AECOM Imagine it. Delivered.

DESIGN REVIEW

Autumn/winter 2017

Putting the best minds together to push the creative and technical limits of what's possible.

With thanks to:

Al Dhabi Properties

Belfast Health and Social Care Trust

Cengiz Insaat Sanayi Ve Ticaret a.S./ First Kuwaiti General Trading & Contracting Co. Joint venture

COIMA SGR

Hyperloop One

IGI

Karis Holdings/ING

London Borough of Hammersmith and Fulham

Manchester City Council

Ministry of Sport and Physical Education, Government of Cameroon and Yenigun Construction

NASA

Network Rail

Ravensbourne Gateway Ltd

Rolls Royce

Saudi Royal Court

Schiphol Nederland B.V.

Square Kilometre Array Project

Sunline

The Serpentine Gallery

University of Glasgow

Foreword

In this autumn/winter edition of our Design Review, we celebrate design and its power to transform buildings, urban environments and cities.

AECOM's collaborative and integrated, multidisciplinary approach is at the heart of each of these inspiring projects. Whether it is with our own vast team of talented professionals or working with like-minded partners, we collaborate with clients to bring to life their most complex ambitions and dreams.

This edition's featured project, the 2017 Serpentine Pavilion, is a great example of our collaborative approach. As engineer on the project, we worked with client, architect and contractor as one, using innovative structural engineering and immersive technology to test the design, materials and lighting before fabrication and construction — all within a 20-week timeframe.

But no matter the scale of project, we always put the best minds together to push the creative and technical limits of what's possible.

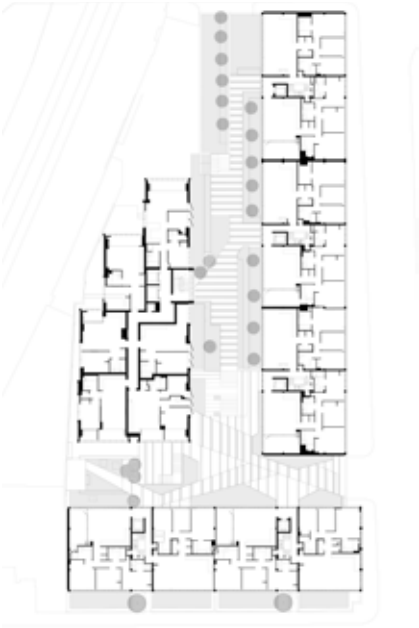
We hope you enjoy this snapshot of our 2017 design activity.

LOFTY ASPIRATIONS

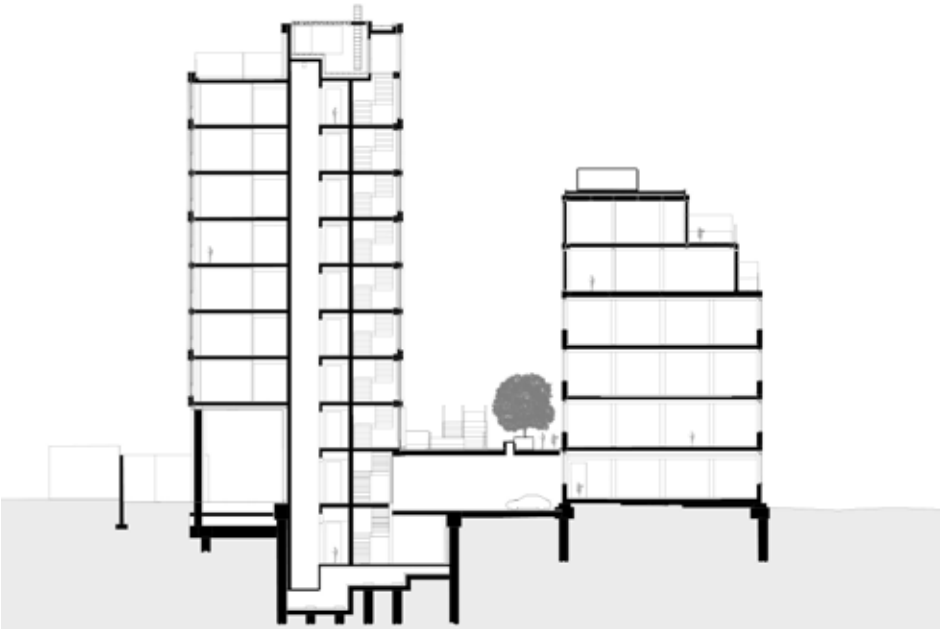
Shoreditch in London's East End is becoming an increasingly desirable place to live. To preserve the inner city district's historical industrial past, new developments require a careful blending of old and new.

Located in a conservation area, the Long Street development brings 119 luxury loft-style apartments with interconnected public gardens to the area — the first of its kind in this part of London. The development consists of the construction of a new 10-storey building and the refurbishment of two existing 1950s warehouses, while retaining the building's original brick walls.

This was AECOM's first fully integrated design and build luxury residential project in the UK.



Floor plan



Building section

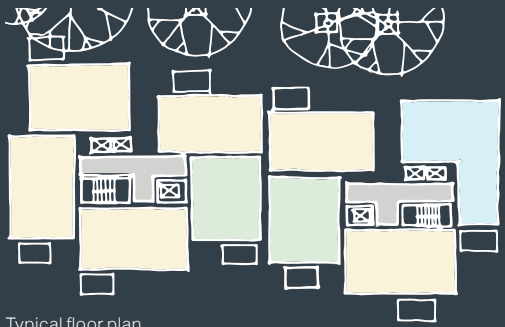
INTERLOCKED COMMUNITY

The Mayor of London is committed to increasing investment in housing and to bringing forward more public land across the capital for affordable homes.

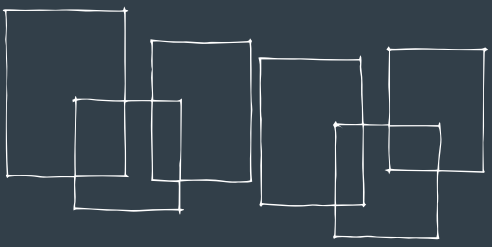
To support the Mayor's commitment and ensure communities remain connected, we established a layout for social housing that clusters apartments around communal amenity areas.

The staggered, interlocking apartment blocks integrate quality social housing within the existing urban fabric of a London neighborhood. A playful rhythm of windows and balconies gives individual identity to each apartment. The scheme provides 33 affordable homes for the local authority to rent to people in need of decent housing.

AECOM provided architecture, engineering, landscape design, transport design, environmental, cost consultancy and town planning consultancy.



Typical floor plan




PEARSCROFT

CONVERSATION STARTER

The city of New York is experiencing unprecedented growth. Forecasts predict an additional three million people will join its population in the coming 25 years. As an ever-evolving city, there are significant questions about where and how this growth will be accommodated: what will be the environmental impacts, connectivity and transportation demands, and is there a housing market able to accommodate changing demographics?

Helping inform the dialogue about the challenges and choices for the city, AECOM produced a framework document exploring the regeneration and development potential of Southwest Brooklyn to drive an ascendant, resilient, equitable and thriving New York City.

Comprising Red Hook and Sunset Park, this neighborhood represents, by far, the single largest area left for development in New York.

TRAVELLING LIGHT

Running alongside one of Chicago's best assets, the Lake Michigan shoreline, the 18-mile (29-kilometer) Lakefront Trail is one of the most important routes in the city, connecting Ardmore Street on the north side to 71st Street on the south side. However, with a diverse set of users moving at different speeds, including walkers, runners, cyclists and rollerbladers, the trail was becoming increasingly dangerous with more collisions on its route, particularly at night.

Taking inspiration from its location and providing the infrastructure needed to make the route safer, AECOM has designed lighting for the route combining beauty and function.

Lampposts, inspired by the prairie grass which once fringed Lake Michigan, will line the route. The undulating, nature-inspired design conceals the state-of-the-art technology housed inside: sensors designed to respond to daylight and motion and LEDs programmed to correspond to key city events. Photovoltaics allow lampposts to operate independently from a power source and add security through the inclusion of cameras. This means that the important route can be monitored and maintained for years to come.

Exploded diagram

Section

View of pole from above

View of sensor and camera

View of PV array

FROM BROWNFIELD TO BEAUTIFUL

With three million new homes needed in the UK by 2030, brownfield and derelict land provide a great opportunity for development.

The site of a former bottling plant in the port town of Folkestone was an urban eyesore, a sprawling concrete ground slab of nearly four hectares. Working closely with a local developer, our iterative design process led to our proposal for a mixed-use development for the site. Recognizing that successful communities are diverse, our scheme includes retirement living, a hotel, workspaces and shops, as well as more than 400 new homes. At its heart is an interpretation of a traditional village-green — a landscaped park for play, fitness, community events or simply relaxing.

In this scheme, streets are designed primarily to meet the needs of pedestrians, cyclists and children. Mitigation measures are used to reduce the speed and dominance of cars.

