

FOR LEISURE ARCHITECTS, DESIGNERS, INVESTORS & DEVELOPERS

PROFILE

## Snøhetta's Kjetil Trædal Thorsen

### SPACE SYNTAX

The science of human behaviour

PEGASUS CAPITAL'S

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on the Galapagos Islands

ON THE COVER

## David Rockwell

Shares the secret of his creativity

COVER PHOTO: CHRISTOPHER STURMAN





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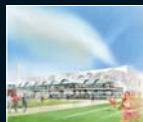
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Mixed-use leisure creates destinations and communities and adds value. But to thrive, its needs must be better understood



## Building respectful partnerships

**M**ixed-use developments of all kinds rely on the inclusion of leisure elements for a range of vital impacts which make the difference between the success or failure of a scheme.

Adding leisure can turn a property development into a destination by giving it a sense of place. It can add services which are vital to consumers to create a community and, as we saw in the previous edition of *CLADmag* (2015, issue 1), the addition of some elements – such as wellness – can add up to 30 per cent to hotel rack rates and the value of residential real estate.

But dovetailing leisure with other real estate types requires a thorough understanding of the needs of leisure operators. It also requires a respectful working relationship in the early stages of a project between investor, developer, architect and operator which is often lacking.

Too many developers believe it's acceptable to leave an empty shell as part of a development and market forces will take care of the rest: they figure that if one operator doesn't take the space, then one of their competitors will.

But this lazy approach undermines everyone: the investor, the reputations of developer and architect and the local community, when a scheme remains empty or fail to thrive.

Developers and architects too often design and build spaces which can never be optimised, due to their lack of knowledge of the ratios and business models of leisure businesses. Spaces are designed which are the wrong size, configuration or orientation or of the wrong type for the operation which is needed, either to win the planning consent which is being sought or to create the desired mix.

This leaves sites full of dead spaces which are simply not viable because of a lack of forethought and these can blight a development which might otherwise thrive.

The leisure industry is a fast moving and innovative one, and the options available to the developers and the architects who design for them are ever-changing, richer and more responsive to consumer demand and trends.

From the oyster hatcheries and urban farms being added to restaurants to operations such as Kidzania and the new breeds of health and fitness budget and micro gyms, there are hundreds of operations suitable for inclusion in mixed-use schemes and many are committed to fast global rollouts.

Developers, investors and architects must work to understand the needs of these entrepreneurial businesses and develop respectful partnerships, so mixed-use retail and residential developments realise their true potential.

Liz Terry, Editor, CLAD @elizterry

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Including leisure in mixed use developments can mean the difference between success and failure for a scheme, but strong and respectful partnerships are essential for it to work, says Liz Terry

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PHOTO: CHRISTOPHER BURMAN

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*We have created GOCO Spa Venice. The largest spa in Venice is opening on Isola delle Rose Island in March 2015.*



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CLADglobal, the organisation behind CLAD, is a media business creating magazines, books, websites and digital feeds to enable CLAD professionals to share news, opinions and best practice. Find out more about the CLAD portfolio at CLADglobal.com

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It's the biggest area of consumer expenditure in the developed world and the biggest driver of growth in the developing world.

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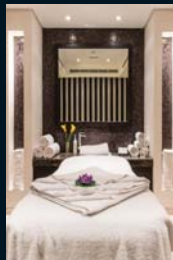
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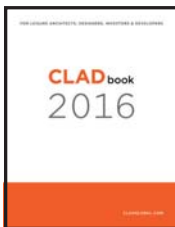
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# CLAD UPDATE

## Leonardo DiCaprio announces Belize eco-resort plans



PHOTO: MCLENNAN DESIGN

Blackadore Caye will have strict environmental requirements including water and energy self-sufficiency

Leonardo DiCaprio has announced plans to open Blackadore Caye – an eco-resort – on his private island in Belize in partnership with New York real estate firm Delos. It will be designed by Jason McLennan of McLennan Design.

DiCaprio bought the island for US\$1.75m (£1.66m £1.2m) after a holiday in 2005. The resort will have 68 villas spread across its 104 acres (42 hectares) when it launches in 2018.

Paul Scialla, owner of Delos, founded development arm Restorative Islands to build the resort, while Restorative Hospitality – another division of Delos – will operate the property.

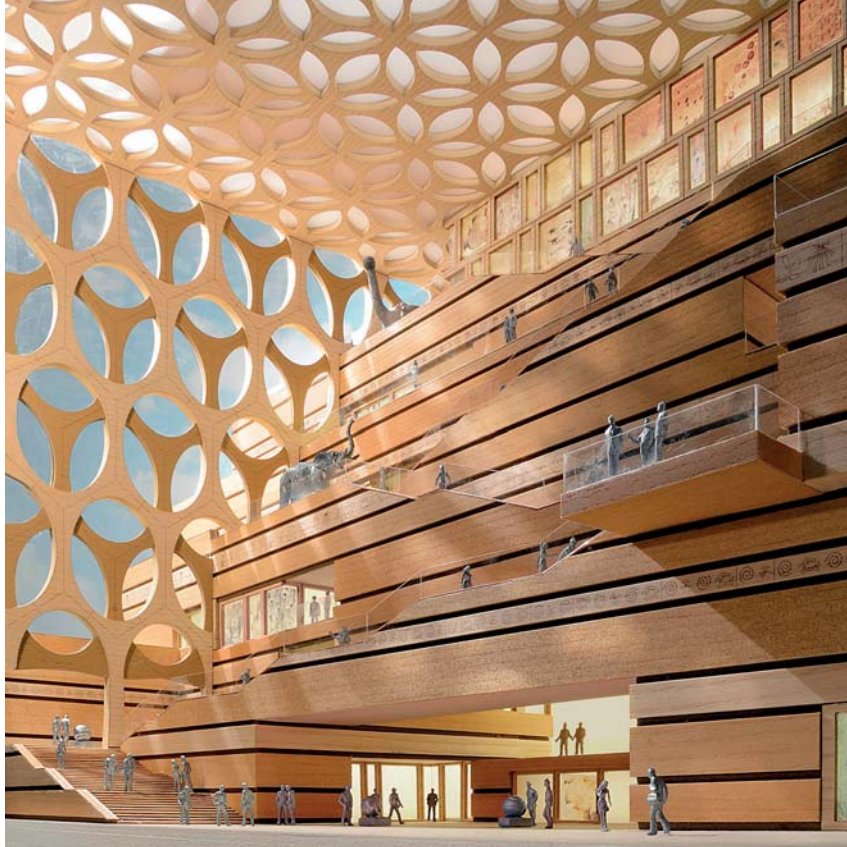
DiCaprio serves on the Delos advisory



board, along with McLennan and Deepak Chopra, who will have a centre on the island.

The resort will be the first to adhere to the Living Building Challenge which lays down environmental requirements for water use and energy self-sufficiency. McLennan said: "Many of Delos' health and wellness technologies will also be built into the architecture."

"The main aim is to do something that will change the world," said DiCaprio. "I couldn't have gone to Belize and built on an island if it weren't for the idea that it could be ground-breaking in the environmental movement." *More: [http://lei.sr?a=c7r7H\\_C](http://lei.sr?a=c7r7H_C)*



A series of exhibition halls in the main atrium will be stacked on top of each other

## Neutelings Riedijk unveils Naturalis Biodiversity Center

Neutelings Riedijk Architects have revealed final designs for the merger of three Dutch museums in Leiden, incorporating a central atrium to seamlessly blend old with new.

Combining the Natural History Museum 'Naturalis', the Zoological Museum in Amsterdam and the National Herbarium of Leiden and Wageningen, the existing 20,000sq m (215,000sq ft) museum will be renovated with further construction adding another 19,000sq m (204,500sq ft) of space.

The design includes a 36m (118ft) high

atrium, which will act as the meeting point between the existing Natural History Museum and the new expansion. In addition to exhibition and storage space, the new institution will also contain a laboratory, office space and various educational areas.

As part of Neutelings Riedijk's plans, a series of exhibition halls in the main atrium will be stacked on top of each other from the largest to the smallest. Each hall will be connected through a series of stairs on what is referred to as 'museum mountain'.

The glass crowning the hall uses three-dimensional elements to form a leaf pattern, while its windows will be screen-printed with coral designs. Both the inner and outer façades of museum mountain are decorated with fossil designs and feature natural stone panels resembling layers of the earth.

The Naturalis Biodiversity Center will house 37 million artefacts – making it among the top five attractions of its kind in the world. The expansion is scheduled for completion in early 2018. *More: [http://lei.sr?a=p5r7V\\_C](http://lei.sr?a=p5r7V_C)*



WINNERS SANAA

SANAA and the Art Gallery of New South Wales will now collaborate to finalise design plans

## SANAA wins contest for AU\$450m Sydney art gallery

Kazuyo Sejima and Ryue Nishizawa's vision for Sydney's Art Gallery of New South Wales will be realised after SANAA architects were named winners of the contest to design a AU\$450m (US\$344m, £315.6m, £225.2m) revamp of the facility and surrounding area.

As part of the expansion, the 23,000sq m (247,500sq ft) building will double in size to

become 'a global cultural landmark'.

SANAA's design connects the gallery to its surroundings – including the botanic gardens – with exteriors featuring cascading platforms of sandstone and glass.

The expansion and redevelopment will include educational facilities, space for live performances and open exhibitions and the

re-introduction of natural light to the gallery's original 19th century exhibition spaces. SANAA and the Art Gallery of New South Wales will collaborate to finalise the design.

The existing gallery attracts 1.3 million visitors annually. If plans go to schedule, the gallery will open in 2021 ahead of the institution's 150th anniversary. *More:* [http://lei.sr?a=v4D4B\\_C](http://lei.sr?a=v4D4B_C)



The existing Art Gallery of New South Wales building dates back to 1896 and attracts 1.3 million visitors a year



PHOTO: IWAN BAAH / HERZOG &amp; DE MEURON



The 42,000-seat stadium hosted its inaugural match on 23 May. The design uses 900 white columns, which replicate nearby pine trees



## Herzog & de Meuron complete Bordeaux stadium

Herzog & de Meuron's 42,000-seat football stadium in Bordeaux, France, has been completed – with Zinedine Zidane the guest of honour at its inaugural match.

Delivered on time and on budget, Nouveau Stade de Bordeaux has been designed to appear light and open. Grand staircases blur the boundaries between inside and out, while

900 white columns guide visitors. Herzog & de Meuron said the combination of the two symbolised openness and accessibility.

The design is inspired by the slender pine trees of the nearby Landes Forest. The jungle of white columns on the exterior supports the stadium's bowl, which ensures maximum flexibility and optimal visibility for fans.

"Its purity and geometrical clarity inspire a sense of monumentality and gracefulness," said the architects. "The stadium opens up to the landscape and its transparency reveals the energy and activities that will transform this land into a new and vibrant part of Bordeaux."

The stadium will host five matches during Euro 2016. *More:* [http://lei.sr?a=h9t8S\\_C](http://lei.sr?a=h9t8S_C)



PHOTO: IMAN INJANING

BIG has followed up the installation of a sports hall at Gammel Hellerup High School with a new arts building

## Bjarke Ingels finishes project at his old high school

Architectural practice BIG has completed the second phase of a project at Gammel Hellerup High School, Copenhagen, Denmark – the old high school of founding partner Bjarke Ingels.



The new addition, a 1,400sq m (15,069sq ft) arts and culture building, follows the completion of a multi-purpose sports hall in 2013, which paid homage to Ingels' maths teacher by using the mathematical formula for a ballistic arc – the flight path of a shuttlecock – to shape the geometry of its curved roof.

Located next to the sports hall, parts of the new two-storey building are beneath a football field. It has facilities for arts, music, drama, and student counselling.

BIG said the building has been designed to connect the sports areas with the gym's existing educational facilities in one continuous flow out to the main entrance at street level.

The roof of the building extends the school's existing football fields into a green carpet that can be used as informal seating to overlook sports events. *More:* [http://lei.sr?a=a6m4e\\_C](http://lei.sr?a=a6m4e_C)



PHOTO: BARNIS HOFERRECHT

The two new buildings increase the capacity of the school



PHOTO: MARITSEN HORNBERG



PHOTO: MARITSEN HORNBERG

The new building connects sports areas to educational facilities; The green roof can be used as additional seating for watching events

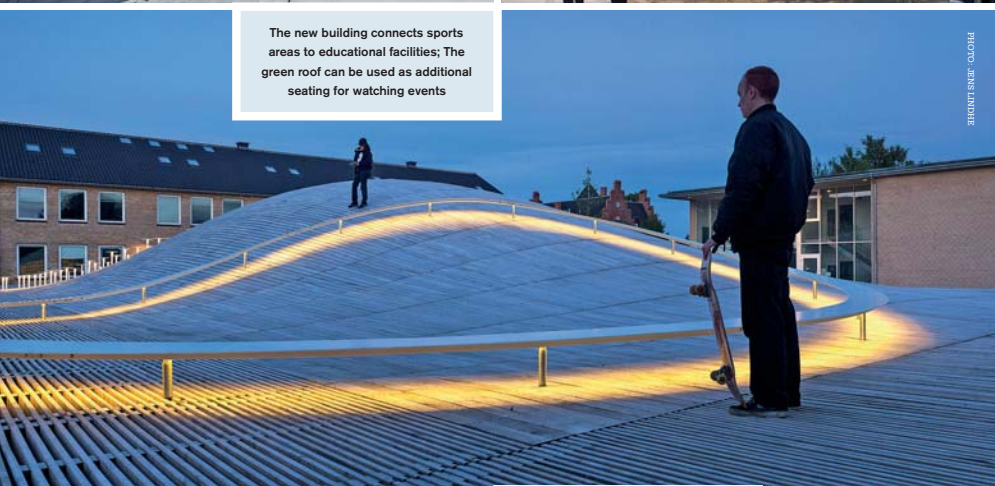


PHOTO: JENS LINDBLIE



PHOTO: JENS LINDBLIE

The existing sports hall was completed in 2013 (below); The roof of the multi use hall, which is located underground (left)

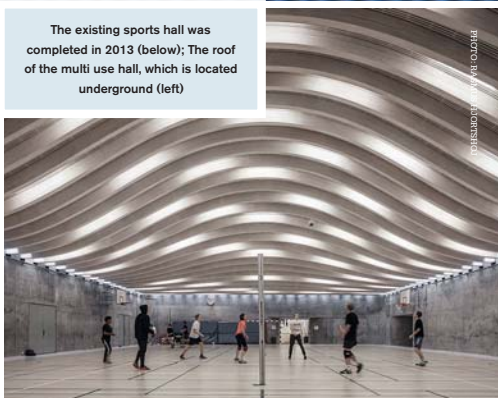


PHOTO: MARITSEN HORNBERG



PHOTOS: ZAHA HADID ARCHITECTS

One Thousand Museum by Zaha Hadid Architects features a spa and an aquatics centre

## Zaha Hadid's super-luxe residential tower in Miami will have custom scenting and helipad

Zaha Hadid has designed a new, super-luxe residential tower called One Thousand Museum for the Museum Park area of Miami, US.

The 62-storey building will have 30,000sq ft of private leisure facilities for residents and guests, making it an enclosed community.

With 83 exclusive, luxury apartments, One Thousand Museum is offering an elegant, six star lifestyle with 'museum-quality' residences. Options will include duplex townhomes, half-floor residences, full-floor penthouses and single duplex penthouses.

The building will have a dramatic sculptural concrete exoskeleton, with columns splaying out at the base. Facilities will include a five star restaurant and a double height aquatics centre with indoor infinity pool and outdoor sun deck on the top floors overlooking the Miami skyline and the Atlantic Ocean.

A two-storey wellness and spa centre will occupy two floors at the base of the building, overlooking a sun and swim terrace. A fitness centre will have dedicated areas for

movement training and stretching, as well as an outdoor area for other fitness activities. The spa has treatments rooms for body and beauty services, steam and sauna, plunge pools and a relaxation lounge.

**The 62-storey building will have 30,000sq ft of private leisure facilities for residents and guests, making it an exclusive community**

A multimedia theatre, billiard room and event space complete the mix. All greenspace and gardens have been designed by Swiss landscape architect Enzo Enea.

The residential building will also feature its own private rooftop helipad.

One Thousand Museum will have its own custom scenting: all interior amenity spaces, including the lobby, wellness and spa levels, aquatic center, and sky lounge, will be

perfumed with signature ambient scents designed by olfactory consultants 12.29.

Residences can be also scented with a custom or unique scent for an additional fee.

The building, which is due for completion in 2017, sits adjacent to a number of world class attractions, including the Adrienne Arsht Center for the Performing Arts, which was designed by architect Cesar Pelli, and the recently redesigned Museum Park on Biscayne Bay which was designed by New York's Cooper, Robertson & Partners.

One Thousand Museum is also situated to take advantage of US\$10bn of investments in nearby retail, hospitality, and entertainment developments which are coming on stream.

The neighbourhood also has two new museums. The Perez Art Museum Miami, a contemporary collection of international modern art, which opened in 2014 and the Patricia and Phillip Frost Museum of Science – or MiaSci – which is under construction and set for completion in 2016. *More: [http://lei.sr?a=b4R6U\\_C](http://lei.sr?a=b4R6U_C)*



The building will have a dramatic sculptural concrete exoskeleton, with columns playing out at the base

## Five teams shortlisted for Singapore's Rail Corridor

Following the phenomenal success of New York's High Line, architects across the world have been keen to get their hands on similar projects, with cities and countries wanting to capitalise on unused space. The Singaporean government is the latest to get involved, shortlisting five architects to develop a feasible plan for 24km (15m) of track spanning the length of Singapore from north to south.

The Singapore Rail Corridor is the site of the country's previous rail link to Malaysia. The stretch of track has four key entry points around Singapore: Buona Vista, the Bukit Timah Railway Station area, the former Bukit Timah Fire Station, and Kranji.

Singapore's government is looking for a project that responds sensitively to the ecology of the site and respects its natural qualities, saying: "We want the corridor to be an outstanding urban asset, and are therefore open to innovative concepts; ideas that demonstrate a freshness of approach and exceptional design qualities that will enhance our urban landscape." *More:*

[http://lei.sr?a=r6p5s\\_C](http://lei.sr?a=r6p5s_C)



The Singapore Rail Corridor is the site of the country's previous rail link to Malaysia

## Oregon's Willamette Falls to get Snøhetta treatment



The falls were home to lumber, flour, wool and paper mills as well as a brick-making operation

A Snøhetta-led team has been chosen to create a walkway giving public access to the second largest waterfall in the US.

Toronto-based architects Dialog and Portland-based landscape studio Mayer/Reed complete the design team for the 'Riverwalk' portion of a revitalisation project at Willamette Falls, in Oregon City, Oregon.

Riverwalk connects the city centre to the waterfall, which will be accessible to the public for the first time in 100 years.

The design team envisions providing an 'experientially-rich' walkway which amplifies the beauty of the falls, while interpreting the site's history. An important gathering spot for Native American tribes, Willamette Falls was also the location of the country's first long-distance transmission of electricity in 1889 and home to thriving lumber, flour, wool and paper mills, as well as a brick-making operation.

"We believe that the site and the history it holds means it's a one-of-a-kind landscape that should not be upstaged by the hand of any designer," said Snøhetta's Michelle Delk.

*More:* [http://lei.sr?a=v0p8y\\_C](http://lei.sr?a=v0p8y_C)

## Underground arts venue for Brunel's Thames Tunnel

Isambard Kingdom Brunel's original entrance to the world's first underwater tunnel is to be turned into a cultural venue for music performances, theatre and events.

The 65ft (19.8m) deep entrance shaft to the Thames Tunnel, in Rotherhithe, London, was the first project the famous engineer worked on. Architectural practice Tate Harmer has now designed a freestanding cantilevered staircase that will provide public access to the circular 'sinking shaft' for the first time in 150 years. The staircase will also come with a high level viewing platform.

There will be capacity for up to 135 people in the new venue, which will also be available for hire. Construction work is expected to be completed later in 2015.

The project was conceived by the Brunel Museum and will also include a redesigned public entrance. It is the first phase of a wider masterplan for the museum, developed in collaboration with Grimshaw Architects.

The tunnel is considered to be the birthplace of the London Underground system.

More: [http://lei.sr?a=J5k9Q\\_C](http://lei.sr?a=J5k9Q_C)



Brunel's sinking shaft will provide a unique setting for cultural events

## Design Competition announced for vast Doha gallery



Doha is investing in cultural infrastructure on its historic waterfront

Qatar Museums has started its search for an architect to design a one million square foot art gallery in Doha, Qatar.

The Art Mill International Design Competition will see the remodelling of the Qatar Flour Mills, using existing grain silos to create one of the largest galleries in the world.

The site is 83,500sq m (898,787sq ft) with extensive outside space integrated with the design, giving opportunities for cross-programming and public engagement, as well as creating a sustainable setting.

The gallery is sited on Doha's cultural and historic waterfront, next to I.M. Pei's Museum of Islamic Art, and Jean Nouvel's National Museum of Qatar, which is under construction.

Competition organisers are calling for an accomplished design, with architectural integrity and presence. The design contest is being organised by Malcolm Reading Consultants and will take place in three stages.

Entrants must register by June 26 with the winning practice revealed in spring 2016. competitions.malcolmreading.co.uk/artmillqatar/

More: [http://lei.sr?a=x9u8K\\_C](http://lei.sr?a=x9u8K_C)

PHOTO: HIFTON + CHOW



PHOTO: JAKUB CHERTOWICZ

The building's spiky skyline is reminiscent of the city's gothic spires (top left); The auditorium interiors are golden with faceted panels

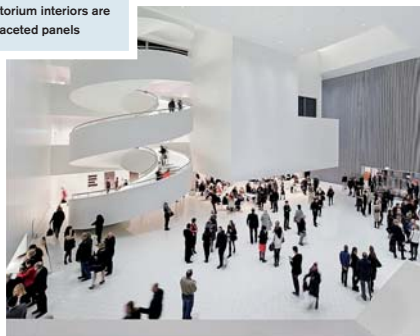
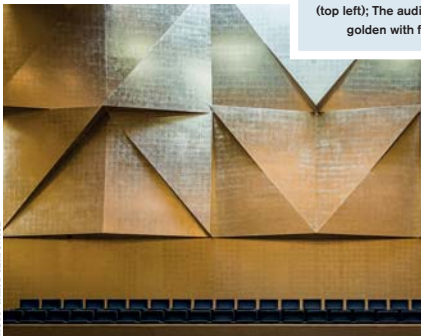


PHOTO: JAKUB CHERTOWICZ

PHOTO: MICHAEL COLTIER

## Dazzling Szczecin Philharmonic wins Mies van der Rohe

The winner of the 2015 Mies van der Rohe Award has been announced as Barozzi / Veiga's extraordinary, glowing concert venue, the Philharmonic Hall in Szczecin, Poland.

The building scooped the E60,000 Prize for Contemporary Architecture from a shortlist of five projects, taking the award, which is given every two years in recognition of outstanding European architecture.

Although Barcelona-based Fabrizio Barozzi and Alberto Veiga were inspired by the neo-Gothic spires of the city, the hall's translucent glass façade is a minimalist counterpoint to its surroundings and glows white among the surrounding dark stone buildings.

Outside, the sheer walls of the concert hall stretch up to numerous steeply pitched roofs,

giving a spiky profile. Colour changers shift the light in bands which glow in a colour sequence.

Inside, the Philharmonic Hall houses two auditoriums, conceived as suspended boxes, with an ample bright lobby between them lit by skylights. The interiors are lined with angular metallic panels, giving a golden glow and contrasting with the white walls of the lobby. The Philharmonic Hall has already picked up the Life in Architecture award 2013-2014 for best building in Poland from Polish architecture magazine, *Architektura Murator*.

Three of the other four finalists – the Ravensburg Art Museum by Lederer Ragnarsdóttir Oei's, the Danish Maritime Museum by BIG and the Antinori Winery by Archea Associati – were also leisure projects.

The award has been given biannually since 1987 by a group made up of the European Commission, the European parliament and the Fundació Mies van der Rohe.

Named after the American-German architect – one of the pioneers of modern architecture – the award is among the most prestigious in Europe. Winners are selected from projects completed by European architects in the preceding two years.

