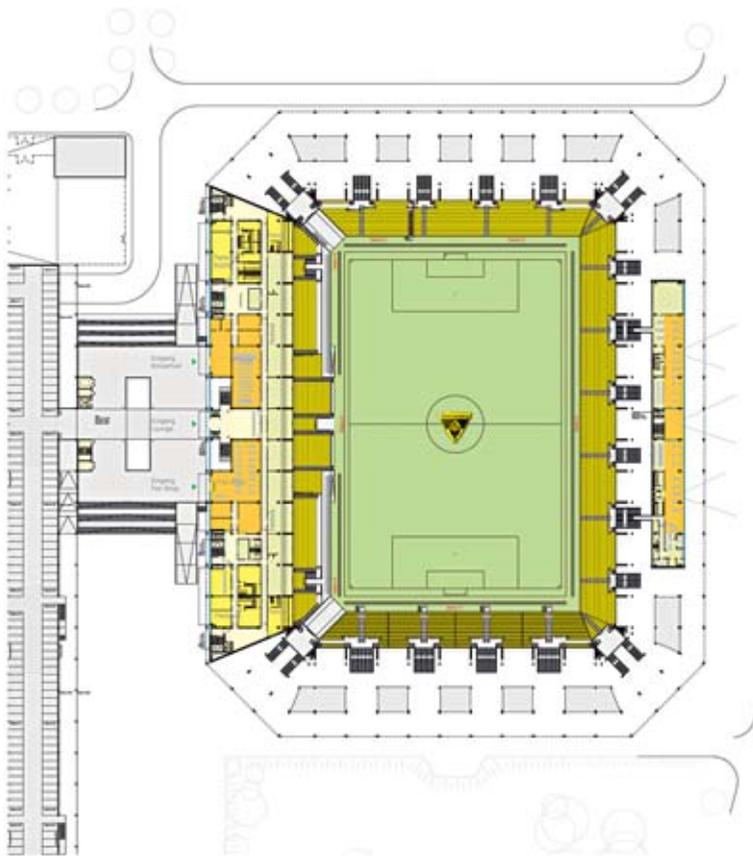
and-trusted concept of having only one terrace. This ensures the arena appears intimate and compact. So as to give fans the greatest possible closeness to the pitch the design also fully exploits the limits of German construction legislation. The seats are lined up above each other at an angle of over 30 degrees, which as Managing Director Frithjof Kraemer explains achieves a balancing act that makes him happy: The arena combines typical Alemannia mood with maximum value-added.

#### **Pure emotion and English closeness to the pitch**

Yellow and black seat shells also accentuate the color logic of the long-standing West German club in the interior and as such guarantee a high recognition value, which is enormously important in the media distribution of photos and films produced in the stadium interior. In the rigorously square area, however, the club colors are omitted from a conspicuously large area: in the new Südkurve (Southern fan area) the Tivoli has an unusually lar-

ge standing section with space for just under 10,600 fans. Ideal conditions for concentrated verbal power that is sure to intimidate every opponent. Moreover, high-lying stand entrances ensure fans have very close contact to the players: the first row is just 80 centimeters above the playing field level. The distance from the stands to the goal line is 7.50 meters, or six meters along the sidelines. Ideal conditions for "40 rows of pure emotion" as those in charge at Alemannia express it. As such, in the new arena fans need not forgo the English habit they have grown to love over the decades of being close to the events on the pitch. As regards the favor of the fans, however, there was definitely room for improvement last season. Only the first home game against FC St. Pauli was sold out. Yet though the 2009/10 season only brought moderate sporting success the Alemannia could post average seats sold of 22,252. After the soccer strongholds of Kaiserslautern and Düsseldorf the third-best result in the league, and a number that is 1,000 higher than the total capacity of the

Not only does the new Tivoli look more elegant than its predecessor, it also holds more spectators. The rigorously square shape adds a distinctive touch.



Layout



Alemannia branding down to the smallest detail: When choosing a line of switches, it was Busch-Jaeger that was selected, with its future® linear program – in a special version boasting the Alemannia crest on the switch button.

old stadium. In other words, the value-added has already seen a positive development – with room for improvement if the club is to move into the upper soccer echelons again. What should be a considerable help in this regard is the newly conceived training area: The training infrastructure for professional players and promising newcomers was improved. The Alemannia now has five large pitches including two all-weather pitches that were installed on the roof of the adjoining parking building. A return to the old Tivoli is out of the question. True, no final action has been taken yet but it certainly looks as if the arena steeped in history will be torn down early in 2011. But the architects have also made provision for this outcome: to offer nostalgic fans a focus of meditation the stadium clock (which was often out of order) from the old Tivoli has been implanted in the new arena. As a kind of relic.

## Project partners

### Client

Projektgesellschaft Stadionbau,  
Alemannia Aachen GmbH

### Architect

agn Niederberghaus & Partner  
(design, concept and approval planning)

### Building technology

Integrated products by Busch-Jaeger:  
Operating elements from the future® linear switch series (Special version with the Alemannia coat-of-arms on the switch)

# A lot of space

You can see how a sponsor with real financial clout can catapult a small soccer club skywards - by taking the example of the TSG Hoffenheim. The FC Ingolstadt 04 soccer club still plays in the 2nd Division, but it has just received a brand new, modern stadium, the Audi Sportpark. Naturally those responsible hope that the club's performance will likewise rise to higher levels.

By **Franziska Bettac** Photos **Stefan Bösl**

With a strong sponsor at their side and big ambitions in tow, the management of FC Ingolstadt 04 decided in 2008 to erect a new stadium on the grounds of what was once a refinery. As the special DFB permit for the shabby erst-while Tuja stadium building was expiring, there was no time for a lengthy competition process. Four planning teams submitted their plans in spring 2009 with ar.te plan from Dortmund together with general contractor Hellmich from Dienslaken winning the bid.