COASTAL SKYLINE

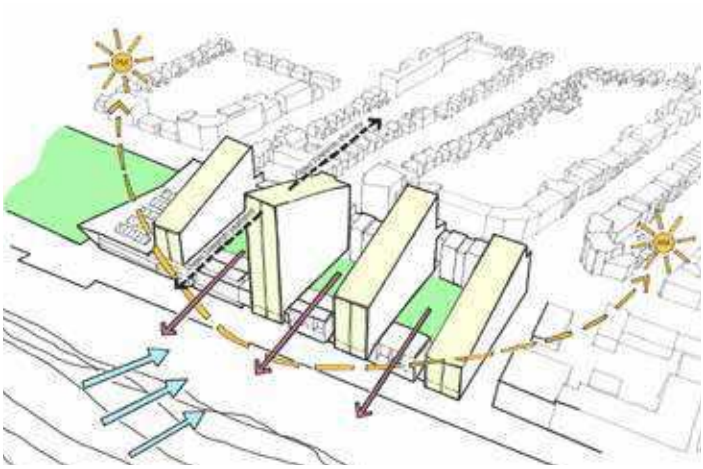
Brighton and Hove on England's south coast is one of the country's most desirable places to live. Due to its increasing popularity, more homes are needed in the region.

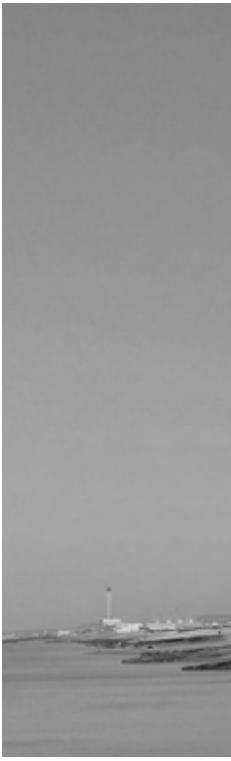
For the local authority, we developed plans to transform a beachfront site, consisting of an outdated sports and leisure centre and a plot of land, into a thriving residential development.

Combining a leisure center with spaces for both indoor and outdoor sporting activities, a seafront promenade and over 600 new homes, the development includes private and social housing. Residences are laid out in four linear blocks, like contemporary piers, offering sea views for all residents and sea breezes from coast to town.

Informed by a series of sustainable initiatives in recognition of the environmentally-sensitive nature of the site, AECOM developed the architectural design for the project, in collaboration with LCE Architects.

The scheme design focuses on delivering cost-effective low-carbon living for residents, and encourages wellbeing, biodiversity and sustainability through green roofs, private gardens and extensive landscaped courtyards.

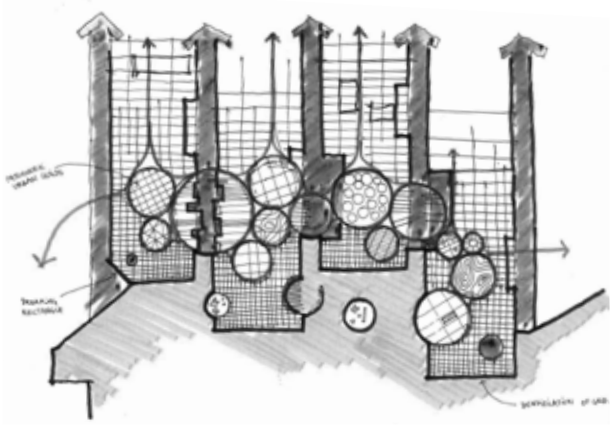




Cross section

URBAN VISION

The Red Sea region in Saudi Arabia has tremendous potential for economic development. We have been working with our client to design a future for the region that integrates next-generation building design, robotic infrastructure and advanced manufacturing, while also considering the constraints of the local mountainous terrain, offering a glimpse into the future and what's possible for the region.



PATHS TO SUCCESS

The rejuvenation of Piccadilly Gardens is playing a big part in the economic and social success of the wider regeneration of Manchester city center.

Following an international competition, AECOM was chosen to redesign the public space, transforming it into an appealing location for the local community and visitors to the city. Our design focuses on making Piccadilly Gardens the city's largest public space, further extending Manchester's regeneration, and on ensuring versatility, through features such as simple and flexible garden spaces. An elliptical, black granite fountain sits at the centre of the garden, providing a focal point for the space.

ACADEMIC TRANSFORMATION

The University of Glasgow has a long history as a center of academic excellence. As an iconic symbol of Glasgow's social ambition, it forms a key part of the city's identity.

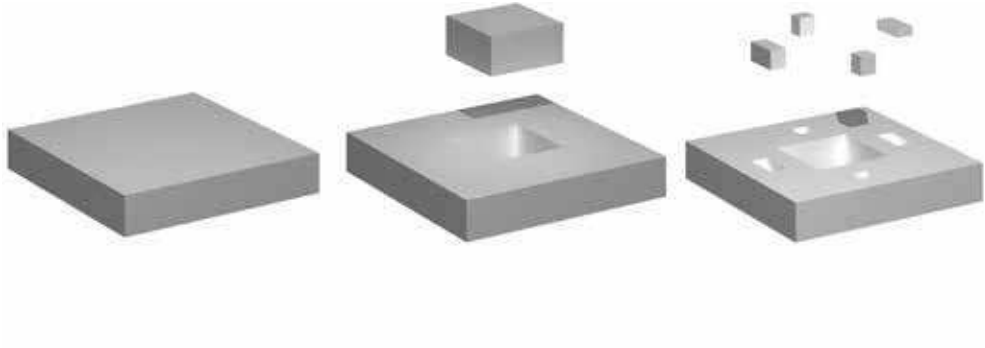
To continue its success into the future and following the university's acquisition of a five-and-a-half hectare site, AECOM is helping the university expand and transform while paying homage to its rich history. As part of this, we are developing plans for an extensive network of open and covered spaces, integrating the demanding functional requirements of a full spectrum of academic disciplines and enabling the creation of a new city quarter.

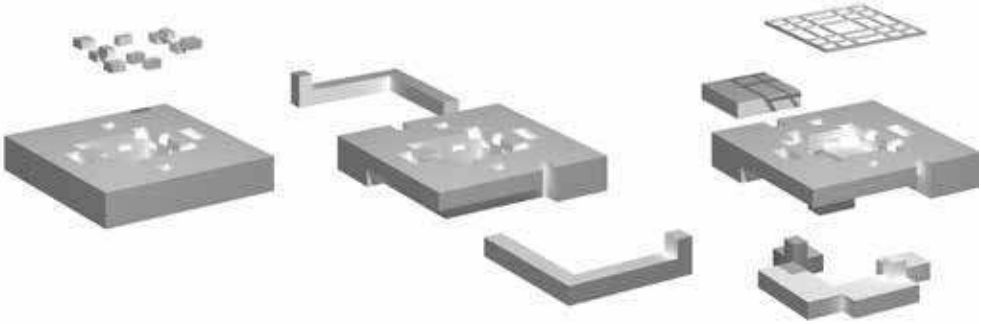
AECOM is delivering the project masterplan with 7N Architects and Spaces That Work.

WORKING TOGETHER

A new way of working: an adaptive space that enables different tasks, whether they be technical, creative or managerial, to be carried out in a connected space and engender innovation. This was the design competition brief for a 20,000-square-meter (c. 215,000-square-feet) office and laboratory building for a leading engineering company's base in Derby.

Our design proposal delivers both flexible and formal work spaces that enable and encourage unscheduled encounters as well as planned focus areas for inspiration. The light-filled piazza, an informal meeting space at the center of these buildings, creates a new heart for the campus. New features include wide spiral staircases and indoor terraces, a glazed courtyard and roof terraces, and planting that visually draws the outside into the building. These design features promote collaboration and have helped the client deliver on this vision — a new way of working.





LIGHT WORK

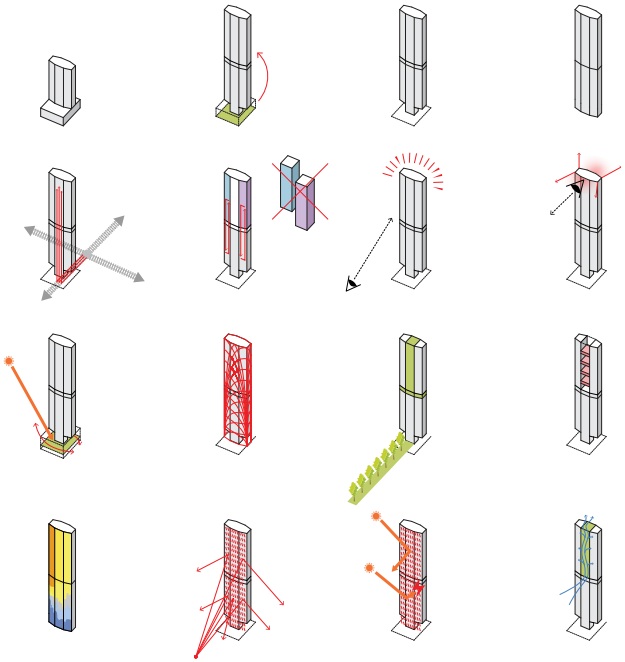
In Spain, plazas are typically central public spaces that sit at the heart of communities. This is the concept behind our design for a new headquarters complex in Madrid that focuses on creating a new space for employees centered around public spaces and the relationship between buildings.

Conceived as a series of pavilions, the plaza within our design becomes a focal point, with connections made across the site through green roofs and a series of green courtyards.

OVER THE TOP

As land values rise, building heights rise. MetLife, one of New York's most iconic buildings, is no exception.