Previous winners have included the Harpa Concert Hall and Conference Centre in Reykjavik, Iceland, by Henning Larsen Architects and artist Olafur Eliasson and the Neues Museum in Berlin, Germany by David Chipperfield Architects and Julian Harrap.

More: [http://lei.sr7a=S6F7e\\_C](http://lei.sr7a=S6F7e_C)





PHOTO: JEFFREY M. CHOW

Inside the dramatic spiral staircase provides access to various auditoriums and event spaces



PHOTO: GUY HOLLOWAY ARCHITECTS

The regeneration of Folkestone is driving innovation, with new projects planned and underway

## Guy Holloway reveals world's first multi-level skate hub

Guy Holloway Architects have revealed plans for a multi-level skate park to draw international skaters and spectators to Folkestone, UK.

The plans outline a 1,000sq m (10,700sq ft) three-storey skate park for the seaside town in the south east of England, the first multi-story facility of its kind.

The sports park will also host a variety of popular urban sports including skateboarding, BMX-ing, rollerblading and scootering, with additional trial cycling facilities, a climbing

wall and a boxing club. It will serve as a national and international attraction, besides offering access to young people involved in the popular local skate and BMX scene.

The building is a former bingo hall which is located near Folkestone's regeneration zone. Nearby, the town's creative quarter is home to other architecturally significant projects, including the recently completed Quarterhouse performing arts centre and digital hub 'The Workshop'.

Commissioned by the Roger De Haan Charitable Trust, the scheme by Guy Holloway Architects went out to public consultation locally in May as part of a process that will lead to a formal planning application.

Chair of Folkestone Youth Project, Damian Collins, said: "The proposals would take provision for young people in Folkestone to a new level, and would help to establish permanent amenities that would be the envy of any town in the south east." *More: [http://lei.sr?a=c4V5N\\_C](http://lei.sr?a=c4V5N_C)*



Subsix is an underwater venue offering a spectacular setting for a variety of events

## Underwater nightclub redesigned by Poole Associates

It can only be reached by taking a speedboat over a coral reef and descending a dramatic three-tier staircase, and was originally opened in 2012 as the world's first underwater nightclub. Now Poole Associates has redesigned Subsix, the underwater venue located at the Per Aquum Niyama resort in the Maldives, to become a multi-functional creative space which can be "transformed into whatever guests imagine it to be".

The Singapore-based architect and interior designer drew inspiration from the aquatic surroundings for the redesign, which allows guests to take part in a range of events.

These events include subaquatic lunches, gourmet dinners, weddings, hosted events and wine tastings, while parties and DJ



Poole Associates' redesign was inspired by the venue's aquatic surroundings

nights maintain the venue's club roots.

A clam-inspired bar takes centre stage in the middle of the room, with its fibreglass shell illuminated by mood lighting that shifts throughout the day. Additionally, thousands of strands of capiz shells drape from the ceiling and mimic an undersea kelp forest, while coral-like chandeliers provide lighting. Silver-panelled columns throughout the venue are inspired by the ribbed gills of manta rays, according to Poole Associates.

Floor-to-ceiling glass windows line Subsix, allowing views of the marine life and the more than 90 coral reef species outside.

The nightclub is located 6m (20ft) below the waterline and 500m (1,640ft) offshore. [More: http://lei.sr?a=q2k5T\\_C](http://lei.sr?a=q2k5T_C)



PHOTO: RITZ PARIS

The Ritz Paris first opened in 1898. It has always featured a Coco Chanel suite

## Chanel will open its first ever spa at the Ritz Paris

Thierry W. Despont's soon-to-be completed renovation of the Ritz Paris will see the first ever Chanel-branded spa unveiled at the historic hotel, officials have confirmed.

While many details of the spa remain well under wraps, in a statement, the Ritz Paris said the spa – Chanel au Ritz Paris – will be “a new beauty concept dedicated to Chanel’s skincare” and will “provide guests with a

unique sensorial and customised experience inspired by Chanel’s art of skincare.”

The Ritz Paris, open since 1898, closed its doors in 2012 for extensive, historic renovations. The project is being led by architect and designer Thierry W. Despont, who the company said is “dedicated to conserving the magic of the Ritz Paris whilst adding to the very latest technologies.”

Chanel au Ritz Paris will be located within the Ritz Club and the spa of the hotel that has been “entirely rethought” during the extensive renovation. The Ritz Paris is a natural place for Chanel to make its spa debut – Coco Chanel famously lived in the hotel for 34 years, bringing her furniture with her, and the hotel has always featured a Coco Chanel suite. *More:* [http://lei.sr?a=d2n7Q\\_C](http://lei.sr?a=d2n7Q_C)

PHOTO: BLUE LAGOON



## Exclusive: Iceland's Blue Lagoon to undergo €40m expansion

The world-famous Blue Lagoon geothermal destination spa in Iceland has revealed exclusively to CLADglobal that it's investing E40m in an expansion and redesign project.

Sigrídur Sighthorsdóttir of Basalt Architects will lead the project, which is due for completion in 2017. She's been the architect at Blue Lagoon for almost 20 years and her work in harmonising the man-made and natural environment has received international acclaim.

A new thermal bathing pool, built into the surrounding lava field, will connect to the existing lagoon and enlarge it by half. A luxury 60-bed hotel will also be included in the development.

The Blue Lagoon, which holds six million litres of geothermal seawater, is one of the most popular tourist attractions in Iceland and last year it welcomed 766,000 visitors. *More:* [http://lei.sr?a=T5M2k\\_C](http://lei.sr?a=T5M2k_C)



PHOTO: BAHARASH ARCHITECTURE

Baharash Architecture was appointed as lead designer for The Sustainable City

## Solar powered hotel for Dubai's Sustainable City

A hotel powered exclusively by solar energy is to open at Dubai's 'The Sustainable City' development, which has been designed by Baharash Architecture.

Intercontinental Hotels Group (IHG) has signed an agreement with Diamond Developers – which is leading the city project – to develop the UAE's second Hotel Indigo.

As well as being fully solar powered, all waste water produced by the hotel will be recycled, and all material waste will be sorted at source and then recycled. Additionally, a solar powered shuttle bus will connect hotel guests to downtown Dubai.

The 170-room hotel will include a restaurant, health club and outdoor pool and is scheduled to open in the first half of 2017.

Aiming to be a regional leader in eco-tourism and global environmental protection, The Sustainable City will be Dubai's first net zero energy city, covering an area of 5,000,000sq ft (464,515sq m). Diamond Developers selected Baharash to be the lead architects for the second phase of the project back in 2013.

A museum, planetarium, amphitheatre and equestrian centre will also feature, alongside residences, a green school, a community centre, a mosque, and an organic farm.

"The Sustainable City will set the bar for environmental standards," said Faris Saeed, CEO of Diamond Developers. "Hotel Indigo is the perfect brand for this new community and with IHG's strong track record we're confident the hotel will be a success here." *More:* [http://lei.sr?a=j7p7p\\_C](http://lei.sr?a=j7p7p_C)

## Equinox to diversify into hotel business

Equinox Holdings, parent company of US health club chain Equinox Fitness, is preparing to launch an upscale hospitality brand.

Plans are afoot for 75 hotels worldwide, each with a fitness facility within the hotel, or very close, which would be open to hotel guests as well as to members.

The first site is slated for Manhattan in 2018, as part of the massive Hudson Yards scheme. It is a development by Related Co – a

major shareholder of Equinox – which plans to invest several billion dollars in the chain over the next few years.

Designed by Yabu Pushelberg, the property will include indoor and outdoor swimming pools and the company's largest gym at over 600,000sq ft. The second site is expected to follow a year later in Los Angeles.

The hotels will offer one-on-one coaching, a spa providing recovery-specific treatments

and a organic destination restaurant.

"We are appealing to the discriminating consumer who lives an active lifestyle and wants to have that as a hotel experience," says Equinox CEO Harvey Spevak. "We are experts in the art of life maximisation, creating bespoke experiences, offering unparalleled services and always seeking to inspire through considered design." *More:* [http://lei.sr?a=2F3t6\\_C](http://lei.sr?a=2F3t6_C) ●



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# ESPA



ESPA Life at Corinthia, London



# CLAD PEOPLE

**“The complexity of the architecture will create a positive tension between the art and the architecture”**

**Rem Koolhaas** Founder, OMA

Project: **Fondazione Prada, Milan, Italy**

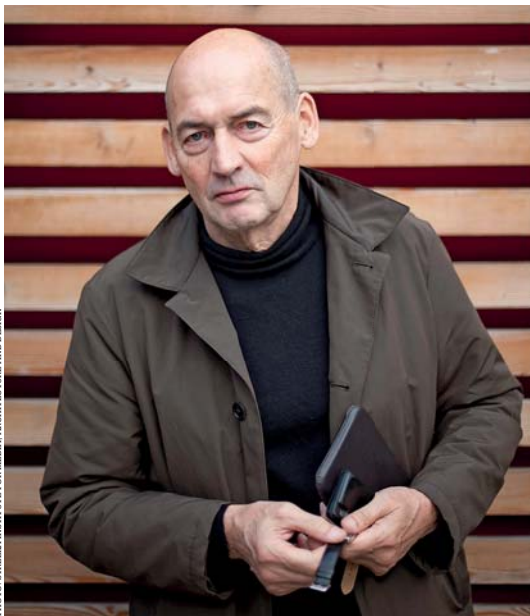


PHOTO: STREBELA INSTITUTE FOR MEDIA, ARCHITECTURE AND DESIGN

**O**MA, the architectural practice founded by Rem Koolhaas, have converted a former industrial complex in Milan, Italy, into a new home for designer Miuccia Prada's Fondazione Prada.

Fondazione Prada was established by Miuccia Prada in 1993 as a cultural organisation dedicated to the arts, cinema and philosophy. The new venue opened on 9 May.

The 19,000sq m (204,500sq ft) art campus, has been seven years in the works and was masterplanned by the OMA team of Koolhaas, Chris van Duijn and Federico Pompignoli.

Commissioned by Fondazione Prada, the project blends modern and traditional architecture with the regeneration of a 20th century factory. Local architects Alvisi Kirimoto & Partners and Atelier Verticale also worked on the project, while Favero&Milan acted as structural engineers.

The former gin distillery comprised warehouses, laboratories and brewing silos. The redevelopment leaves seven of the existing buildings and adds three new structures. These contain a museum, cinema, auditorium, space for temporary exhibitions and a 10-storey permanent exhibition space to house the foundation's collection.

The building also has a café designed by film director Wes Anderson and an exhibition pavilion. The standout feature is a building known as the Haunted House – a structure



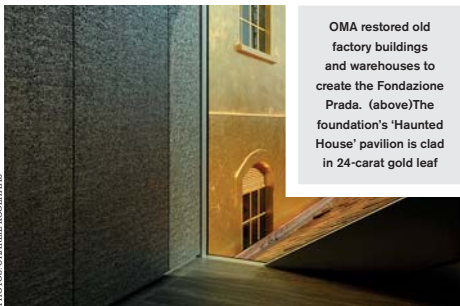


PHOTOS BY SAATCHI & SAATCHI

clad in 24-carat gold leaf, with only the glass on the windows remaining exposed.

"The Fondazione is not a preservation project and not a new architecture project," said Rem Koolhaas. "Two conditions that are usually kept separate here confront each other in a state of permanent interaction – offering an ensemble of fragments, each of which will keep its own identity, while not dominating the others."

He added: "New, old, horizontal, vertical, wide, narrow, white, black, open, enclosed – all these contrasts establish the range of oppositions that define the new Fondazione. By introducing so many spatial variables, the complexity of the architecture creates a positive tension between the art and the architecture."



PHOTOS CHARLIE KOOIJHAAS

**OMA restored old factory buildings and warehouses to create the Fondazione Prada. (above) The foundation's 'Haunted House' pavilion is clad in 24-carat gold leaf**

PHOTO: LUCA BRUNO/ALFRESS ASSOCIATION IMAGES

The Serial Classic exhibit includes a collection of cars reworked by a variety of artists (above); Koolhaas said he wanted to create a diverse range of spaces for displaying art

PHOTO: BAS PRINCEN

FONDAZIONE PRADA





RECONSTRUCTION COURTESY

Miuccia Prada with her husband Patrizio Bertelli, CEO of Prada. Miuccia is co-CEO of Prada.



PHOTO: ARTILIO MARIANO COURTESY OF FONDAZIONE PRADA



PHOTO: BREVETEL BILD/REDA/PA PRESS ASSOCIATION IMAGES

Film director Wes Anderson designed Bar Luce, which features a pinball machine inspired by his film The Life Aquatic



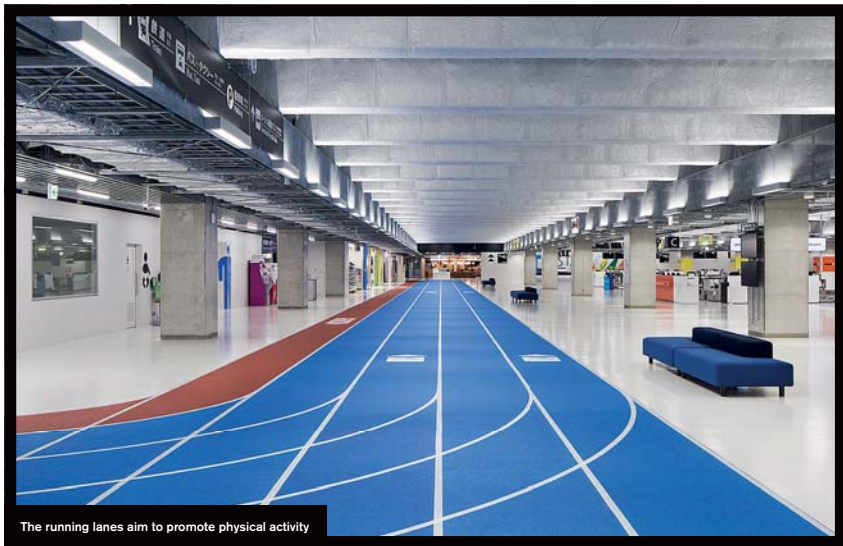


PHOTO: NARITA AIRPORT

The running lanes aim to promote physical activity

## “I thought it would be interesting to capture the positive feeling that occurs when running”

**Naoko Ito** Chief creative officer, Party

Project: Narita Airport Terminal 3, Tokyo, Japan

**J**apanese creative lab Party are behind the innovative design of Narita Airport's Terminal 3, which features a running track designed to help passengers find their way through the airport.

A tight budget meant the architects couldn't install moving walkways into the Japanese airport. The solution turns this into a positive, using colour-coded running lanes to promote activity ahead of the 2020 Tokyo Olympics.

"I was on the track team in elementary school and I thought that it would be interesting if we could capture the positive feeling that occurs in the moment of running," Party chief creative officer Naoko Ito told CLADmag.

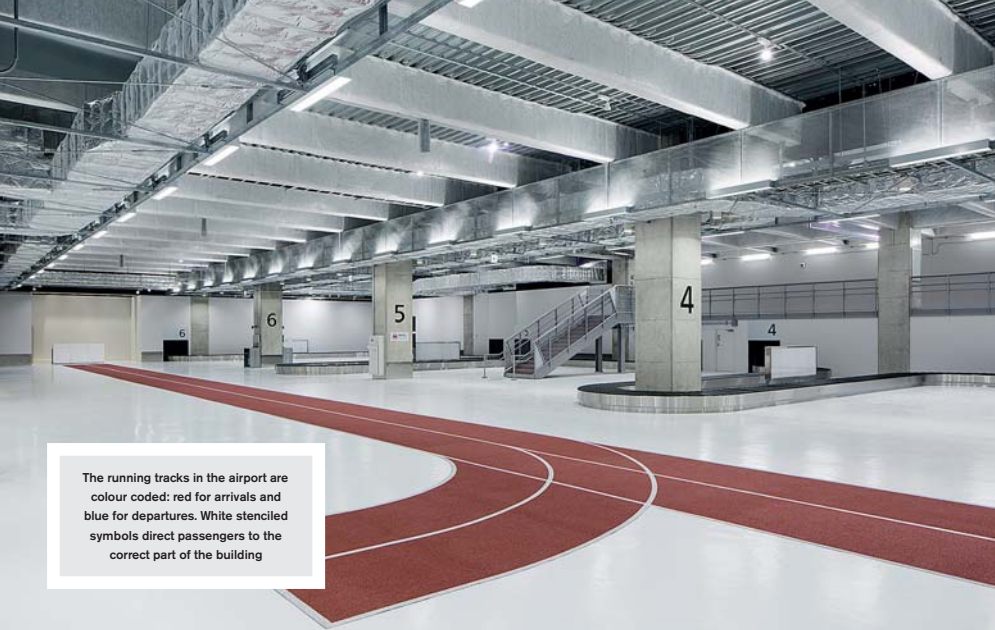
"To offer an exciting walking experience that is easy on the feet, we implemented running



tracks used for track and field, which also serve as clear signage for user-friendly guidance."

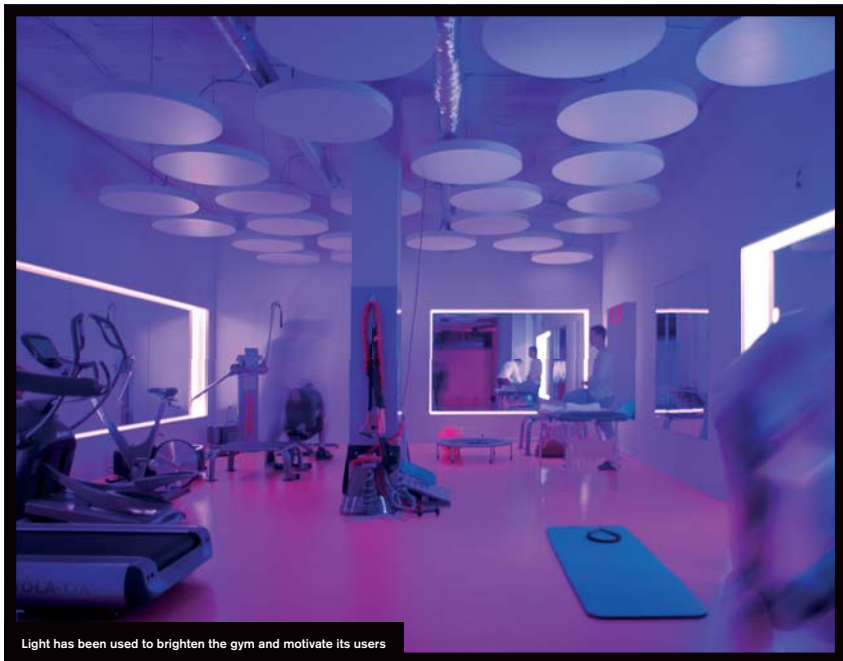
The Narita Airport project was three years in the making; the lack of expensive walkways and illuminated signage used in the terminal kept costs very low. Ito said the airport's preparations for the Olympics and the fact that Terminal 3 will be exclusively used by low-cost airlines meant that 'physical activity meets economy' was a perfect theme for the project.

"For me, the key to great architecture and design is fitting 2+ into 1," added Ito. "We always seek to consolidate two or more functionalities into one in pursuit of economic reasonability. In short, we as an agency treasure innovative designs which provide an affordable twist on the norm."



The running tracks in the airport are colour coded: red for arrivals and blue for departures. White stenciled symbols direct passengers to the correct part of the building





Light has been used to brighten the gym and motivate its users

## “We used light, colour and air as our main materials”

**Gabriel Gomera** designer

Project: R3 Fitness Centre, Manresa, Spain

**F**aced with a very tight budget and a small space, Spanish architect Gabriel Gomera decided to let light play centre stage at the R3 fitness centre in Manresa, Spain.

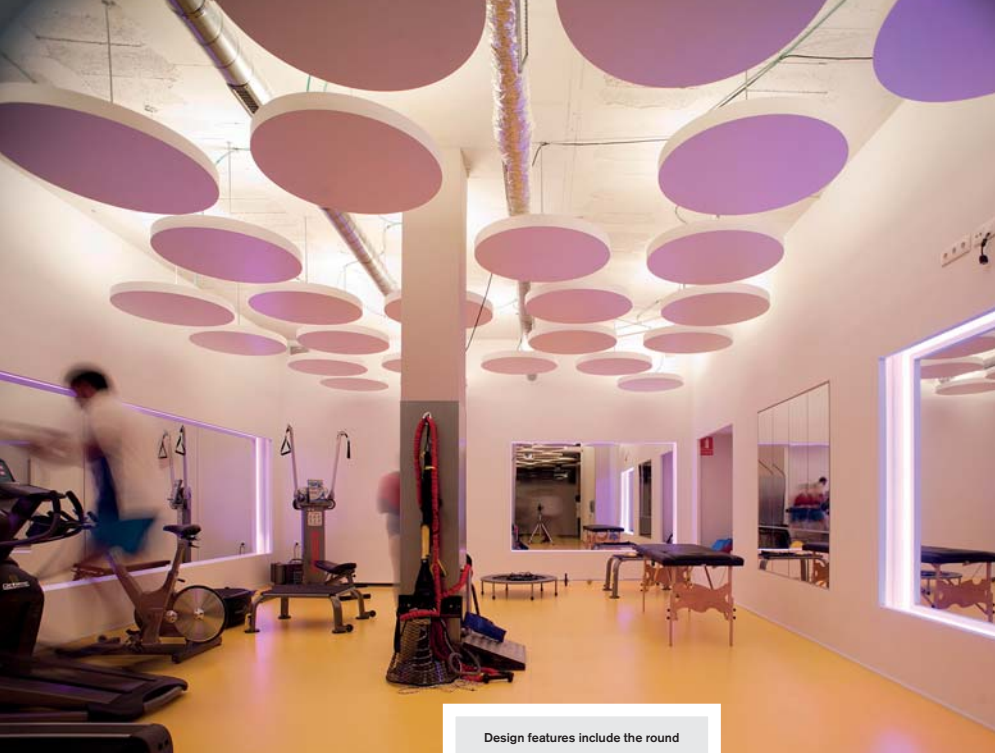
The 230sq m active therapy centre, which is aimed at athletes, is located on the ground floor of a residential building in the town and features a number of different activity and training rooms as well as a reception and entrance area plus changing facilities.

In order to get away from the traditional dark gym, Gomera used large windows and mirrors to open up the small space. The bright yellow flooring contrasts with the white walls and natural woods, and large round ‘saucers’ house the lighting, providing indirect illumination.

“The budget was really low, so we decided to keep the space naked, just adding the most basic elements to make it work,” Gomera told CLADmag. “We played with the light, colour and air, which we used as our main materials.