## **Smooth flow in stadium**

The grandstands (with seating for 9,000 and standing room for 6,000), the entrances and the service facilities around the circumference were erected as pre-fabricated concrete parts in the Audi Sportpark as this was the only way to keep costs and timing under control. The architects covered the stands completely with a simple steel structure and troughed sheet roofing. Despite the extremely short planning period the club and stadium operators prioritized functional processes and a high degree of comfort for the fans, sponsors and players. In particular, the large number of relatively small entrance-

ways to the stands guarantees that spectators do not have to pass more than ten seats to get to their own, and this also makes for a compact-looking stand. The noise and spectator mood will thus hopefully stay in the Sportpark and raise things to fever pitch. A completely glassed-in functional and administration block greets the arriving visitors. Adjacent to the reception area are the club office and the fan shop, also integrated into the barrier-free ground floor are the team cabins and a spacious press area. The two upper floors house the VIP restaurant and a total of 19 business lounges which can be rented by companies for a minimum of three years, and then furnished as they wish for that period. Thorsten Wagner from Raumwerk Frankfurt, already renowned for the design a number of car showrooms and presentation rooms for Audi AG, handled the look of the main Audi lounge and restaurant zone. Refined wooden surfaces for tables and floors lighten up the otherwise black and white interior. The VIP area is furnished with red and cream colored chairs by Italian makers Arper. Flat-screen monitors, integrated high-performance speakers and a modern building management system with touch panel for controlling

Color contrasts in red and deep green characterize the view into the new Audi Sportpark for FC Ingolstadt 04. Steeply inclined, completely roofed stands and a large contingent of standing spaces make for a good atmosphere at home games.





lights, blinds and air conditioning leave nothing to be desired in technical terms.

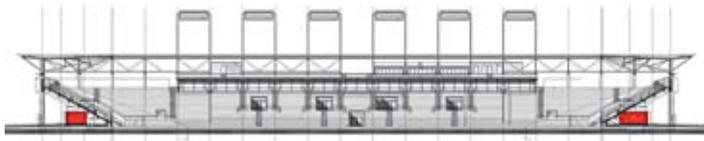
#### **Other uses planned**

In addition to soccer events, the VIP zone can be divided into different areas and is also designed to be used for business events. In Ingolstadt, there is at present no congress center which allows for catering for between 10-1,500 persons and consequently the company operating the facility firmly hopes it will prove popular. A large opening in the facade at the 1st floor level with a drive-in car hoist enables the main sponsor to present auto product innovations in the middle of the large restaurant: On match-days, the latest Audi model will glisten in-between bar tables and buffet. Another possible use would be open-air events, the stadium can organize concerts for up to 12,000 people. Two of the ground-level playing field entrances even allow a large truck to drive directly onto the lawn to transport stage elements.

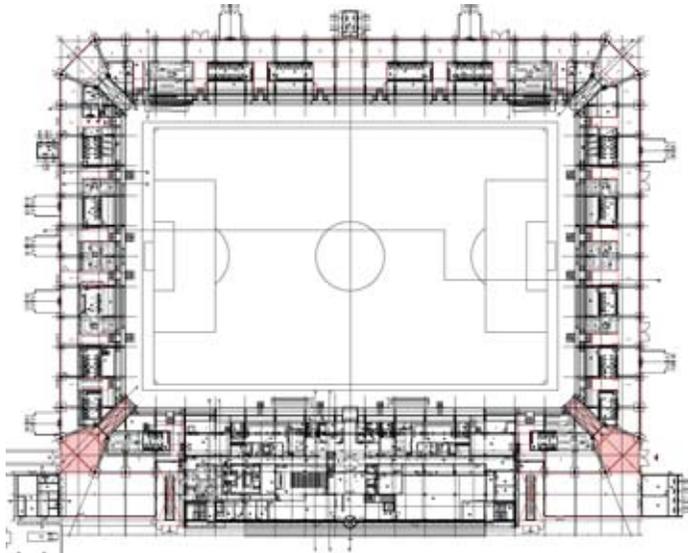
#### **Regenerative energy and water consumption**

The stadium managers are proud to claim that the building is "one of the most ecological stadiums in Europe". The solar system on the grandstand roof produces 400,000 kWh per year, the use of groundwater for watering the lawns or the playing and training fields, and waterless urinals were all likewise incorporated into the design. Fans can reach the game comfortably by bus or bike - bicycle stands and a bus shuttle service are provided. Floodlighting with 1,200 lux instead of the 800 required by the DFB has been fitted, bathing the playing field in dazzling light from twelve high towering floodlight frames. The advantages of the Audi Sportpark surely lie with the good organization, the technical equipment and the intelligent footprint. This stadium does what it promises: short distances, optimized processes and clear, simple forms that are reflected in the uniform design of the sales kiosks and toilets as well as the handrails, garbage cans and turnstiles – those items of equipment that otherwise so often get neglected by architects

A large glass facade greets visitors and allows one to see into the VIP area. The away games are transmitted onto a large integrated screen for those fans who stayed at home.



Cross-section



Layout



### Big plans for the future

In the long term, the club plans to bundle its overall activities with the club house and other training venues at Scheelestrasse - for the moment, however, they are focusing on retaining their place in the league and settling into the new stadium. Should the club succeed in going up into Germany's Bundesliga at the end of the season, then the expansion will not be difficult, as it has already been factored into the current concept: Additional tiers can be added on the existing spectator stands and the infrastructure is already configured for larger spectator numbers. In other words, we can wish that some stronger architectural drive matches FC Ingolstadt 04's sporting ambitions - a somewhat more spectacular roof construction would be desirable to entice not just football fans but also architecture fans to the city on the Danube in Upper Bavaria.

## Project partners

### Client

FC Ingolstadt 04 Stadionbetreiber GmbH, Ingolstadt

### Architect

ar.te plan, Dortmund

### General contractor

Hellmich Group, Dinslaken

### Integrated products by ABB/Busch-Jaeger

User elements from the future® linear switch series, some with red frames from the Busch-axcent series.



gmp Architekten

## Pleasant prospects

It goes without saying that planners leave little to chance when it comes to large and highly prestigious sporting events. Entire cities and regions are subjected to a comprehensive re-planning and linked with original ideas for the infrastructure. The most successful sporting locations of the future will have a positive impact on their setting and provide a host of inspiration.

