

NOVEMBER 2021

INSIDE K&A

Khatib & Alami Newsletter

FOR BETTER CITIES

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Riyadh Smart Square: an Intelligent and Resource-Efficient Community

Reviving Al-Jahra Waterfront in Kuwait

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Bahr Al-Baqar Tackling Water Scarcity in Egypt



A NOTE FROM OUR CHAIRMAN AND CEO

As we enter the final months of 2021, the world is finally looking forward with a level of hope and optimism that has been missing for much of the past two years. While we have been fortunate in our sector to have escaped the worst impacts of the pandemic, it is nevertheless a great relief that some sense of normality is returning. The evidence of this is felt nowhere more strongly than the UAE, where all eyes turned at the beginning of October for the launch of Expo 2020 Dubai.

K&A was privileged to play a role in the delivery of five different pavilions – the Kingdom of Saudi Arabia, Egypt, USA, Pakistan and Palestine – so we understand and appreciate the enormous effort that has gone into its production over several years. Staging such a showpiece global event is a huge achievement, and we look forward to witnessing its success over the months ahead as it attracts new audiences to the region.

K&A colleagues have been celebrating a number of other important project milestones across our geographies which are together improving the lives of millions of people.

Perhaps the most powerful example of this is in Iraq, where our water and utilities experts are assisting in the delivery of multiple large-scale projects which will bring safe, clean water to Basra Governorate for the first time in three decades.

In October, K&A oversaw the completion of Mahila Reverse Osmosis Plant, one of the most complex projects in the portfolio. This facility is able to operate under remarkable variations in salinity, varying from 2,000 to 30,000 mg/l, enabling it to produce potable water despite the changeable conditions of the Shatt Al-Arab river.

RECORD BREAKER

In Egypt, K&A's work is also playing a vital role to treat polluted water through a project which is creating jobs, driving prosperity, improving the environment and significantly supporting the country's drive for greater self-sufficiency. Bahr Al Baqar wastewater treatment plant, for which K&A was lead consultant, was inaugurated in September by President Abdel Fattah El-Sisi. The project, which has been recognized by the Guinness Book of World

Records for its huge capacity, will treat 5.6 million cubic meters of wastewater every day, enabling the irrigation of more than 1,400 km² of farmland along the Suez Canal. K&A colleagues were recently delighted to be recognized for their work on the project when it was awarded an Engineering News-Record (ENR) Global Best Project Award.

Another project which was recognized by ENR, with an Award of Merit, was Qatar University's New College of Education. The 59,000 m² building, for which K&A provided lead design and construction supervision services, is a model of sustainable development, having been built to 4-Star Design and Construction Standards in line with Qatar's Global Sustainability Assessment System (GSAS).

In addition, City Centre Al Zahia, the largest mall in the UAE's Northern Emirates, was named Retail Project of the Year at the MEP Middle East Awards. This stunning LEED Gold project, for which K&A was lead consultant, was the first major retail development to be launched in the MENA region during the pandemic.

OVERCOMING CHALLENGES

The fact that such impressive, large-scale projects were all completed during the challenges of the past 12 months is a testament to all stakeholders involved, and clearly reflects the extraordinary determination and capability of this region to progress, no matter what obstacles stand in the way. This is all the more reassuring, given the fact that Covid-19 is likely to be among us in some capacity for some time to come.

Nevertheless, governments in the region are taking important and necessary steps to ensure they are prepared for any future escalations.

BEACON OF EXCELLENCE

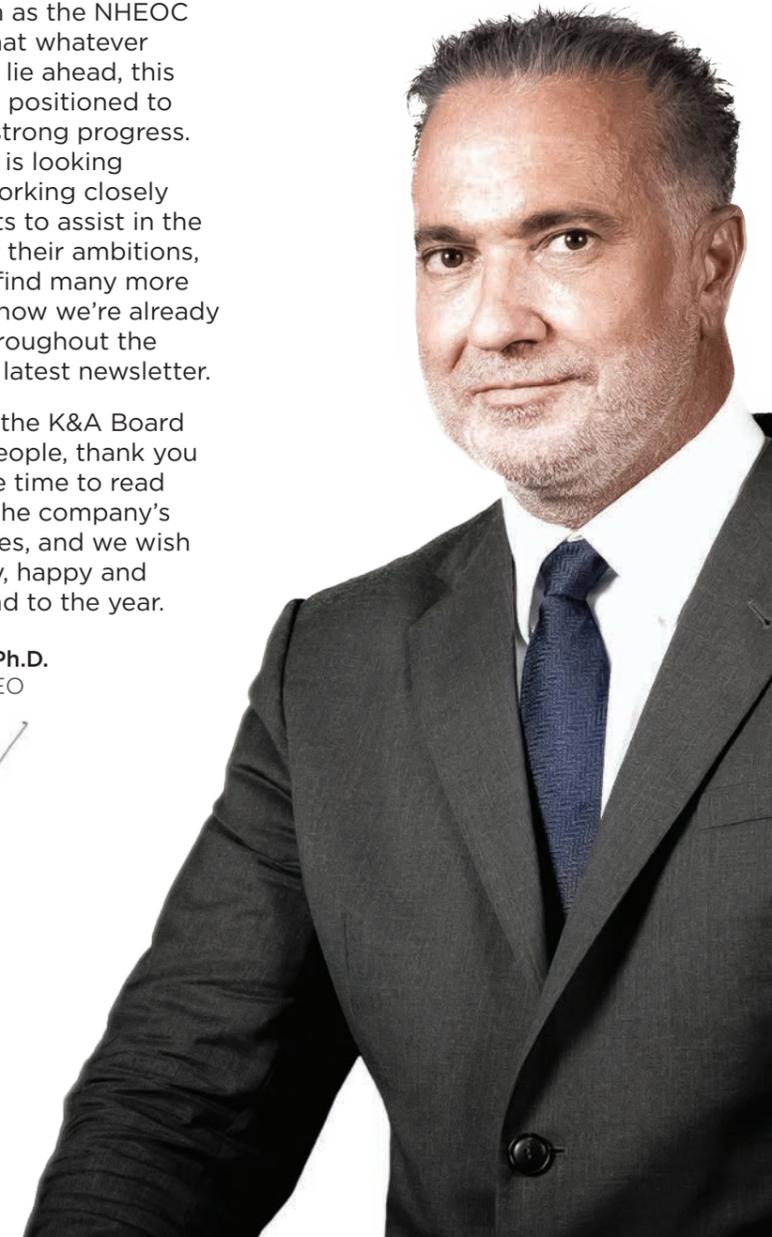
An example of this is the Kingdom of Saudi Arabia's National Health Emergency Operations Center (NHEOC). This exceptional project, for which K&A was lead consultant, seamlessly integrates WebEOC emergency management software with other technologies, such as GIS, to digitally transform the Kingdom's emergency management services and healthcare delivery.

Through its success, the Kingdom has established a leadership position in the field of emergency management and health disasters. This was recognized in October, when the NHEOC became the first facility in the Eastern Mediterranean region to be accredited by the World Health Organization (WHO).

The leadership and forward-thinking demonstrated by projects such as the NHEOC will ensure that whatever uncertainties lie ahead, this region is well positioned to maintain its strong progress. As ever, K&A is looking forward to working closely with its clients to assist in the realization of their ambitions, and you will find many more examples of how we're already doing this throughout the pages of our latest newsletter.

On behalf of the K&A Board and all our people, thank you for taking the time to read more about the company's latest activities, and we wish you a healthy, happy and successful end to the year.

Najib Khatib, Ph.D.
Chairman & CEO



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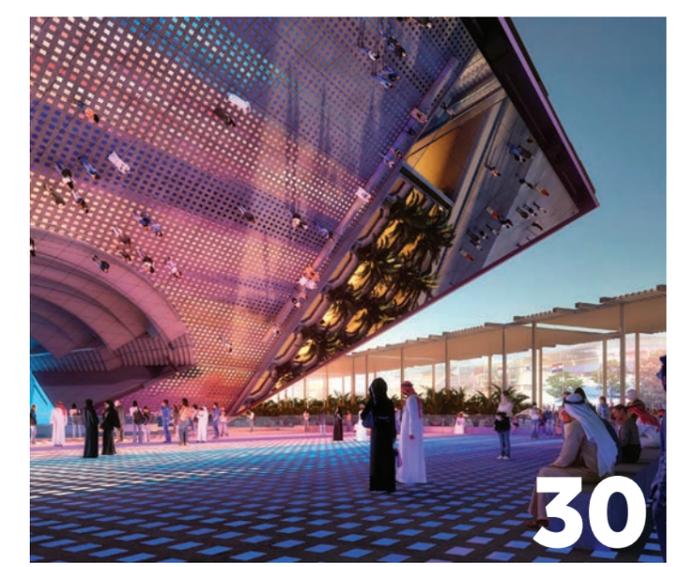
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BASRA BACK TO LIFE

REBUILDING RESILIENT INFRASTRUCTURE AND SUPPORTING RECOVERY IN IRAQ

K&A is set to bring lasting benefits to Basra in southern Iraq through working on several projects focused on restoring infrastructure and supporting local communities.