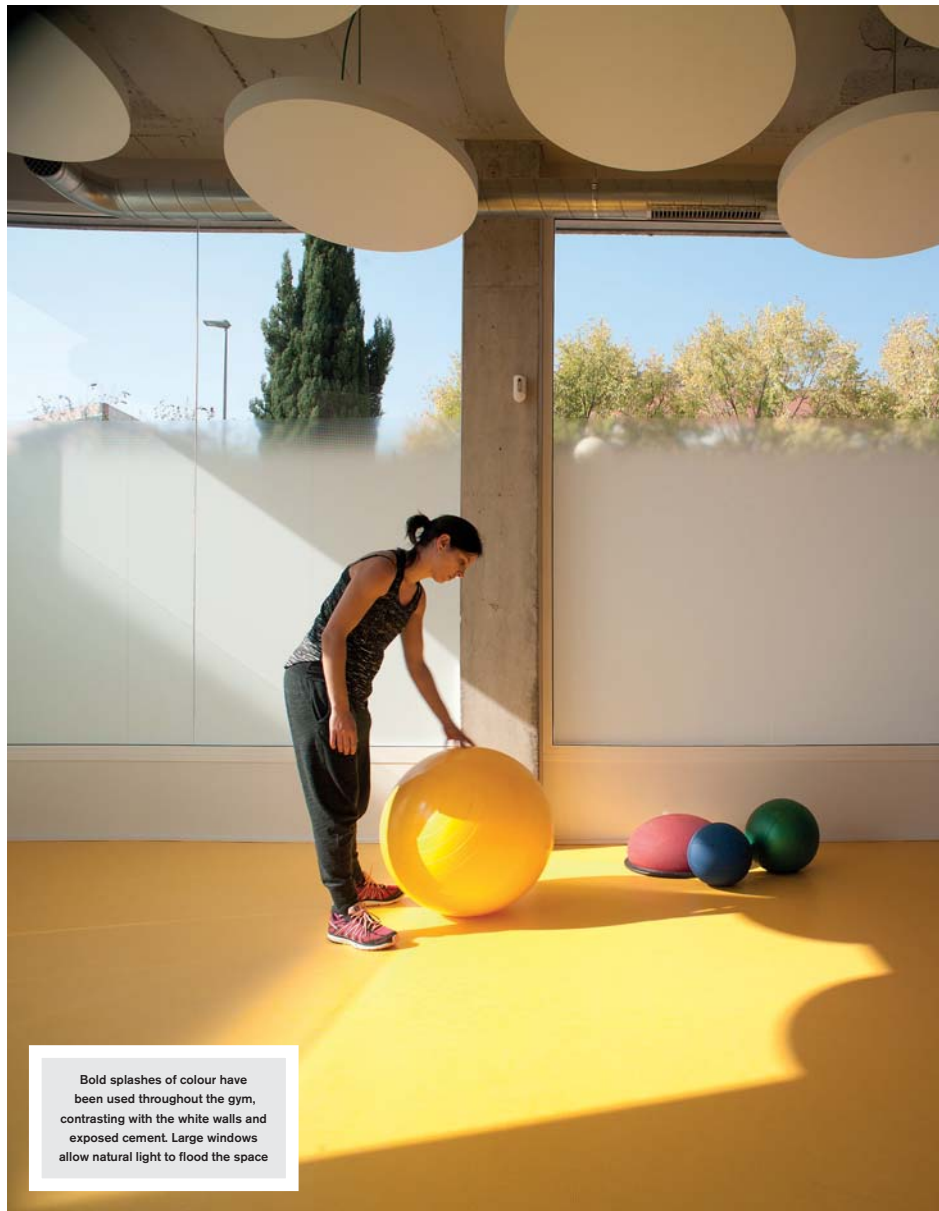
“I’ve always felt that working out in a closed room was a kind of contradiction. In this centre my aim was to make users feel the freedom of the outdoors. Using air and light we managed to transform the limits of the space.

“I’m very proud of the custom lighting result. We call the ceiling lamps ‘plattillos’, which means small dish in Spanish. We found that this simple round element could transform the atmosphere of the space, while also creating a personal identity for the gym.”



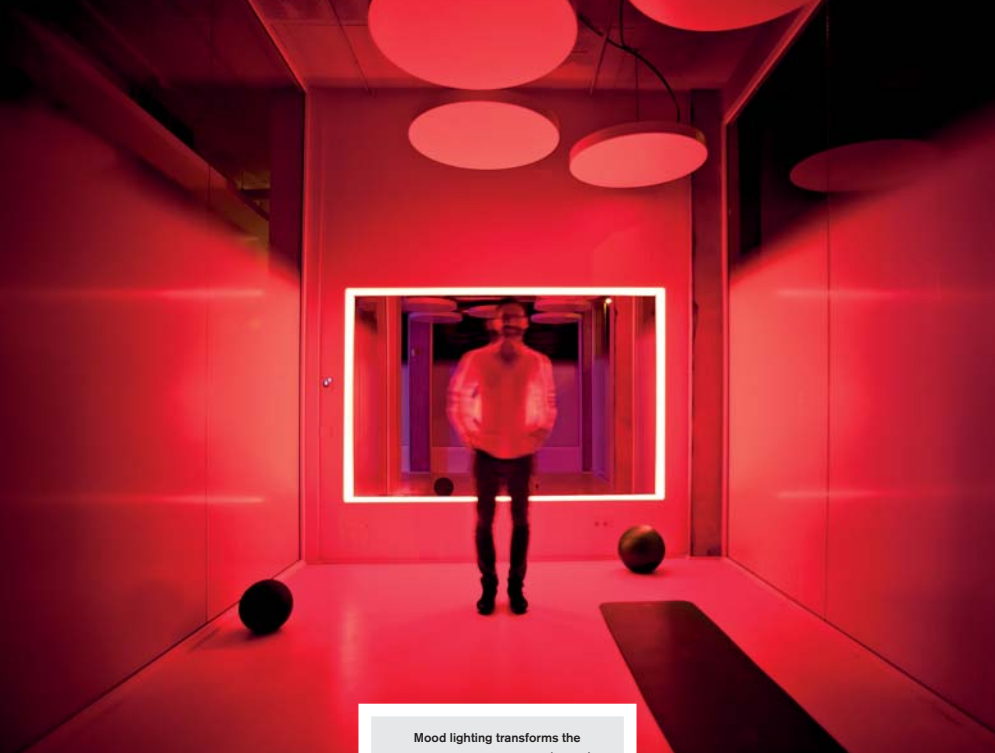
Design features include the round ceiling lamps, which also diffuse the light (above and below); Gabriel Gomera (below right) wanted to open up the space using air and light





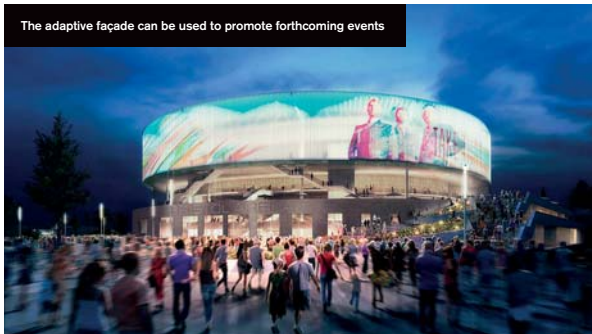
**Bold splashes of colour have been used throughout the gym, contrasting with the white walls and exposed cement. Large windows allow natural light to flood the space**





Mood lighting transforms the atmosphere of the studio (above); The changing and reception areas use a muted colour palette to create a calming feel (below right and left)





The adaptive façade can be used to promote forthcoming events

## “It’s unique the way we’ve delivered it as an architectural piece”

**Mike Trice** senior principal, **Populous**

**George Ferguson** Bristol Mayor

Project: **Bristol Arena, Bristol, UK**

**I**nternational architecture firm Populous were chosen in March to design the £90m Bristol Arena in Bristol, UK.

The winning team, comprising of Populous (with Feilden Clegg Bradley, BuroHappold and Vanguardia) was selected from a shortlist of five to design the 12,000 seat multi-use venue.

“Our arena ticked all the boxes on function and form; it’s an eminently operable building,” project architect Mike Trice, senior principal at Populous, told CLADmag.

The winning design is a flexible building that converts from a 12,000-seat arena to a more intimate venue for smaller events.

“The unique thing about the way it reconfigures is that it can go from a very small venue for 4,000 people up to a big venue for up to 12,000 people. It allows any sort of band to play in it and can cope with any sort of stage configuration,” said Trice. “It’s unique the way we’ve delivered it as an architectural piece.”

The exterior features a masonry plinth base, designed to reflect the industrial history of the area, with a crystalline disk above it.

The environmental sustainability of the



Mike Trice (left) and George Ferguson (right)

building was a key factor in the choice of design. “We’re targeting a BREEAM ‘Excellent’ rating; the exact features that will be used will depend on the precinct-wide energy strategy that is agreed upon by the council,” said Trice.

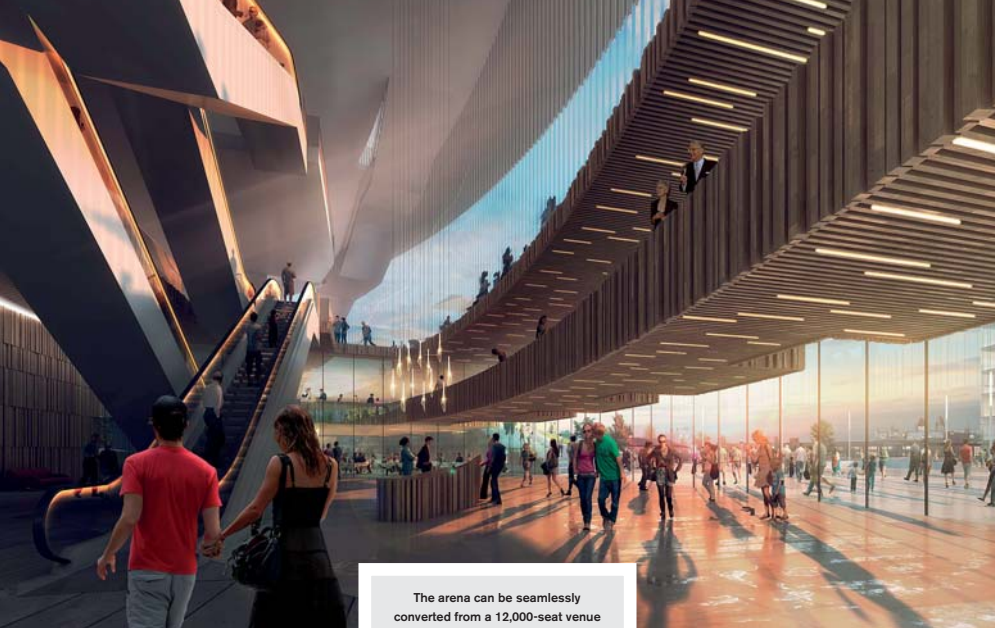
Bristol Mayor and former RIBA president George Ferguson promised to bring an arena to Bristol as part of his election manifesto [he

was elected Mayor in November 2012].

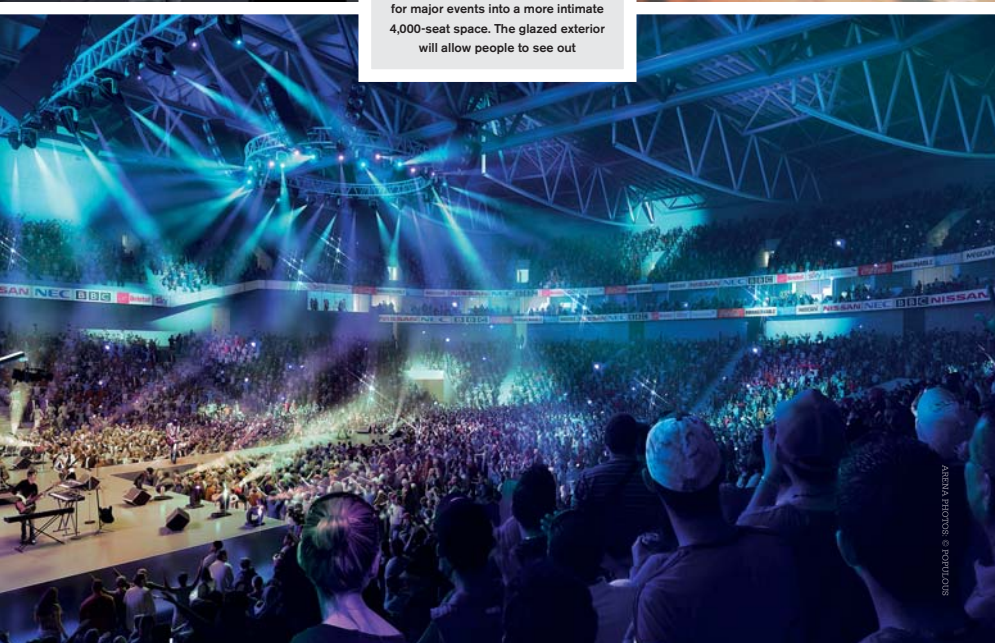
“This arena will strengthen Bristol’s attraction as a destination and it will be a major catalyst for the regeneration of the Bristol Temple Quarter Enterprise Zone, creating jobs and stimulating economic growth,” said Ferguson.

“The design offers real flexibility for programming for now and into the future.”

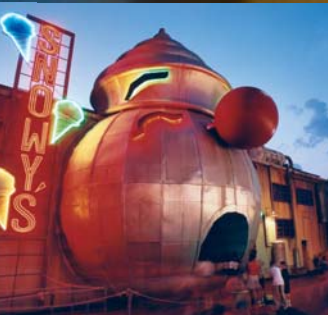
PHOTO © CHRIS JAHN

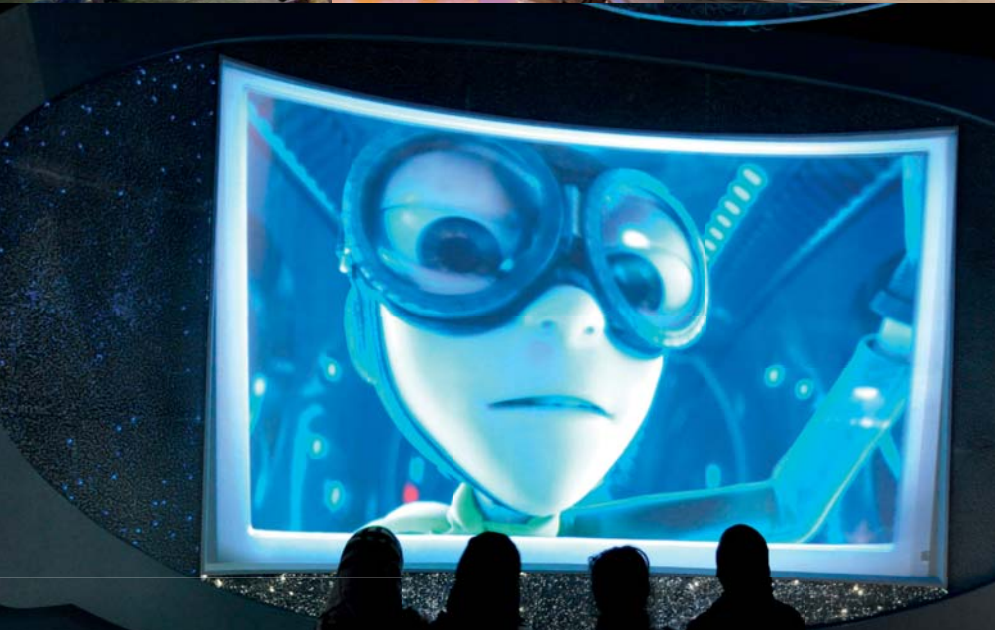


The arena can be seamlessly converted from a 12,000-seat venue for major events into a more intimate 4,000-seat space. The glazed exterior will allow people to see out



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# David Rockwell

Whether he's designing Nobu, a new kind of playground or the interiors for Battersea Power Station, David Rockwell has always refused to be pigeonholed. He tells Magali Robathan why curiosity is his biggest asset



PHOTO: CHRISTOPHER CLONIN

“More than anything, I believe design should be memorable,” says architect, interior designer and set designer David Rockwell,

speaking to me from his office in New York.

Since launching the Rockwell Group 30 years ago, Rockwell has built up a vast and diverse portfolio, ranging from the camp theatricality of *The Rocky Horror Show* set to the simple power of the World Trade Center Viewing Platform, and from the sleek interiors of Nobu to the quirky originality of the child-directed Imagination Playgrounds. Though the projects are all very different, they have one thing in common – they’re all vividly memorable.

Inspired by his love of the theatre, Rockwell uses lighting and materials to create a sense of excitement and drama in the spaces he designs. His latest book, *What If...? The Architecture and Design of David Rockwell*, demonstrates his endless curiosity and determination not to be defined or constrained by any one sector – to explore unexpected combinations (or “mash ups”) of forms and materials to create something new. Rockwell Group’s work spans restaurants, hotels, hospitals, museums, Broadway shows, playgrounds, airports and retail spaces, with lessons learned from each project used in others – often in unexpected ways.

“When I launched Rockwell Group I was driven by one thing – curiosity,” says Rockwell. “That’s something that hasn’t changed. For me it’s about constantly recreating an environment in which you’re willing to not know the answer.”

Today, the New York-based practice employs 250 people, with satellite offices in Shanghai and Madrid. As well as being

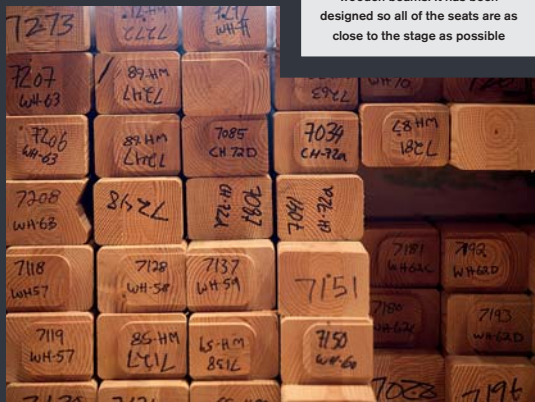


The Rockwell-designed Virgin Hotel Chicago opened earlier this year (above); The group designed a high-tech space for Omnia at Caesar's Palace (below)





The temporary TED Theater in Vancouver is built using 8,200 wooden beams. It has been designed so all of the seats are as close to the stage as possible



Rockwell's designs for the food hall in Battersea Power Station, London, one of several interiors created by the group

designers, his employees are also sculptors, artists, chefs, opera singers, architects, playwrights, set designers and more. "Given the breadth of our design work, it makes sense that we have designers with expertise across all disciplines," says Rockwell. "It also means there's a certain amount of creative friction, which can be very useful."

#### TAKING STOCK

"The past year has been incredible," says Rockwell. "It's been phenomenal in terms of the work we've completed, the projects we're just beginning and a sense that we're rebooting for the next few years. Most creative individuals find the things they are intuitively driven to and passionate about. At some point you look in the rear view mirror and start to figure out what connect those interests."





One of these interests is temporary structures, but while Rockwell is no stranger to designing sets, designing a whole temporary theatre was a new proposition. In 2014, the group created a 1,300-seat temporary theatre for the TED conference in Vancouver, which was designed to be built in just five days, used for a week, and then dismantled and stored ready to be used again the following year.

"The TED Theatre is something of a breakthrough for us right now, because it straddles my interest and passion in things that are temporary – like theatre – and things that are permanent, like buildings," says Rockwell.

The idea for the temporary theatre was initially sketched on a napkin by Rockwell; it consists of 8,200 structural beams, all individually labelled ready for assembly on site. Built inside Vancouver Convention

**For me it's about  
constantly recreating  
an environment in  
which you're willing to  
not know the answer**

Centre's 45,000sq ft ballroom, it features a variety of seating – from sofas, lounge seating, benches and chairs – all less than 80ft (24m) from the stage. "It was built to appear and disappear, and everything in it was specifically designed for how people want to be at a conference – whether they want to sit rightside, at a bench, or stand at the back and log into their iPad," he says.

Other recently completed projects include the design of the Virgin Hotel Chicago (by Rockwell Group Europe); Nobu Doha; the Art Deco set design for the Broadway musical *On the Twentieth Century*; and OMNIA, a nightclub for the Hakkasan Group at Caesars Palace in Las Vegas which uses technology to transform the space – motion sensors in the entrance respond to guests' movements, LED lights on the wall can change colour and a giant kinetic chandelier features changing displays of movement and light.


Meanwhile Ian Schragger's 273-room New York Edition hotel – which Rockwell Group worked on with Schragger and his design team – has just opened in the Metropolitan Life Tower on Madison Avenue, featuring a 1920s-inspired lobby and a mix of restored architectural features and contemporary design.



Aerial view of the Culture Shed in New York with 30th St entrance under the Highline (above); The venue will host a wide range of exhibitions and events (below)



IMAGES OF THE CULTURE SHED COURTESY OF DILLER SCOFIDIO + RENFRO IN COLLABORATION WITH ROCKWELL GROUP



The venue will house 40,000sq ft of exhibition space and will slide open to create further space

## LOOKING AHEAD

Coming up, Rockwell Group has several high profile projects, including a series of interior spaces at Battersea Power Station, London. Working with British architects Wilkinson Eyre, Rockwell is designing the lobby and atrium, as well as a separate market area. "That project is exciting on so many levels," he says. "When I was a student at the Architectural Association in London, Battersea Power Station was such an icon. It's an amazing building."

Another major project comes in the form of the Culture Shed, a multi-use cultural venue and performance space in New York's Hudson District. Rockwell Group is working with Diller, Scofidio + Renfro on the building, which is housed in a 200,000sq ft space on Manhattan's Far West Side, at the intersection of the High Line and Hudson Yards. It will host a range of events, including exhibitions, festivals, film, literary, culinary and fashion events, and could become the home for New York Fashion Week.

The space includes 40,000sq ft of exhibition space and a large telescoping outer shed structure that slides open to create an

**It's been a privilege  
working with Nobu.  
In some ways we  
complete each other**

additional 17,000sq ft. "It's by far the biggest thing we've ever done," says Rockwell, before adding with a laugh: "It feels as though it's been going on since the beginning of time!"

Other forthcoming projects include a major redesign of Newark Airport's Terminal C. Meanwhile Rockwell Group's LAB, the arm of the business focusing on the 'intersection of physical space and the digital world' is working on several projects, including the creation of interactive windows that represent a re-imagining of the tradition of corporate art for a midtown Manhattan office building.

## EARLY DAYS

Rockwell was born in Chicago, and moved to Deal, New Jersey with his mother, step-father and four brothers when he was three,

where his lifelong passion for the theatre was ignited. "The Jersey Shore was a fascinating place to grow up; big houses, very little public realm – almost all of the activities took place in private homes," he says. "I was intrigued by the things that were public, one of which was the community theatre, which my mom was a founder of. This one place where the community would come together and create and perform was very compelling to me."

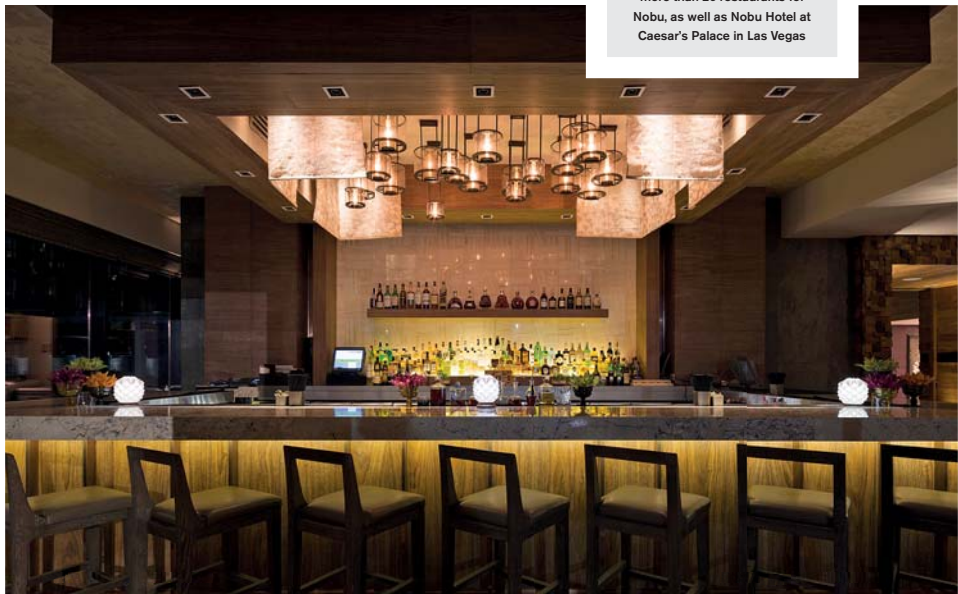
When he was 12, the family moved to Guadalajara, Mexico, where the light, colour, spectacle and culture of the country had a huge impact on the young Rockwell. "It couldn't have been more different from New Jersey. It's really all about the public space in Mexico," he says.

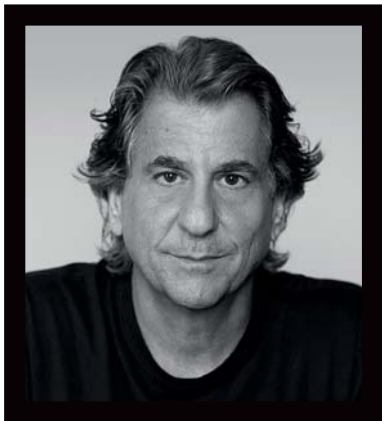
After studying architecture at Syracuse University, Rockwell spent a year at the Architectural Association in London. He spent the next five years working in New York, before launching Rockwell Group in 1984.