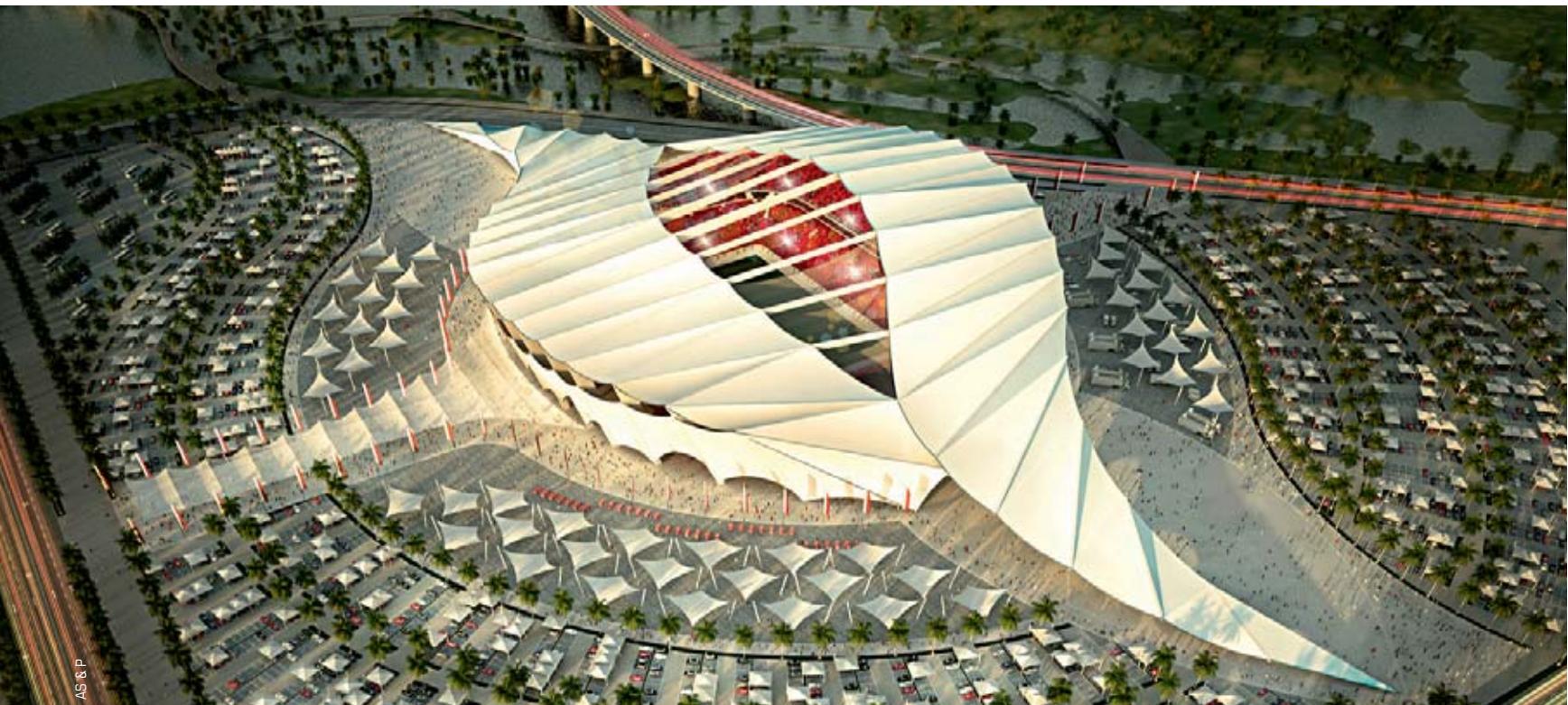
### **gmp: Manaus Stadium, Brazil**

The Brazilian soccer federation will celebrate its 100th anniversary in 2014, and as such it is hardly surprising that the country that won the event most has been chosen to host the world championships in 2014. In the North West of the enormous country, in the midst of tropical rainforests in the Amazon region, lies the town of Manaus; here an ambitious and especially sustainable stadium is to be realized. Today, the one-time rubber metropolis is above all an attraction for eco-tourists and the starting point for many jungle tours. Given the moist tropical climate strong rain showers can be expected every day. Inspired by the formal diversity of the jungle, the roof construction consists of a net of mutually supporting cantilevers that double up as large water channels and provide effective drainage for the roof even when enormous amounts of water collect on it. The roof skin of translucent fiberglass structure has a special coating that reflects the heat and prevents the stands from heating up. The architects are striving to achieve eco-certification based on the stringent American LEED system, which not only evaluates the building's energy balance but also includes the manufacture, transport and disposal of construction material together with the operation of the building site in the assessment.

### AS-P: Candidacy for the Soccer World Cup 2022, Qatar

In the history of the FIFA Soccer World Cup the event has never taken place in a country in the Middle East. This explains why there was such excitement surrounding the presentation of the stadium designs for Qatar's bid to host the FIFA Soccer World Cup 2022. The new stadiums boast a feature that is a world innovation: CO<sub>2</sub>-neutral technology will cool the sporting locations, fan festivals and training centers. Three newly designed and two modernized stadiums were presented. The Al Shamal Stadium in North Qatar with seating for 45,120 is modeled on the traditional design of the local fishing boats. The design of the Al Khor Stadium in the North East of the emirate was based on an asymmetrical shell motif. There will be space for 45,330 spectators. Not far from the capital Doha, the existing Al Gharafa Stadium is to be expanded to accommodate around 44,740 spectators.

The stadium facade is to feature the national colors from all the qualifying teams and symbolize friendship, tolerance and fair play. The renowned urban planning office Albert Speer & Partner based in Frankfurt/Main developed the master plan including all the necessary infrastructure and will manage the rest of the project. A new Metro system covering a total of 320 kilometers is to be completed by 2021. An additional bonus for the compact hosting concept: as all the stadiums are at most one hour's train ride from the capital Doha fans can visit more than one match a day. All the stadiums can be accessed via Qatar's motorway network; some can even be reached by water taxi.