For many decades, Basra Governorate has suffered from low accessibility to safe drinking water despite having enormous natural water resources, like the Tigris and Euphrates rivers flowing to the north and forming the Shatt al-Arab river towards the Gulf. In 2018, environmental pollution in the

Shatt Al-Arab, together with saltwater intrusion from the Arabian Gulf, culminated in acute water and environmental crisis, affecting the health of more than four million inhabitants.

Basra, once one of the biggest producers of dates in the Middle East, has lost much of its capability due to the lack of sufficient fresh water. Rain shortages and the high salinity of the Shatt waters damaged the soil and killed plants, which led to farmers losing their main source of income.



Al-Mribad/Zubeir PS1 (Sewer (2,390 l/sec) and Stormwater (7,110 l/sec))



Batching Plant

“OUR TEAMS DEVELOPED A WATER IMPLEMENTATION STRATEGY WHICH INCLUDES THE CONSTRUCTION TIMEFRAME FOR SEVERAL WATER TREATMENT PLANTS.”

Nassif Abi Abdallah,
Design Manager

WATER STRATEGY PROJECTS BY NUMBERS



TOTAL SERVED POPULATION AT YEAR 2045
7.5 MILLION



TOTAL LENGTH OF PROPOSED TRANSMISSION & DISTRIBUTION WATER LINES
850 KM



TOTAL SERVED AREA FOR BASRAH PROVINCE
19,070 KM²



TOTAL CAPACITY OF PROPOSED DESALINATION PLANTS
12,000 M³/HR



TOTAL CAPACITY OF WATER TREATMENT PLANTS
30,000 M³/HR



TOTAL PROPOSED WATER PROJECTS
14

INFRASTRUCTURE PROJECTS BY NUMBERS

TOTAL SERVED AREA AROUND
55 KM²



TOTAL SERVED POPULATION AT YEAR 2045
1.3 MILLION



TOTAL LENGTH OF ROADS NETWORK
770 KMS



TOTAL LENGTH OF SEWER NETWORK
1,380 KM
DIAMETERS UP TO 2200MM



TOTAL NUMBER OF SEWER AND/OR STORMWATER PUMP STATIONS
57 NOS.



TOTAL LENGTH OF POTABLE WATER NETWORK
1,070 KM
DIAMETERS UP TO 1800MM



TOTAL LANDSCAPED GREEN AREA
817,500 M²



TOTAL NUMBER OF STREET LIGHTING POLES
13,568 NOS.

TOTAL CAPACITY OF SEWAGE TREATMENT PLANTS



QORNAH DISTRICT
35,000 M³/DAY
ZUBEIR DISTRICT
140,000 M³/DAY

TOTAL LENGTH OF GROUNDWATER NETWORK
259 KM



STORMWATER NETWORK
450 KM
DIAMETERS UP TO 2400MM



TOTAL ELECTRICAL POWER
281 MVA

TOTAL LENGTH OF IRRIGATION NETWORK
145 KM
DIAMETERS UP TO 500MM



To find a long term, sustainable solution, K&A has been commissioned by Basra Governorate to deliver a water strategy that will build resilience in the water system against natural hazards and climate risks in both the short and medium terms.

“Most of the water treatment facilities are aged, damaged or eroded and, as a result, are inadequate to treat raw water for drinking,” said Nassif Abi Abdallah, Design Manager.

“After undertaking a thorough assessment of the existing infrastructure and the future population demand, our teams developed a water implementation strategy which includes the construction timeframe for several water treatment plants, with a total capacity of 1 million m³/day, and around 160 km of transmission lines.”

K&A will also spearhead full infrastructure design and supervision for wet utilities (potable water, sewer, stormwater and irrigation networks), dry utilities (medium and low voltage, SCADA and telecom networks in addition to street lighting networks), roads, and landscaping in Naft, Moallemeen and Mowazzafeen areas of Touba and Nakheela district, in addition to Qornah and Zubeir districts, with a sewage treatment plant for each.

Project Director, Michel Saba said: “A multidisciplinary team of 80 specialists has been working in tandem to champion the detailed infrastructure design of five areas with a construction cost of more than \$1.7 Billion.”

PROJECT HIGHLIGHTS

Client:

Basra Governorate, Beneficiary party: Basra Governorate

Role of K&A:

Main consultant for the Entire Project

Project Specifications:

Construction Cost: \$ 1.73 Billion

Design Completion Date: 2021

Construction Completion Date: 2023

Services Provided:

- Design
- Construction Supervision



Al-Askari/Zubeir PS6 (Sewer (860 l/sec) and Stormwater (9,800 l/sec))



“We are currently leading all design works head-on thanks to our growing team’s capabilities, and this is enabling us to overcome the difficulties of operating for the first time in a new geography with challenging projects’ requirements.”

K&A in Iraq goes beyond the water sector and is playing an important role in rehabilitating the country’s infrastructure. “Our work in Basra is among a growing number of projects being undertaken by K&A in Iraq. Our office has grown to more than 80 employees and is expanding its expertise to take on multidisciplinary projects, such as the recently designed Safwan land port at the border between Iraq and Kuwait,” added Senior Manager – Infrastructure, Dr. Maher Kahil. ■

SAFWAN LAND PORT

A CATALYST OF ECONOMIC RECOVERY AND TOURISM DEVELOPMENT BETWEEN IRAQ AND OTHER GULF COUNTRIES.

The recently delivered design for Safwan Land Port in Southern Iraq is among several other high profile infrastructure projects being undertaken by K&A on behalf of Basra

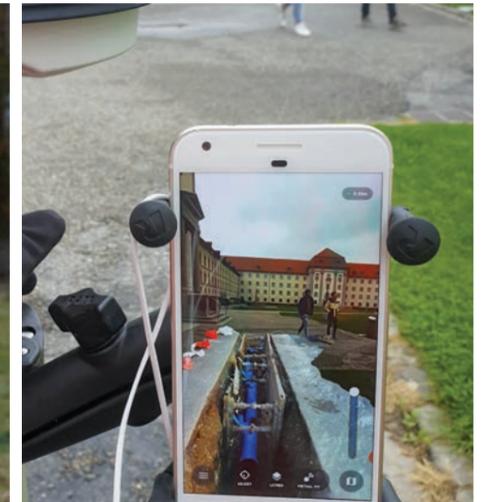
Governorate. The project will enhance the passage of commercial goods and people by increasing capacity to around 1,000 vehicles per day, with the seamless separation of traffic between commercial goods and travelers. The final designs and plans for the circa 727,500 m² site include industry-leading technologies for customs transactions and goods clearance. These will improve the experience of travelers, increase the

efficiency of customs revenue collection and reduce overcrowding, while maintaining preventive health measures. ■



PARTNERSHIP

K&A PARTNERS WITH VGIS TO OFFER AUGMENTED REALITY EXPERTISE



Images courtesy of vGIS

Khatib & Alami (K&A) has further extended its Geographic Information System (GIS) and Building Information Modelling (BIM) capabilities after partnering with Canada-based vGIS, a leader in visualizing hidden infrastructure through Augmented Reality (AR) technology.

AR provides users with an interactive experience of a real-world environment, enabling them to visualize digitally-created objects within the real-world view. AR can also offer the ability to interact with these objects via smartphones and headset devices.

Through its strategic partnership with vGIS, K&A provides clients with accurate AR views of the surrounding infrastructure at project sites, such as utility networks or proposed engineering designs. This will significantly enhance

the detection of potential clashes or other errors which can lead to delays or cost overruns while supporting stakeholder collaboration.

“GIS, BIM and AR can be used together to display infrastructure and utilities in-field and in real-time, helping designers, project managers and field workers to locate the right assets faster, saving time and preventing costly errors and delays,” says Manal Sayed, Senior Director of GSI at K&A.

“By incorporating AR into enterprise GIS data that can be viewed as a natural extension of the real world, users will be able to see their geospatial

data around them in the most understandable way possible.”

Like K&A, vGIS is an award-winning partner of Esri and Microsoft. The company’s product portfolio includes a visual GIS platform and a range of custom mixed reality applications designed for Microsoft HoloLens.

“USERS WILL BE ABLE TO SEE THEIR GEOSPATIAL DATA AROUND THEM IN THE MOST UNDERSTANDABLE WAY POSSIBLE.”

Manal Sayed,
Senior Director of GSI

K&A is a multidisciplinary consultancy company and a global leader in providing Geospatial solutions and the

Platinum Partner for Geographic Information Systems (GIS) software specialist Esri in the Middle East & Africa. The company’s experts are supporting the development of geo-enabled smart cities across the region. ■

THE MISSING LINK BETWEEN BIM AND GIS IN CONSTRUCTION INDUSTRY

Mohammad Hammoud, Senior Account Manager in K&A's Geographic Systems Integration team, looks at the transformational role augmented reality (AR) can play in the construction sector.



The last decade has seen BIM (Building Information Modelling) and GIS (Geographic Information Systems) become widely adopted tools across the engineering and construction industry. Both enable people, technology, and processes to deliver improvements in project delivery.