Rockwell Group started off primarily in hospitality, and quickly made a name for itself in restaurant and hotel design. Early on, Rockwell teamed up with the celebrated



Nobu Manila opened in April 2015. Rockwell Group has designed more than 20 restaurants for Nobu, as well as Nobu Hotel at Caesar's Palace in Las Vegas





**I'm fascinated by magic and I collect working drawings of how illusions are created**

Japanese chef Nobu Matsuhisa to work on Nobu's first restaurant, Nobu New York.

"We created a heavily narrative space, from the river stone walls to the cherry blossoms stenciled on the floor that refer to Madame Butterfly," says Rockwell. "It was a richly layered environment that was inspired by Nobu's food." It's a relationship that has lasted more than 20 years, with Rockwell Group designing many of Nobu's restaurants, as well as his first hotel in Las Vegas, and they are working together on further hotels. "It's been a privilege working with Nobu – he wanted to be an architect and I wouldn't mind being a chef, so in some ways we complete each other."

After making a name for himself in hospitality, Rockwell moved into set design. "I spent about four years meeting with directors and sketching solutions for theatre, and building that muscle and dialogue with directors, before being asked to do the set design for the *Rocky Horror Show*," he says. "It was the perfect first show and a miraculous experience." Since then his firm has

designed sets for shows including *Hairspray*, *Legally Blonde* and *Dirty Rotten Scoundrels*, for the Trey Parker and Matt Stone-directed film *Tamara Faye: World Police* and for the Annual Academy Awards in 2009 and 2010.

#### SEPTEMBER 11 2001

Pre-9/11, while Rockwell Group had worked on projects such as the Children's Hospital at Montefiore, the majority of their work was focused on spaces that brought people pleasure – they were even working on a book titled *Pleasure* at the time. In the immediate aftermath of the attacks on the World Trade Center, however, Rockwell found himself struggling to find the same level of enthusiasm in both himself and his team for the work they'd been doing.

"I was so deeply affected, personally and professionally by the attacks – I lived in Tribeca, less than a mile away from the Twin Towers," he says. "Our neighbourhood was totally devastated. It was very hard for me and the team to understand how creating

#### DAVID ROCKWELL Q+A

##### Which buildings give you goosebumps?

Gaudi's Sagrada Família in Barcelona certainly does, as does walking up the stairs at Radio City Music Hall in Madison Square Gardens in New York. The first time I went up the escalators at the Centre Pompidou in Paris was a pretty extraordinary experience. I only heard one concert at Gehry's Walt Disney Concert Hall in LA, but that certainly gave me goosebumps.

##### Which architects and designers do you admire?

I'm obviously a fan of Diller, Scofidio and Renfro – we do a lot of work with them. I think Todd Williams and Billie Tsien do extraordinary work. I visited Gehry's Fondation Louis Vuitton building in Paris recently. Gehry is an easy person to pick, but the fact is the work is exceptional. I was recently in his studio and

his level of R&D is amazing.

I respect the work of the graphic designer Stefan Sagmeister and I've always loved the work of the Tokyo-based architects Atelier Bow-Wow.

In terms of up and coming talent, there's a small design firm called Ibuku that I'm really interested in. They're led by Elora Hardy, and they use bamboo to make fantastical creations.

##### Tell us something not many people know about you

I love to play piano, I love to cook and I'm a fanatical Chicago Bears fan. I'm fascinated by magic and I collect working drawings of how illusions are created. I also have a 100 piece kaleidoscope collection.

##### What drives you?

The desire to grab any opportunity I can to create something that brings a sense of delight.

these places we created was relevant in light of this enormous disaster."

As Rockwell was thinking about what to do next, he was approached by a parent from a local school that had been destroyed by the attacks. The children were moving to a temporary school, and the parent asked Rockwell to help make the cafeteria more uplifting.

"I went to look at the school and had a very clear A-ha moment that there was a chance to use design as an affirmation of life," says Rockwell. "That project was a really cathartic and eye-opening experience for myself, my studio and all the other artists we brought in to help."

As a result of this project, someone from the city of New York approached Rockwell and asked whether he might be interested in building a temporary viewing platform for VIPs at Ground Zero.

Rockwell teamed up with fellow New York architects Liz Diller, Rick Scofidio and Kevin Kennon, and decided they would take on the project, but only if they could create a public



**Imagination Playground  
grew out of my  
experience post 9/11  
and of being a father**

viewing platform, rather than one just for VIPs. "At that time, there was no way to take in what had happened in a way that was not seen through a media filter," he says. "We wanted to create a very simple, unmediated platform that would allow people to take in what had happened."

The team created a 300-ft long platform from metal scaffolding, birch plywood and rough decking that was installed for eight months at the World Trade Center site. Raised 13ft above the ground, it provided 180 degree views and offered a quiet place for reflection for more than a million visitors.

"It was an astonishing experience," says Rockwell. "It was a major affirmation of design as a way to make the world more understandable, the power of collaboration and of having

a mission, and the willingness of people to participate in something that was important."

**CHILD'S PLAY**

In an indirect way, this experience led on to what is possibly my favourite Rockwell project. Imagination Playground started life when one of the funders of the foundation established to raise money for the viewing platform asked what Rockwell was planning to do next with the foundation. At the time Rockwell had two young children, and their local park had been destroyed in the 9/11 attacks. "I was thinking about that playground, and I said to myself, 'wouldn't it be great to develop a totally new form of playground?'"

What followed was five years of research, development and testing with the City of



PHOTO: SHANNON COLEMAN/2015

New York and with a coalition of playworkers assembled from around the world. The aim was to try and create a playground that would allow children to use their imagination to create their own playspace.

The first permanent Imagination Playground opened in Lower Manhattan in 2010, the result of a public private partnership with the New York City Department of Parks and Recreation. The playground features sand, water and a range of purpose-built loose blocks and tools, allowing children to build, create and design their own playspace.

Since then, Rockwell Group's Imagination Playgrounds can be found around the world, including portable sets that can be set up where traditional playgrounds can't be built. A UNICEF project, in partnership with Disney,

Rockwell Group's first  
Imagination Playground opened  
in Lower Manhattan in 2010

has also brought the playgrounds to more than 13,000 children in Haiti and Bangladesh.

"Imagination Playground is, for me, maybe the most significant project we've done, because it grew out of my experience post 9/11 in New York and of being a father," says Rockwell. "It also links back to the reason I became interested in design in the first place. As a kid I was always making things – boxes, playgrounds, spook houses, Rube Goldberg

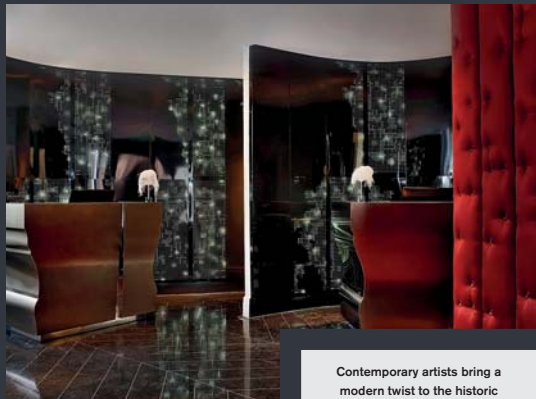
contraptions...It was the way I learned to communicate and make sense of the world."

#### KEEPING IT FRESH

For the future, Rockwell is determined to keep on challenging himself, to remain curious and be open to all opportunities.

"I believe that it takes four or five years of investigation into a project type before you're able to really contribute in a big way," he says. "What I've found, though, is that each project type gives us a chance to grow a skill set that is helpful in other projects.

"Becoming an expert at hospitality or theatre takes time, but after a while those different areas of expertise start to overlap and you can start to connect them in different projects. That's when it all comes together."



Contemporary artists bring a modern twist to the historic interior at W Paris – Opéra. Rockwell Group Europe were responsible for the design



## DAVID ROCKWELL

### Selected projects

#### W Hotel Union Square

New York, US 2000

That project was a big breakthrough for us. It was our first complete hotel, and was transformative for me.

#### Gordon Ramsay's Maze

London, UK 2005

It's in a spectacular location and it had a great opening party. I still love going there – I've never met Gordon though!

#### Nobu Restaurants and Nobu

##### Hotel Caesars Palace

Selected locations 1994 – present

Our work with Nobu is a very rare gift. It's a 20 year relationship, and that's something that as an architect you don't often get. It's been a privilege to partner with Nobu and help develop his concept over 20 years.

#### The set design for the Rocky

Horror Show 2000

That was my first Broadway show, and I was lucky enough to not know what you couldn't do. It was the perfect first show for us and it was a miraculous experience.

#### The Center for Civil and Human Rights

Atlanta, US 2014

We were invited by the theatre director George Wolfe to do this project. George had been brought on board to write and creatively direct the story of the museum. It was a great experience and a chance to create a series of environments that do the best of what documentary films, art installations and memorials do. It morphs between many different forms of storytelling, but they're all informed by a master storyteller.

#### Virgin Hotel

Chicago, US 2015

People have certain expectations about what a Virgin Hotel might be, and the most interesting thing about this project is that it's surprising. The check in is surprising, the room product is surprising – we tried to bring something fresh and unexpected to the whole project. ●





Rockwell Group designed the exhibition space at the National Centre for Civil and Human Rights with director George C Wolfe and human rights activist Jill Savitt



# BUILDING IN PARADISE

The Galapagos islands are among the most precious places on Earth. What building challenges does this present? Ecuadorian architect Humberto Plaza talks to Kath Hudson about designing eco-hotel Pikaia Lodge



Pikaia Lodge is set on the crater of an extinct volcano 450m above sea level on the Galapagos island of Santa Cruz

**You can feel God here. When I first saw the site, it felt like heaven on earth. I fell instantly in love with it**



Project architect Humberto Plaza

**O**n top of an active volcano, with year round sunshine, spectacular views of one of the most beautiful places in the world and home to giant tortoises, this site in the Galapagos Islands presented an extraordinary opportunity. But the stakes were high: to create something both architecturally impressive and responsibly-built, with as little impact as possible on the precious environment.

Eco-resort Pikaia Lodge, which opened in 2014, is the brainchild of Swiss-born Galapagos plantation owner, Herbert Frei. He met architect Humberto Plaza through his daughter, Maria-Elena Frei-Shepherd, an interior designer who did an internship with Plaza at his practice in Ecuador.

As there was only one luxury hotel on the island, Frei believed there was an opportunity for a high-end eco lodge and had put together some ideas. "I felt these initial concepts didn't take full advantage of the incredible views," said Plaza. "I felt the building should be about the views, not the architecture."

Plaza, who had previously designed a hotel on Santa Cruz, says this project had no precedents: "The island has only had permanent residents since 1830, so there was no





Pikaia Lodge's Sumaq spa is decorated with Peruvian travertine marble. It features a massage room, sauna, whirlpool and gym



The hotel offers guided day trips on a private yacht to explore the local scenery and wildlife



architectural language to follow," he says. "We had to come up with something completely new, for the location on top of a dead volcano. It was about following our hearts.

"I wanted to make sure the hotel touched the site as little as possible, because it's very delicate, and also I wanted to ensure the construction process wasn't invasive. We needed a cradle to coffin approach, so that when this building needs to be dismantled one day, it can be done as cleanly as possible."

The topography – a half moon crater, covered with vegetation – didn't lend itself to a building which was designed to blend in: "It's absolutely magical, but there are hills and no trees," says Plaza. It wouldn't have been possible to create a building which would blend in with the landscape. If I'd tried to do that it would have stood out more. I wanted to create a building which would hardly touch the land."

To be respectful to the site, Plaza designed trusses with joints which only touch the

ground at two points and then span a huge distance. Some bungalows, to be built as part of a second phase, have been designed to allow water and animals to pass underneath.

### Orientation

Because the view is the USP, there's a lot of glass in the building, so to stop the rooms getting too hot, there's a roof overhang and the building is orientated so as to not get direct sunlight for too much of the day.

Plaza's first choice of material was wood, but because there's a ban on bringing live materials onto the island, to avoid importing insects, this was ruled out.

Metal was selected as the most appropriate material and as the site is 400m above sea level and 10k from the coast, there is no issue with frost or salt in the atmosphere. The metal elements were pre-shaped on the mainland and welded on-site. This made construction light and touched the ground as little as possible.

### About Pikaia Lodge

Pikaia Lodge, which has a resident giant tortoise as one of its attractions, offers 3.5km of trails within its boundaries and an infinity pool, spa, 29 deluxe rooms, bar, dining and lounge areas.

It offers the most luxurious way of experiencing the Galapagos Islands. There are fixed arrival and departure dates for three, four and seven night packages, including all meals and excursions on the island and to neighbouring islands, via the resort's yacht.

Visitors can partake in activities such as visits to volcanic craters, lava tunnels, the Charles Darwin Scientific Research Center or snorkelling, scuba diving, sea kayaking, mountain biking and catch and release fishing.



The hotel features an infinity pool, a restaurant, a bar, a spa and – more unusually – a giant tortoise reserve



The lodge features a wind generator, solar panels and solar collectors for the pool, jacuzzi and spa



The buildings are orientated so that they provide views but avoid direct sunlight for much of the day



The interiors are modern and sleek. Large windows and doors allow the views to take centre stage





The tin/polyurethane roof helps keep rooms cool

Plans to paint the building so the metal resembled wood were shelved in order to retain authenticity. "The building is very monochromatic and structural," says Plaza. "Instead of conceding to the struture, we decided to celebrate it. The structural elements became the aesthetic motif."

A sandwich was used for the roof using tin/polyurethane. This is effective in conserving heat and – when combined with good natural ventilation – means the air conditioning doesn't have to be used all the time. Rooms are cool enough to sleep in with just a fan, or an open window. "This roof is extremely light and that made construction lighter and cleaner," says Plaza.

### Indigenous interiors

To give the building an indigenous flavour, lava rocks from the island were used as a wall covering. "They're too heavy to use as bricks and the heat transmission is high. However, they look great on the outside of blockwork," says Plaza. "Because there's no endemic architecture, we needed some element which could be clearly recognised and understood by locals and visitors. In many Galapagos buildings lava rocks are the only identifying feature."

The lodge has its own independent energy supply, using wind and solar energy and bio-diesel, made from mango skins. The design, with natural light and ventilation, means energy consumption is low for a hotel.

### **Finding workers was difficult – those who are qualified tend to be very expensive and very lazy, so we had to bring them from the mainland**

A number of challenges arose during the process. Development is limited on Santa Cruz, so it took more than five years to complete the paperwork to enable the hotel to go ahead.

In addition, there are no building regulations on Santa Cruz and development restrictions are put in place by residents who can be more concerned about protecting their livelihoods than the environment. This left the team to create its own code of conduct. "We did the project the best way we could, with an honest effort to get things right. We didn't cut any corners," says Plaza.

There isn't a proper port in Santa Cruz, so moving materials from ship to island was complicated and risky. "We achieved it through good luck and a lot of prayers," says Plaza.

Labour presented another challenge, due to difficulties in finding qualified workers. "Those who are qualified tend to be very expensive and sometimes very lazy, so we

### Coplaza-Arquitectos

Coplaza-Arquitectos was founded by Humberto Plaza Lavezzari (Humberto Plaza's father) in 1965. The firm is based in Guayaquil, Ecuador, and currently employs eight architects.

Coplaza-Arquitectos is currently working on a 210-bed Marriott hotel in Guayaquil featuring a convention centre, three office buildings, one apartment and 900 car parking spaces.

The practice is also working on the Aqualina Tower in Punta Carnero, Ecuador, a condominium building with an infinity pool, poolside juice bar and a health centre. Past projects include Iguana Crossing, a small hotel in the Galapagos Islands.

needed to bring supervisors and engineers from the mainland," he says.

Frei-Shepherd was responsible for the interiors, which Plaza describes as straightforward and elegant. "It's not flashy, but manages to be both modern and conservative at the same time," he says.

Plaza says some people might consider the design to be rather industrial, but there's a practical reason for that. "We had to consider maintenance, because fixing things on the islands is always a challenge. You have to think how easy it is to clean the windows and paint the outside and how often you will have to do that," he says. "You can't buy anything on the Galapagos Islands, so if there's a problem with a fixture you have to go to Ecuador. Also labour is a problem. So everything has to be heavy duty and practical. Whatever the design, it had to be easily maintained, and this determined many of the decisions."

Pikaia Lodge has created a new way in which to experience the Galapagos and provided Santa Cruz with its first piece of statement architecture. Let's hope their sensitivity towards the environment will be emulated by future developers – even in the absence of building regulations. ●



Kathryn Hudson is a former editor of Leisure Management and a freelance design, travel and health writer based in Cornwall, UK

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We invite people from a range of backgrounds, then when you start doing the creative work you leave your profession behind. It's like a kind of role play



## Kjetil Trædal Thorsen

Snøhetta's founding partner talks about the expansion of SFMOMA, the September 11 Memorial Pavilion in New York and the importance of blurring professional borders. Rhianon Howells reports

**G**iven Norway's rich tradition of folklore, the story of the naming of Snøhetta – the Oslo-based integrated design practice, embracing architecture, landscape architecture, interior design and brand design – has a pleasing ring of mythology about it, despite being entirely true.

In 1987, a number of young architects and landscape architects set themselves up in an attic studio above a popular Oslo beer hall called Dovrehallen, meaning Hall of the Dove. Dovre is a mountainous region of central Norway, so it followed that the collective should name themselves after its highest peak: Snøhetta. Two years later, one of the group's members, Kjetil Trædal Thorsen, together with fellow architect Craig Dykers, founded the shareholding company Snøhetta Architecture and Landscape AS.

As well as being a pun on the studio's location, the name reflected its core philosophy. A mountain, according to Thorsen, is both an object and a landscape, and therefore a perfect representation of the firm's commitment to integrating architecture and landscape architecture in a single design process.

The founding of Snøhetta also marked the beginning of Thorsen's professional ascent. After a childhood spent in Norway, Germany and England, he had studied architecture at the University of Technology in Graz, Austria, before moving to Oslo in 1985 to work as a freelance. Two years later, Snøhetta was born, and just two years after that, the firm won its first big commission: the Alexandria Library. With two main studios in Oslo and New York, the practice now employs more than 160 people from 28 different countries.

### Why did you become an architect?

My art O-level teacher at the secondary school I attended in England recommended I become an architect. I was interested in drawing, in art and in the sequence of producing things, whatever they might be: models, painting, sculptures or scratchboards. I had a general interest in creating things, which led me to believe my teacher was right.

### What were your aims when you set up Snøhetta?

We had seen the need for collaboration between different professions dealing with our physical surroundings, such as urbanism, public art, landscape architecture and

interior design. We were interested in trying to co-locate these disciplines in a profession-free environment where there could be broader collaboration – especially, in the beginning, between landscape architecture and architecture.

The idea was that the borders between the professions would start to get a little more blurred, and one would influence the other. Landscape architecture would no longer just be the leftovers of whatever the architect did – the spaces between the buildings, filled with whatever was left of the budget. We started to look at more integrated ways of practising all the design disciplines related to our physical environment.

### Is that something that is now more commonplace?

Yes, absolutely. Since 1987, the search for more transprofessional ways of working and closer collaboration between different professions has started to become more and more normal in everyday practice.

### How does it work in practice?

It's a workshop-based process. We invite people from a range of professions from both within and outside Snøhetta, and sometimes



Kjetil Trædal Thorsen trained at the University of Technology in Graz, Austria. He is a founding partner of Snøhetta and is based in the practice's Oslo office

**"It's not about substituting the loss. It's about reacting to a possible future presence"**

from the client side as well. Then when you start doing the creative work, you leave your profession behind. It's like a kind of role-play, where you swap roles... The process releases you from your basic responsibilities.

We call it transpositioning here, when the landscape architect becomes the architect, the architect becomes the artist, the artist becomes the sociologist, the sociologist the philosopher... For instance, when we were working on the Norwegian National Opera and Ballet, it was the guy writing librettos who more or less defined the movement of the public on their way to the opera house as part of a non-processional movement, which would on one hand be individually experienced and on the other hand collectively.

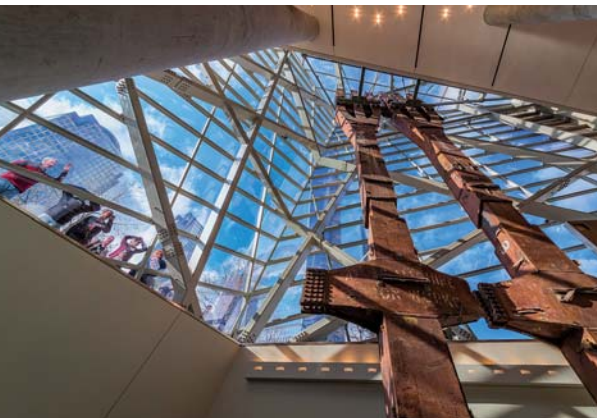
**What did the September 11 Memorial Pavilion project mean to you?**

It's been a massively important project for us. When you design something like this, it is not about substituting the loss; it is rather a way



PHOTOS THIS PAGE: © JEFF GOLDBERG/REXTO

The pavilion was designed to act as a bridge between the September 11 memorial and museum. Two structural columns rescued from the original towers stand in the atrium

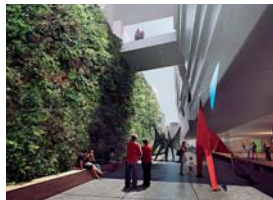


of reacting to a possible future presence – for the public actually coming there, and going in, and looking at it.

We also knew there would be a lot of different opinions as to what should be done and how it should be done. So from the very beginning, we said this would be a negotiated project – it would be more negotiation than design. And we set out by saying our intention was to reflect the present, whereas the two waterfalls going into the footprints of the two towers reflect the past. In that sense, it would be a more dynamic building, creating an immediate connection between the public and what was happening on the site.



The SFMOMA expansion will see the creation of free, public ground level galleries (above). New entrances will also make the museum accessible from every direction



### What was the brief and how did it evolve?

In the very beginning, the building was intended as a cultural centre, housing two organisations: the Drawing Center, a New York arts institution, and the newly created International Freedom Center. As it turned out, that brief changed completely, and neither of those organisations is in the building.

Now it's more of a transition zone than a straightforward cultural institution – an entrance, a meeting place, a coffee shop, a lecture room and a family room. The changing brief also had an impact on the size of the pavilion and how it was located on the site,

and I have to say we're quite happy that the building isn't too big and sits quite naturally within the Memorial Quadrant.

### What inspired the design?

We wanted the surfaces on the outside of the building to reflect different aspects of the surroundings, so very early on we were looking at prisms that would take different types of light from different positions and reflect them into the interior.

As the design evolved, it became more about bending and angling the reflective surfaces, so the reflections would be thrown in different directions – so one surface might

have more of the sky, while the other would have more of the ground. And that would also influence the colour of the skin of the building. So it became more a matter of designing reflections than designing façades.

### Snøhetta has designed the expansion of the San Francisco Museum of Modern Art. What are the main aims of the project?

Creating more social interactions and closer relationships to the surrounding streetscapes, giving more connection to outdoor and indoor areas and, of course, expanding exhibition areas and making it possible to show more art.

**When you move into an urban space where there used to only be cars you experience it in a new way**

**What were the main challenges?**

It was a very tight, very urban site, so in order to create exhibition floors with a certain volume, we had to expand quite creatively. We needed to expand between two street façades and we needed a more open representation at street level – something more like a storefront.

With a vertical museum structure, we needed to bring people in an easy yet recognisable way from one floor to the next. And we needed to connect the two buildings and create interactive areas that would support both. We have done that by creating a new common space on the first floor that links the buildings in a simple manner and also makes it easy for visitors to orientate themselves.

San Francisco is an earthquake region so that was also quite a big technical challenge, as we wanted to create free-span exhibition spaces without columns.

**How well do the two buildings work together?**

We tend to call them dance partners, as they're like two different, strong personalities dancing tightly together in that urban setting.