**West 8: Berlin Leisure Complex, Germany**

On the lookout for a meaningful use of the 420-hectare former Tegel Airport complex in Berlin, Dutch landscape architects West8 have come up with a particularly attractive concept. The "Berliner Spielwiesen" would be a large leisure, events and sports park. West8 are also supporting an Olympic Games candidacy using the existing areas. The Park's objective: to enable leisure and sporting activities close to nature. Rather than mowing the grassed areas, a herd of half-wild grazing animals would keep them trim and tidy. The existing airport lake would be expanded and connected up to the Berlin water system so it could be used for rowing, canoeing and pedal boat rides. The mountain bike course, the BMX track, the artificial toboggan hill (made from the waste of the removed runways) and a large camp site are other attractions of the design for the complex.



**Njiric +: Za(breg) 2012, Croatia**

Provoking the Bilbao effect and helping Zagreb become an architectural icon was the central idea deployed by Njiric + Architekten when designing the new stadium Za(breg) 2012. Hardly had the results of the competition been announced than the winning entry became known as "Blue Volcano" - a first indication that the architects would succeed in their objective to achieve a symbolic architecture. The new stadium is embedded in an artificial mountain of recycled car tires and forms a hill - similarly to a Greek amphitheater. The stadium fits well into Zagreb's urban development concept, which envisages three elevations for sport: Medvednica is the local mountain for skiing, the onetime waste dump Jakufievac is to become a leisure hill close to the center - and now a volcano for soccer. The external shape, the topography of the stadium is to enable other types of sport such as skateboarding or climbing. A helium balloon now floats over the stadium and displays the current score.

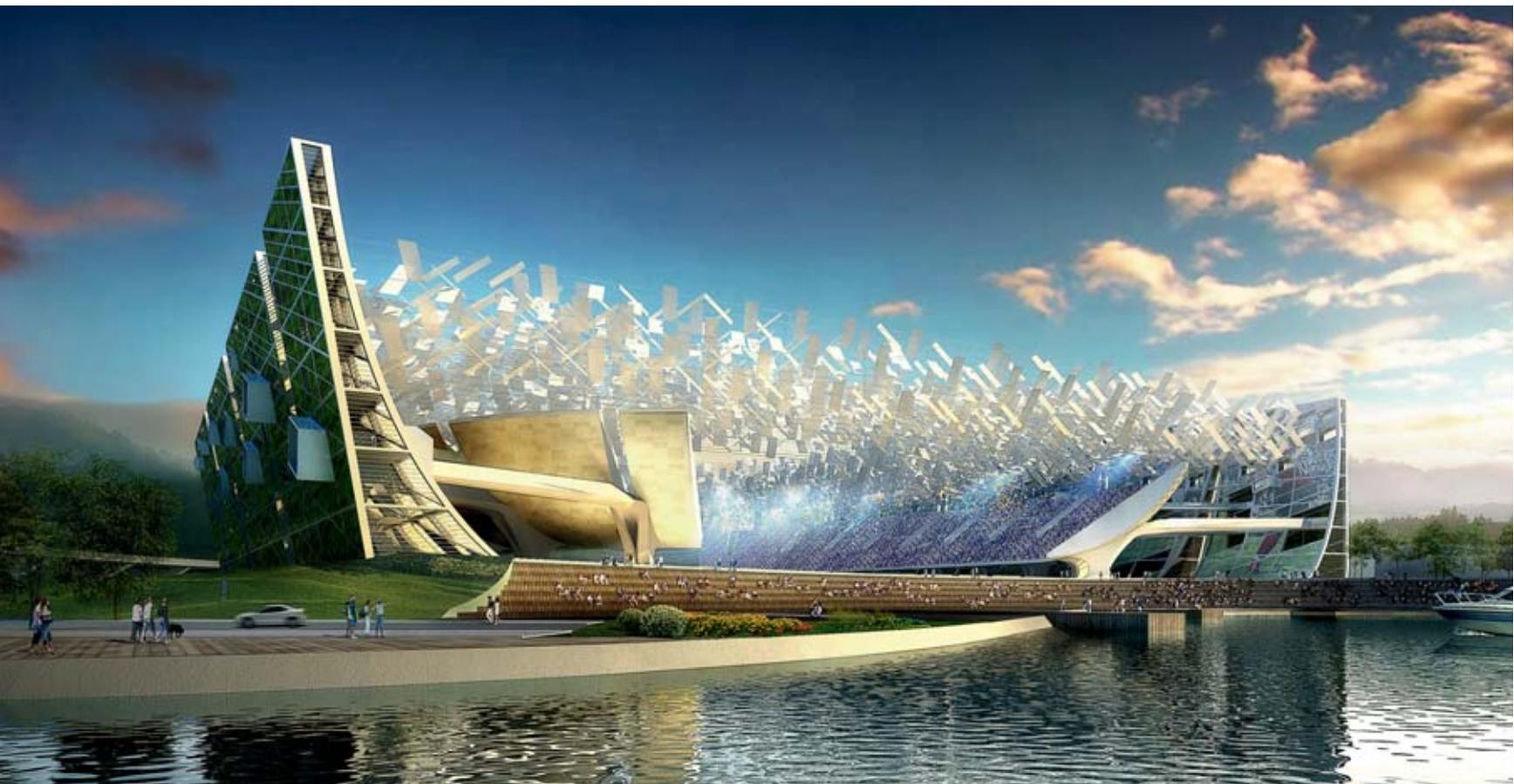


**NBBJ: Dalian soccer stadium, China**

With six million inhabitants, Dalian is an important port located on the southern tip of the Liaodong peninsula in the North-East of China. In the mid-1990s, like so many others in China the city launched a comprehensive urban renewal program, which includes revitalizing the city's embankment areas: less industry, more leisure. As part of this renewal program an international competition was organized in order to find the right design for a new stadium for local soccer club Dalian Shi-de. Having won eight national championships since 1994 the club is widely considered to be China's most successful soccer club and the new stadium is to reflect this standing. One concept that has attracted particular attention is the proposal by US office NBBJ: On the side facing the sea the spectacular-looking stadium dish appears to be cut open. From the landscaped, towering stands spectators can both follow the game but also look out at the sea. Shading will be provided via waving strips of fabric operated using a cable and rope system.