Designed in 1959 by Emery Roth & Sons in collaboration with Pietro Belluschi and Walter Gropius, the client is now looking at almost doubling the building's height from 250 to 490 meters (820 to 1600 feet). Our design, an exoskeletal truss, makes this possible, by optimizing distribution of structural load from roof to ground. It also repositions the MetLife building for the 21st century with new floors on either side of the atria and a new vertical park affording spectacular views across Manhattan.

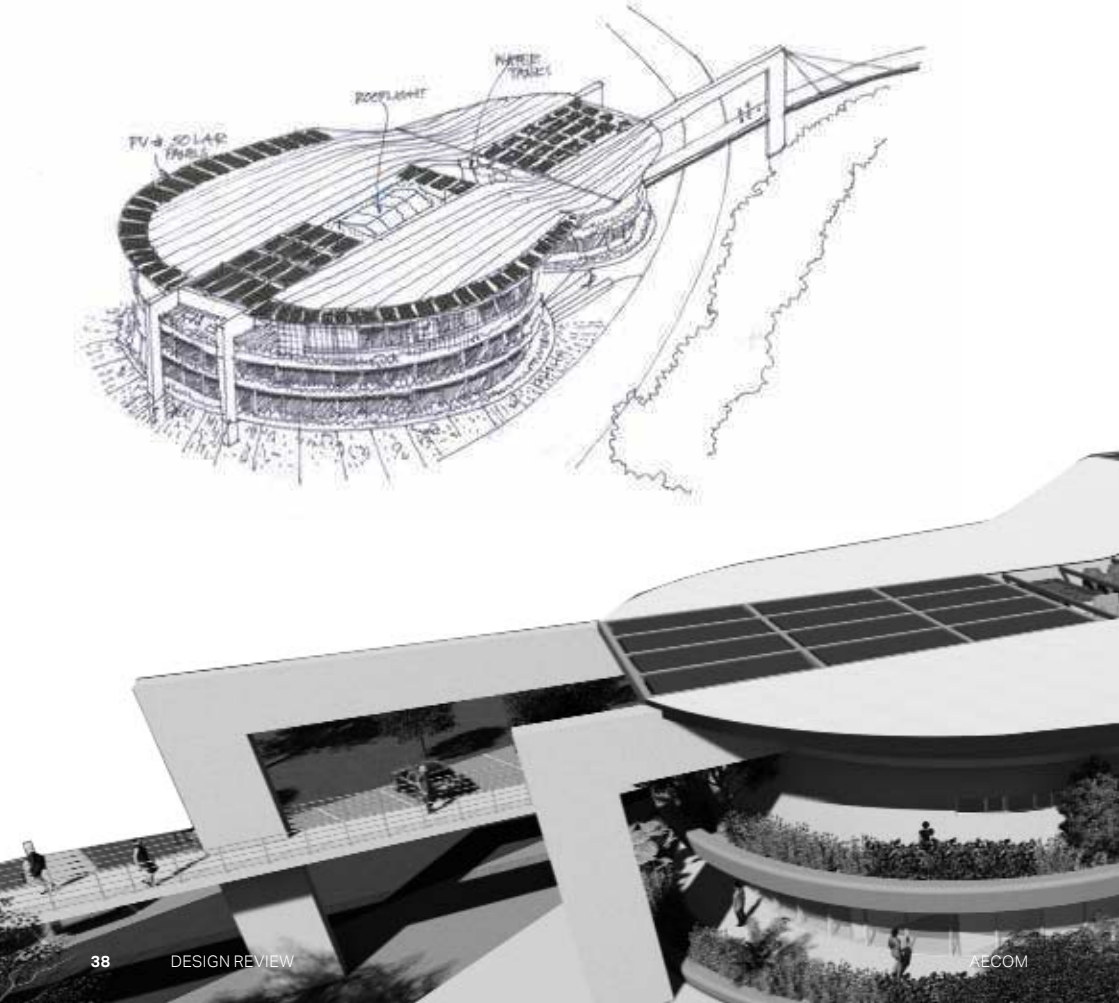


RESPONSIVE FAÇADES

While development is essential to the growth of our cities, it inevitably impacts on the environment — from materials adopted in design to carbon emissions in use.

In 2016, a competition run by Metal in Construction magazine, invited consultants to design a high-rise building that could significantly address development environmental issues.

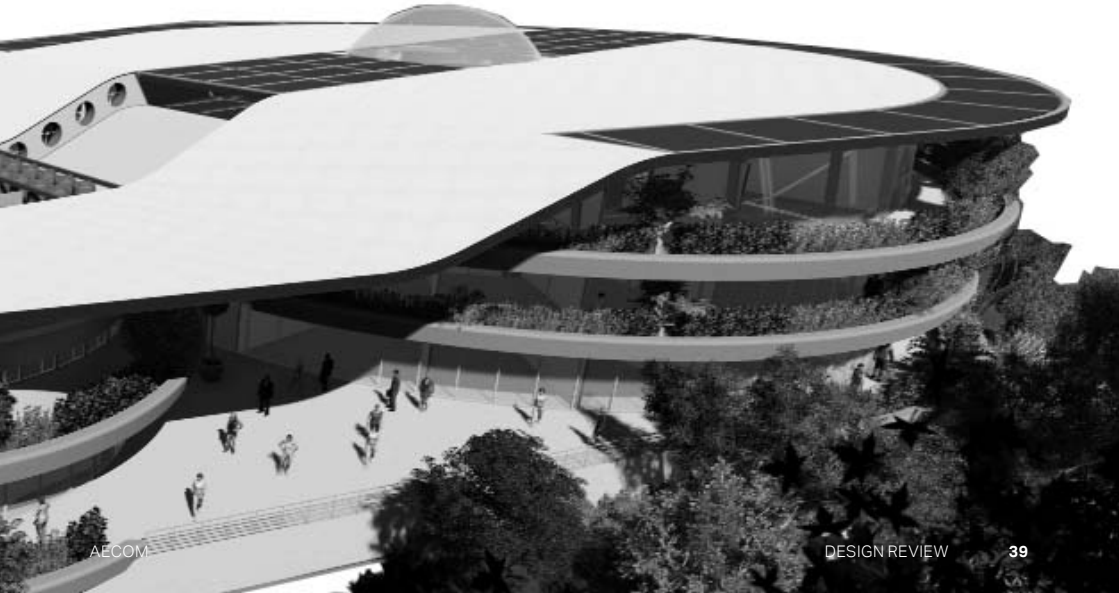
Our design, a finalist in the competition, considered both the structure of the building and its occupants. We designed the modulated structural skin to help mitigate solar gain while protecting workspaces from unwanted glare, thus improving occupant wellbeing and offering an extensive view for all to enjoy. The elliptical design allows more daylight in than a typical office floor plate, creating a bright, welcoming workplace.


PV & SOLAR
ROOFLIGHT

SIGNAL FROM THE STARS

The Square Kilometre Array (SKA) comprises multi radio telescopes located under clear skies in the semi-desert of South Africa. Once built, it will have a total collecting area of one square kilometer; the larger the area, the more light a telescope can collect at one time. The data collected will be analyzed in a new office building based in Cape Town.

Connecting the past with the future, our proposal for the new building links it to the historic 18th century observatory via a pedestrian bridge. The form of the building, with dual circular volumes and a sweeping roof, alludes to an interplanetary ship, capturing the spirit of the project.



ARTISTIC AMBITIONS

How do you create a modern development in densely-populated central China that respects and incorporates the region's history?

As part of our work on the Sunline project, a new mixed-use high-rise development in China, our designers were keen to embrace the area's historical ties to the site's former railway. To do this, we included a cultural space at the ground level of the development with a dual aim: to continue the site's legacy with features linking back to the railroad, and to create a cultural destination in its own right by including a flexible space that allows for a range of cultural activities, such as exhibitions and performing arts.

The development combines office, residential and retail spaces across eight city blocks. The site will accommodate four towers, including office and residential, with the tallest standing at 350 meters (1140 feet).

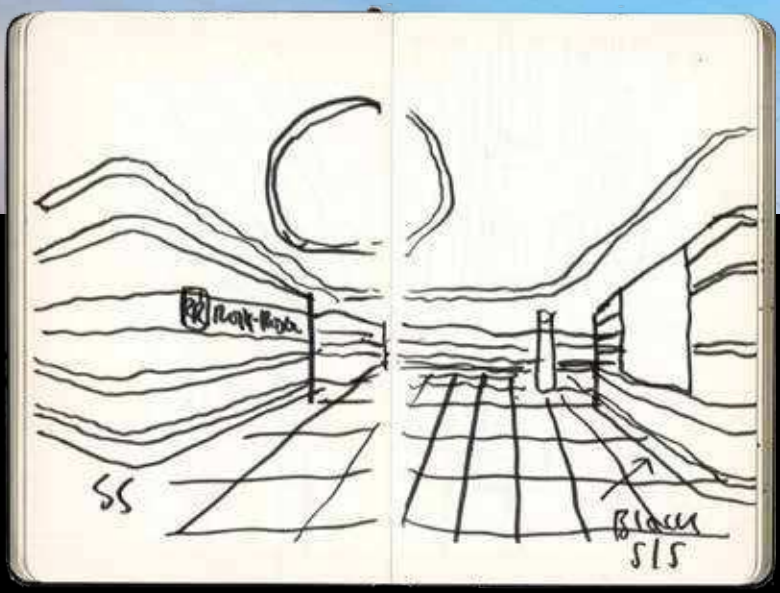
CREATIVE EXCHANGE

Bringing 2,000 employees into one central London location gave AECOM the opportunity to not only design an inspirational workplace but also deliver a showcase — an office fit for the future.