**What was the aim of your recent redesign of Times Square?**

It's a way of giving Times Square back to the people of New York, by removing traffic and creating a new floor for both citizens and visitors. When you move into an urban space where there used to be only cars you experience it in a new way. You have a different speed, a different height, a different location, so you perceive the surroundings, surfaces and façades in a different manner. It encourages new activities – sitting, standing, doing yoga – but it also has an infrastructural element to it, by providing better drainage, new wiring, lighting and benches.



**What are you working on going forward?**

One project under construction is the Lascaux IV Caves Museum in France, which includes the recreation of the Lascaux caves and their 10,000-year-old paintings. We're also building The King Abdulaziz Center for World Culture in Dhahrah, Saudi Arabia, which is the biggest building we've ever done – it's a huge cultural centre housing the country's first public cinemas as well as a library, a concert hall, an exhibition hall and a lifelong learning centre.

We have several projects in Norway, including the Bergen National Academy of the Arts, and we're just starting the expansion of the Ordrupgaard museum in Copenhagen. We've also just shared first prize with the Japanese

firm SANAA for the Hungarian National Gallery in Budapest, so we will need to compete further on that one. We currently have about 12 projects under construction and 40 on the drawing table.

**Which other architects do you admire?**

Among living architects, I think Frank Gehry made a huge difference to how architects are perceived. You can like or dislike the repetition in his work but there was a turning point in history, where architects started gaining overall importance again. Then there are architects like Herzog and de Meuron who produce fantastic projects. You also have small companies like the Austrian firm marte.marte or the architect Fernando Menis from Tenerife, who





IMAGE © SHOSHITVA & JIM

The NYC Department of Transport hired Snøhetta to permanently pedestrianise Times Square, following a hugely successful pilot project in 2009 (above). The Lascaux IV Caves Museum will include a recreation of the caves (right)

are doing extraordinary things. But more than being inspired by architects, our inspirations come from elsewhere – from writers, from philosophers or people from the art world.

#### How do you relax?

I go skiing or mountain-climbing. That gives you a very intimate relationship with the landscape you're performing within. ●



IMAGE © SHOSHITVA & JIM



The Busan Opera House in South Korea features an angled roof that curves down to meet the ground, allowing visitors to climb up to a public space on the rooftop (above and below)

BUSAN IMAGES © SHIBBITTA & TIDDMARK



## Thorsen on...



PHOTO: GÖRBAULD ZICKMANN

### The Library of Alexandria

Egypt  
(1989-2001)

Our goal was to create a library in Alexandria that would not ruin millions of people's imaginations of the Ancient Library of Alexandria [dating back to the third century BC]. At the same time, we wanted to say something about the past, present and future – so the section below the horizon is the past; at the horizon is the present, and above the horizon is the future.



PHOTO: LILLEHAMMER MUSEUM

### The Lillehammer Art Museum

Lillehammer, Norway  
(1990-1994, extension 2013-)

This was really our first constructed piece of architecture. It's an interpretation of the hillsides of Lillehammer, compressed onto a specific site, and it functions a little like a musical instrument. The strings are hit by the musicians, who are the artists; the acoustic body of the museum strengthens the vibrations of the strings and turn them into music. We're now working on an extension with the artist Bård Brøvik.

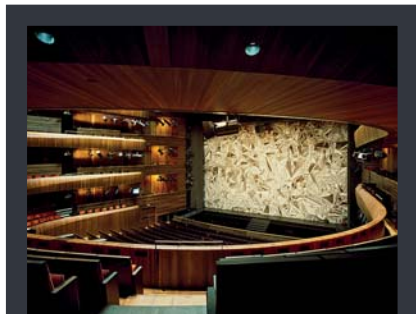


### Väven

Umeå, Sweden  
(2010-2014)

The concept is in the name, which means 'weave' in Swedish – it's a way of combining many cultural functions in a small city and weaving them together in a single building.

PHOTO: AEE ESON LINDMAN

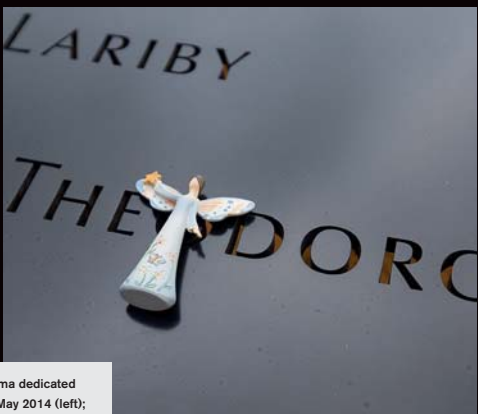


### The Norwegian National Ballet and Opera

Oslo, Norway  
(2000-2008)

We wanted to change the perception of an opera house from being something very elitist into something public and accessible. We did this by providing a huge, accessible roof, without any commercial activities on it, which was simply a free space – for tai chi on a summer morning, for outdoor concerts, or simply for taking a stroll.

PHOTO: GÖRBAULD ZICKMANN



President Obama dedicated the museum in May 2014 (left); Victims' names carved around the edge of the waterfalls at the Memorial Plaza (bottom right)



# A MUSEUM FOR EVERYONE

From the architecture and exhibition design to the content and visitor experience, every aspect of the 9/11 Memorial Museum in New York had to be meticulously planned. Museum director Alice Greenwald talks Alice Davis through the process

**N**ever before has a museum been built to tell the story of an event that was witnessed by a third of the world's population. On September 11 2001, people across the globe stopped whatever they were doing and watched the attacks unfold, live, on television. The 9/11 Memorial Museum in New York City, New York, opened in May 2014 to try to tell that story. It has already had close to 2 million visitors.

The unimaginable scale, the confusion, the horrifying images of that day and the tragedy of the lives that were lost – it's incised into the minds of those who watched from afar.

"All of us carry a story of 9/11 with us," says museum director Alice Greenwald. "The premise of the museum is to tell history through the vantage point of those who experienced it, which means it's inclusive of those nearly 2 billion people."

For those in Lower Manhattan or New York, Washington or Shanksville and for those who survived, knew victims or responded to the emergencies, 11 September is not history, but a part of their lives, and a 'museum' must seem misplaced in time. "It was also important to hear from those who lived that experience, who evacuated the buildings and survived, the first responders, and those who lost their lives," Greenwald says.

It's hard to imagine a more challenging project than conceptualising and realising the 9/11 Memorial Museum. Every aspect and every detail had to be considered with



Alice Greenwald has been the director of the 9/11 Memorial Museum since 2006

thought, assessed from every angle and meticulously judged. As Greenwald describes the museum, you can see that this is true for every single decision that was made.

## REFLECTING ABSENCE

Understanding the relationship between the Memorial Plaza and the museum is important to the visitor experience. Two inverse fountains now fill the footprints of the Twin Towers, set in a public park scattered with trees, surrounded by skyscrapers. Standing there, visitors wouldn't necessarily know there's a museum beneath their feet. It's marked only by a glass pavilion, some way

away between the two pools of water. The park is a place of contemplation, and there are no signs of the devastation that happened there, save the names of the victims inscribed around the bronze edges of the pools.

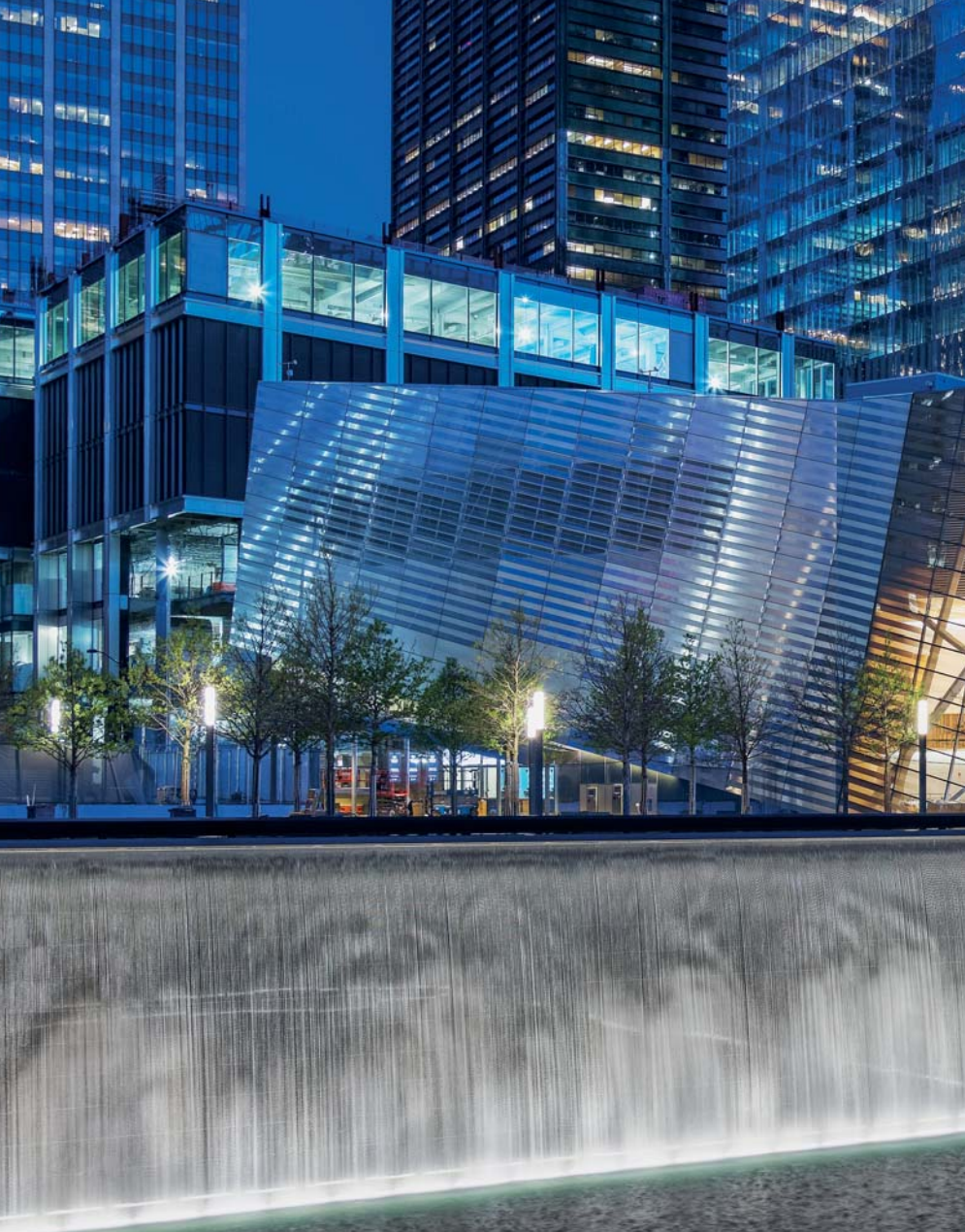
"The Memorial Plaza is about the absence of verticality and what's no longer there," says Greenwald. "The plaza was always intended to be a horizontal environment. It's about the absence of the buildings, the absence of the people we lost. It's about reflecting absence, which was the name given to the design by its architects, Michael Arad and Peter Walker."


The museum itself is in the very foundations of the North Tower and South Tower of the World Trade Center complex, seven storeys, or 21m (70 ft), below ground. "It's essentially built in the cavity of the foundations," says Greenwald. "As well as being a historical museum and memorial institution, it's also an archaeological environment with in situ remnants of the World Trade Center still visible."

## CONNECTING CONTEXTS

For Norwegian architecture firm Snøhetta who designed the pavilion – the glass atrium which forms the entrance and foyer of the museum – a balance had to be struck between the absence represented by the horizontal plane of the Memorial Plaza and the descent into the museum space far below – the space which, Greenwald says, is about "reflecting presence."

"The museum is about what remains, whether it's the remnants of the buildings





The Snohetta-designed pavilion acts as a bridge between the museum and the memorial

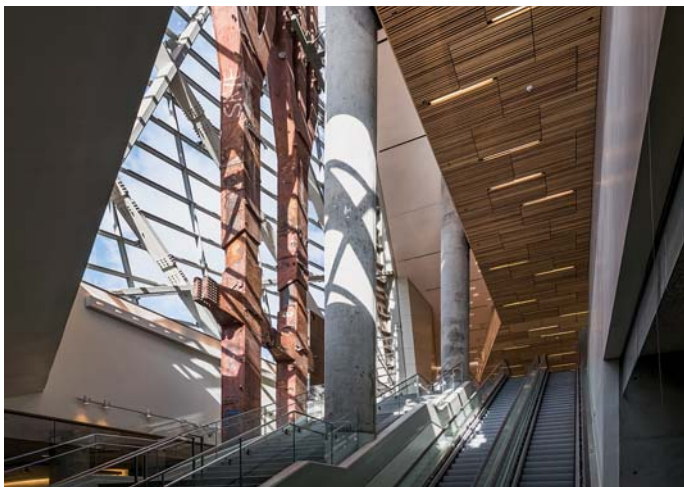


PHOTO: CLADGLOBAL.COM

The World Trade Center's steel 'tridents' inside the Memorial Pavilion's atrium

We set out by saying that our intention was to reflect the present with the Memorial Pavilion, whereas the two waterfalls going into the footprints of the two towers reflect the past

or the artifacts that represent those lives or the material that tells the story of the day.”

The Snohetta architects needed to build a connection between the two contexts. Their glass structure rises from the ground to create a deep atrium inside, filled with light by day, and uplit by night. Inside the atrium, where the entrance hall gives way to a staircase down to the exhibition, are two of the 24m (80ft) steel tridents, which were once part of the structure of the North Tower.

“We set out by saying that our intention was to reflect the present, whereas the two waterfalls going into the footprints of the two towers reflect the past,” says Snohetta’s Kjetil Traedal Thorsen. “In that sense it would be a more dynamic building, creating an immediate connection between the public and what was happening on the site.” [For more on the process of designing the pavilion, see our interview with Thorsen on p88]

“The pavilion suggests presence without being overly vertical, though it gives you verticality in the tridents,” says Greenwald. “Inside the pavilion, you look at these tridents and you look through the window and not only do you see both of the pools, where the Twin Towers stood, but you also see the new One World Trade Center, rising 1,776ft [541m] into the sky. You immediately get the proportions of what was here. It was critical in the design that when you entered the pavilion you were still within the memorial context: you were not separate from it; there was a continuity.”

#### AUTHENTICITY AND SCALE

Heading down the first flight of stairs, the visitor enters the main museum space, which was designed by New York architecture firm Davis Brody Bond. The descent features different levels leading down to the Foundation Hall, passing the Survivors’ Stairs which

enabled hundreds of people to escape the burning towers. In many ways, the museum is not a building, but an expansive interior space, punctuated with original pieces of engineering – now historical assets – such as the slurry wall, twisted pieces of steel and the box columns that have been excavated to reveal the outline of the North Tower footprint.

“Given a fixed set of existing geometries at the site, we were faced with the challenge of translating them into a series of coherent spaces that are punctuated by surface, texture and volume,” says Davis Brody Bond.

“We chose as the space’s main narrative element a gently descending procession (dubbed ‘the ribbon’) that guides visitors from the plaza to the bedrock level where the cut columns of the World Trade Center towers are revealed. The ‘ribbon’ evokes the ramp used to remove debris from the site in the aftermath of the attacks. It also offers multiple





The Pavilion features inclined transparent surfaces that encourage people to touch and look into the building

**Jake Barton** Principal Local Projects

**What was your role in the 9/11 Memorial Museum?**

I was half of the team, with Thinc Design, that won the international competition to masterplan the museum and design its exhibits and media. Local Projects produced all of the 100 media pieces inside.

**How did you approach the project?**

We spent an enormous amount of time looking to solicit and use the authentic narratives about the event in a way that would make the museum a platform for visitor self-expression. This would allow the museum to change and evolve and respond to every visitor's story, meeting them where they were, and also allow the museum to change and evolve over time.

**How did you use media in the exhibition?**

We used media to execute the concept that the museum was a platform for collective memory. Visitors can leave their own memories, hear others' stories, share messages which they can then see projected onto the slurry wall. This is all in the midst of the massive artefacts and stories that make the museum epic. The interactive media makes it a human and approachable experience, and each visitor can add to it.

**What was the most challenging decision you had to make?**

The decision to stop trying to design experiences in the abstract



and jump into prototyping, to make the designs as real as possible as fast as possible. This was critical to move the project forward as for a while the project

wasn't making a huge amount of progress because it was all too abstract. This approach allows us and the client to see what's successful or not, allowing for progress on even the most challenging project.

**Which digital exhibit stands out for you?**

Timescape is an algorithmic exhibit that culls meaning from the 3 million plus articles from 11 September 2001 to today. We authored an experience that creates linkages and meanings between these different articles. It's updated daily. The timelines that it creates link today's events back to the date of 9/11 and illustrate some of the causal roots of our post-9/11 world.

Scale was always the story of the World Trade Center - the scale of what was here, of the events that took place and of the potential for recovery and redevelopment

views of the slurry wall, the original retaining wall that was built to withstand the lateral forces of landfill and river, and which survived the collapse of the towers.

"At the end of the ribbon, the descent continues down along the Vesey Street Stair ('Survivors' Stairs'), which were used by hundreds to escape to safety on 9/11. It ultimately leads to two exhibition spaces and Foundation Hall, the Museum's culminating space whose sheer scale conveys a sense of the enormity of the site and reinforces awareness of the absence of what once was there."

Greenwald says: "The architects created a ramped descent with vistas that tell you how enormous the space is. Scale was always the story of the World Trade Center - the scale of what was here, of the events that took place, the scale of the potential for recovery and redevelopment. All of that is conveyed in the architecture. It's extraordinary to take in the authenticity of the site, the enormity of the space and begin to contemplate the narrative of the museum exhibit. Davis Brody Bond

designed what I think is one of the great built environments in New York, if not in the world."

Inside the museum, it was decided at an early stage to create a segregated area where visitors opted in. The space meant the most difficult artefacts wouldn't be encountered unless a visitor chose to do so. It became the historical exhibit, enclosed in the North Tower. The South Tower houses the memorial exhibition. Tom Hennes and his studio Thinc Design conceptualised the exhibition, with the help of media and technology partner Local Projects, and designed about 80 per cent of the finished exhibits. Layman Design took charge of the historical exhibit.

**FREEDOM TO CHOOSE**

For Hennes, the most important consideration when designing the exhibition was a respect for the trauma engendered by the attacks, and finding a way to present the story without forcing visitors to relive that trauma.

"Trauma plays a central role at the personal and the social scale," Hennes says. "That's



Foundation Hall features the 'slurry wall' and the 36ft-high 'last column' covered with inscriptions, missing posters and mementos

PHOTO: ANDREW AN OFFICER



The Wall of Faces, part of the In Memoriam exhibition, communicates the scale of human loss to visitors

PHOTO: KIM LEE

The 70ft-high 'tridents' are on permanent display in the pavilion, alongside information putting them into context

Catholic Mass  
EVERY SUNDAY  
10:30 AM 10:30 AM  
UNDER THE CROSS - WASTE

**SEARCH AND RESCUE**

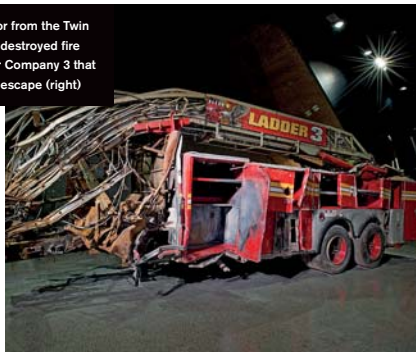
Search and rescue is a critical part of disaster response. It involves finding and recovering victims and remains, as well as identifying and recovering evidence. Search and rescue teams are often the first to arrive at a disaster site and are responsible for identifying and recovering victims and remains. They also play a key role in identifying and recovering evidence, which is essential for determining the cause of the disaster and for legal proceedings.

Search and rescue teams are often equipped with a variety of tools and equipment, including search dogs, thermal imaging cameras, and ground penetrating radar. They also often work in difficult and dangerous conditions, and are often required to work long hours.





An elevator motor from the Twin Towers (left) A destroyed fire truck from Ladder Company 3 that helped people escape (right)



## With most museums the central design challenge is bringing the materials to life, but in this museum the material is all too present and alive for most people

most significant for the people who were directly involved, but the ripples of trauma travelled through society. Our world view was disrupted on that day."

The designers worked closely with advisers, including historians and psychologists, to create a layout that permits each visitor to determine their own route. As long as they are informed about what's coming next, visitors are able to "regulate the intensity" of their museum experience. There is no definitive route through the exhibition, so visitors have the freedom to choose their journey. "Visitors understand they're in a museum, and not in 9/11," Hennes adds. "Here and now is a museum on the site of one of its attacks, not a re-immersion in 9/11."

### ETHICS AND APPROPRIATENESS

In the same way the visitor experience was devised to avoid being unduly traumatic, every artefact had to be tested by the same principles before it was deemed suitable for display.

One unique challenge lay in the fact that so much of the material was audio media, such as cockpit recordings, voicemails and radio transmissions. "The timbre of the human voice has an immediacy and a power that is very real," says Greenwald. "Our advisors cautioned early on that we needed to be extremely prudent in our selection of audio materials."

Hennes gives an example, describing how he had trawled through video of the towers falling countless times, but on one occasion listened with the volume on and heard the screams of a female voice, from out of shot. "I found that more difficult than just about any of the material I have seen because it took me to that raw, unprocessed, traumatic, emotional experiencing of terror and disbelief of the moment," he says. Imagining a museum that has this type of subject matter thus demands a sense of responsibility from the project team. "In some ways, that intensity is what we have to shield people from, unless they really want to go there, because it can trigger trauma. Trauma is a felt experience that may not even be fully understood."

Discretion was applied by the curators and designers across every type of artefact, Greenwald says. "When do you cross the line between documentation and exploitation? We debated endlessly that question and we worked very hard not to cross that line."

A case in point was the telling of the story of United Airlines Flight 93, which crashed in Shanksville, Pennsylvania, killing all on board. Very little survived the impact that could document the attack, but almost 40 phone calls were made by crew and passengers during the onboard siege. "We made choices to include certain voicemail

messages that are heartwrenching, but we felt they passed the test for us of being appropriate in a museum setting," says Greenwald. "There were recorded experiences aboard that plane that we chose not to include, and that was a discretionary decision based on ethics and appropriateness."

As Hennes says, this curatorial vigilance is necessary to prevent throwing visitors into that state of raw trauma. "To expose people to the unprocessed experience is to invite a kind of shock reaction and it is traumatic."

However, he says, the healing of trauma is about making sense of our felt memory and our narrative memory. "Trauma is a splitting between what we feel and see, which is recorded in one part of the brain; and the story and sequence we give it, which is recorded in another part of the brain. The healing of trauma brings those two aspects of memory together into something coherent."

"We recognised that coming to the site of one of the attacks would be a kind of pilgrimage for many people," he says. "We wanted to create a journey through this horrible event that would be bearable. With most museums the central design challenge is bringing the materials to life, but in this museum the material is all too present and all too alive for most people. The central problem is making it bearable to witness it."



The museum uses victims' voices, faces and names to humanise the experience

The events of 9/11 are a symbol of a larger and much more significant unfolding story. A museum which purely historicises would be out of place here

## REMEMBRANCE AND EVOLUTION

A salient point is that the 9/11 Memorial Museum has managed to reflect too the resilience of the city, the strength of the spirit that survived in the people who were affected the most. It seems vital to the museum that in places it has this energy within it, and that it is closely related to the words of the people who did not die that day.

There are listening alcoves in the history exhibit where visitors can hear recordings made by people who escaped the Twin Towers or the Pentagon and rescuers. "There is something enormously powerful in hearing their experiences spoken in their own words, not filtered through the museum's curatorial voice," says Greenwald.

In the memorial exhibit too, first-person recordings by relatives and friends of victims strike a similar chord. "What you find is that the stories they tell are the same stories that all families tell; stories that celebrate lives and remember people for the best of who they were," she says. "The stories are not about how they died but about how they lived."

It's debatable whether the commemorative nature of parts of the museum corresponds to the typical definitions of what a museum

is and should be. Hennes refers to an article in *The New Yorker* published in July last year, that questioned the case for the museum, saying "nothing is really taught ... [the designers] are in constant peril from the enormous American readiness to be mortally offended by some small misstep of word or tone. They can be felt navigating the requirements of interested parties at every turn."