NBBJ



# Identity and intimacy

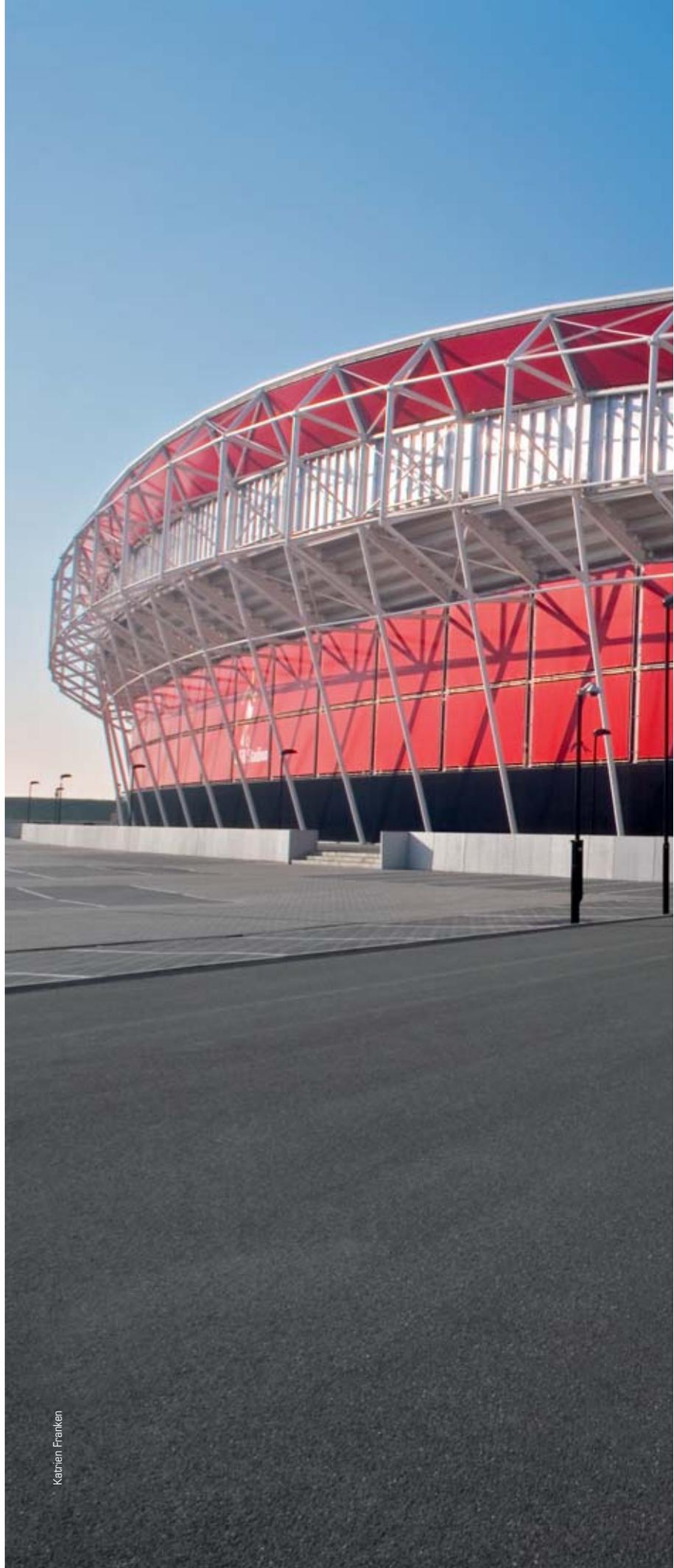
Since the renovation of the traditional Feyenoord soccer stadium in Rotterdam, the Amsterdam-based studio Zwarts & Jansma has been considered the leading Dutch firm in the field of sports architecture. Talking to *pulse*, Rein Jansma explains that the studio is now even involved in the country's bid for the 2028 Olympics.

By **Lasse Ole Hempel**

The studio was founded in 1990 by Professor Moshé Zwarts and Rein Jansma. Its portfolio includes major projects such as sports and leisure buildings, as well as extensive infrastructure modernization plans. The studio has received, among others, several design awards, the MIPIM Future Projects Award and the Dutch Sport & Leisure Award. Today, Zwarts & Jansma is headed by Rein Jansma, Reinald Top and Rob Torsing.

## **Building stadiums is a special field. How did you come into contact with it?**

One of our specialist areas is sports facilities. We came to it by chance. We founded the studio about 20 years ago and were working on a metro station in Rotterdam. It was a very difficult renovation project where we had to build around an existing subway line. At that time, the Council of Rotterdam together with the Feyenoord Rotterdam soccer club was looking to renovate the Feijenoord Stadium in Rotterdam, Feyenoord's home stadium. It is a beautiful building, designed by the famous Dutch architects Brinkman and Van der Vlugt in the 20th century. It is a very light steel and concrete building, a very early example of Modern architecture.





VAK  
MNO PQ Stadion





**Which belongs to a famous soccer club...**

Yes, a famous club, with a 50,000-seater stadium which has monumental status. It had been used a great deal and so needed major renovation work to upgrade it. As it is a listed building, we could not alter the main structure, which is also very lightweight. It is so flexible that during concerts there is even a technical team that measures the stadium's movement, which can be 20 or 30 centimeters. We designed the canopy, the cover for the seats, as an independent element and also upgraded all the facilities, two business lounges and a large building in front of that. It appeared to be a success. We went on to design many other Premier League stadiums in Rotterdam, The Hague and Alkmaar.

**But now you also have projects abroad, such as for Euro 2012, to be hosted by Poland and Ukraine.**

We are currently working on a master plan in Poland and on several studies in Belgium and Slovakia. But we are also working on a huge indoor golf arena as well as other indoor sports facilities in the Netherlands. Also very exciting for us is that we are working for the Dutch government on the Olympic master plan. The Netherlands wants to host the 2028 Olympic Games. In our opinion, it is



Rein Jansma, 51, founded the architecture studio Zwarts & Jansma in Amsterdam in 1990. His first major project was the planning of the Dutch Pavilion for the 1992 World Exhibition in Seville.