The design of our new EMIA headquarters — a 7,790-square-meter (83,850-square-feet) space to the east of the City of London — is a catalyst for and a reflection of AECOM's integrated and collaborative working.

Through a network of communities and spaces, open plan working and IT-enhanced meeting areas, our people are able to come together to deliver complex and transformational projects, creating an inspiring place to work.

BRAND OF DISTINCTION



Today's workplaces need to be more than just offices. Employees need to be able to connect and feel inspired while companies themselves need to be able to live their brand and express their aspirations.

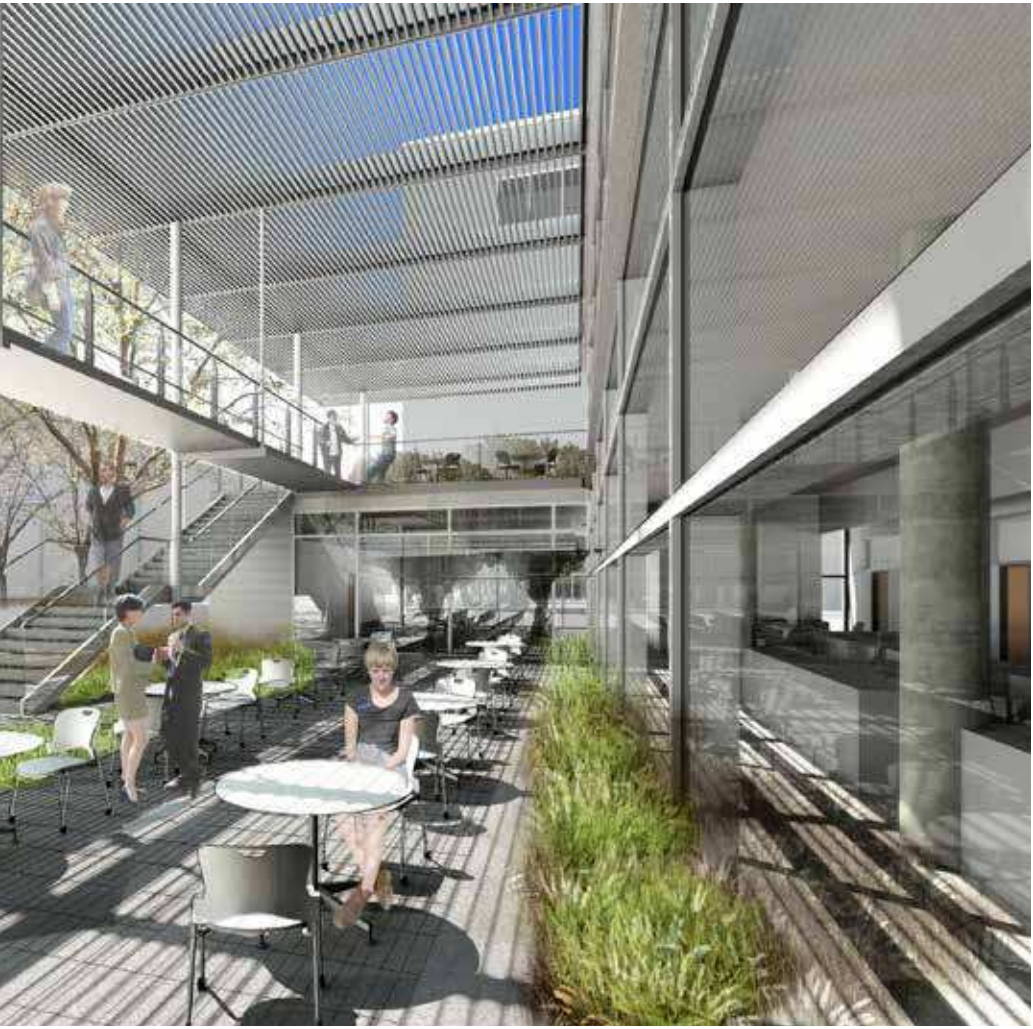
Located across two floors, Rolls Royce's new headquarters in London encourages a sense of community for employees through the creation of a connected opening between the floors, directly linking meeting and board rooms on the lower level with the office environment on the floor above. The staff café also provides opportunities for staff engagement and socialization. To communicate the Rolls Royce brand, a video wall in the reception area is linked to the building's lighting system, where different colored lights change in sync with videos shown, creates a striking visual impression of the car manufacturer's brand for visitors from the moment they arrive.

EVOLVING SPACES

AECOM has worked with NASA, at its Ames Research Center, for over 20 years.

As part of NASA's vision to create a research and office space for the future, we designed a new laboratory at the Center that brings its people together to more easily share ideas.

Located in the densest part of the site, at the center of the campus and within its pedestrianized core, the laboratory provides easy access to surrounding amenities. Coupled with the building's 'openness', this provides passers-by with more opportunities to view inside, and engage with Ames' more technical operations and laboratory staff.



VISION TO REALITY

Since 2013, AECOM has been instrumental in delivering unique, innovative pavilions for the Serpentine Gallery Architecture Programme in Kensington Gardens.

The Serpentine Pavilion is one of the top ten most-visited architectural and design exhibitions in the world. Since 2000, the Serpentine Gallery commissions an international architect, who has not yet completed a new-build project in the UK at the time of the Gallery's invitation, to design a temporary summer pavilion. For the fifth year running, AECOM has delivered technical advisory services for the Pavilion, including

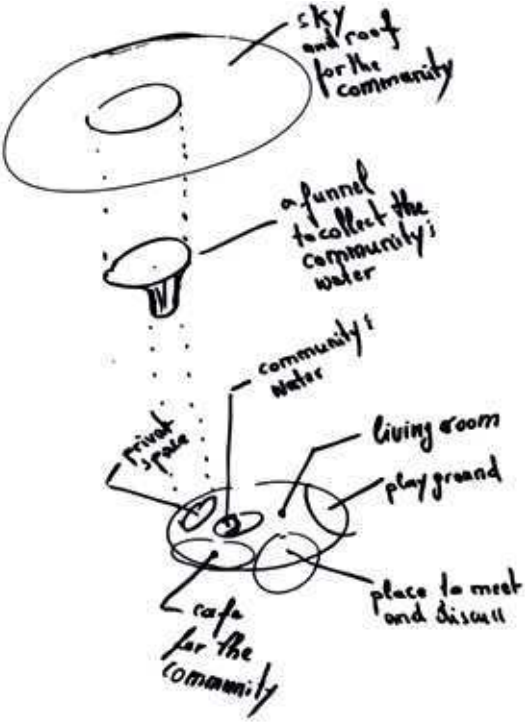
structural engineering, fire engineering, electrical engineering and lighting design. Each year, we work with a different international architect to craft technical solutions to bring their designs to fruition: collaboration is at the heart of our success.

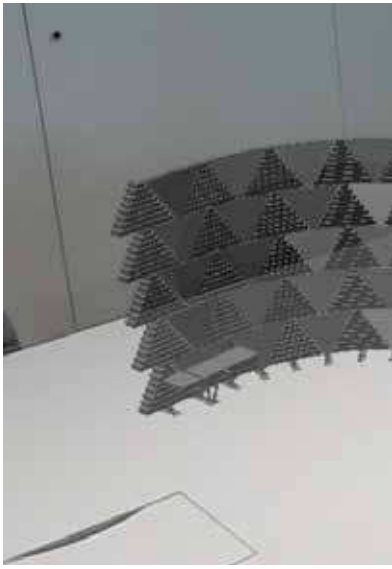
In 2017, Berlin-based Burkino Faso architect, Francis Kéré produced a concept that adopted a traditional African vernacular, to create a dramatic design imbued with a sense of community. In just three months, the technical team worked with Kéré to develop his concept. Our role as engineers was to turn Kéré's vision into a reality.

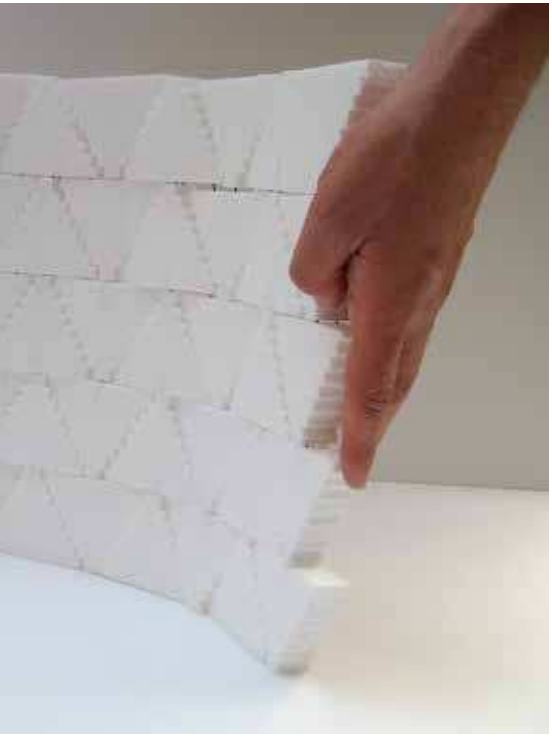
"This year's Pavilion showcases the power of collaboration — of sharing experience, enthusiasm and expertise to realise a striking concept as a finely detailed building that the public and local community are excited to explore and enjoy.