Perhaps it's because this is an event that belongs to everybody – as Greenwald said, everyone has his own 9/11 story – so wasn't it right to build a museum that could be something to everybody? The museum and design teams believe the museum is organic; it will evolve and grow as the years pass, as fresh audiences come, as the event moves out of memory and more into history.

"To say a memorial museum is a contradiction in terms is missing the fundamental point about the potential of a memorial museum, which is that it's there to help society wrap a story around a traumatic event so it can come to terms with it. It's a way of turning it into history," Hennes says. "It's about maintaining an alive awareness of the meaning of 9/11 and the fact that it isn't over. The events of 9/11 are a symbol of a larger and much more

significant unfolding story. A museum which purely historicises would be out of place here.

"Visitors can put their own experience of this event into a more fully understood and fully realised context. The museum should enable people to be more engaged in the complex world that's come out of this event and I think that's a radically different mission for a museum."

Without its human voices, faces and names, the museum would be a dissonant experience. And, it's hard to imagine that a cold, hard, faceless version would be well received by a public who arrive from all over the world, people who have been there, as Hennes points out, in some way, before. The repercussions of 9/11 reach beyond Manhattan, after all.

For Greenwald, the humanity is central. "These were people just like you and me, who got up in the morning and went to work or boarded an aeroplane, and got caught in the vortex of a global event," she says. "Over 90 nations were represented in the people killed. They were from two and a half to 85 years old, from every sector of the economy, every faith tradition, every ethnicity imaginable. They were us." ●



Krasnodar Stadium, Russia

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PHOTO: CHRIS ASANOV/SHUTTERSTOCK.COM

HOK's Flame Towers light up Baku's waterfront (main pic). The European Games flame is travelling the country on its way to the new Olympic Stadium (inset pic opposite)





# BAKU TO THE FUTURE

Azerbaijan is investing in architecture, sport and tourism to establish itself as a major destination. This year, it hosts the European Games at the newly opened Baku Olympic Stadium. Kath Hudson reports





**B**aku, Azerbaijan's capital city, was awarded the inaugural 2015 European Games in December 2012. This oil rich country was the only bidder, which makes it no less of an achievement, since other bidders were frightened off by the tight timescale.

Keen to join the world stage and secure a major international sports event as a precursor for its ambitions to one day host the Olympic Games, Azerbaijan committed to be Games-ready within two years.

Tekfen Construction was appointed and tasked with an aggressive build schedule, which necessitated designing and constructing simultaneously. The challenge was successfully completed, with the stadium

finished in early March 2015, in plenty of time for the European Games in June.

Europe is the last of the major continents to have its own Games. They will be held every four years, in the year before the Olympics. The first Games will see 7,000 athletes from 49 countries, taking part in 20 sports. It will be the biggest sporting event Azerbaijan has ever seen and has sparked investment in cutting edge architecture.

"The government sees sport as an excellent vehicle through which to engage with Azerbaijan's youth, as well as raising the profile of the country on the international stage," says Jeremy Edwards, general manager, venue management Baku 2015 European Games.

"Not only are the Games a chance to inspire more people to lead a healthy and active

life, but they also provide an opportunity for graduates to develop new skills and obtain experiences that will further help Azerbaijan earn a place on the world stage."

#### ASPIRATIONAL ARCHITECTURE

Azerbaijan has been aspirational with its architecture. Eager to secure international prestige, architecture is being used to present an image of modernity and the sports facilities are at the forefront of this campaign.

The new stadium is part of a new village cluster, which includes athletes' accommodation and The National Gymnastics Arena, which hosted the European Rhythmic Gymnastics Championships last year. Designed by Broadway Malyan and Pasha Construction, this is another example of

The form of the building was inspired by gymnasts' ribbons; lighting on the façade makes it look as though the stadium is 'fluttering'. Unusually for an Olympic stadium, it is perfectly circular



ground-breaking architecture. The form was inspired by the ribbons of rhythmic gymnasts and strobe lighting is used to make the building look as though it's fluttering.

Now the US\$640m (£436m, E604m) Baku Olympic Stadium, situated near the city centre, with views over Lake Boyukshor, forms another prestigious landmark. Funded by the Azerbaijani government, the 68,000 capacity stadium will cater for international sports and cultural events and provide urban amenities.

The development comprises performing arts, concert and exhibition spaces, a health club, restaurants, office space and an information centre, as well as a shopping centre integrated in the six storey stadium. With special covers to protect the turf, the stadium is also set to be used for spectacular concerts.

"The stadium has been designed to reflect the youthful, energetic spirit of Azerbaijan," says Edwards. "It's equipped with the latest in mobile connectivity, large HD screens and seating configuration to ensure every spectator enjoys a perfect, unimpeded view of the sports as they take place around the arena."

Additional infrastructure has been put in place to allow people to access and exit quickly and efficiently and to link the stadium to the public transport network.

The structure is formed by five interlocking structures which are inspired by the cylindrical shape of the Maiden Tower, a 12th century Azerbaijani monument which is UNESCO World Heritage-listed. The exterior façade resembles the burning flame of Azerbaijan – the symbol of the 'Land of Fire'.

Six hundred EFTE cushions cover the roof and façade, chosen for their sound insulation properties, ease of use and attractive appearance. Thousands of LEDs light the stadium at night. A lighting study was carried out to determine daylight UV transmission, to optimise spectator comfort and natural turf demands.

Olympic Stadiums are usually elliptical, because of the 400m running track. However, Baku Olympic Stadium has been designed as a perfect circle, with pure geometry.

#### WORLD CLASS FACILITIES

Azerbaijan has yet to make much of an impact on the international football scene, but this stadium will boost its efforts, as the national football team will be the main tenant. It meets the highest international standards

**The land was previously  
occupied by an oil  
refinery so we installed  
isolation layers before  
laying the pitch**

for stadiums set by FIFA and UEFA and will host tournaments and qualification games for the 2020 European Football Championships.

Being the world's fastest stadium build was not allowed to impact on the quality of the project. With hopes of one day securing an Olympic Games for Azerbaijan, the stadium has been designed in accordance with track and field standards set by the International Association of Athletics Federations. The main stadium has achieved IAAF grade A status, while the warm-up area is IAAF grade B.

#### THE BUILD

Tekfen Construction and Installation, supported by Korea's Heerim Architects and Planners, were awarded the design and build contract for the stadium. The brief also included façade cladding, ETFE lighting, interior aluminium glazed systems, constructing the complementary sports facilities, as well as infrastructure works and landscaping.

A tough brief for a 24 month project. To support the accelerated schedule, an advanced



The flame began its journey around Azerbaijan on 26 April

modelling approach was used: the engineering team developed an automated design routine to check beam and column reinforcement against seismic code provisions.

Precast reinforced concrete and piled raft foundations – more typical of high rise buildings than stadiums – were used, all of which further speeded up the build.

There have been a number of challenges involved in the project. "The land was previously occupied by an oil refinery, so we installed isolation layers on the ground before laying the pitch," says SIS contracts manager, Burak Ertas, who was responsible for laying the pitches. "In addition, the warm up pitch is outdoors, so we sometimes had to deal with winds of up to 60km per hour."

#### OLYMPIC DREAMS

Having unsuccessfully pitched for the 2016 and 2020 Olympics, could the Baku Olympic Stadium, combined with a glitch-free inaugural European Games in the summer, be what Azerbaijan needs to secure the blue riband of international sporting events?

"Our main challenge is to make the most of this opportunity," says Edwards. "With Azerbaijan set to host a F1 Grand Prix, the Islamic Solidarity Games and matches in the UEFA 2020 European Championships, a key part of the legacy of these Games is to ensure we provide young Azerbaijanis with the chance to develop the skills and experience that will help them deliver major international events in the years to come." ●



Jeyran Aliyeva is one of the most successful volleyball players on the Azerbaijani national team. She is an ambassador for the European Games and features in the marketing campaign

#### ABOUT AZERBAIJAN

Situated at the crossroads of Eastern Europe and Western Asia, the Republic of Azerbaijan is an oil rich state, bordered by the Caspian Sea to the east, Russia to the north, Georgia to the northwest, Armenia to the west and Iran to the south.

Azerbaijan proclaimed its independence in October 1991 and is the first Muslim majority democratic republic and the first Muslim majority country to have operas, theatres and modern universities.

It has a high rate of economic development and literacy and a low rate of unemployment,

with the population of nine million almost equally split between urban and rural. However, a high level of migration means population growth is lower than in the rest of the world.

Football is the most popular sport, although so far Azerbaijan has a relatively low performance on the international stage. Freestyle wrestling has traditionally been regarded as Azerbaijan's national sport, and it has won 14 Olympic medals in this sport.

It is one of the leading volleyball countries in the world: its national women's team came fourth at the 2005 European Championships. Azerbaijan also has a Formula One race track and will be hosting its first Grand Prix in 2016.



The stadium is a multi purpose venue designed to host football matches and athletic meets. The building was modelled in two locations: Volos, Greece and Istanbul, Turkey



#### COMPANIES WHO WORKED ON THE PROJECT

Design architect: Heerim Architects & Planners Co, Ltd  
Structural: Thornton Tomasetti  
Geotechnical: Arup International Ltd  
Façade subcontractor: Vector Folitec  
Pitch subcontractor: Support in Sport Eastern Europe  
Athletic track and sport flooring subcontractor: Mondo S.p.A  
MEP subcontractor: Anel Group  
Seating subcontractor: Blue Cube (GB) Ltd  
Interior fit out subcontractor: Sinerji

#### VITAL STATISTICS

Total layout area: 617,000sq m (6,641,332sq ft)  
Main stadium layout area: 87,000sq m (936,460sq ft)  
Seating capacity: 68,000  
Total confined space: 215,000sq m (2,314,241sq ft)  
Maximum height from ground: 65.70m (213ft) (six storeys)  
VVIP suites area: 1,600sq m (17,222sq ft) with 220 seating capacity  
VIP - CIP suites total: 500 spectator capacity  
Total special area of interior: 25,200sq m (271,250sq ft)  
Car parking capacity: 3,078 cars  
Warm up area: 9,075sq m (97,682sq ft)  
Seating capacity in athletes' warm up area: 1,800  
Other facilities: MEP Building, Information Centre, two external buildings, parklands, heliport



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Above: Dax Polé Commercial



Den Haag Zuiderpark



Lyon Carre de Sole



Derby Arena



Omnisportcentrum Apeldoorn



WOHA's Space Asia Hub consists of two conserved historic buildings joined by a contemporary glass infill structure

# NEW LIFE

A new approach to heritage conservation has led to some exciting projects across Asia. Christopher DeWolf takes a look at some innovative examples

It wasn't long ago that Hong Kong lacked a heritage conservation policy. Historic structures were regularly demolished and there was no strategy to deal with the few that had been preserved. Then everything changed. "I'm amazed at how quickly it happened," says Lee Ho-yin, director of the University of Hong Kong's architectural conservation programme. In 2009, the city's government launched a new initiative that encourages the adaptive reuse of historic buildings by NGOs. The city suddenly witnessed a spate of innovative examples of adaptive reuse, including an old police dormitory turned into a design hub, a row of shophouses converted into a cultural centre for comic books and a former military compound turned art complex.

A similar story is playing out in cities across Asia, where the days of blind progress have given way to a more measured approach to development.

"What's interesting now is you see old buildings being integrated into part of a larger development," says Chan Ee Mun, an architect with Singapore firm WOHA, which has undertaken a number of heritage conservation projects. Instead of treating old buildings like artefacts, these projects infuse them with new life through contemporary design. "Innovation is the key," says Lee. "It is the only way we can produce heritage for the future."



Christopher DeWolf is an architecture journalist and photographer based in Hong Kong

## Space Asia Hub

Location: Singapore

Date: 2010

Architects: WOHA (Singapore)

Singapore was one of the first cities in Asia to adopt a conservation strategy, and its early historic conservation projects, such as the revitalisation of Clarke Quay, won international recognition.

But innovation wasn't always encouraged, which was the case in Bencoolen Street, where an old villa and shophouse were joined by a new infill structure whose architecture was required to mimic its historic neighbours. "It recreated the shell of a shophouse and packed in as many floors as it could," says WOHA's Chan Ee Mun.

In 2010, architectural practice WOHA was tasked with transforming the block of buildings into a furniture showroom. It began by clearing out the decades of subdivisions that had turned the shophouses and villa into dingy warrens, restoring them to their original, airy splendour. Next came the infill building, which was transformed into a modern glass structure.

With more open spaces, sightlines have been improved. "Within the series of three buildings you have greater appreciation of the building next to you," says Chan. "It's a chance to generate a dialogue between old and new. The result is the old buildings regain their prominence on the site."





Space Asia Hub was a finalist in the 'new and old' category of the 2012 World Architecture Festival. The redevelopment project created a contemporary showroom while retaining many heritage elements of the building.



The former Police Married Quarters in Hong Kong have been reborn as a design hub featuring studios, shops, restaurants, a library, a rooftop garden and exhibition space

### PMQ

Location: **Hong Kong**

Date: **2014**

Architects: **Architectural Services Department (Hong Kong)**

Saved from redevelopment by neighbourhood activists, Hong Kong's former Central Police Married Quarters posed a challenge for the government. Built in 1951 as a dormitory for police officers and their families, it was an imposing modernist structure typical of Hong Kong's postwar living conditions, with two parallel blocks of small living units that opened onto wide communal balconies with shared kitchens. It wasn't the most easily adaptable structure, but then came a solution: convert the former flats into shops and studios for local designers.

The rebranded PMQ is now a lively

design hub with a mix of retail, workspaces, bars and restaurants. "The key word is community," says architect Billy Tam, who consulted the NGO that runs the complex, which opened in mid 2014. Tenants are free to make use of the balconies that connect each unit, while a new multi-functional space was created by bridging the two blocks with a glass-walled cube that has a roof garden on top. A number of historic elements were preserved, including Victorian-era stone walls and the foundations of a 19th century school that occupied the site until it was destroyed by bombing in World War II.



There are currently seven URSts in Taipei

## The Urban Regeneration Stations allow Taipei residents to see old buildings in a new light

### Urban Regeneration Stations, Taipei

Location: **Taipei**

Date: **2010-ongoing**

Architects: **Various**

The decline of Taipei's industrial economy, along with the eastward push of development, left the Taiwanese capital with an aging stock of shophouses and factories on the historic western side of town. To protect them from redevelopment, the city launched an Urban Regeneration Office in 2010 that sought to revitalise neglected structures in creative ways.

There are now seven Urban Regeneration Stations scattered across the city, including shophouses converted into workshops for artists and filmmakers and a former liquor warehouse that now houses studios for creative enterprises.

Former URO coordinator Lin Yu-Hsiu describes the stations as provoking "a renewal of thought" that allows Taipei residents to see old buildings in a new light. While other historic preservation projects in Taipei have taken a more commercial approach, the Urban Regeneration Stations are more community-orientated, with programmes that are meant to draw in people from the surrounding neighbourhood. Buildings are donated by their owners, who are then compensated with a site of equivalent size in another part of Taipei.



The URSs can be used as “an area for workshops, neighbourhood activities, information gathering, social interaction, exhibitions, experimental actions and a resting area for tourists,” according to the Taipei City Urban Regeneration Office



The Comix Homebase project saw 10 pre-war tenement houses in Wan Chai converted into an arts and cultural centre dedicated to the promotion of Hong Kong's comics and animation culture

### Comix Homebase, Hong Kong

Location: Hong Kong

Date: 2013

Architects: Aedas (Hong Kong)

To say that Hong Kong is intensively built would be an understatement. Over the past century, most sites in central neighbourhoods like Wan Chai have been redeveloped four or even five times. Barely 1,000 structures remain from before World War II. In 2009, the city's Urban Renewal Authority was tasked with renovating a cluster of 10 shophouses built in 1910 and converting them into the Comix Homebase, a cultural hub for Hong Kong's venerable comics industry that opened in 2013.

The shophouses were in a rough condition – the timber structure had begun to rot – and Hong Kong's strict building codes required the provision of new lifts and fire escapes. Architects from the Hong Kong office of Aedas responded by

demolishing half of the most dilapidated structures to create a public plaza sheltered by the shophouse façades, while retaining the more intact structures.

Existing timber purlins were reused and incorporated into modern structural frames, which gives the shophouses the appearance of retaining their original timber-framed tiled roofs. Original timber staircases were also conserved, with hidden structural support and fire protection to bring them up to present-day building standards. In the new plaza, a green wall made up of interchangeable planter boxes recall the potted plants that commonly filled the balconies of shophouses, while also creating space to hang art installations and display screens.



The hotel clearly contrasts the old and new

**“It’s a statement that historically sensitive buildings like this one can be done and can be successful”**

### The Waterhouse, Shanghai

Location: Shanghai

Date: 2010

Architects: Neri & Hu (Shanghai)

When Shanghai-based architects Lyndon Neri and Rossana Hu completed this 19-room boutique hotel project in 2010, they actually lost some major hotel clients who felt the work was too avant-garde. No matter: the project has since won international acclaim, including the 2011 World Interior of the Year Award. Its success comes from an imaginative relationship between a 1930s-era warehouse and a new structure designed by Neri and Hu. The architects stripped the old interiors to reveal stained, weathered concrete, which they paired with rusted Corten steel doors and support beams.

A similar industrial palette was employed in the new structure, but with sleeker, more polished materials. Intriguingly, the building's layout was structured in a way that allows for the hotel's private areas to be glimpsed from public areas; a blurring of lines that Neri says was inspired by the “voyeuristic” experience of walking among Shanghai's fast-disappearing laneway houses. “To me, it's not a stylistic concept,” said Neri. “It's a statement that historically sensitive buildings like this can be done and be successful.”



#### **The Waterhouse, Shanghai**

The original three-storey 1930s Japanese Army headquarters building has been restored and new additions added over the existing structure using Corten steel, reflecting the area's industrial past. Neri&Hu architects were also responsible for the hotel's interiors



ASIA SOCIETY HONG KONG CENTER PHOTOS: MICHAEL MORAN/OTTO

Sitting in a rainforest surrounded by skyscrapers, the Asia Society Hong Kong Center has been described by Williams and Tsien as a “horizontal building in a vertical city”

**“We’d never been given a site like this. It was astonishing, like something out of a film”**

### Asia Society Hong Kong Center, Hong Kong

Location: Hong Kong

Date: 2012

Architects: Tod Williams Billie Tsien Architects (New York)


When architects Tod Williams and Billie Tsien first encountered the site chosen for the new Asia Society cultural centre in Hong Kong, they were astounded. “We’d never been given a site like this,” says Williams. “It was astonishing – like something out of a film.” Perched on a steep hillside, the land was first developed as an explosives compound by the British military. Now it was overgrown with thick vegetation cut through by a waterfall.

Tsien and Williams restored the historic military structures and converted them

into exhibition and performance spaces.

They also designed a new pavilion with an exhibition space, a restaurant and a gift shop. Completed in 2012, the building is low-slung, in defiance of the skyscrapers that surround it, and its use of locally-quarried black, grey and green stone, along with matte metal, gives it a sedate quality that blends in with the surrounding greenery. Most remarkable is the zig-zagging, double-decker bridge that traverses the waterfall, connecting the historic and contemporary portions of the site.





A walkway inspired by those seen in traditional Chinese courtyards links the buildings



Dashilar's changing attitude to conservation is seeing a number of historic buildings restored to house a range of design-led businesses

### Dashilar, Beijing

Location: **Beijing**

Date: **2013-ongoing**

Architects: **Various**

Beijing has a shaky record when it comes to historic conservation. While monuments like the Forbidden City and the Drum and Bell Towers have been preserved, the everyday fabric of this ancient city was subject to wanton demolition after China liberalised its economy in the 1980s. Things came to a head around the 2008 Olympics, when the Qianmen commercial district was razed and rebuilt with pseudo-historical architecture, a project that was roundly criticised by conservationists and ordinary Beijingers alike.

Not far away, a new model is taking shape in the 700-year-old hutong alleyways

of Dashilar. "The policy has changed from demolish and rebuild to this more organic, bottom-up renewal," says Neill McLean Gaddes, an architect who worked with Beijing Design Week on a masterplan for the area. Since 2013, the government-funded organisation has worked on revitalising Dashilar through small-scale interventions. So far, a number of historic structures have been restored by private businesses, including a greystone Art Deco building that is now a shop and restaurant, and an early 20th century structure that was at various times a printing press and a public bath, and is now a popular café.



The museum aims to preserve hutong history

**The project was led by master craftsmen who used materials reclaimed from other demolished hutongs**

### Shijia Hutong Museum, Beijing

Location: **Beijing**

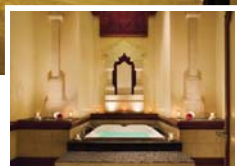
Date: **2013**

Architects: **Prince's Charities Foundation, Chaoyangmen Sub-District (Beijing)**

In 1990, when British-Chinese artist Colin Chinnery brought his grandmother back to the house she owned in Beijing before fleeing China's Communist Revolution, they discovered it had been turned into a nursery school. More than two decades later, thanks to investment from the Prince of Wales' Charitable Foundation, the traditional courtyard home has been turned into a free public museum about life in Beijing's historic hutong alleyway neighbourhoods.

This was no simple restoration. "They basically rebuilt it from scratch," says Chinnery. Modern amenities like indoor plumbing and geothermal heating were installed, but much of the project was led by master craftsmen who used materials reclaimed from other demolished hutongs to create traditional features like hand-carved window grills. Among the exhibits is a room of traditional hutong sounds collected by Chinnery, including hawkers' cries. "Hutongs have a very specific sonic property – if you're in a courtyard and you hear a bicycle ride past, you hear it in a way you haven't before because of the way it bounces off the hutong walls," he says. ●





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# CRAIG COGUT

In 2012, Pegasus Capital Partners bought the Asia-based resort and spa company Six Senses with a view to its global expansion. Three years on, the firm's founding partner tells Rhianon Howells what they've achieved so far and where they go next

At first glance, Pegasus Capital Advisors' decision to buy Six Senses Hotels Resorts Spas three years ago may have seemed a little surprising. After all, the US-based private equity firm didn't have a track record of investing in spas or hospitality, while the Asia-based development and management company had built its reputation on creating intimate, slightly quirky and highly localised (albeit highly luxurious) experiences of a kind not obviously compatible with the growth expectations of most private equity investors.

You don't have to delve too deeply, however, to understand what attracted Pegasus to the contract management business – then including 10 Six Senses- or Evason-branded resorts and spas, plus 18 Six Senses Spas in other properties – which it purchased from founders Sonu and Eva Shivadasani and shareholders for an undisclosed sum in April 2012.



Craig Cogut founded Pegasus in 1996 and serves as chair and president

Since 1996 Pegasus Capital Advisors, under the steerage of its founding partner, chair and president Craig Cogut, has made its name by specialising in sustainable and, more recently, wellness-related investments. With current assets under management of \$1.8bn, the firm

actively seeks to partner companies "committed to overcoming global resource scarcity in the fields of health and wellness, sustainable communities, energy and zero waste".

Meanwhile, Six Senses, which turns 20 this year, has long been a pioneer of sustainable practices in the hospitality industry, as well as one of the first resort brands to put spa and wellness at the heart of its offering.

Add to this Cogut's experience of investing in hotels with a significant spa presence and the potential for Pegasus to add value – and for Six Senses to deliver it – is clear.

"[We felt] the brand was uniquely positioned but hadn't been fully fleshed out or grown," says Cogut, who co-founded Apollo Advisors (now Apollo Global Management) prior to setting up Pegasus. "Our belief was that this was an absolutely tremendous platform."

In addition to the company's environmental and wellness credentials, Cogut cites the evocative identity – "you couldn't ask for a better name" – and the properties themselves as key factors in the decision to buy. "The existing resorts were spectacular. The bones were there, both in terms of architecture and design and in terms of every Six Senses being different and having its own sense of place."