It is not blocks, but a softly curving sphere that shapes the face of the European Championship stadium for Sosnowitz in Poland (on the l.). Zwarts en Jansma made a name for themselves in stadium construction with the modernization of the Feyenoord Stadium (on the r.).

impossible to start work on such a project only seven years in advance, because infrastructure is a very large part of the planning. Basically what we are designing is the legacy. What will be left when the two weeks have passed in 2028? Then the question will be: What has it led us to achieve? But we also want to be prepared should the IOC not decide in favor of the Netherlands in 2021. Then we will say: That's a real shame, but look where we came from and what we have achieved and what we needed anyway.

#### **Which Dutch city will bid to host the Olympics?**

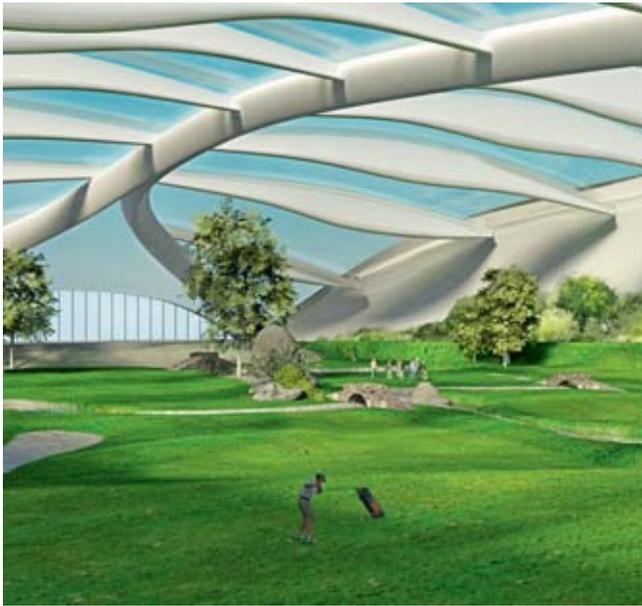
Amsterdam and Rotterdam are both willing to host the Games. Part of our research is finding out what opportunities the Olympics will present for both cities. How would each gain by hosting the Olympics? Would it be possible to have them jointly host the Games? Would it be possible with travel times between the venues? Amsterdam, being the more famous of the two, thinks it is an ideal potential host city because of the facilities it already has. Rotterdam on the other hand could really use the Olympics to promote its development. So there is a case to be made for both. Other people will decide, we are doing the research for it.

#### **So you focus on multifunctionality and infrastructure...**

We found that putting the infrastructure, such as roads and public transport, in place around major sports facilities is just as expensive as the venues themselves. So if the venue costs €100 million, you have to spend the same amount on infrastructure.

#### **In terms of multifunctionality, what other events could be held in a soccer stadium?**

We think that stadiums are the silliest buildings you can build. Who builds something that costs tens of millions, if not hundreds of millions of euros? For it to be used only once every two weeks? That cannot be a good design concept. A stadium should be a 24/7 building and will probably be more adaptable in the future. We already have in the Netherlands a stadium where the pitch slides out, so you can use it as an indoor hall for other events. It is also possible to raise the field, giving you an extra functional space underneath. We are now also developing retractable roofs, which can be closed and opened. If the stadium is not used for soccer, it can serve as a movie theater, as there are plenty of seats there and you can simply lower the screen. And when you partition the area, you can make a lot of smaller cinemas.



certain numerical value you can calculate from that, the c-value. It means that every row behind you must be a little bit higher than the one in front. So that is sort of parabolic seating. And of course it gets steeper and steeper and we say that there is a maximum gradient. We think a 30,000-seater is the optimum size. Of course you can build 80,000-seaters, which give you a certain thrill, but the bigger they get, the less intimate they are. A stadium is only a really good stadium if it is sold out. 80,000-seaters rarely sell out, at least in the Netherlands. But internationally too, we are not ones for saying "the bigger, the better". Intimacy should be the aim of our planning.

**But stadiums for major events like the World Cup have to have a certain number of seats...**

We are working on a concept where you can reduce the number of seats following a major event like the European Championships or World Cup. The question is: How can we achieve that feeling of coziness and unity? I love the Beijing Stadium by Herzog & de Meuron, but I did hear that it is hardly used at full capacity anymore. Seen from the point of view of sustainability, we don't make things which we don't use for the next 20 years. One thing we really must think of is the legacy. One of the key concepts, for example, might also be the option of using the highest parts of the building as apartments and offices. You could take out the seats and make a special zone there. Most of the time the pitch is like a park. It feels like a green open space, and is only used for soccer now and again.

**And the inhabitants would not have to pay entrance fees...**

Maybe, and perhaps they could bring all their friends home for a game. So it would be such a social thing.

**Many sports halls in smaller towns are intended to double up as venues for prestigious functions. How can that be achieved in architectural terms?**

Cities are getting bigger and bigger and at the same time are searching for identity. As players often move from one club to another, the clubs themselves also need a sense of identity. Instead of achieving fan loyalty to one player, the fans need to identify long-term with the club, such as Ajax, Feyenoord or Alkmaar. This is a big challenge for architects. And in the end it is not all about building the best stadium, which is then reproduced all over the world. We have to build identity instead.