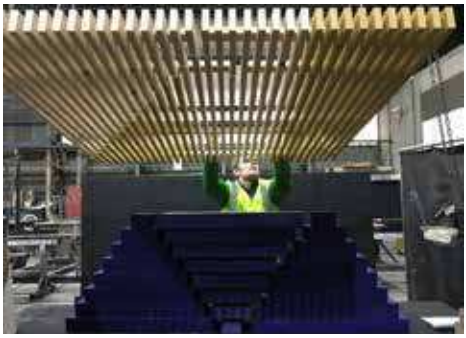
Amy Koerbel
Regional Director, Structures, Building Engineering, AECOM

The challenging timescale — 20 weeks from initial sketch to opening day — led to spontaneity in the design: a fusion of art, architecture and engineering. From day one, client, architect, engineer and contractor worked as one, sharing expertise and experience. The engineering interpretation relied on a combination of using cutting-edge computational design and fabrication, the application of engineering first principals and knowledge of material and manufacturing techniques. Our team was involved in all aspects of the design, from structural analysis to engineering the structural connections and fixings, as well as material and color selection. We worked with Kéré to develop the Pavilion structure as a modern interpretation of traditional, low-tech materials that combine the warmth of his home-town community with the rich architectural tapestry of London.

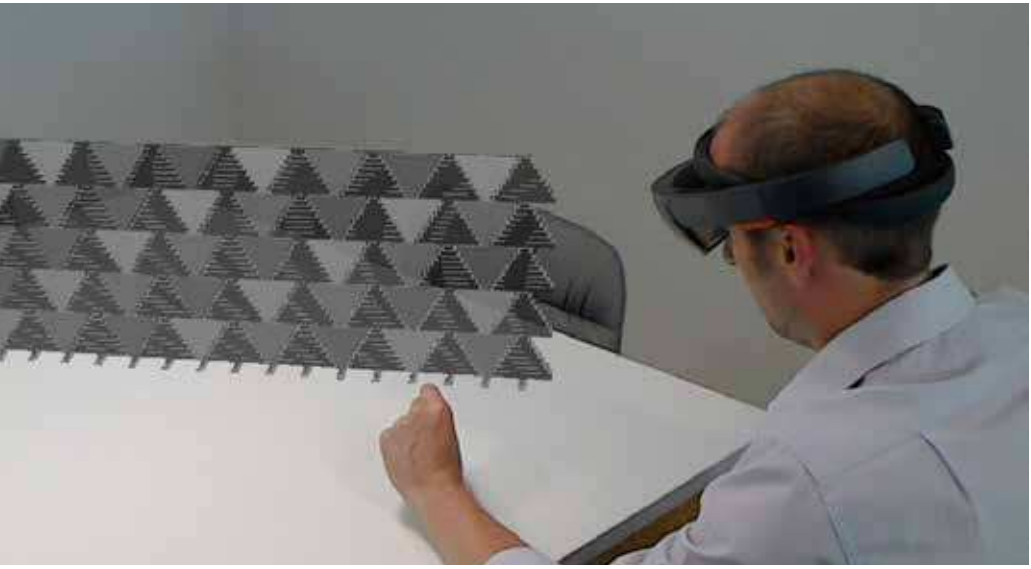




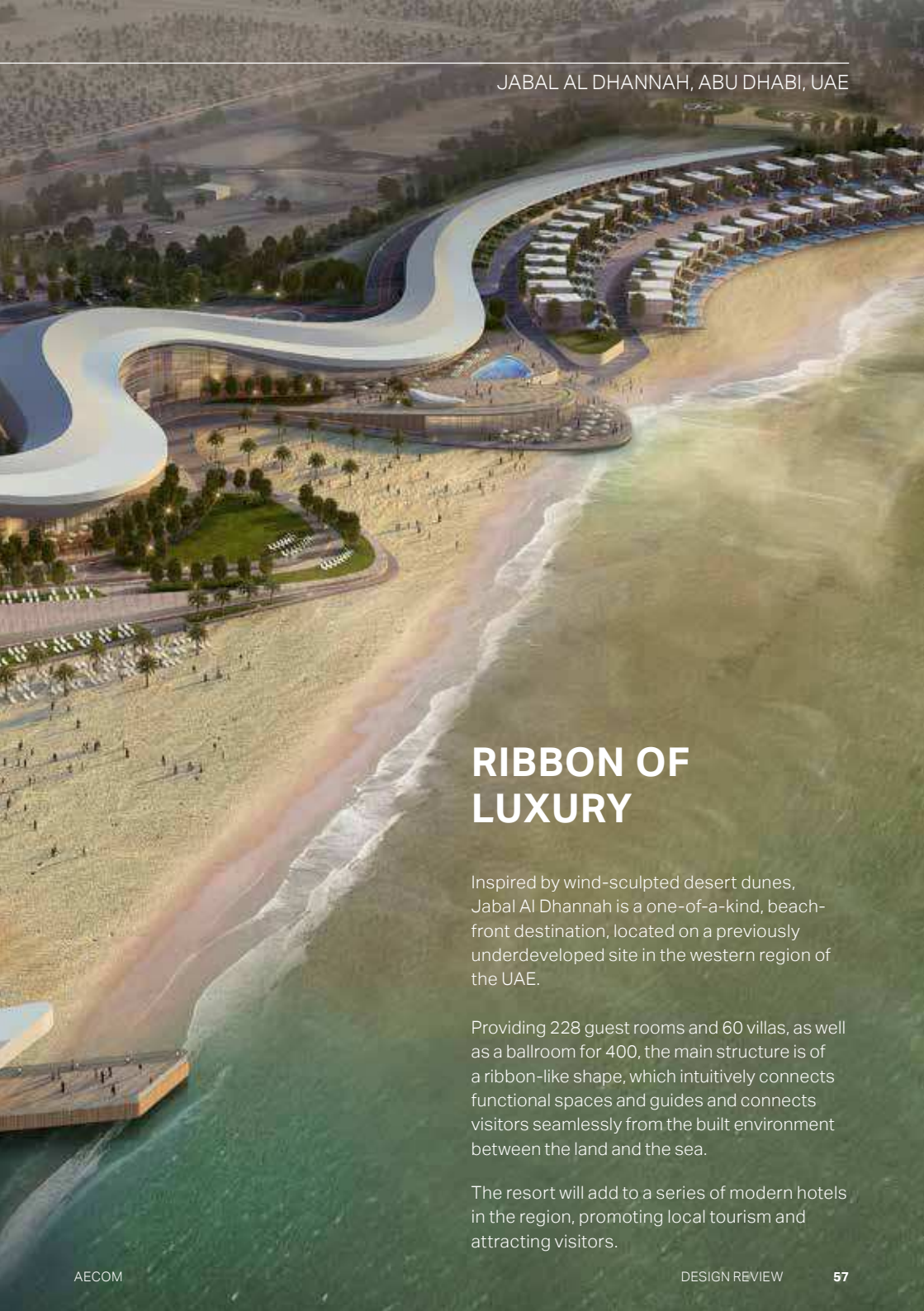




Fabrication and testing



The finished structure's iconic tree-like canopy created a visual focal point for visitors, surrounded by curved walls that defined a series of flexible spaces, including family areas and a play space for children. At night, the Pavilion became a beacon of light, creating a warm and inviting space. The Pavilion is designed to be dismantled and erected elsewhere, securing the structure's legacy.



RIBBON OF LUXURY

Inspired by wind-sculpted desert dunes, Jabal Al Dhannah is a one-of-a-kind, beach-front destination, located on a previously underdeveloped site in the western region of the UAE.

Providing 228 guest rooms and 60 villas, as well as a ballroom for 400, the main structure is of a ribbon-like shape, which intuitively connects functional spaces and guides and connects visitors seamlessly from the built environment between the land and the sea.

The resort will add to a series of modern hotels in the region, promoting local tourism and attracting visitors.