Combined with steady growth in the luxury travel market and increasing recognition of wellness in the hospitality sector, there was, says Cogut, an opportunity for the Asia-based company to become a global leader. Since then, the firm has further strengthened its spa and wellness portfolio with the acquisition in 2013 of Raison d'Être Spas, the Stockholm-based spa consultancy and management company.

Three years on from the Six Senses acquisition, how close is Pegasus to realising its goals for its first spa and hospitality investment? And as a fund manager whose obligation is to its investors, what's its next move?



Six Senses was founded in 1995



Six Senses' Qing Cheng Mountain resort near Duijiangyan in China (above); The group's Zil Pasyon resort in the Seychelles, which is due to open late 2015 (below)





## Global growth

Unlike some private equity firms, Pegasus focuses on "long-term business building and working with management teams to create something of fundamental value, rather than just to play with the markets," says Cogut.

With Six Senses, the first crucial step was getting the right people. Starting with Wolf Hengst, former president of Four Seasons, as new executive chair, a dream team was recruited: Neil Jacobs, former president of Starwood Capital Hotels and senior vice president for Four Seasons in Asia, as CEO; Bernard Bohnenberger, previously the group's managing director, as president; and Anna Bjurstam, former owner and CEO of Raison d'Etre Spas, as vice president of Six Senses Spas (now managing partner of Raison d'Etre, Bjurstam divides her time between both businesses).

"We brought in a world-class management team to enable growth," says Cogut. "Neil's a visionary. The people he's brought in, and

Six Senses has 15 confirmed new resorts set to open over the next three years in Bhutan, China, Bali, Taiwan, France, Portugal, the Seychelles, Tunisia and St Lucia

some people we had before, are superb."

The next priority was the backlog of projects and opportunities that had been put on hold during the takeover. Now, with the decks cleared, the focus is firmly on refining the product and global expansion. "Clearly part of our investment thesis was to expand: Africa, South America, and selectively in North America and Europe. We're starting to do that," says Cogut.

According to Cogut, Six Senses has "a very, very big development pipeline," and while there's a lot he can't talk about, there are 15 resort openings confirmed for the next three years, including five in Bhutan, three in China

and one each in Bali, Taiwan, France, Portugal, the Seychelles (its first African resort), Tunisia and St Lucia. There are also seven spas in other properties: one each in Oman, Qatar, Greece, Spain and the US, and two in India.

Which is Cogut most excited about? "I'm excited about everything we're doing," he says, although he namechecks two resorts due to open this year: the Douro Valley in Portugal's wine region, which has "both history and natural beauty," and the Seychelles, an island property that's "going to be absolutely spectacular. About three-quarters of the island won't be developed but will be available for hiking. It should be a national park."

## Design vision

In such pristine settings, getting the architecture and design right is crucial, says Cogut. In an interview with CLADmag's sister magazine, *Spa Business*, Neil Jacobs said the Six Senses design philosophy would evolve "to

**“Urban retreats are hard to find.**

**There’s a segment of guests who’d welcome**

**Six Senses hotels in urban locations”**

**INTERVIEW: CRAIG COGUT**



Pegasus allows the Six Senses design team to take full control of the design vision for the brand

lose a bit of the Robinson Crusoe feel and add some modernity.” Cogut confirms this, but stresses the change will be a subtle shift of emphasis in select properties rather than a complete overhaul.

“We appeal to customers of various ages, but compared to some other luxury brands, [our customer base is] more cutting-edge and younger-feeling, and [a more modern] aesthetic is relevant to that group,” Cogut says. “One of the wonderful things about Six Senses is there’s not a lot of bricks and mortar. There are some [hotel] brands that like a lot of concrete. Six Senses isn’t about that, our resorts have a low footprint and we’re not changing that at all – or how we harmonise with the environment.”

When it comes to creating the design vision and hiring architects, Cogut says Pegasus plays no direct role, instead placing complete trust in the judgement of his team: Jacobs and Bjurstam, on the spa side, along with

## LIGHTING SCIENCE

Lighting Science Group is a Pegasus portfolio company developing energy-efficient LED lighting that addresses important environmental and health concerns, with products specifically designed to support natural melatonin production, improve sleep, boost alertness, accelerate plant growth and protect wildlife.

Using patented technology, the company has created a groundbreaking

range of LED bulbs and lamps that eliminate wavelengths of light proven by decades of medical research to disrupt circadian rhythms in humans, animals and plants.

Products on offer in the health- and wellness-related Rhythm Series include Good Night, which uses spectrum-filtering technology to greatly reduce melatonin-suppressing blue light, and Awake & Alert, which emits a blue-enriched white light aimed at increasing energy and alertness. Other company products serve environmental functions,

such as MyNature Grow, which uses purple or ‘true white’ light to promote healthy plant growth; and MyNature Coastal, which offers beachfront lighting for resorts and homes that is less disruptive to wildlife.

Resort operators already making use of the technology include Miraval Resort & Spa in the US, which has installed Good Night lamps in 116 guest rooms; and, of course, Six Senses, which features Good Night lamps in all of its guest rooms and spas, and Awake & Alert lamps in its gyms and exercise rooms. [www.lsgc.com](http://www.lsgc.com)



Six Senses is opening the Zil Pasyon resort on the private island of Félicité, Seychelles, later this year

Andrew Best, the group's vice president of architecture and technical services, and Omar Romero, vice president of development.

An exception to this hands-off policy is in the area of sustainability. In addition to appointing experienced environmental architect Amber Marie Beard to the newly created role of vice president of sustainability and putting together a high-profile advisory board, Pegasus draws broadly on its many other eco-focused investments – from waste management and energy to lighting and air-conditioning companies – to bring ideas, knowledge and expertise to the table. This takes Six Senses' commitment to sustainability, which is already central to its philosophy, to another level. But what does the fund manager hope to gain?

"I obviously believe, since we invest in it, there are economic benefits," says Cogut. "But sometimes you can't measure just on narrow economics. There are long-term benefits to doing things properly which often corporations don't focus on."

### New directions

In addition to expanding geographically, another growth strategy under consideration is the development of Six Senses hotels in urban locations, both to help build the brand and to cater for the needs of its city-dwelling and visiting customers. "Urban retreats are hard to find," he says. "There's a segment of guests who'd welcome that. It's incredibly appealing in the world we live in, where

**"We're trying to aggressively position the spa business to offer new services, taking advantage of science and knowledge on the wellness side"**

we're so disconnected from nature – from our sixth sense."

It's not something they will be rushing into, however. "It's on the cards, but these things take time. Finding the right sites and the right partners is important," Cogut says.

The company is also considering investing in Six Senses-branded real estate. "We're looking at owning or investing in certain properties through a number of structures," he says.

A more immediate focus for the company, however, is on refining and expanding its spa and wellness offering under Jacobs and Bjurstam's leadership. "We're trying to aggressively position the spa business to offer many new services, taking advantage of science and knowledge on the wellness side."

In certain areas, such as sleep health and digestive disorders, Pegasus helps directly by contributing ideas and expertise from its other wellness-related companies – such as the Lighting Science Group, a company developing LED lighting to aid sleep and improve health, or PanTheryx, a medical nutrition company specialising in intestinal problems.

Alongside Six Senses, Pegasus is expanding and adding value to Raison d'Être Spas, particularly its educational platform (the company

runs online spa management programmes) and its LivNordic brand, which combines Scandinavian design, fitness, bathing, treatments and products in a single concept.

"The interest in nordic wellness and the LivNordic brand has been incredible," he says. "In addition to the original LivNordic spa in Stockholm, we've entered the cruise industry with a LivNordic Spa on the Viking Star and two cruise ship spas planned for next year, plus another five on land."

For now, Pegasus has no plans to acquire more spa or hospitality businesses – "Six Senses and Raison d'Être are our focus and our vehicles" – nor is it letting go of the investments any time soon. "We're in no hurry to sell because there's tremendous value creation happening. There's a lot to do to build out both brands. We're a fund and have to sell for our investors, but certainly not in the short term."

Such is Cogut's enthusiasm for Six Senses, in particular, you get the impression that when the time does come to sell it will be with some regret. "I love Six Senses," he admits. "I vacation there, and it's because my family and I love what they do – whether it's the spas, the wellness programmes, the beauty of the setting or the sense of place." ●

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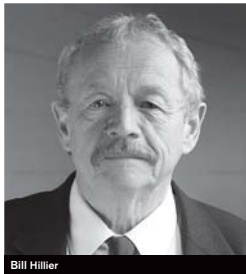
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# THE LANGUAGE OF SPACE

Space Syntax explores the science of human behaviour for cities, urban places and buildings. Director Bill Hillier and managing director Tim Stonor tell Katie Buckley and Alice Davis how their approach works



Bill Hillier



Tim Stonor

The social housing of 1960s London gets a bad rap these days, but when the structures were being built, a student named Bill Hillier found them exciting. Fascinated, he'd find and explore them, buoyed by the notion that great things were happening in the city's architecture. But, after 10 minutes inside, he'd get the feeling that "life wasn't worth living."

"There was something wrong," Hillier says, "something had disappeared." The sense of organisation and connectedness he associated with the city were not present in these developments. "These places seemed to be quite different; they seemed to separate people and create empty spaces," he says.

Hillier wanted to know why, and that marked the start of his life's work:

understanding the way people behave in space. He discovered that this not only informs the way we move, but can also affect our psychological wellbeing and wider societal behaviours.

Throughout the next decades, 'space syntax' came into being, an evolving family of theories pioneered and developed by Hillier and Julienne Hanson at University College London (UCL) to analyse spatial configurations.

Hillier established the company Space Syntax as a consultancy whose "science-based, human-focused" methods determine the optimum planning direction for buildings, urban spaces and cities. Space Syntax aims to help urban planners and architects achieve the best possible performance for their project and the surrounding community, in terms of social, environmental and economic benefits.

## SYNTAX STEPS

When a new project lands on a desk at Space Syntax, there's a process of research, analysis, discussion and evaluation to go through.

### 1 Diagnosis

A thorough investigation of the existing situation. The firm builds a spatial analysis model of the site and a detailed set of pedestrian movement surveys. This helps them to understand the wider context of the project.

### 2 Report

The findings are presented to the team and the client, and the constraints and opportunities of the development are discussed. The findings inform the architect's creative process.

### 3 Design Development

Based on space syntax principles and expertise, design concepts are tested. Proposals are simulated to help clients understand different options. These are then explored and evaluated in an iterative process between the design team, the client team and Space Syntax.

### 4 Impact Assessment

A detailed impact assessment investigates the plan within a variety of socio-economic parameters, from a pedestrian movement forecast to projected rental incomes or property values to assessing risk of burglary.

### 5 Planning Support

The reports generated are used to various ends; for example, to communicate likely impacts to stakeholders and investors.





## BEIJING, CHAOYANG CBD

In 2009, the China Academy of Urban Planning & Design (CAUPD) and Space Syntax created a low carbon masterplan for the extension of Beijing's Central Business District (CBD). The design union developed a vision for Chaoyang with five guiding principles: to celebrate the history of the district; to integrate new development with the existing CBD and the surrounding urban neighbourhoods; to promote a total energy solution for the new CBD incorporating resource-efficient consumption and renewable energy generation; to establish a civic identity for the new CBD based on human-scale streets and public spaces; and to balance historic preservation with redevelopment to create a harmonious historic continuity.

Bill Hillier Founder and Director

**What motivated you to start researching spatial organisation?**

A building has to work for the community, so knowledge of space organisation and its social effects is a critical part of architectural knowledge. In the 1960s there seemed to be a gap in this knowledge. Our concepts were naïve and too simple.

Back then, we were replacing the street-oriented system with a highly broken-up system. The only people who went to certain areas were the people who lived there. Residents were cut off from the main structure of the city. Many places were so problematic they had to be pulled down. What was happening seemed to be producing a social and psychological effect unlike anything we were familiar with.

**And so you began testing the theory?**

I was looking for ways of systematically understanding the relationship between architectural organisation and its social consequences. It became clear that first and foremost it was a problem of space. There was something about how cities were organised spatially, which made them work the way they did, and there was something about those new places that didn't work spatially.

**What have you learned so far?**

How space is structured has a critical relationship to economic and social effects. It's led to a theory about how the city is put together as a system of space, both a place you can 'live' in a cultural and social sense, and a place where you are close to economic activity.



In London, for example, you're always close to a small centre and not far from a much bigger one. There's interaction between economic activity and where we live. The duality of our existence is reflected in the structure of the city: we work, but we're also social. We developed a theory of the city as a very subtle structure, which reflects both microeconomic activity and social and cultural factors.

**How have your ideas progressed?**

They've become more subtle and also applicable at a much larger scale. At the moment, for example, I'm working on a space syntax map of England, Scotland and Wales.

**What is the purpose of mapping Britain?**

I wanted to see if I could find effects at this scale. The crucial thing is not the city but the system of cities.

Twenty years ago, cities were thought to be bad things. New Town programmes wanted to decant the population into smaller remote cities. Now it's completely changed. We understand cities are economic drivers and much more powerful than we thought. They work in excess of their size. Increasing the size of the city by a certain percentage will increase its productivity many times more. Now, in the UK – for example – instead of saying London is too big, we're saying Manchester and Birmingham are too small.

The range of poverty and the economic power of a city relate to the way the city is structured. Two things matter, the location of cities in relation to each other and the internal structure of cities and how that facilitates the intensity of economic activity against a viable social background to make cities productive.

**Where does responsibility lie for bringing in this thinking?**

Government, and local government. Work we're doing in places like Jeddah and Dubai shows space syntax isn't just a way of analysing space, but a new concept and methodology of town planning.

By analysing spatial configuration you can predict 60 to 80 per cent of movement. The astonishing thing is that applied at the national level, about 70 per cent of movement can still be explained just by the grid configuration. Scientifically this is very important; it's an amazing result.

We thought it would be different in different places but it isn't, it works as a system.

**THE SOCIAL LOGIC OF SPACE**

Developed by Bill Hillier and Julienne Hanson in the mid-80s, space syntax is an all encompassing method of analysing how people react in and to a space. Using a combination of angular movement analysis and multi-scale activity

analysis while integrating an existing layout enables Space Syntax to understand how a site is used and deliver environments that enhance mobility, economic activity, safety and social conviviality.

The modelling that Space Syntax uses takes all of this data and transforms it into a network graph. Each section of the site

is divided up from a centre point, designating individual areas into 'segments'. For a building, these segments become designated tiles, allowing a micro approach to analysing space.

The segments are then assessed using integration depths and mathematical algorithms to further understand their accessibility; for example,

how easy it is to reach the specified segment. Once this is established, clear patterns begin to appear about how the space is used, and how to improve the space.

Space Syntax's method of understanding space gives architects, developers and investors the chance to use their spaces to their full potential.



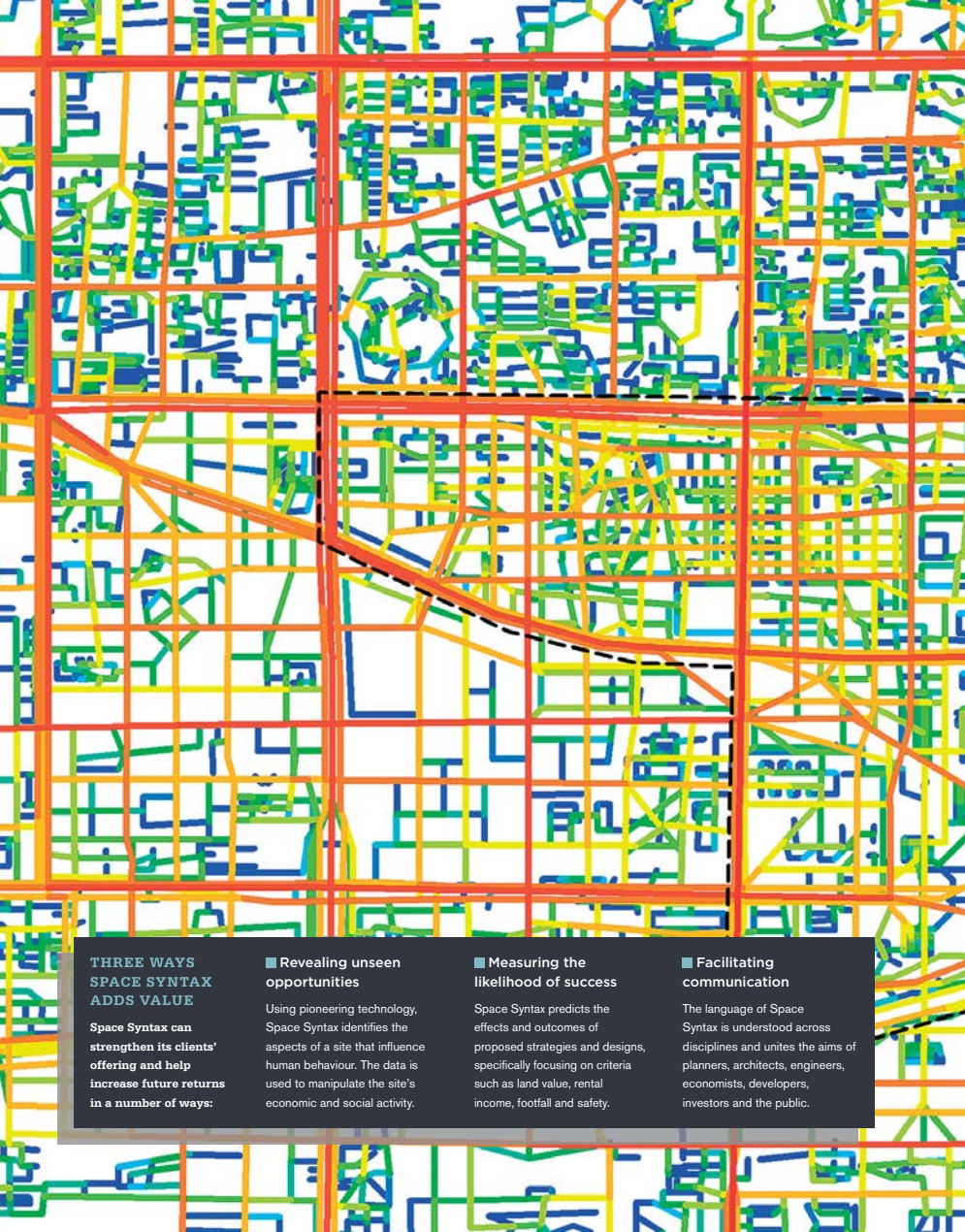
### JEDDAH UNPLANNED SETTLEMENTS

Space Syntax completed a Strategic Planning Framework for Jeddah in 2006. The redevelopment strategy creates smooth transitions from city-wide access to local routes within Jeddah's unplanned settlements, thus reconnecting the settlements to the larger city.



### DUBAI

In 2008, Space Syntax carried out an assessment of spatial structure and density distribution proposed by the strategic growth plan for Dubai. The work was carried out for Aecom.



**THREE WAYS  
SPACE SYNTAX  
ADDS VALUE**

**Space Syntax can strengthen its clients' offering and help increase future returns in a number of ways:**

■ **Revealing unseen opportunities**

Using pioneering technology, Space Syntax identifies the aspects of a site that influence human behaviour. The data is used to manipulate the site's economic and social activity.

■ **Measuring the likelihood of success**

Space Syntax predicts the effects and outcomes of proposed strategies and designs, specifically focusing on criteria such as land value, rental income, footfall and safety.

■ **Facilitating communication**

The language of Space Syntax is understood across disciplines and unites the aims of planners, architects, engineers, economists, developers, investors and the public.



## We don't want to be the only consultancy doing this, we want to embed our thinking into general practice



**Tim Stonor** Managing Director

### How would you sum up what you do?

Science-based, human-focused architecture.

### And what is the process that you go through?

We bring together data on how people behave with data on how places perform (including land value, rental value, crime and pedestrian movement) and we show how the layout or architecture of places influences patterns of human behaviour and economic performance.

We show how architecture really matters because when you design a building or lay out a city you design its human behaviour pattern. That has profound social, economic and environmental consequences. It's organising relationships between people, and those relationships have economic consequences. Environmentally, generating more walking, cycling and public transport will have a massive carbon impact.

### What do you offer your clients?

There's nothing like having a baseline that tells you how your site is working, who's around it, what's beyond you that you can connect to and what's between your building and the buildings across the road. We found clients really love it; being evidence-based seems to go down really well with investors, owners and occupiers.

### How can we improve the way this is done as an industry?

By not having to rely on Space Syntax to do it. Our company mission is about disseminating this knowledge directly into architecture and planning, to put the technology onto the tables of designers and planners.

We don't want to be the only consultancy in the world that does this. We want to embed our thinking, our technology and our learning, into general practice.



### How are you doing that?

Through an academy. We offer face-to-face classroom-based training – with the support of UCL (University College London) – aimed at training professionals. We had planners from Sweden in recently from a local authority, we have designers, architects and urban planners coming in, and we have an internship programme. But we need to scale up, so we are building the Space Syntax Academy to offer classroom training. We have also built a soon-to-launch website to give people access to the information for free. We are confident that our reputation and commercial essence will continue into the future, because we will be the leader in a field that we have generated.

At this stage we are looking for significant investment, so that we can do this at scale.

### Can you give some examples of your work?

We worked for the Olympic Development Authority with the Queen Elizabeth Park, helping develop the masterplan for Stratford City in the first instance. That then became the Olympic site and the Olympic masterplan. We were asked to look at the legacy and how

the park could connect with the communities and businesses around it. We wanted a place that was common to all of them; not just a special place that you might visit once or twice in your lifetime, but an everyday place embedded in local communities.

In Woolwich, we have helped to create a central public space. Footpaths run through the middle of it, which are aligned with the streets that feed into it, making it more likely that people will walk through the square and engage with other people sat in it.

### What are the challenges facing leisure architects?

I think it's being categorised as a leisure architect or a commercial architect or a retail architect. The problem we have in our profession is that we silo our disciplines.

### So all architects are leisure architects?

Leisure has to integrate itself into the everyday activities of all architects. Very few buildings don't incorporate this, don't have elements of the informal, the serendipitous. To me that's leisure.

### Are public spaces more of a challenge in densely populated cities?

Density is a big issue. If you spread people too far apart you have the problem of low-density sprawling suburbs, where nobody ever gets to meet anybody else, and everybody has to drive. If you can bring people closer together they will meet more often and you can make a public space work.

In densely populated cities like Hong Kong and Singapore, you always find places to be quiet. There are parks, so although there is the vibrancy of a multi-level city environment, you just have to turn a corner to find a moment of quiet. Offering a spectrum of opportunities is something every great city does. ●

# MILAN EXPO 2015

**M**ilan Expo 2015 kicked off on 1 May, with a lavish opening ceremony that featured a performance by Andrea Bocelli and a video link with the Pope. It's a huge event, featuring 145 participating countries and expecting around 20 million visitors over the course of its six month run. The theme for this year's expo is Feeding the Planet, Energy for Life, and it aims to explore issues around agriculture, sustainable development and energy conservation, with participating countries showcasing their solutions.

The road to opening certainly hasn't been smooth, with problems including cost overruns, accusations of corruption, construction delays and violent anti-globalisation protests. While critics of the Expo have accused it of being wasteful (masterplanner Jacques Herzog recently branded it a vanity fair), its supporters say it will help raise awareness of the vital issues of food scarcity, global hunger,

**It's had its share of problems, but Milan Expo 2015 is now well underway. Alice Davis and Magali Robathan take a look around and speak to some of the pavilion designers**

climate change and population growth, and will leave a positive legacy.

It is also set to boost Italy's economy – Italy's Chamber of Commerce and the University Bocconi in Milan have estimated that the expo is worth an extra E10bn (\$11bn, £7.3bn) to the Italian economy and E5bn to the tourism sector. Public investment in the Expo is E1.3bn; according to the organisers, operating costs of E800m are balanced with

E800m in revenues received from sponsors, ticket sales and merchandise.

As for the architecture, there are a whole range of varied and innovative designs on show, with pavilion designers including Daniel Libeskind (Vanke pavilion), Foster + Partners (UAE pavilion) and Herzog & de Meuron (Slow Food Pavilion).