While BIM is known as the digital representation of a facility's physical and functional models, by including information in three dimensions (3D) and integrating information required for architecture, engineering and construction (AEC) projects, GIS looks at the positioning of structures with their surroundings. It is used to manage and analyze spatial data, focusing more on real-world modeling.

While the roles of BIM and GIS can be complementary, the AEC industry hasn't yet widely adopted a method for truly consolidating the power of both technologies.

WHY BIM IN CONSTRUCTION?

Briefly, BIM improves collaboration while reducing errors. For instance, construction documentation can be produced automatically, workflows can be accelerated immensely, and 3D building models can be created and shared, which widens the accessibility of the data and enables non-specialists to engage and edit building designs. This 3D modelling has brought tremendous improvements to design and construction.

It provides freedom to experiment with ideas digitally before committing project money. Architects can experiment with new materials and push the pragmatic limits of design without risking the physical construction.

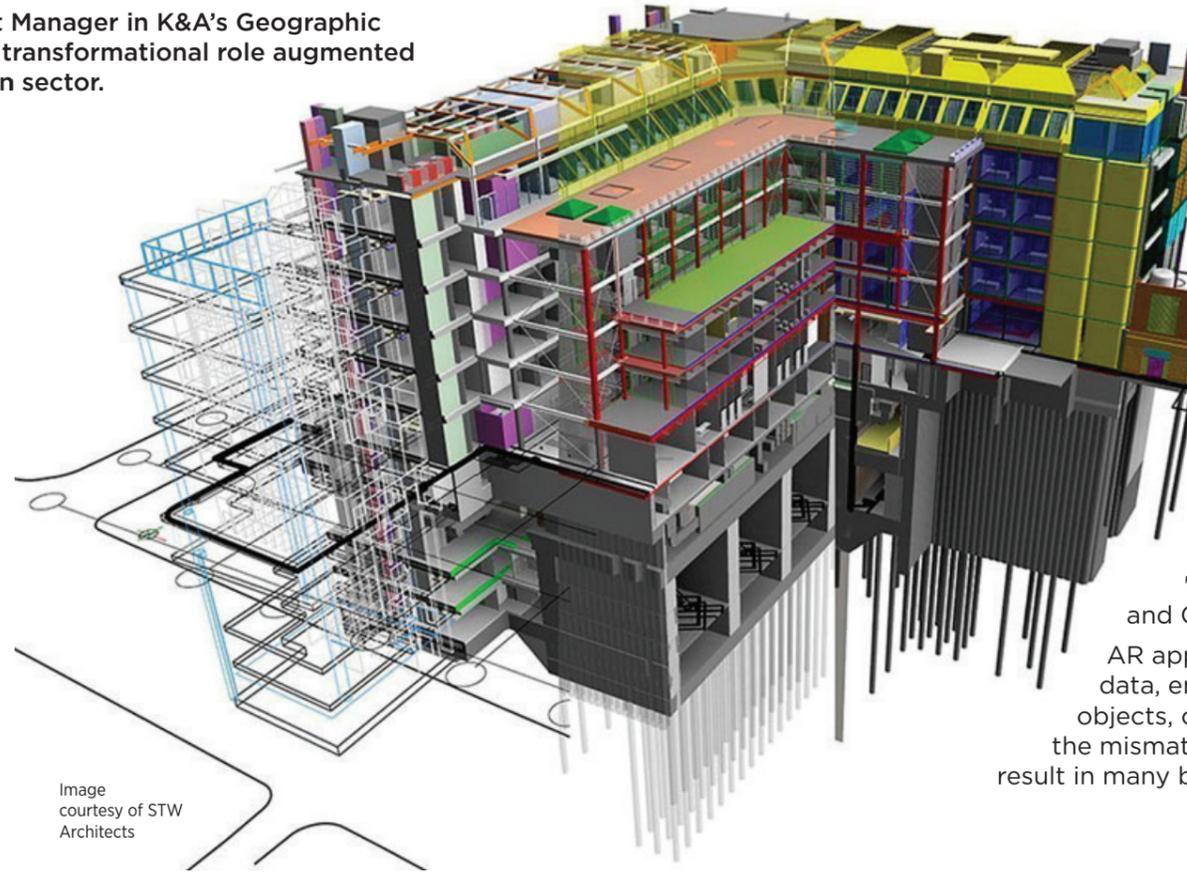


Image courtesy of STW Architects

WHY GIS IN CONSTRUCTION?

GIS can link project activities on sites with 3D drawings to provide better visualization of actual construction progress. It is designed to integrate, manage, and analyze spatial and non-spatial information, related to real-world assets, such as buildings and infrastructure. Most, if not all, of new constructions, renovations, real estate management, infrastructure maintenance and environmental plans are based on GIS. While BIM is best suited for managing data related to the buildings themselves, GIS is more applicable for everything outside and around the buildings. BIM and GIS are therefore very different.

But is there an efficient way to overlap both technologies? And what would the connection look like between the two?

THE MISSING LINK

Imagine how much simpler it would be if site workers could simply draw a red mark on the spot where a pipe should go; or if they could quickly locate existing

underground infrastructure assets (water/electrical pipes, fiber cables) to avoid damaging or obstructing them.

Augmented Reality (AR) has the potential to transform the way people work on construction sites

and could be the "next big thing"

in the AEC industry. AR provides a user-friendly means of

zooming in and out while looking at BIM and GIS models, making it easy to

observe any mismatches between model and reality. This could provide "the missing link" between BIM models and GIS reality.

AR applications can be used to visualize BIM data, enabling users to introduce any missing objects, correct errors in the model or address the mismatches for further investigation. This will result in many benefits:



Image courtesy of vGIS

Platform as a Vision

Yet the greatest benefit of AR in construction is to integrate all of your BIM and GIS data into an open platform, available to anyone in a truly digital format. Engineers want to know what installations, for example, the electrician has made in a certain time frame. Workers need to receive the information they need for their installation task on site. In addition, users should be able to add feedback to their BIM models on the go, and such AR applications enable this two-way information transfer in real-time.

Project status tracking in Augmented Reality (AR)

A simple status AR tracking app can be deployed, allowing anyone to understand the progress of the project in a visually understandable way. Stakeholders, regardless of their technical expertise, can now access and interact with the project model in real-time, making it easy to follow the project's progress.

On-site clash review

Design and construction data can be combined and visualized into a one-single model. Accordingly, clashes and interference problems can be identified and resolved before construction, while aggregating data from multiple sources. Because AR enables the visualization of BIM and GIS together, an automatic overlay of both the design and real-world is now possible.

On-site construction documents

Professionals on the ground can overlay designs in AR on top of the ongoing construction project, as well as surface construction documents from Revit and others software tied to their exact position. Instead of shuffling through thousands of paper-based construction documents or PDFs, the on-site team is armed with the information they need to catch design flaws early and perform their jobs more efficiently.

IN SUMMARY

Construction sites can't be managed without information – the more readily available that information is, the better it is for all involved with the project. AR is set to bridge the gap between BIM and GIS by bringing together the physical and virtual space onsite. ■

AWARD SUCCESSES SHINE LIGHT ON K&A PROJECTS AND PEOPLE

Despite the challenges posed by the pandemic over the past two years, the construction market across the Middle East & Africa region has proven to be remarkably resilient. This is set to be the central theme at awards events throughout the year as the industry comes together to celebrate its many achievements.

Although it was still early in the awards season when this edition of Inside K&A went to press, our teams were already pleased to have won recognition for their exceptional work.



Bahr Al Baqar Wastewater Treatment Plant in Northern Sinai, Egypt, has scooped two top awards – ENR Global Best Project of the Year in the infrastructure category, and ‘national winner’ at the MEED Projects Awards. The project now enters MEED’s regional competition, with the chance to win overall best water project of the year. Read more about this record-breaking project on [pages 24-26](#).

In addition, ENR recognized Qatar University’s **New College of Education (NCE)** with an Award of Merit in the education category. This 59,000 m² project was designed to accommodate 2,500 students, supported by 200 academic and administrative staff.

Located within Qatar University Campus, the project is a model of sustainable development, having been built to 4-Star Design and Construction Standards by Qatar’s Global Sustainability Assessment System (GSAS). Its open-air courtyards are symmetrically located on both ends of the building cores, making four natural light sources. A key feature within the access halls and staircases is a series of hydroponic green walls that simultaneously improve air quality and the aesthetics of the indoor space.



Another recently completed building project to be recognized for its outstanding design was **Al Zahia City Center in Sharjah, UAE**, which was named best retail project at the Middle East MEP Awards. With a total built up area of 363,976m², and a gross leasable area of 136,200 m², it is the largest mall in the Northern Emirates of the UAE. It was the first major retail development to be completed and launched in the MENA region during the pandemic, reflecting client Majid Al Futtain’s commitment to delivering this ambitious project despite challenging times.

The project is LEED GOLD certified, having achieved 15.47% energy reduction and a 37.81%

reduction in water use. All the main MEP functions are housed in a separate Energy Center that holds the primary mechanical plant and equipment and a 33 kilovolt station.