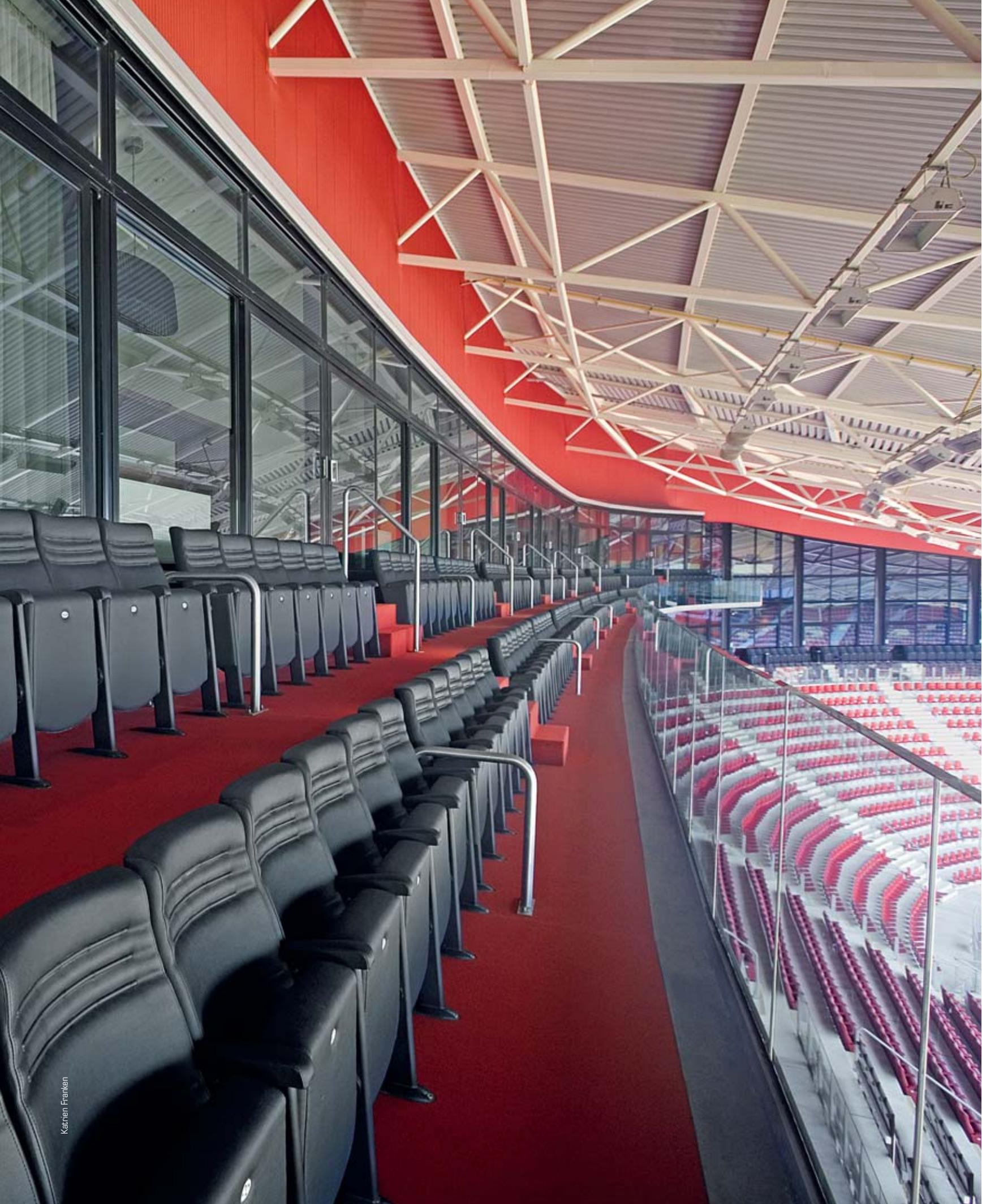
With a training area measuring 14,000 square meters, the Indoor Golf Arena designed by Zwarts & Jansma will be the largest of its kind in the world (l.). The club color, red, dominates the new AZ Alkmaar stadium (right, see also p. 33). A Busch-Installationsbus® EIB/KNX system is responsible for the lighting.

**Stadium designs are often measured in terms of whether they can generate 'atmosphere'. How can that be done?**

A stadium is not just about seeing the match. It is more about the experience. So it is for the emotional value that you go with a lot of people and you see the match and can really feel it. The atmosphere is about being there together. That is why we always plan the seating to wrap around the entire stadium instead of having four independent blocks, where the corner seats are not so good. Then you feel sort of cut off. And we always try to arrange the seats as close to the field as possible. As a matter of fact, we don't even like expanding the stadium. Why, for instance, would we want to seat 22,000 instead of 20,000? It is much better to have a sold-out venue and every seat filled, which promotes a feeling of unity, than have a few hundred more people. We prefer the sold-out, intimate game and the feeling that you are really there.

**One issue always mentioned in this context is the c-value...**

If you sit in one of the stands and want to look at the field, the person in front of you obstructs your view. There is a



# Concrete

Materials are the soul of architecture. They lend character to buildings and atmosphere to rooms. But what do architects think of classic materials today? *pulse* sought their opinion.

Answers by **Dominique Marrec, ecdm architects, Paris**

**Today, frequent use is made of the terms "concrete jungle" and "concrete bunker". At the same time, architects value the variable and adaptable character of concrete. How can this be reconciled?**

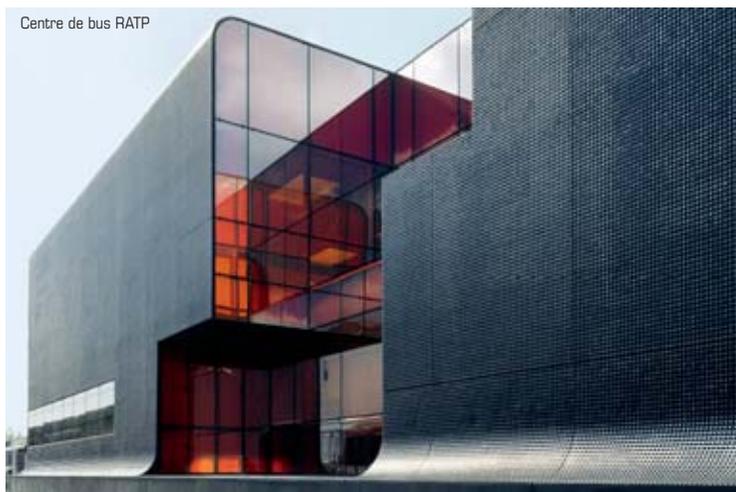
Concrete is an eternal material. Beyond its aesthetics, it has exceptional qualities and can respond to the highest requirements. These expressions point out the lack of pertinence of the requirements. The problem lays in the ability of these requirements to prefigure the evolution of the cities.