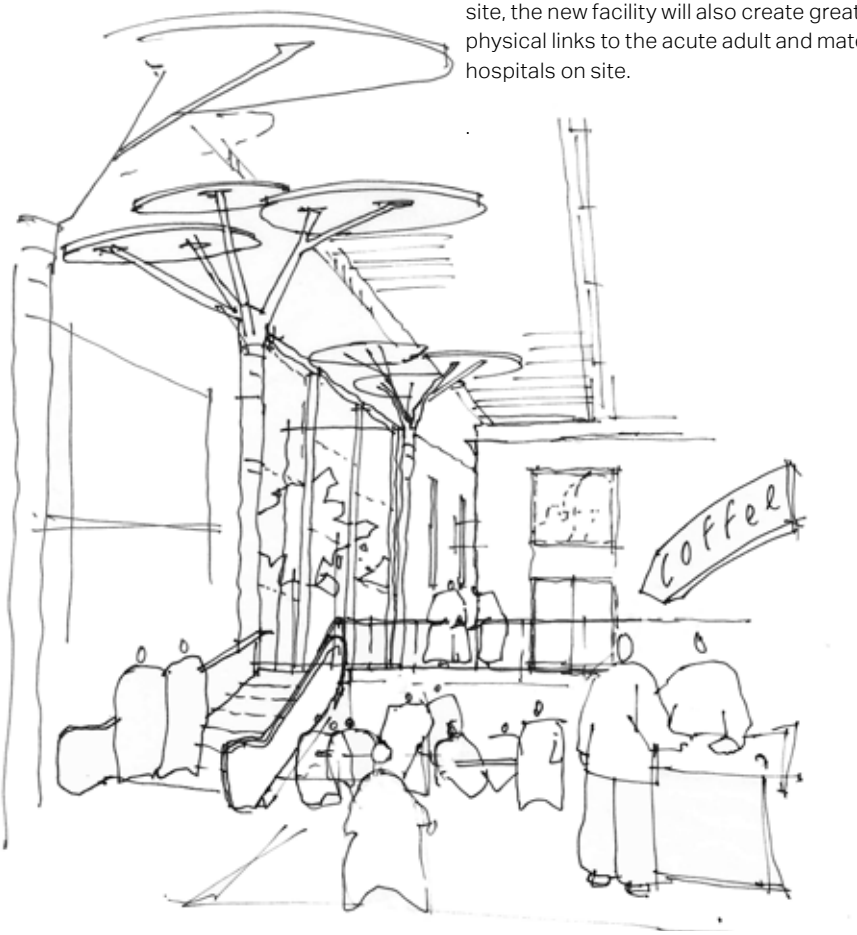
MEETING FUTURE NEEDS

Our competition-winning design marks a new era for the only hospital in Northern Ireland dedicated to the care of children. With aging infrastructure and deterioration of the existing hospital, the Royal Belfast Hospital for Sick Children will be crucial to the long-term provision of exceptional care.

Our design, led in partnership with Isherwood and Ellis, doubles bed capacity and allows the hospital to provide acute pediatric care to children up to the age of 18. Each level will also have a distinct theme, which will influence the signage, color schemes, graphics and furniture, making it simple for patients and staff to orientate themselves within the building. Artwork creates the suggestion of a waterfall flowing from the roof to the rear of the atrium, which is the main social space in the hospital.

As part of the wider Royal Victoria Hospital site, the new facility will also create greater physical links to the acute adult and maternity hospitals on site.

.



TAILOR-MADE

Cameroon, the host for The Africa Cup of Nations 2019, needed a low-maintenance, economically sustainable and easy-to-navigate sports stadium suitable for hosting both football matches and athletics.

The AECOM-designed Japoma Sports Complex sets new standards for sustainable building design in the region, and has been designed to ensure it can be used long after the Africa Cup is over.

The 50,000-seat stadium at the heart of the complex will be one of the main venues for the international sporting event. While the design is rooted in its local cultural and physical environment, it is, nonetheless, fully compliant with FIFA and IAAF requirements. The stadium includes modern IT and communication systems, LED floodlighting, media and broadcast facilities and high-quality audio visual systems.

Pattern selection

Color palette

Material durability, and ensuring the complex is low maintenance, are at the heart of the design: impermeable surfaces have been reduced to allow rainwater to infiltrate into the ground naturally. In addition, half the number of structural frames have been used compared to standard stadium design, speeding up construction and significantly enhancing the architectural quality of the concourse and external visual appeal of the stadium. The unique Cameroonian culture has been entwined into the distinctive design, with the stadium roof and envelope reflecting the shape and colors of the nation's traditional woven basket.

A NEW HEART IN MILAN

This public square, named after Gae Aulenti, the late Italian architect of the Musée d'Orsay in Paris, sits at the heart of the Porta Nuova Garibaldi development — one of Italy's largest regeneration projects in the past five years.

Adjacent to Milan's main train station, the award-winning piazza is now a vibrant place. At its heart is a vast 60-meter (196-feet) diameter pool which cascades down two floors around a central lightwell connecting the outside public space to retail and car parking spaces in the surrounding buildings. The design of the piazza, with its sinuous walkways and sculpted seating, creates a space where people want to meet and stay, delivering a beautiful, contemporary answer to the grandeur and purpose of Italy's traditional piazzas.

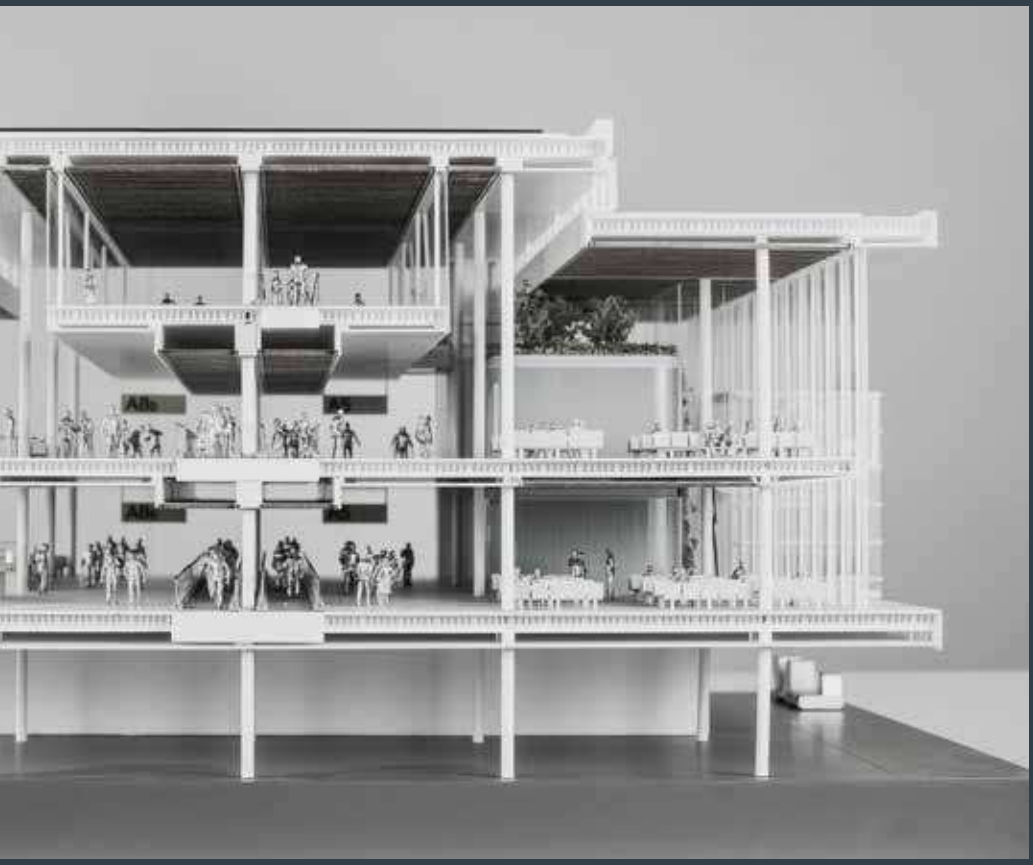
EMERGING HORIZONS AT SCHIPHOL

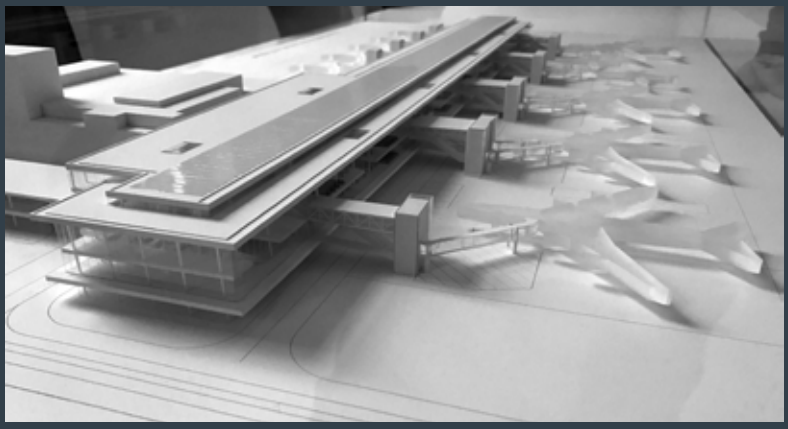
With a record number of 63.6 million passengers travelling from the Netherlands' main airport in 2016, and a desire to become the 'preferred' airport in Europe, Schiphol airport is in need of expansion.

As part of a the airport's phased expansion, AECOM, in collaboration with Cepezed Architects-Holland, produced an competition-winning design for the new Schiphol Pier-A, which will provide additional boarding gates and circulation, intended to increase capacity and enhance the passenger experience through the creation of a calm and relaxed environment.