In addition to our projects, K&A’s people have also been honored with industry plaudits. **Talented urban planner and architect, Dana Al Haremi**, was named Rising Star of the Year at the Construction Week Oman Awards in March, in recognition of her vast potential and ability to bring fresh perspectives to the projects she works on. Dana was also praised by the judges for her dedication towards constant self-improvement for the benefit of her company, colleagues, clients, and community.



This was followed, in September, by **Ghida Kaddah’s** success in winning the Mechanical Engineer of the Year trophy at the MEP Middle East Awards. Ghidah, who joined K&A in 2003 after gaining her master’s in mechanical engineering degree at the Lebanese University, has proven her expertise on many projects, such

as La Perle Water Theatre in Dubai Habtoor City and The Peninsula at Business Bay, Dubai. She impressed judges with her willingness to go above and beyond to meet or exceed client expectations. ■

RIYADH SMART SQUARE AN INTELLIGENT AND RESOURCE-EFFICIENT COMMUNITY

Khatib & Alami (K&A) has completed the design of Riyadh Smart Square, one of the first projects by Aqalat that adopts the smart city development concept.

Smart cities have been increasingly gaining attention in the Kingdom of Saudi Arabia in recent years. Both the government and developers have embarked on major projects that leverage technology to boost citizen wellbeing and deliver smart, sustainable, and inclusive growth. Saudi Arabia's goal under Vision 2030 is to have three cities recognized in the top-ranked 100 cities in the world.

An important catalyst of this strategy is Saudi Telecom Company (STC), whose real estate developer subsidiary Aqalat has been spearheading communities in which information and communications technology (ICT) is utilized to deliver smart infrastructure. Riyadh Smart Square in the city's

Al-Mursalat district is a prime example of this initiative in action. K&A was appointed to design and deliver masterplan solutions incorporating a mix of residential, commercial and retail units. The design phase is complete, with construction expected to start in the coming months.

"The challenge of this project was to deliver a smart sustainable development for Aqalat that harnesses latest technological advancements and innovations from STC," said Riyadh-based Project Manager, Omer Al-Hali. "A key part of achieving this goal was to deliver an integrated ICT infrastructure from the very outset of the project that combines the best-of-breed of digital technologies." ■





SUSTAINABILITY AT THE DESIGN CORE

A bespoke sustainability strategy was designed for this project, right from the inception stage, aimed at achieving high-performance, resource-efficient, smart, innovative, and people-centric design. Several sustainability Key Performance Indicators (KPIs) were to measure the achievement of the sustainability strategy, throughout design, construction and operational stages. Some of the primary attributes of targeted sustainability KPIs include:



Double Skin Façade

The office building features a highly efficient double-skin façade composed of external screen, designed to reduce direct solar heat gains, regulate glare, and improve occupant indoor comfort.



Low Carbon Embodied Material

Regional and recycled materials, as well as, certified products with Environmental Product Declarations (EPDs) and other approaches have been used to promote resource efficiency, circularity and low carbon development.



Photovoltaic Roof Panels

Rooftops are covered with photovoltaic panels to generate solar energy capable of meeting essential energy load demands through clean and renewable energy. In addition, more than 30% of the outdoor space will be vegetated or finished with high albedo material, all of which will improve outdoor thermal comfort and contribute to a variety of additional passive energy reduction methods.



User Wellbeing

The design integrates enhanced indoor air quality levels, healthy construction materials and thermal comfort measures to maximize building occupant productivity and wellbeing.



Energy Efficient Technologies

Utilizing the latest energy recovery technologies, demand-controlled ventilation, optimized interior lighting, smart controls, and monitoring systems all contribute to energy efficiency.

A SMART-EMPOWERED COMMUNITY

As the design consultant, K&A harnessed ICT and other physical devices connected to a centralized and integrated command and control center (CCC) for intelligent building systems linking all core services, such as lighting, power, and water meters, pumps, heating, fire alarms, cooling, elevators, and access control systems.

This will help gather information and allow seamless and mass distribution of critical instructions, notifications and alerts.

“The CCC is a state-of-the-art building considered nowadays as the spinal cord of any smart city’s compound capable of monitoring, controlling and commanding its operations.

Moreover, it helps to analyze the massive amounts of data from different sensors and instruments placed strategically to allow real-time exchange of data, optimize efficiency and operations, save resources, and access analytical tools for

“THE INTEGRATION OF SMART AND INNOVATIVE TECHNOLOGIES IN THIS DEVELOPMENT, WAS ONE OF THE KEY ELEMENTS IN DELIVERING HIGH-PERFORMANCE, RESOURCE EFFICIENT AND USER-CENTRIC DEVELOPMENT”

Waseem Al Azzeh,
Head of Sustainability Sector

evidence-based decisions,” said Elias Selwan, Electrical Team Leader. The efficiency of Riyadh Smart Square relies heavily on its interconnected network availability and reliability. By leveraging emerging technologies, such as Artificial Intelligence, Internet of Things (IoT), and Big Data Analytics, the project was designed to prioritize mission-critical applications such as security, traffic management, and daily residents’ activities. With STC being the first telecom provider of 5G technology in the region, the advanced technology has unlocked IoT potential by connecting mobile devices,



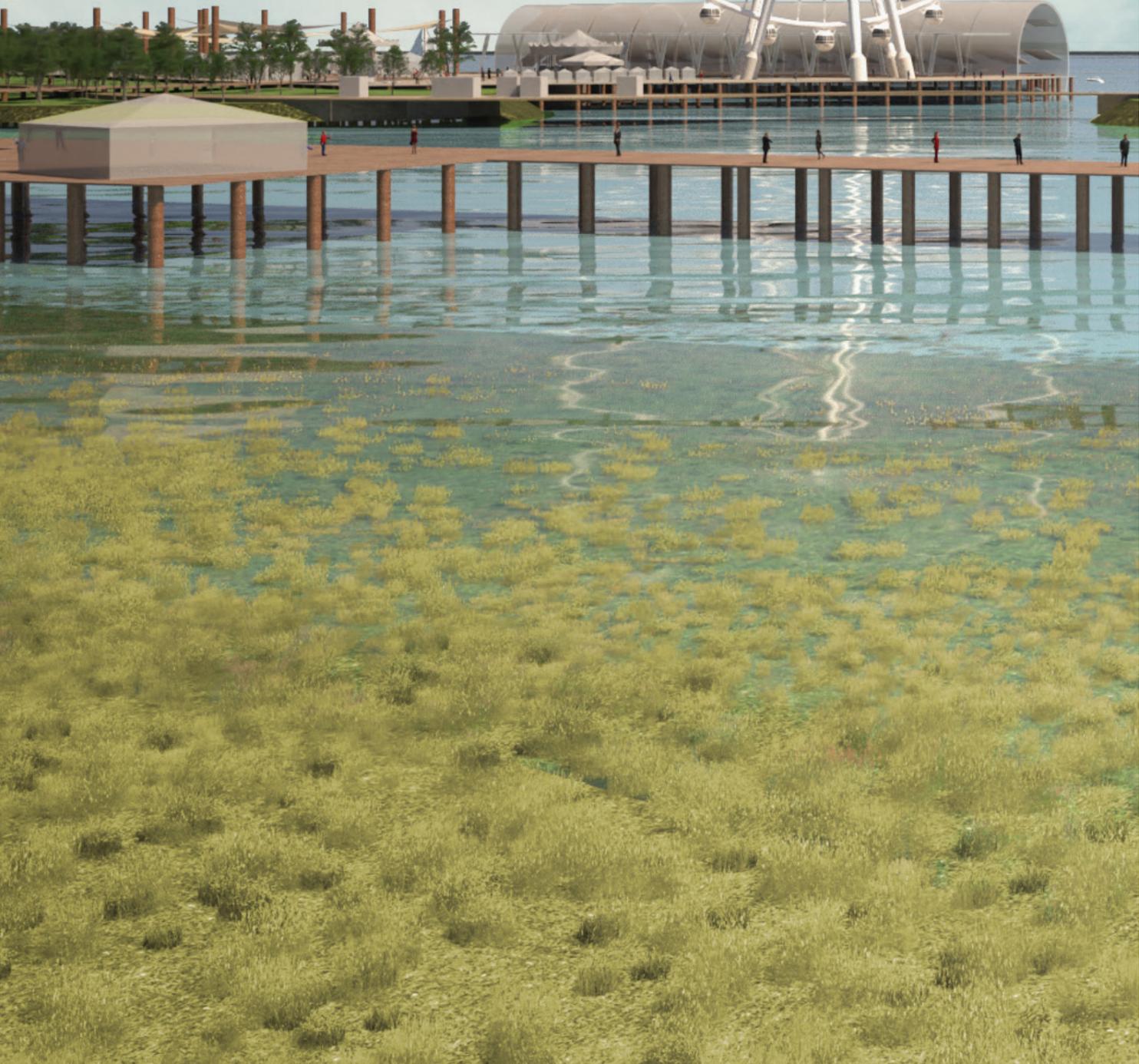
sensors, autonomous cars, home appliances, and data centers. This will enhance operational efficiencies and user experiences and provide new revenue opportunities.