The Expo content has been divided into two formats: experiences and focuses. Experiences are aimed at people looking for fun and entertainment, while the focuses are in-depth analyses of the challenges of feeding the planet. Experiences include the Supermarket of the Future, showing how food might one day be produced and consumed, the food on site and live entertainment including Cirque du Soleil and music concerts. The 'focuses' meanwhile, are divided into three topics, each with a programme of debates, talks and conferences. The second focus looks at food groups and agricultural zones and the third looks at special projects such as the UN's Blue Spoon against Hunger installation.

## Piero Galli

General manager  
Milan Expo's Event  
Management division

### How did you decide on the theme for the Expo?

Expo Milano 2015 provides an opportunity to reflect upon, and seek solutions to, the contradictions of our world. On the one hand, there are the hungry and, on the other, there are those who die from ailments linked to poor nutrition or too much food. In addition, about 1.3bn tons of foods are wasted every year. For these reasons, we need to make conscious political choices, develop sustainable lifestyles, and use the best technology to create a balance between the availability and the consumption of resources.



### What is the role of architecture at the Expo?

The exhibition site was designed by internationally renowned architects Stefano Boeri, Ricky Burdett and Jacques Herzog. Eco-friendly and recyclable national pavilions and thematic areas were designed by the world's foremost architects – from Norman

Foster to Daniel Libeskind and Michele De Lucchi. The number of self-built national pavilions – 53 – is a record in the history of universal exhibitions.

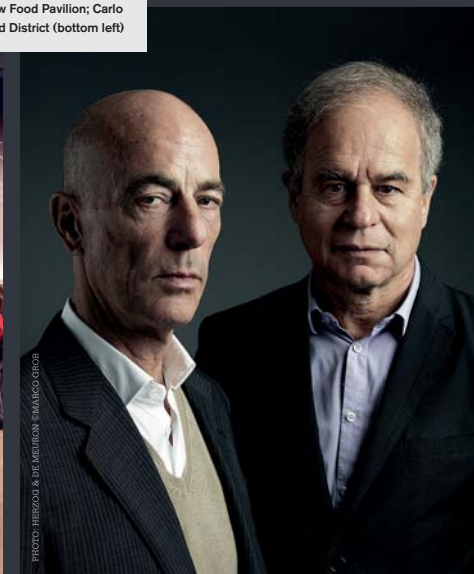
### How will this Expo stand out?

Expo Milano 2015 is all about innovations. For the first time in its centuries-old history, the Expo won't simply be an exhibition of human progress, but the opportunity to promote discussion and cooperation between nations, organisations and businesses to develop joint strategies to improve the quality of life and support the environment.

One of the brightest examples of innovations introduced by Expo Milano 2015 is the concept of clusters. Clusters represent shared exhibition areas dedicated to countries that – for various reasons – do not have their own pavilion. They are located throughout the site and allow the countries to represent their food history, culture and traditions.



Studio Arthur Casas and Atelier Marko Brajovic's Brazilian pavilion (above); Herzog & de Meuron (bottom right) designed the Slow Food Pavilion; Carlo Ratti's Future Food District (bottom left)





## UK PAVILION

Design Wolfgang Buttress and BDP  
Construction Stage One

Inspired by the idea of the honeybee and its role in the wellbeing of the planet, the 1,910sq m UK Pavilion has been designed by a team led by artist Wolfgang Buttress, with BDP providing architectural input, and construction and manufacture by Stage One.

The pavilion consists of five areas – the Orchard, the Meadow, the Terrace, the Hive

and the Architectural Programme. Visitors are met by an orchard of British fruit trees, surrounded by walls designed to evoke an English country garden. From there they walk through a steel corridor to the 40m long meadow, featuring plants and flowers, with amphitheatre seating at one end.

The hive is, of course, the star of the show. A 14m x 14m x 14m 3D honeycomb structure made from separate aluminium components, it features a sheltered piazza area underneath, allowing visitors to enter and experience the beehive

from within. The structure is connected to a real beehive in the UK, and a series of audiovisual devices allow it to pulse and buzz in accordance with the activity of the real bees. Accelerometers – used to measure the acceleration of a moving body – measure the vibrational activity of the bees and these signals are fed into LED lights embedded within the structure to generate a visual representation of their activity.

A 300sq m podium houses the terrace, which features a bar and acts as a social space, as well as providing access to the hive.



PHOTO: BAIRNEY MELTON



Artist Wolfgang Buttress creates 'simple, elegant and contextual sculptures which seek to celebrate a sense of place'

## Wolfgang Buttress

Artist

### How was the idea for the UK Pavilion born?

The form and idea originated from dreaming and a hand drawn sketch. I wanted to find a simple metaphor for the state of the planet in 2015. The bee can be seen as a sentinel for the health of the world. Pollination is essential to the wellbeing and feeding of the planet. I wanted to express something that's universal, and that goes beyond language, age and intellect.

The role of wider ecosystems in our food chain is very significant, but is often overlooked in favour of a more anthropocentric emphasis. Many people are aware that the honey bee is facing a crisis in recent years, I wanted to highlight the significance of this issue for food security.

We got in touch with biophysicist Dr. Martin

**The experience is immersive and emotional. We wanted to connect the visitor with nature and ecosystems on an experiential level**

Bencsik, who is doing some incredible research into the honey bee. By measuring vibrational signals he can interpret their language and communications, which is an amazing step in understanding their behaviour and more importantly how our behaviour affects bees.

Our central idea was to use this technique to connect a real beehive in the UK to our pavilion in Milan. Digital signals from the bees are streamed in real-time and expressed to visitors through light and sound.

### What is the aim of the pavilion?

I wanted to create something reserved and conscious of its context, yet at the same time innovative and impactful. For me, the tension between those qualities is important.

### How do you want the pavilion to make visitors feel?

The experience is immersive and emotional. We wanted to connect the visitor with nature and ecosystems on an experiential level. An important strategy was to configure the site as a whole, with different places, routes and transitions. Within this, we aimed to provide multiplicity, so visitors can curate their own experience of the pavilion as an active participant. Use of the senses was also key. We've created something that will engage through sound, taste, touch, smell and sight.

### How did you feel when you heard you'd won?

Excited and proud to be an artist representing the UK on such an enormous platform.



### Christian Lachel

Vice president, BRC  
Imagination Arts

#### What's the aim of the EU Pavilion?

Since its inception, the EU has been about bringing people together around a common idea and common policies. Because the Expo is about feeding the world's population, our story features agriculture and science working together to solve some of the biggest issues we're facing today. We've got to pull together to address global hunger, food safety, nutrition, sustainability, the environment, and climate change.

The story of Sylvia and Alex offers an engaging and entertaining way into these serious issues. Europe is leading the way in best practices, and experiencing how those practices improve the lives of characters they come to care about helps visitors take in those ideas in a way that resonates with them emotionally and sticks with them after they leave the Expo.

#### The European Pavilion

Architecture: Nemesi & Partners  
Exhibition design:  
BRC Imagination Arts

The European Union chose experience designers BRC Imagination Arts to develop a series of activities to showcase EU agricultural policies, research and development global food assistance. BRC came up with a family-friendly experience with two animated characters at its heart; Sylvia, a scientist and Alex, a farmer.

#### Can you talk us through the experience?

We've created a really fun story about two animated characters: Sylvia, a scientist, and Alex, a farmer. In the queue, we follow both Alex's and Sylvia's families through a series of photos and mementoes; the family stories develop alongside the birth and growth of the EU after World War II. In the pre-show, we enter the storybook world of our characters. The story comes to life through projection mapping, LCD media screens, dynamic audio, and other techniques.

The main show features an animated 4-K film and dynamic theatre effects, including a platform with vibration floor speakers. Guests exit the film into the content centre, where they can learn what happens to Sylvia and Alex after the film, and explore key messages by interacting with three custom touch screen storybooks and games.

#### ITALY PAVILION

Architect: Nemesi & Partners  
Proger & BMS Progetti:  
Engineering & cost management

The Italian Pavilion, the only permanent structure on the site, has been designed by Nemesi & Partners, who worked with engineers Proger and BMS Progetti and sustainability consultant Livio De Santoli. It features a 'smog filtering' façade in the form of special cement panels designed by Italcementi Group.

The design of the façade was inspired by branches in a thick forest.



PHOTO: SHANGHAI PHOTOGRAPHY BY ITALCEMENTI



The pavilion's ceramic red tiles have sustainable self-cleaning and air purification properties

#### China Vanke Pavilion

Architect: Daniel Libeskind  
Exhibition design:  
Ralph Appelbaum

With its shimmering red 'scales' and dynamic, twisting form, the Daniel Libeskind-designed Vanke Pavilion is probably one of the most widely recognised images from the Expo.

Libeskind was enlisted by Chinese developer Vanke to design its 1,000sq m pavilion. Libeskind has designed a curved building clad in shimmering red tiles with a large opening leading up to a rooftop terrace. Two spiralling staircases ascend the building, serving as both circulation and seating.

Inside, exhibition designer Ralph Appelbaum has created an exhibition centred around the idea of shi tang – or table – and its role in Chinese society.

The main space features a 'forest' of bamboo stems – resembling a giant game of Kerplunk – with 200 screens attached to the stems showing short films depicting the importance of food in the lives of ordinary Chinese citizens.

At the end of the Expo, all of the pavilion's steel elements will be collected and reused.



The Vanke Pavilion is clad with more than 4,000 red metalised tiles that Libeskind designed with Casalgrande Padana; The exhibition design centres around the idea of the shitang, or table





## US PAVILION

Architecture: Biber Architects  
Exhibition design: Thinc

Titled American Food 2.0: United to Feed the Planet, the US Pavilion consists of a simple rectangular barn-like structure featuring a giant vertical farm planted with vegetables, grains and herbs.

According to the building's designers, Biber Architects, the open, accessible design has been created in direct contrast to the last USA Expo Pavilion in Shanghai in 2010 (designed by Canadian architect Clive Grout), which they describe as "a closed, opaque oddly-shaped building filled with video monitors and entered via a long, long queue."

Visitors enter Biber's pavilion via airplane hangar-sized doors, where a boardwalk (made of lumber recycled from the original Coney Island boardwalk) rises to the second floor. The main exhibition space is on the ground floor, and will host art exhibits, readings, concerts and other cultural events. A rooftop terrace features a translucent floor and energy-generating panels. Outside, a food truck serves regional American street foods.

According to James Biber, "The pavilion itself is a scaffolding for ideas, a rethinking of the nature of expo pavilions and of America as a force in the food world."

This photo: American industry, products and entrepreneurship are highlighted using interactive exhibits; Below: James Biber's building is open and accessible



### Where did the inspiration for the design of the US Pavilion come from?

American agricultural buildings, Coney Island Boardwalk, the first Expo building (Crystal Palace, London, 1851), the long narrow site, America's love affair with the road and the aspirations of America to be transparent, open and accessible while offering freedom of choice.

### What were you trying to achieve?

We wanted to create a scaffolding for ideas, a social space, a pavilion that could be experienced in multiple ways, and one that was never blocked by a discouraging queue out front. The pavilion was to be an invitation to enter, not a fortress protecting the interior.

### The building is quite simple in design. Why was this important?

Having spent time at a number of other pavilions I'm more convinced than ever that we did exactly the right thing in creating an open, free flowing, breezy building that can be understood in an instant, but experienced as a rich sequence of events. The simple elegance of the formal idea (a long open extrusion with a rising ramp and grand exit stair) allowed us to concentrate our resources on the things that matter. A complex form would have precluded that.



**James Biber,**  
Partner, Biber Architects

### What were the biggest challenges of designing this pavilion?

Time, money and the restrictions of the context (just like any other project). We also invented some architectural elements that had never been done before, such as the vertical farm façade in motion, and individually addressed digital roof array, and required custom solutions that had to

work perfectly from day one. We didn't have an R&D budget or years to develop these elements, but had to invent them on the run.

### There have been criticisms that the Milan Expo is wasteful and is a vanity fair. What are your thoughts on that?

Jacques Herzog was nearly 100 per cent right in his original plan. It was a brilliant and logical way to undo much of the waste at an Expo.

He was right except for the fact that no one would participate in that version of an Expo.

Expo is the design Olympics, and tucking a few temporary sheds under a tented site would not satisfy the participants' need to express their national identity in an open and competitive forum. This Expo may succeed in raising issues for a global conversation, and that would make it enormously successful.

### What is your favourite pavilion at the Expo other than your own?

Pavilions I admire include the Bahrain pavilion (a small, domestically scaled pavilion, beautifully crafted and simply arranged. plus no queue!); the UK pavilion (one idea, elegantly executed); the Austria pavilion (a complete forest in a straightforward rectangle); and the Future Food Pavilion (a working co-op supermarket).



**Tom Hennes**  
Founder, Thinc Design

### What did you want to achieve with the US Pavilion exhibition design?

Global food security is becoming an enormous and very interesting issue. We think the United States has a great story to tell about the innovative research and different communities of expertise working on these issues.

We want to present this not just as a problem but as an opportunity. It's not just about solving the problem of population growth, it's about harnessing human energy and having a planet that's healthier than the one we were born to.

### Can you talk us through some of the key features of the exhibition?

We begin with a soundscape that comes from the indigenous Native Americans, giving thanks for nature's bounty. Then a chorus of other American voices connected to the land, including a farmer, pick up the story. Visitors then move up the step ramp to the middle floor, or boardwalk.

Outside the pavilion, a magnificent two and half acre vertical farm features crop plants growing on

big pivoting panels that are positioned to capture sun. We've brought some of these plants inside; exhibit stations spiral upwards, and are topped with 'chandeliers' growing the plants. The stations have screens attached, with each presenting a different perspective on global food scarcity.

In the centre of that is an interactive exhibit that six people can play at any time – it brings all of these threads together. We also have a rooftop terrace which has a view of the whole expo site. It's primarily a place to decompress and it also acts as a space for special events.

On the ground floor we have the Great American Foodscape, which is a landscape of folded forms that have videos projected onto them telling the story of American history and culture through its food.

### What do you want people to take away from their experience?

I want them to feel they know Americans a little better; to know that we're a country of diversity that likes to invent and to solve problems.

## FIRST PERSON EXPERIENCE

## Christian Lachel

Vice president  
BRC Imagination Arts

I love World Expos. I've had the opportunity to work on four BIE events: the Aichi Expo 2005, Shanghai

Expo 2010, Toronto 2012 and now

the Expo Milano 2015. World expos are magnificent parties designed to bring people together from around the world to produce new ideas, new thinking and new solutions.

Food culture and tasting experiences create a joyous unifying thread for this expo. The pop-up stands, food trucks and restaurants are serving ever-longer lines, promoted by word of mouth. My early favourites include the Holland Pavilion, a food truck experience that gets it right. The Argentina Pavilion is another favourite, with the best empanadas I've ever tasted (great with a native wine!)

Of course you're here to do more than eat. Here's my quick list of what to see and do at the Expo.

## Architecture

The pavilion architecture varies greatly. You'll find the good, the bad and the bizarre. Some of my favourites include:

- **The Italian National Pavilion** with its gorgeous white façade.
- **The UAE Pavilion** Norman Foster's pavilion is high on the list in terms of quality.
- **The UK Pavilion** A simple, elegant statement, beautifully designed. I'd recommend visiting in the evening.
- **The Austria Pavilion** All of the elements inside and out are simple, elegant and inspired by the natural world.
- **The France Pavilion** elegant in form and structure.



Foster + Partners' UAE Pavilion: "High on the list in terms of quality"

- **The Tree of Life** A wonderful sculpture that comes to life with music, water, colour and effects. It's a big hit with Expo visitors.

## Experience (shows, exhibitions and events)

Plenty to choose from here as well. Some experiences are artistic and simple. Others are full on immersive presentations. Still others are music filled celebrations. Some of my favourites include:

- **Pavilion Zero** Epic in scale, story and presentation techniques.
- **German Pavilion** A great experience from exterior through the finale show. It incorporates exciting new technology, and the end experience is full of energy and music. It's wonderful!
- **Korea Pavilion** Artistic installations, beautiful projection and choreographed robots. What else do you need?
- **Japan Pavilion** Audacious bordering on bizarre, but artistic. Here you'll find immersive projection worlds you can explore. The finale show blends Iron Chef with virtual dining experience Tokyo style.
- **UAE Pavilion** A touching story presented with a variety of media-based presentation techniques. Don't miss the Expo 2020 Dubai preview centre.
- **Kazakhstan Pavilion** A surprise. The first artistic show experience is worth a visit.
- **Argentina Pavilion** A wonderful projected world. Don't miss the amazing live performance stage. It will get your heart pumping and make you feel alive.

## Expo Milano Legacy Plans

Organisers say that strategies are in place to prevent the site becoming derelict after its October finale. A statement from the Expo says that the site will be ready to 'host a new city area of technology and innovation, with perfect infrastructure, green spaces, environmentally-friendly materials and renewable energy'.

All countries were asked to build their pavilions in a sustainable way, where they can be easily disassembled and recycled. In Milan, certain Italian pavilions will remain on the exhibition site after the Expo is over, such as Palazzo Italia, which will become Milan's centre of technological innovation.

So, is Expo Milano 2015 worth visiting?

Yes, definitely. You'll love exploring the rich, varied pavilion designs and experiences. For designers and architects, this is a clinic in breakthrough ideas (and a chance to learn from fascinating failures as well.)

This is a global party where we come together from around the world to celebrate the great mission we share: the commitment to find new and better ways to feed the world, eliminate waste and create a global food culture that is abundant and sustainable. ●

ALL PHOTOS THIS SPREAD © CHRISTIAN LACHEL



The US Pavilion (top left);  
The food wall in the Japan  
Pavilion (top right); The  
Lithuania Pavilion (right)



Gold wine sculpture in the  
Taste of Italy Pavilion (left);  
Touch screens in the EU  
Pavilion (right)



# CLADkit

A stained glass window doubles as a green energy source, pollutant-absorbing pavements in Barcelona and an award-winning 50-metre video graphic wall



For full company and contact details of any of the products and services featured here, please visit [www.CLAD-kit.net](http://www.CLAD-kit.net)



Carbon3D technology uses light and oxygen to grow objects from a pool of resin

## 3D printing breakthrough

A new approach to 3D printing promises to deliver commercial quality manufactured parts at a much faster rate. Silicon Valley-based Carbon3D's Continuous Liquid Interface Production (CLIP) technology harnesses light and oxygen to continuously grow objects from a pool of resin instead of printing them layer-by-layer. It says the technique is 25-100 times faster than conventional 3D printing, and can deliver commercial quality objects with consistent mechanical properties. A broad range of polymeric materials can be used to manufacture complex parts. The technique works by carefully balancing the interaction of UV light,



Carbon3D CEO Joseph DeSimone

which triggers photo polymerisation, and oxygen, which inhibits the reaction, to continuously grow objects from a pool of resin. Carbon3D has partnered with Sequoia Capital and Silver Lake Kraftwerk to raise \$41m to commercialise the technology. CLAD-kit.com keyword: **Carbon3D**



Hunter Douglas offers an array of facade solutions

## Flashy facades

Hunter Douglas facades offer a wide range of shapes, joint options, materials, finishes and colours. Its Quadroclad range consists of honeycomb core panels with facings in coated or anodized aluminium, zinc and stainless steel. The panels are lightweight and offer a high level of flatness, even on very large panels. Sizes can go up to 1,500mm width x 10m in extreme cases, with a sharp finish and clean lines. A variety of fixing systems are available. MPF, or Multiple Panel Format, offers a plank style, single skin panel in the same range of metals as Quadroclad. It is a versatile panel with widths from 150mm to 600mm x 6m maximum length. Joints can be opened or closed and played to good architectural effect, according to Hunter Douglas. CLAD-kit.com keyword: **Hunter Douglas**





Bloom, a freestanding 3D-printed cement pavilion, is made of 840 customised blocks

## Demonstrating potential

The first and largest powder-based 3D-printed cement structure has been built at a US university. Created to demonstrate the architectural potential of 3D printing, the freestanding pavilion – Bloom – is composed of 840 customised blocks, measures roughly 12ft by 12ft, and is 9ft high. The University of California, Berkeley research team was led by Ronald Rael, associate professor of architecture, who developed a new type of iron oxide-free Portland cement polymer formulation which enabled the 3D printing. “We are mixing polymers with cement

and fibres to produce very strong, lightweight, high-resolution parts on readily available equipment; it’s a very precise, yet frugal technique,” said Rael. “This project is the genesis of a realistic, marketable process with the potential to transform the way we think about building a structure.” Siam Cement Group provided the Portland cement, while additional support and materials were provided by Emerging Objects, a startup company co-founded by Rael and Virginia San Fratello, and Entropy Resins. [CLAD-kit.com](http://CLAD-kit.com) keyword: **Siam Cement**



Coloured glass generates energy

## Solar powered stained glass

Dutch designer Marjan van Aubel has created a stained glass window that doubles as a clean energy source. In the ‘Current Window’ project, coloured pieces of glass generate electricity from daylight, and can even harness diffused sunlight. The power is then sent to a USB port in the window ledge. The glass pieces are made of ‘dye sensitised solar cells’, which use the properties of colour to create an electrical current – just like photosynthesis in plants, according to van Aubel. As various shades of green chlorophyll absorb light, the coloured window panes harness energy.

[CLAD-kit.com](http://CLAD-kit.com) keyword: **Aubel**

## Smart paving for Barcelona

Pollutant-absorbing pavements and ambient lighting will help turn a Barcelona bridge into a green urban plaza. Spanish architecture firm BCG is upgrading the Sarajevu Bridge in the Catalan capital in a bid to turn it into an attractive gateway to the city. The new pavement will use a photocatalytic concrete surface, a self-cleaning material that absorbs air pollutants, converting them into harmless substances. Applied to white or grey cement, the removed pollution is then washed away by the rain. Photo-luminescent elements within the concrete provide a source of ambient light, absorbing solar energy during the day and releasing it at night. The upgraded bridge will be energy self-sufficient, using solar panels that generate the energy consumed by new LED lighting. [CLAD-kit.com](http://CLAD-kit.com) keyword: **BCG**



Pollutant-absorbing pavements use self-cleaning photocatalytic concrete surfaces

### Acoustic sessions

Bringing back the concept of a traditional bandstand, Flanagan Lawrence's Acoustic Shells project has been recognised with an architecture award. The concrete seaside shelter and bandstand sited in a sunken garden beside the beach in Littlehampton, West Sussex, UK, picked up the AJ Small Projects Special Prize. The visually striking Acoustic Shells have been designed as an architecture that can represent

'sound', and the people that made it, according to Flanagan Lawrence. One shell faces the town and forms the principal bandstand. The acoustic design of the interior creates a reflective surface to project the sound of the performers to the audience in the sunken garden. The other shell faces the beach and forms a more intimate shelter for listening to the sound of the sea or for buskers to perform facing the promenade.

CLAD-kit.com keyword:  
**Flanagan Lawrence**



Acoustic Shells doubles as a bandstand and seaside shelter



The 50m-long video graphic wall, which consists of 37mm resolution LED pixels

### Wall of fame

A video graphic wall running the length of a 50m corridor has been recognised in a design awards ceremony. The Light Emissions designed and constructed wall at the General Electric Innovation Centre in Saudi Arabia was victorious in the 'Light & Surface Interior' category of the Surface Design Awards 2015. The video display consisted of 37mm resolution LED pixels with a black background, with the ability to render media as full speed video a central requirement. Clear polycarbonate sheets covered the display, providing both protection and a lively 'visual' reflective surface that blended the display content with ambient lighting. The corridor represents the spine of the General Electric facility, linking a reception, theatre and break-out rooms.

CLAD-kit.com keyword: **Light Emissions**

### The right aura

New technology using water deflection techniques to create fan-shaped sheets of water results in an enhanced showering experience, according to designer and manufacturer Methven. The New Zealand-based company has specifically engineered the patented 'Aurajet' technology for its new 'Aio' range. The showerhead's hidden nozzles generate single jets of water that hit precisely engineered surfaces to produce a wide, even shower spray with no gaps and enhanced droplet density. Methven says this results in 20 per cent more total spray force and double the water coverage on the skin than traditional showers. It is also designed to generate greater warmth and use less water, with an estimated nine litres per minute.

CLAD-kit.com keyword: **Methven**



Aurajet technology is designed to create a wide, even spray

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