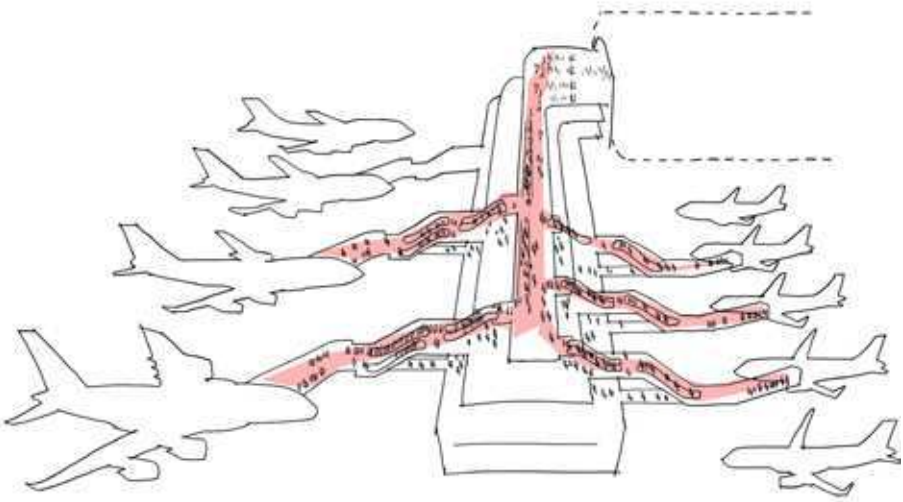
The design allows an abundance of natural light to come into the building, creating a natural extension to the outside, with sustainability, intuitive wayfinding, and building modularity central to the building's overall design.

With construction expected to start in 2018 and project completion planned for 2019, the airport is being positioned as a valuable urban resource for the city, capable of driving economic development by bringing thousands of jobs to Amsterdam and the surrounding region.





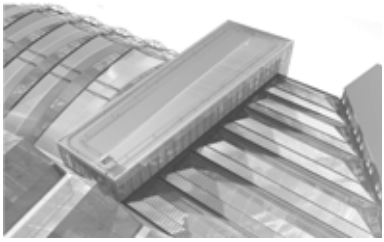

A9
A9

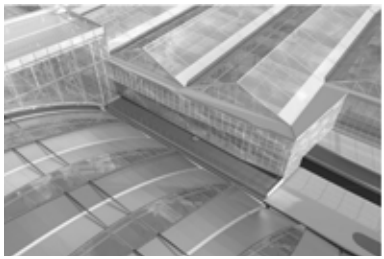


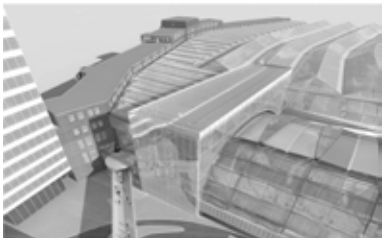
VICTORY AT WATERLOO

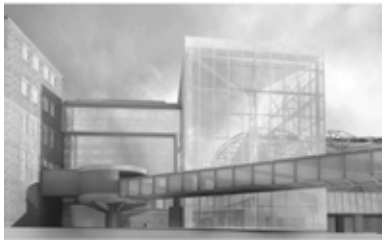
Already the UK's busiest railway station, Waterloo serves more than 100 million passengers per year. As a result, Network Rail is planning an ambitious scheme to increase peak-hour capacity at the station by 30 per cent.

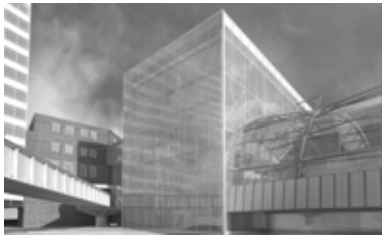
AECOM, in alliance with Skanska, Colas Rail, and Mott MacDonald, is making platform modifications and improvements to outlying stations at Waterloo to allow for the required capacity increase. As lead designer, AECOM is providing architecture, structural engineering and other design services on the project, including signalling, security systems and building services.











Through close collaboration with the other project teams, we have made numerous changes and enhancements to the station, including lengthening platforms to allow suburban trains to run longer services and allowing the former Waterloo International Terminal, previously used for the Eurostar services, to be used for increased Windsor line rail services.

A key design feature of the station upgrade, also led by AECOM and supported by Weston Williamson + Partners, is the conversion and revitalization of the former international terminal, with its new, sweeping concourse below the station's iconic curved glass and metal roof, linking with the historic Waterloo Victory Arch via a new footbridge.

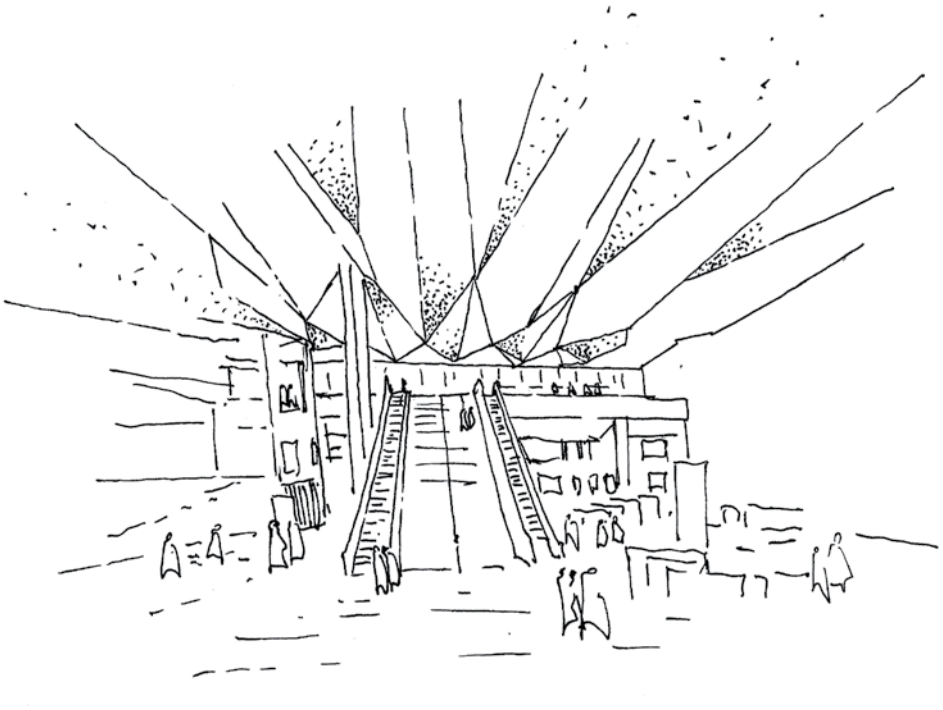
MAKING CONNECTIONS

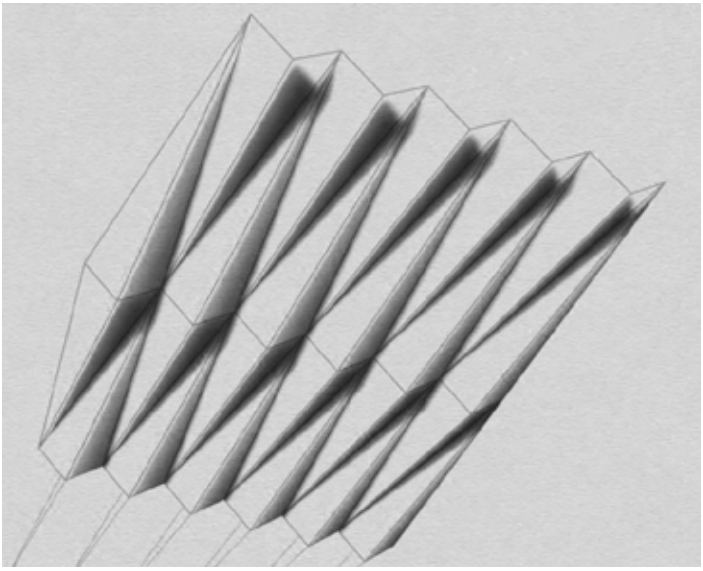
Passenger numbers at Kuwait International Airport doubled between 2004 and 2012. In response, the Kuwait Government announced plans to expand and modernize the airport to meet further anticipated passenger growth: the expansion of Kuwait International Airport will allow an additional 4.5 million passengers to travel through the facility every year. A separate Support Passenger Terminal Building will form part of the expansion.

AECOM is providing architectural design, MEP engineering and construction support services alongside Turkish contractor, Cengiz Insaat, to deliver the additional terminal building and facilities, which will be fully integrated with the existing terminal.

Timescales are the main challenge: with just 13 months to deliver the new terminal, all teams will need to work collaboratively, with a group of specialists from around the globe being brought together to deliver the expansion.

A perforated, faceted ceiling will become the main feature of the support terminal's design, drawing attention and guiding people through the main airport processes, with skylights above as visual references. Additional design features include a clear and direct passenger circulation system designed to minimize turns, decision points and travel distances, avoiding passenger cross-flows and conflicting passenger movements.

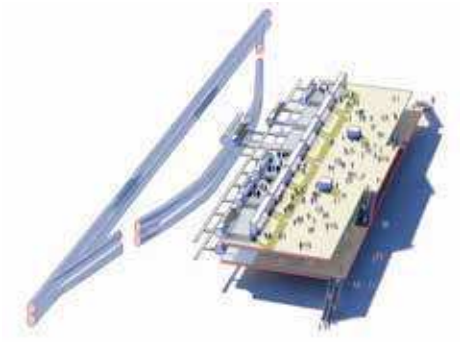




UNITING THE KINGDOM

Since the first days of rail, we have dreamed of travelling faster, connecting people and goods with greater efficiency. Hyperloop brings the opportunity to fulfil that dream, creating a new type of network capable of transporting passengers or cargo at 760 miles (1,223 kilometers) per hour.