“The integration of smart and innovative technologies in this development, was one of the key elements in delivering high-performance, resource efficient and user-centric development,” said Waseem Al Azzeh, Head of Sustainability sector at K&A. “The integrated use of ICT and the deployment of renewable energy technologies to regulate the energy cooling and heating loads helped improve user comfort and reduce energy consumption, with energy savings of 24%, indoor water savings of 38%, and outdoor water savings of 44%.”

The project received the Masterplan Project Award at the 2019 Cityscape Jeddah Awards and is currently pursuing LEED certification. K&A will continue to explore the full potential of digital technologies to design comprehensive urban planning concepts for livable smart cities. ■

REVIVING AL-JAHRA WATERFRONT IN KUWAIT

Ambitious project envisages a holistic transformation of Al-Jahra's 7.3 km² water strip, preserving its biodiversity and stimulating widespread of recreational and cultural activities in a unique sense of place.



Waterfronts are multipurpose public places that boost activity while curating nature inside the city. They mirror the city's identity and contribute significantly to the socio-economic and cultural aspects of urban life.

Developing the Al-Jahra waterfront "Al-Corniche" is among many initiatives launched by the Government of Kuwait in line with the National Development Plan - Vision 2035. Located north of Kuwait's Bay, the 7.3 km² waterfront is a key site as it represents one of the last developable areas before the national reserve network.

CALL IT A DESTINATION

Khatib & Alami (K&A) was appointed by Kuwait Municipality - Projects Development Sector to develop a comprehensive master plan for the area. City & Regional Planning Director, Edgar Mourad, said: "The waterfront has vast potential to become a prime touristic and recreational destination for local residents and visitors alike. In association with our local partner Kuwait Technical Consulting Bureau, we are addressing the project's environmental and urban planning challenges to create a sustainable, socio-environmental waterfront that expresses the Kuwaiti cultural identity."

One of the eminent challenges was solving the site's contextual constraints while safeguarding its pristine ecological value and developing a sustainable financial model with a feasible implementation plan. The area

is surrounded by a multitude of towns, adjacent to the Doha power plant east, the mangrove's reserve west, the Jaber al Ahmad city in the south and a direct frontage onto the sea.

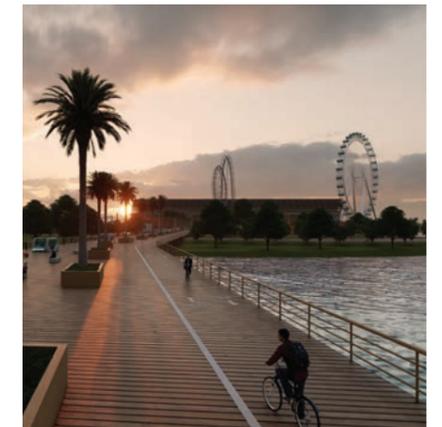
Design Manager, Rania Sassine said: "Our vision was to turn Al-Jahra into a well-connected, safe, comfortable,

sustainable and lively public realm that focuses on lifestyle, multi-sensory experiences, nature immersion in local environment, and physical and mental well-being. The 'genius loci' - spirit of the place - was very inspiring to create a unique spatial experience that will remain with the visitors as a happy memory." ▣



"WE ARE ADDRESSING THE PROJECT'S ENVIRONMENTAL, AND URBAN PLANNING CHALLENGES TO CREATE A SUSTAINABLE, SOCIO-ENVIRONMENTAL WATERFRONT THAT EXPRESSES THE KUWAITI CULTURAL IDENTITY."

Edgar Mourad,
City & Regional Planning Director



ADOPTED APPROACHES AND GUIDING PRINCIPLES



Environmental Sustainability



Urban Integration



Smart & Light Mobility



Social & Cultural Acceptance



Economic & Financial Sustainability



The waterfront was designed with connecting decks and green blue corridors that allow this seamless integration between the natural, recreational, and touristic components. On the northern strip that is adjacent to the mangrove reserve -Kuwait's first protected area and globally recognized in the Green List of the International Union for Conservation of Nature (IUCN) - the master plan boasts an eco-park, featuring a desert botanic garden, a bird observatory, and an eco-cloud with a view on the intertidal wetland.

The sustainable design of the master plan fosters adaptability to many changes that bring all kind of visitors to enjoy a unique place. For instance, the Kuwait Lifestyle Museum, the Friday Mosque and the souk are among many iconic landmarks of the development, reflecting on local identity, history and culture. Moreover, we devised additional activities to attract users to the waterfront but also generate interest among onlookers

such as the entertainment pier, a music venue on the deck, an aquarium, sports and therapeutical areas, in addition to different types of hotels that attract tourists alike.

By introducing a buffer zone to the site, the accessibility was made easy with smart and light multimodal transportation systems that optimize mobility and enhance project attractiveness throughout the year, the week, and the day. ■

“THE ‘GENIUS LOCI’ - SPIRIT OF THE PLACE - WAS VERY INSPIRING TO CREATE A UNIQUE SPATIAL EXPERIENCE THAT WILL REMAIN WITH THE VISITORS AS A HAPPY MEMORY.”

Rania Sassine,
Design Manager

BECAUSE WATERFRONTS ARE NOT ONLY AN EDGE BETWEEN URBAN FABRIC AND WATER

Our experts developed a comprehensive feasibility study and master plan that recognize the environmental asset of the site. “We focused the master plan to positively contribute to Al-Jahra social and cultural integration and environmental preservation while securing financial feasibility. The overarching principle of this project is ensuring sustainability in a multi-layered sense - environmental, socio-cultural and economic,” added Edgar Mourad.

The sea, the intertidal zone, and the mangrove reserve were the greatest asset of the masterplan, becoming the centerpiece for programming and activities.





SUSTAINABILITY | UNITED ARAB EMIRATES

K&A DESIGNS SUSTAINABLE PARK FOR GROWING DUBAI COMMUNITY

Green community space provides a balanced and pleasant area at the heart of the neighborhood.

As cities become more densely populated and concern about the impact of climate change increases, planners, governments, and communities across the world are taking a fresh look at parks and their potential to help address critical urban infrastructure and public health issues. Parks are now recognized as powerful tools for urban communities and local economies.

Dubai Science Park (DSP) in the city's Al Barsha neighborhood now boasts an excellent example of the value that green spaces can bring to a community. It's recently completed district park, for which K&A provided full design and construction supervision

services, provides a stunning 78,000 m² community space where professionals and residents can work, live and flourish.

Dubai Science Park is the region's first free zone community that serves the entire value chain of science, health and pharma sectors, fostering an environment that supports research, creativity, innovation and passion.

"We are pleased to be supporting community greening projects in Dubai," said Marlon Van Maastricht, K&A's Senior Manager of Landscape Architecture, Urban Planning and Design.

"Since we were appointed to the project, Dubai has released its 2040 Master Plan, which envisions improving quality of life by doubling the number of green and leisure areas,

in addition to public parks, to provide healthy spaces for people to exercise and enjoy being outdoors. It's great to have contributed to a project which very much meets these criteria today."

AN INNOVATIVE AND MULTI-FUNCTIONAL ARCHITECTURAL DESIGN...

K&A and Tecom went through a series of design workshops to create a place that promotes outdoor play, fitness and recreation while including family and community interaction within the DSP business district.

One Community

To promote a healthy lifestyle and create a sense of belonging to the community, the core of the site includes a central open space designed as a retreat for visitors and residents.



The Peacock Garden

A flock (or muster) of peacocks is being relocated to a fenced off garden of 18,000 m² from their current home in the Emirates Towers park. As the birds breed, there will be room in the garden to house up to 200 of the spectacular birds, and paths will run through it to enable visitors to walk among them.

A pond and various low-water-demand plant species will be used to create a microclimate and biodiversity similar to the peacocks' existing habitat. The Peacock Garden features the transplanted ghaf trees,

The district park will feature a community herbal garden, a multi-use lawn for neighbourhood events, and a plaza space for weekend markets and pop-up retail.

The streetscape includes shaded reading and seating areas, a playground featuring a multi-games court and spacious urban kids playing area, a jogging track, and outdoor exercise pods, all of which will encourage healthy physical and intellectual activities.

A Sustainable Landscape Design

Greywater recycling and renewable energy will reduce energy loads through the installation of photovoltaic panels and kinetic wind sculptures. The park also features a green roof system, and solar-powered light pads and charging stations.

... THAT PROMOTES SUSTAINABLE LIVING, CLIMATE CHANGE ADAPTATION, AND BIODIVERSITY.

In response to UAE's intense heat and the need to save water, xeriscaping methods have been used to minimize or eliminate the need for irrigation. The park has therefore been planted with drought-tolerant plant species able to withstand the harsh



desert environment and remain green, such as ghaf trees and date palms.