**You have used fair-faced concrete in an unusually delicate manner to create the thin, structured facade shells of the "Centre de bus RATP". Has the design potential of concrete not yet been fully exploited?**

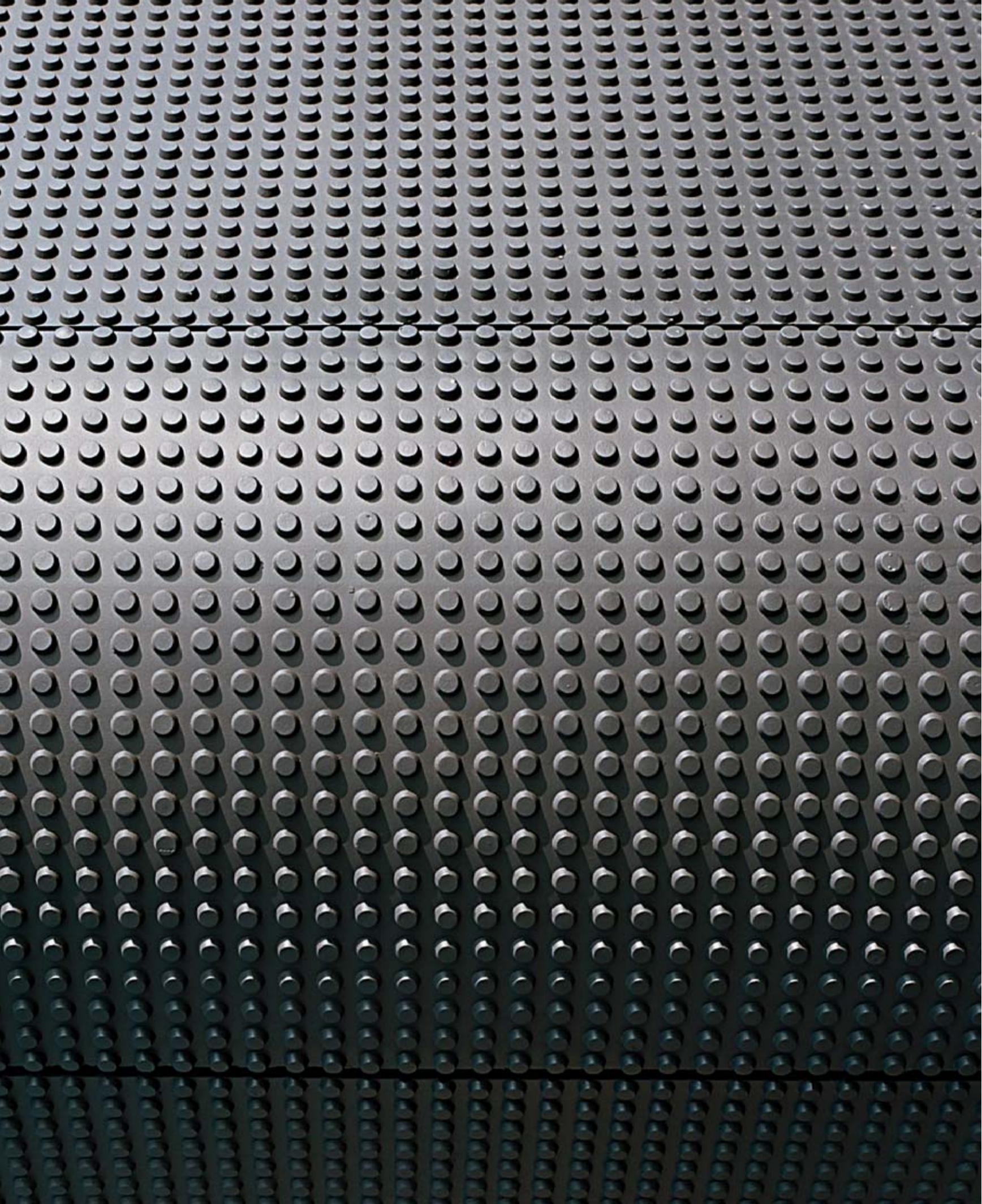
Concrete is beyond technique. Universal and versatile, it is a maximized material which interacts with the expectations and ambitions of its time. Combined with the demands of sustainability, concrete is opened to new fields of experimentations.

**With digitally controlled production processes - also for shell elements - it is forecast that concrete will undergo a renaissance. Is it therefore possible that concrete will be the building material of the 21st century?**

Concrete is the most democratic material in terms that it is local, and, wherever it is implemented, it has a tradition, a know-how and carries ambitions, essentially for the greatest number of people. It certainly is one of the most crucial materials for years to come.



Centre de bus RATP





## Recharge at Home and Enjoy Music – the Busch-iDock



Advances in memory technology are making music more and more mobile. Yet as audiophiles know it takes the right spaces and acoustic conditions to fully enjoy music. Music can have a powerful effect on the ambience of your home and can greatly enrich your life. Indeed, it's hard to imagine life today without music. And the same goes for the home. The Busch-iDock from Busch-Jaeger is a product that responds to these innovations in technology – and it celebrates music in our homes. This new solution allows you to easily charge iPod\* or iPhone\* products in the wall-mounted dock. At this year's light+building expo, the Busch-iDock proved itself a true eye-catcher, with visitors testing the recharging function directly at the Busch-Jaeger booth. Visitors were particularly impressed by the Busch-iDock's interaction with the Busch-DigitalRadio and its interface with the Busch-AudioWorld®, which enables you to broadcast music on an iPod throughout the entire house in just seconds.



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Busch-iDock provides a regular place in your home for your iPod and iPhone, and with no cables Busch-iDock can be integrated easily and attractively in your existing electrical installation. Additionally, its sleek design makes it ideal for any style. You can also use an Apple remote control to conveniently control your iPod or iPhone from a distance, and the 3.5 mm socket supports MP3 players from other manufacturers. The Busch-iDock and Busch-DigitalRadio provide excellent performance: The elegant duo can be integrated seamlessly with switch systems from Busch-Jaeger. When switched off, the UP-DigitalRadio displays the time and has an alarm clock function. One or two specially engineered speakers can be added in each room, enabling you to select high-quality mono or stereo sound throughout your home. The Busch-AudioWorld® System offers further customized solutions for the private domain, in addition to stores, offices, doctors' practices, reception areas, or larger residential complexes, where background music and an intercom function are used.



The home music system in switch-socket duo format combines a digital radio with Busch-iDock and speaker installations. These elements can also be installed individually.

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# How long is the race track in Abu Dhabi?

*pulse* asks a competition question in every new issue. The winners each receive a book.



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## Preview pulse 01-2011:

### Shopping Malls

pulse 01/2011 focuses on the art of attractive appearance, which is naturally part and parcel of the modern shopping experience.



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