As the only company to have planned, designed and constructed a Hyperloop test track, AECOM is taking a leading role in the global development of this high-speed transit system. Among our exciting Hyperloop proposals in development worldwide, Hyperloop UK would unite Great Britain by linking the capital cities of Cardiff, London and Edinburgh, increasing communication, cooperation and access to economic growth.



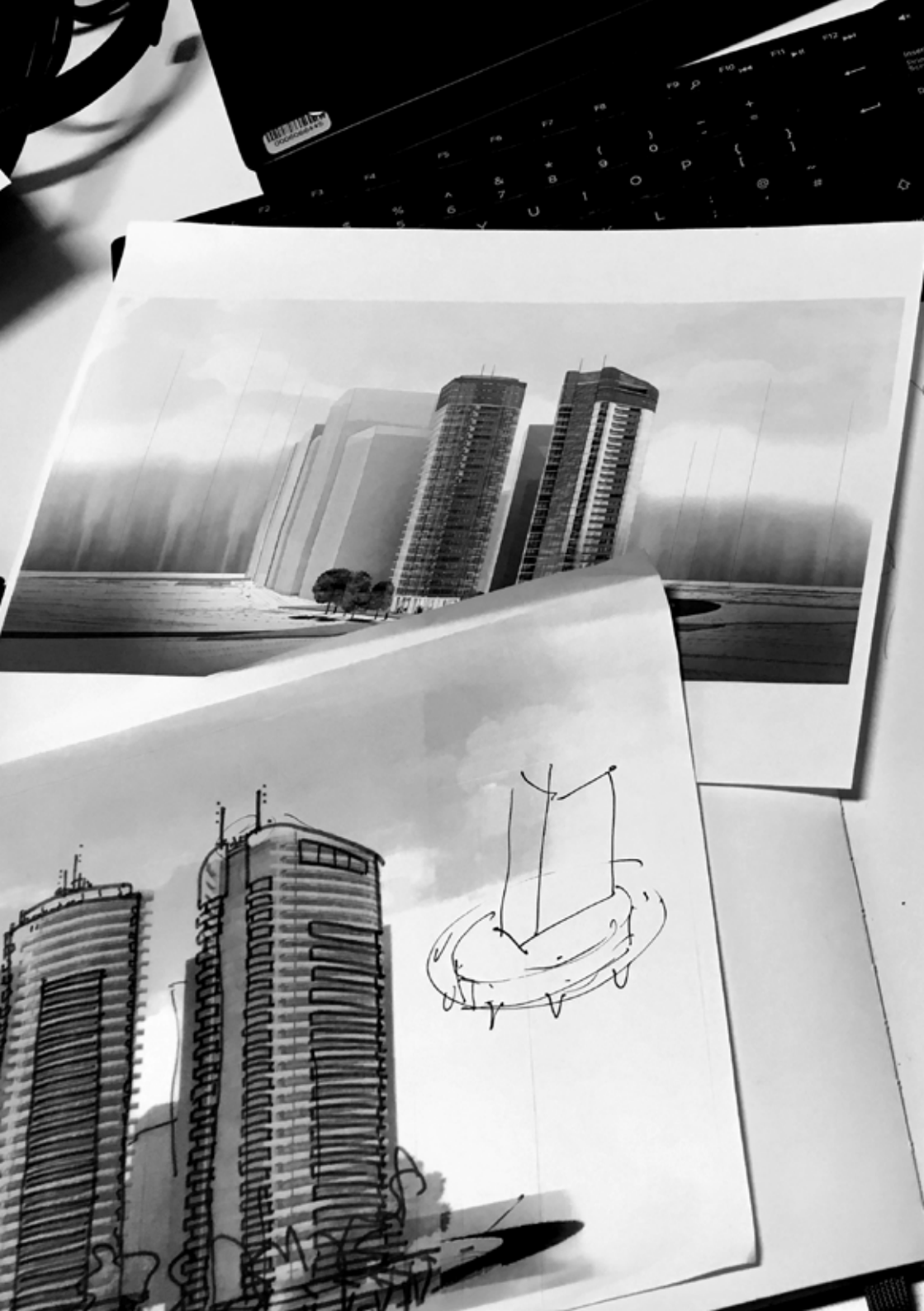
A hyperloop station

LINK UP

The Tongzhou Transportation Hub is an integral part of the development of Tongzhou City, providing much needed connectivity for the new district on the outskirts of Beijing. Our concept design for the station is based on five central principles: clarity of circulation, ease of transfer, sustainability, iconic structures within the new city and constructability. The multi-modal facility will connect 24 high-speed regional rail lines to local subway, bus and ferry services. The development will also include a major new major retail centre. Once constructed, the 550,000-square-meter (5,920,150-square-feet) Hub will be one of the largest transit facilities in the world.

Working at AECOM

We always put the best minds together to push the creative and technical limits of what's possible.



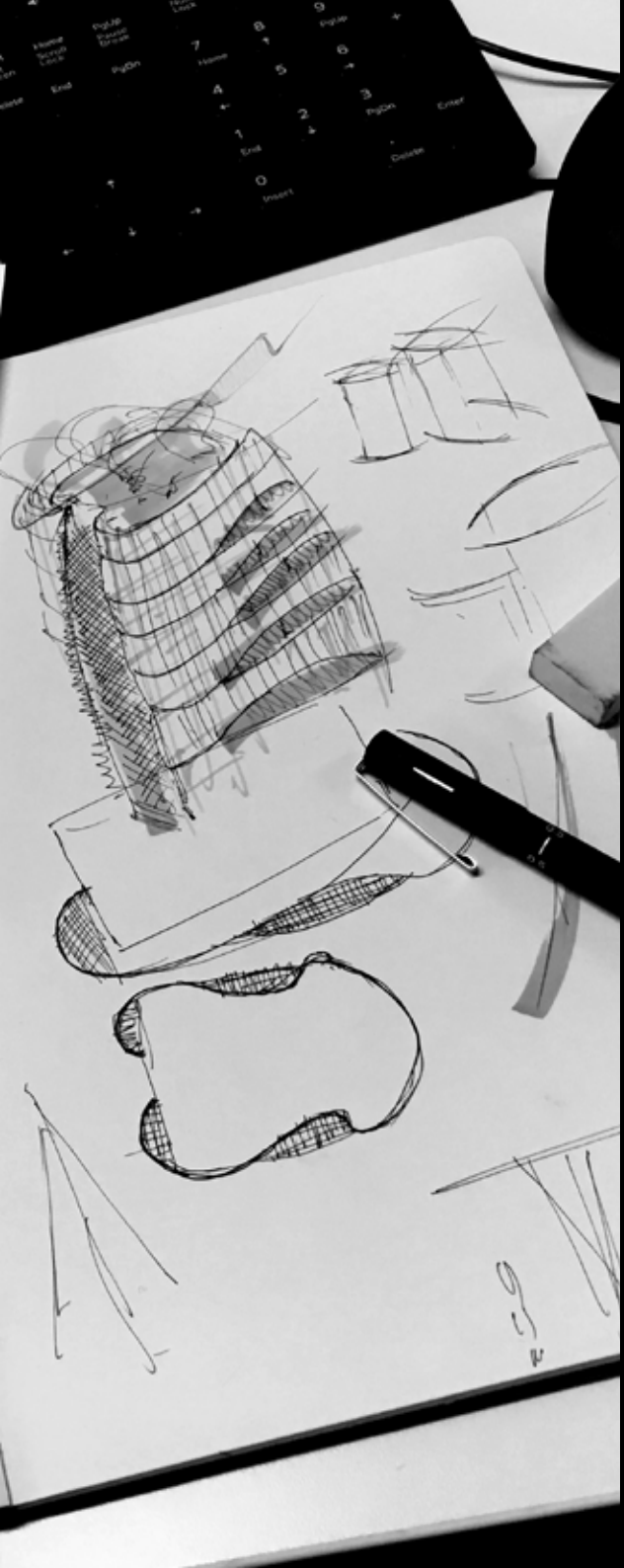


Image credits:

AECOM EMIA Headquarters, London, UK
Hufton+Crow

Rolls Royce Headquarters, London, UK
Hufton+Crow

Serpentine Pavilion 2017, London, UK
Iwan Baan, Francis Kéré,
Kéré Architecture,
Jude Palmer/Stage One

Working at AECOM
Hufton+Crow

About AECOM
AECOM is built to deliver a better world. We design, build, finance and operate infrastructure assets for governments, businesses and organizations in more than 150 countries. As a fully integrated firm, we connect knowledge and experience across our global network of experts to help clients solve their most complex challenges. From high-performance buildings and infrastructure, to resilient communities and environments, to stable and secure nations, our work is transformative, differentiated and vital. A *Fortune 500* firm, AECOM had revenue of approximately $18.2 billion during fiscal year 2017. See how we deliver what others can only imagine at aecom.com and @AECOM.

Contact
Jennifer Dixon
Architecture Lead
Europe, Middle East, India, Africa
jennifer.dixon@aecom.com

Andrew Jones
Design, Planning and Economics Lead
Europe, Middle East, India, Africa
a.jones@aecom.com

Anthony McCarter
Building Engineering Lead
Europe, Middle East, India, Africa
anthony.mccarter@aecom.com

Brian Smith
Programme, Cost, Consultancy Lead
Europe, Middle East, India, Africa
brian.smith1@aecom.com

aecom.com

170227