As part of Dubai's initiative to plant one million ghaf trees, 32 were transplanted from different DSP locations into the proposed District Park to provide a natural shade and thermal comfort and help combat climate change. The Park planting design features trees for shading in prime locations, such as the seating and family areas. It also provides an outdoor recreational and activity space for the community, while ensuring shade and thermal comfort throughout the year.

mixed with big shade trees, shrubs, hedging and ground cover, which will provide nesting grounds for the birds.

Deciduous and salt-tolerant trees were part of the planting design strategy, with careful selection of softscape materials and plant species to maximise sustainability criteria.

"WE ARE PLEASED TO BE SUPPORTING COMMUNITY GREENING PROJECTS IN DUBAI"

Marlon Van Maastricht,
Senior Manager of Landscape Architecture, Urban Planning and Design

"A key focus for Dubai Science Park is to ensure it will stand the test of time, fulfilling its role as a treasured community space," adds Marlon Van Maastricht. "Using quality materials and careful design, we trust it will live on as a community asset for many years to come." ■

BAHR AL-BAQAR TACKLING WATER SCARCITY IN EGYPT

SUSTAINABLE WATER MANAGEMENT AT BAHR AL-BAQAR WASTEWATER TREATMENT PLANT

For many years now, the area of Northern Sinai has been facing a number of serious challenges. Rapid population growth along with dryland expansion, water pollution and lack of safe drinking water are among the many pressing issues that the Government intends to resolve.

To help address these challenges, Egypt developed Bahr Al-Baqar wastewater treatment plant in the east of Suez Canal, which has been recognised in the Guinness Book of World Records as the world's largest with a capacity of with an estimated capacity of 5.6 million m³/day.

Commissioned by Egyptian Armed Forces Engineering Authority, Khatib & Alami (K&A) has successfully completed this ambition project from conception to execution to a fast-track schedule of 24 months.

FROM WATER SCARCITY TO SUSTAINABLE WATER USE

The Egyptian government sought to tackle water resource shortages and fill the current gap, estimated at 20 billion cubic feet of water annually, by establishing a clean-water system for the Bahr Al-Baqar drain within the Sinai Peninsula Development Plan. The new Bahr Al-Baqar plant will help to treat all the wastewater flowing along the drain.



The plant comprises four water treatment lines with a daily processing capacity of 1,250,000 cubic meters each.

The effluents entering the drain come from Sinai households, industries and plantations in the region. The raw water is transported to the proposed treatment plant through deep tunnels passing down the new Suez Canal to the eastern side of the Canal.

Equipped with advanced processes for pumping raw water, coagulation, flocculation,

decantation, filtration, and disinfection, the facility will produce safe and clean water that will be reused to irrigate 140,000 hectares of farmland alongside the Suez Canal.

Moreover, the project will support government efforts to “green” areas of the desert and convert them for agricultural use and traditional farming regions; thus, linking the Sinai Peninsula with the Delta region, and providing job opportunities and better quality of life.

AN EXEMPLAR PROJECT THAT CONTRIBUTES TO ACHIEVING THE UNITED NATION'S SUSTAINABLE DEVELOPMENT GOALS (SDGS)

The Bahr Al-Baqar wastewater treatment plant goes hand-in-hand with the SDGs by providing high-quality reclaimed water, protecting marine and coastal ecosystems from pollution, reducing poverty by creating new job opportunities, ensuring clean energy, and combating climate change.

Ensure access to water and sanitation for all Goal



The project's primary focus is to allow farmers and workers to get access to high-quality reclaimed water covering their agro-industrial

water needs. The Bahr Al-Baqar wastewater treatment plant will improve water quality by decontaminating water from organic substances, households, industrial wastes that used to be drained to Lake Manzala then discharged to the Mediterranean Sea. ■

End poverty Goal



As stated by the Egyptian Minister of International Cooperation, Rania Al Mashat, this project will

make a great impact on the agricultural development in North Sinai, creating more than 100,000 and 1.2 million direct and indirect job opportunities respectively that can help sustain families.

Ensure access to affordable, reliable, sustainable and modern energy Goal



Moreover, instead of a conventional sludge drying bed, a sludge solar drying system will be

adopted to capture solar energy inside 128 green beds and turn sludge into a year-long asset that can be used in the agricultural and industrial fields. A total of approximately 475,000 tons of dewatered sludge per year are to be dried from 24% dry solids (DS) to approximately 75% DS.

This modern system will avoid polluting the air and reduce the carbon footprint by not having to consume the energy that was needed to transport the liquid sludge to the sludge landfills.

Build resilient infrastructure, promote sustainable industrialization, and foster innovation Goal



By reusing and treating resources from wastewater, the Bahr Al-Baqar plant helps to reduce the

environmental footprint of wastewater treatment, minimizes contamination, and ensures the availability of valuable resources for surrounding communities.



Make cities inclusive, safe, resilient, and sustainable Goal



Aligned with the Sinai Peninsula Development Program, this project aims to optimally utilise

water resources and reduce waste, as it will work towards increasing the agricultural area, especially in the Sinai Peninsula.

Also, it will help establish integrated agricultural development projects covering agricultural, animal, and industrial production.

Take urgent action to combat climate change and its impacts Goal



According to the United Nations, Egypt will face critical water shortages by 2025 that could affect around

0.5 million people in the Sinai region. With a capacity of 5.6 million m³/day, the Bahr Al-Baqar water reclamation plant will provide a new source of treated water, which will be used for the irrigation of plantation in the Sinai Peninsula, where water shortages were presenting a threat to agriculture and the economy.

Conserve and sustainably use the oceans, seas & marine resources Goal



Domestic sewage, industrial and agricultural waste used to flow untreated through the

135-kilometre Bahr Al-Baqar channel, discharging into Lake Manzala in the northeast Nile Delta. The discharge from Bahr Al-Baqar, heavily loaded with bacteria, heavy metals and toxic organics, resulted in high fish mortality and malformation. This project will help to sustainably manage and protect Lake Manzala's ecosystem and strengthen its resilience.

Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss Goal



The treated water from the Bahr Al-Baqar water reclamation plant will be used for irrigation to

restore 400,000 feddan of plantation east of the Suez Canal, combating the aridity nature of the region and restoring the degraded land and soil affected by mismanagement of the Bahr Al-Baqar drain. ■

SAUDI ARABIA'S ARAFAT-TAIF WATER TUNNEL ACHIEVED IN RECORD TIME DESPITE THE PANDEMIC

DRILLING HAS BEEN COMPLETED FOR THE ARAFAT-TAIF WATER TRANSMISSION TUNNEL, PART OF WHAT IS BELIEVED TO BE ONE OF THE LONGEST WATER TRANSMISSION TUNNELS IN THE WORLD.

Characterized by water scarcity and no perennial rivers, Saudi Arabia is one of the driest regions in the world. To overcome this challenge, the Saudi government has undertaken substantial investments in seawater desalination, sewerage and wastewater treatment, and water distribution projects. One example is the Arafat-Taif water tunnel, spearheaded by the Saline Water Conversion Corporation (SWCC). Believed to be one of the world's largest water transmission tunnels, the 8.4 m tunnel extends 12.5 km,

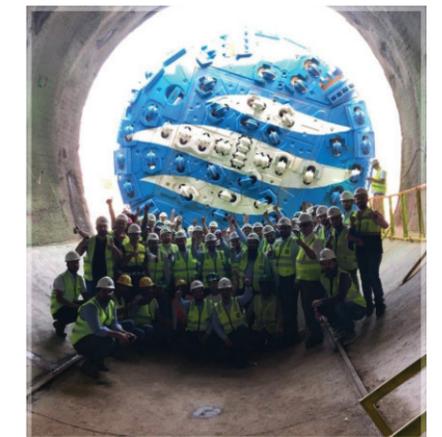
and falls into the Kingdom's ambitious plan to increase water desalination capacity and transmission supply, matching its rapidly growing water consumption.

Despite the terrain challenges and coronavirus pandemic, the project was completed ahead of schedule. Our experts adopted several measures to achieve this milestone. For instance, they have shortened the drilling distance by 40 kilometers by starting the excavation at the bottom of the Al-Hada Mountains to reach the ring road in Taif city. They have also peaked the daily drilling speed using a specialized tunnel boring machine (TBM), characterized by its rotating cutter head and double shields.

With this achievement, we have completed the first milestone of a critical project to supply potable water from Arafat, outside Makkah, to strategic

reservoirs in the cities of Taif, Al-Baha, and nearby villages. A housing compound and an administration area will be built near the SWCC Taif Terminal as part of the project.

K&A has a long-standing relationship with SWCC and is proud to support the Kingdom in this vital project that will transport the required water needs to the western villages in Saudi Arabia. ■



Q&A ON COVID-19 AS 'GAME CHANGER':

HOW HAS IT CHANGED THE FACE OF BUSINESS?

Specialists from K&A Design Centers respond to questions, reflecting on how covid-19, remote working, and digital technologies have paved the way for more opportunity, innovation, and inclusiveness in project delivery. Thanks to Ahmad Faeq, Senior Director - Operation Excellence; Mohamed Saad, IT Director; Micheline Nader, Senior Project Engineer; and Vijaya Venkata, BIM Lead.



AHMAD FAEQ



MOHAMED SAAD



MICHELINE NADER



VIJAYA VENKATA

1. What were the challenges created for K&A by Covid-19?

Mohammad Saad: Time was our biggest challenge. K&A has always been an early adopter of cloud computing; we already had the foundations in place to respond to key challenges such as remote working.

But instead of being able to pilot, test and roll out the home-working programme over several months, the urgency created by the pandemic demanded an immediate transition.

Another rising difficulty was managing logistics during the pandemic, ensuring everyone had the right equipment they needed, as well as fast and secure internet connectivity.

Micheline Nader: The pandemic brought forward a new reality of project delivery that was challenging at the very beginning. We needed to adapt to a new remote working routine and a fast-changing digital ecosystem that necessitates an increased collaboration across design teams.

Especially in delivering large scale projects, it was imperative we foster a high-performing virtual environment that ensures timely and outstanding delivery.

2. From an operational perspective, what new processes did K&A introduce? Specifically, digital changes and applications on specific projects?

Ahmad Faeq: K&A was quick to deploy remote working strategies followed by an extensive training program across our design centers to ensure digital solutions were consistently and efficiently used for communication and collaboration on projects.

The two main collaboration platforms used by the company are BIM360 for technical design and Microsoft Teams for non-technical collaboration, document management and project management.

A dedicated Microsoft Teams site was created for every project and all of K&A's BIM families and libraries were pushed to the cloud to ensure online accessibility and production standardization, unified across all design centers.

Mohamed Saad: We have invested to drive consistent, internationally certified BIM standards across the business, and have been recognized by the British Standards Institution (BSI) for achieving BIM for design, construction and commissioning in accordance

with ISO 19650-1 and ISO 19650-2. The ISO 19650 standards provide a structured process to support BIM implementation on projects. This creates a common approach which improves collaboration and understanding among design teams, while improving cost and time efficiency.

Vijaya Venkata: By embracing digital technologies, we have created a shared culture through regular meetings and brainstorming sessions. Global implementation procedures were also put in place to set up remote working practices. For successful project delivery, we streamlined BIM process and workflows which, in turn, increased productivity and reduced time on repetitive tasks by using automation tools such as Plugins and Dynamo Scripts. Smart ideas were captured through the creation of smart project-specific Revit Family for tagging details and number sequencing, and adding Invert Elevations.

BIM coordination and generating clash reports have helped to isolate errors, thereby enhancing our existing preventive maintenance processes. This has helped to fine-tune our project-related BIM trainings which

were customized to meet project requirements in each department.

3. What was the impact of these changes on our operations and projects?

Ahmad Faeq: Tools such as BIM360 and Teams have played a vital role in supporting collaboration and communication among K&A's remote-working, geographically dispersed teams.

Visibility was improved for project managers, ensuring they are better equipped to monitor and control project tasks and schedules. Although K&A's digital transformation was already well underway, the pandemic was responsible for catalysing adoption, both technically and behaviourally.

The company estimates that the efficiency of its project delivery and collaboration has improved by more than 40% compared to traditional methods, resulting in higher productivity, lower costs, and greater consistency.

Vijaya Venkata: When a complete lockdown was enforced in India, for many of us who did not have computer systems, the office systems were delivered to our homes. Despite the challenges we faced

in the first month at Bangalore Design Center, remote working attendance was 100% which is a record for itself, showcasing the commitment and dedication of our team.

Efficiency and accountability increased during work in virtual mode and we were highly productive, and managed to meet the client's expectations and project deliverables by working around the clock. Communicating with design centres was instantaneous and helped us to resolve problems quickly.

4. What do you think will be the long-term legacy of these changes on your operations and projects? And on the wider construction industry?

Ahmad Faeq: K&A believes the past 12 months have swung the door open to greater digitalization in the construction sector. Although it will take time to change some elements of the ecosystem, there has been an acceptance of new ways of working which are likely to remain post-pandemic, such as holding some meetings virtually instead of face-to-face.

At a deeper level, K&A has also observed a change in mindsets, and has entered dialogue with some clients and partners

"BY EMBRACING DIGITAL TECHNOLOGIES, WE HAVE CREATED A SHARED CULTURE THROUGH REGULAR MEETINGS AND BRAINSTORMING SESSIONS."

Vijaya Venkata,
BIM Lead, K&A India, Bangalore

about digital solutions which would never have been considered previously.

Micheline Nader: New technologies and tools brought about by the pandemic helped us operate in a much larger digital environment, benefiting from remote collaboration across virtual design teams in various geographies. It's a great opportunity for us to leverage communication and collaboration to build capabilities and skills and bring even more talent and innovation into our design projects.

Vijaya Venkata: The pandemic gave an impetus to hasten the process of change management in ways that would not have been possible in normal times. As they say out here in the East: "An Adversity is also an opportunity in a Disguise". The pandemic has completely shifted how we think about work and lifestyle. The lesson learned is that we need to be open to change which can transform our business and lead us to success.

In spite of all challenges, the resilience and commitment of our team resulted in incredible performance. ■

STUNNING SAUDI PAVILION ENTHRALLS VISITORS TO EXPO 2020 DUBAI

The Kingdom of Saudi Arabia Pavilion, for which K&A provided project management consultancy and construction supervision services, conveys a message of dynamism and partnership to the world.

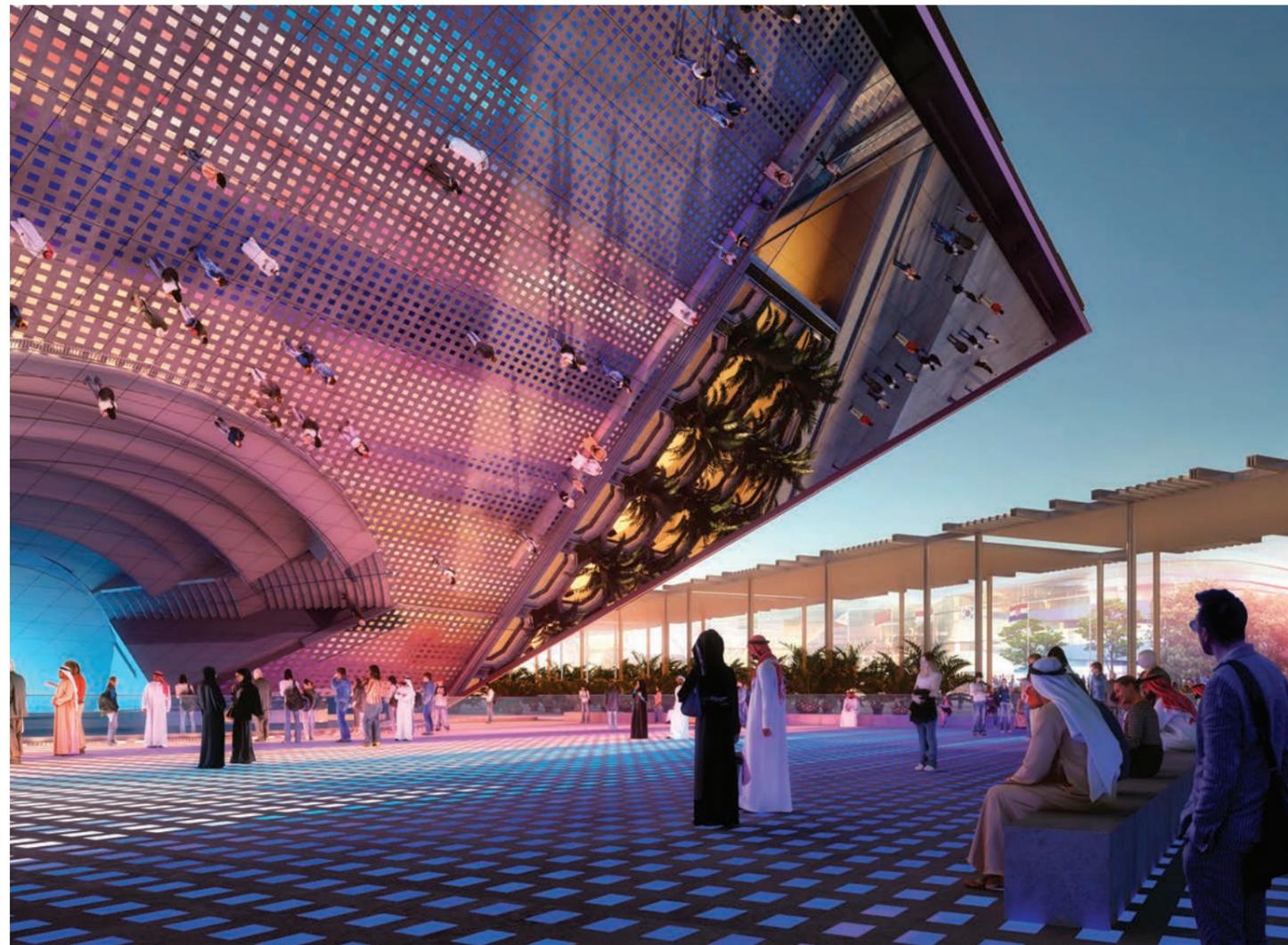
Sitting on a 7,070 m² plot close to the UAE Pavilion at the heart of the Expo 2020 Dubai site, the Kingdom of Saudi Arabia's impressive pavilion features the largest structure of all the visiting countries, with a built-up area of 13,000 m² and a height of 27m. It's eye-catching design features an inclined prism that opens like a large window, reflecting the welcoming character of the Saudi nation and the deeply-rooted culture of its people and history, along with the Kingdom's ambition for transformation.

Delivering a project of such scale and complexity at the height of the pandemic was a significant challenge, made tougher by the fact that it was the first international pavilion to start construction. As a result, all the processes and procedures of the Expo were being implemented for the first time through this project.

As the project manager and construction supervision consultant, K&A played an active role working alongside a large team of stakeholders to support its successful delivery.

DELIVERING ON TIME AND WITHIN BUDGET

Despite the impact of Covid-19, which resulted in the Expo 2020 moving back 12 months to begin



K&A'S BUSY ROLE AT DUBAI EXPO 2020

In addition to its work on the KSA Pavilion, K&A was also involved as the construction supervision consultant for the USA, Egypt, Palestine, and Pakistan pavilions.

in October 2021, the target for completing the project ahead of the original opening date did not change. And thanks to the effective processes put in place to achieve that target, with innovative site management and coordination, the pavilion was completed on time. What's more, strict cost compliance mechanisms ensured the project was also within budget.

Several factors contributed to this project being an exemplar of international best practices:

- The client introduced a first in first out (FIFO) design model where the first critical items to be constructed on site (e.g. Steel Structure, Substructure) were given priority in the design so that on site work could begin.
- To allow a seamless transition between design and construction, the lead contractor was involved early on, from the concept design stage of the project, bringing design buildability and cost efficiencies to the pre-construction phase.
- To save time, 90% of all materials were ordered ahead of schedule. Chillers, escalators, elevators, led screens, and other long-lead items were designed well ahead of time to procure these items at an early stage of the project.
- Construction progress documentation software was used to create a replica of the site, room by room, through 360-degree images taken daily – this improved visibility while saving time and money. In addition, the digitalization of all processes through the use of advanced project management software helped to manage all documentation and on-site procedures, such as snagging and QA/QC.

SUSTAINABLE APPROACH

Sustainability was a primary target for the project. For all aspects of the Pavilion's construction, reuse and recycling of materials was a key consideration:

- 50% of used materials were redeployed or recycled, while 50% of construction waste was recycled.

SAUDI PAVILION WAS THE FIRST VISITING-COUNTRY PAVILION TO OBTAIN:

- Dubai Electrical and Water Authority (DEWA) power-on tie-in and approval, allowing the pavilion's testing and commissioning activities to start
- Dubai Civil Defense (DCD) approval of Pavilion's passive and active life safety components
- Dubai Electrical and Water Authority (DEWA) approval for potable water tie in to allow water supply to the pavilion

- Water-efficient fixtures are expected to reduce consumption by 50% compared to the baseline, while energy management strategies will reduce building energy consumption by 25%, external lighting by 25% and landscape lighting by 50%.
- Renewable energy generated on-site via a "technological skin", integrating solar and photovoltaic panels, will account for almost 30% of electricity usage. The project is on track to receive LEED Platinum certification.

Commenting on the project, Dubai-based supervision director, Amjad AlArdah, said: "The target was to complete the project before the original Expo 2020 opening date. Thanks to the effectively implemented processes, this milestone was achieved despite the effects of the Covid-19 pandemic and challenges such as site logistics and construction traffic."

Congratulations to our client, and to all stakeholders involved in delivering this exceptional project. ■

HOW K&A SAVED 25% OF TIME SPENT ON DESIGN, USING BIM AS IT REIMAGINES FAHAHEEL EXPRESSWAY



OVERVIEW

RETURN TO THE OPEN ROAD

As one of the region's oldest and most trusted design and engineering consultancies, Khatib & Alami (K&A) has long understood that its longevity and success in the market is largely due to its positive outlook towards sustainable best practices and emphasis on time and cost-saving technology. At the core of its design program capability is a long-standing relationship with BIM, and a corporate attitude that embraces deep technical expertise and digitalization as part of its strategy. These foundations guided K&A's team which was tasked with finding the right solution for Kuwait's Route 30 Fahaheel Expressway.

THE CHALLENGE

THREE ROUTES TO SUCCESS

Considered a primary artery of the country's road network, the 38-kilometer stretch of highway that connects the capital to the governorates of Hawali, Mubarak Al Kabeer and Ahmadi has become increasingly congested. However, with the country's Vision 2035 on the horizon, the government decided to take steps to revitalize this essential corridor and thereby return free movement to its major roads, while helping to stimulate the burgeoning commuter and trade routes between Kuwait City and its satellite towns.

Split into two phases, the first phase required K&A to propose three separate feasibility alternatives.

Options included the potential upgrade of the existing highway, the construction of an elevated highway or a hybrid of the two, and three separate feasibility alternatives for the upgrade of 22 existing interchanges.

Ultimately, K&A opted for the construction of an elevated road over the existing Route 30 on a multi-span, 38-kilometer viaduct, but this also brought several challenges.

First challenge was to produce the complete feasibility study in a relatively tight schedule, which would require a highly collaborative process between the Beirut, Kuwait and Egypt-based engineering departments, covering aspects on roads & highways, survey, traffic, storm water and drainage, dry and wet

utilities, structure, architecture and geotechnical aspects.

Second challenge was to deliver the project without disrupting movement on nearby infrastructures such as the city's metro line and the existing utilities, bridges and pedestrian bridges as the location of the highway was in the center of a populated urban environment.

THE SOLUTION

FASTER APPROVALS & SIMPLICITY IN A COMPLEX ENVIRONMENT

K&A's team used InfraWorks, Civil 3D, 3DS Max and BIM 360, during the feasibility study and concept design phase, to provide the client with the three best alternatives that would deliver the project on time and budget. With support of InfraWorks' capacity to handle large volumes of data, it became a highly useful tool for all stakeholders to utilize it as a consolidated source, leading to a more cohesive integration between departments, and providing real time access to all necessary parties. As a project that relied on multi-regional data visualization and regular updates from various stakeholder offices, BIM 360 was essential for syncing and sharing models across all disciplines and enabling real-time coordination.

In terms of overcoming the multiple design challenges, InfraWorks enabled the production of highly accurate



3D models for each of the proposed alternatives, which allowed the client to visualize the expressway more clearly and make faster decisions at an earlier stage. Supporting the design work within an already congested urban environment, Civil 3D ensured that any design conflicts with existing public services or utilities could be identified and amended at the earliest opportunity. It also aided in providing a viable, five-level solution for the interchanges which helped to work around the existing traffic while causing minimal disruption to the area's residents and commuters. In leveraging InfraWorks shareability, the client was also able to make comments and

recommend changes inside the program, leading to significant time-savings in the typical back and forth before final review.

THE SUCCESS

ONE STEP CLOSER TO VISION 2035

From a high level, BIM 360 not only played a significant role in the smooth collaboration between project stakeholders but also optimized project workflows to yield significant savings, particularly in the design stage where the development of 3D conceptual and schematic designs were reduced by 25% and the coordination and approvals between the multi-disciplinary teams saw a reduction of 18%.

From a macroeconomic perspective, the overall solution provided by K&A with the support of Autodesk, will ultimately lead to improved highway safety, mobility, and quality of life for Kuwaitis.

Final challenge was that the team would need to secure the necessary approvals and constantly collaborate with more than ten key stakeholders and authorities, including the Kuwait Municipality, Ministry of Public Works, Ministry of Finance and Ministry of Electricity and Water Works amongst others. ■



KHATIB & ALAMI PARTICIPATES AT THE WETEX 2021 EXHIBITION A PROUD GOLD SPONSOR OF AN INNOVATIVE FLAGSHIP EVENT

As a significant participant in the smart energy community, Khatib & Alami (K&A) took part in the WETEX 2021 exhibition, which focused on energy, water conservation, saving natural resources and building a sustainable environment.

This flagship event, organized by Dubai Electricity & Water Authority - DEWA, provided us with the opportunity to show our understanding of how these sectors are fast developing.

“Participating in this event gave us the opportunity to learn more about the sustainable and innovative technology that’s propelling utilities and energy companies forward,” said Walid Abou Chacra, Digital Energy Manager. “We have also provided a seminar highlighting K&A’s efforts to help the utilities industry enhance performance and efficiency.”



According to Water Treatment Senior Manager, Maher Kahil, this event has helped us to learn more about advanced water treatment technologies and share our in-depth experience

in design and supervision of infrastructure projects. “It was very valuable to network with clients and partners, and to share our thoughts on the sector,” Maher explained. ■

SAUDI ARABIA’S NATIONAL HEALTH EMERGENCY OPERATIONS CENTER ACHIEVES A NEW MILESTONE IN HEALTH AND DISASTER MANAGEMENT

The World Health Organization (WHO) has designated the National Health Emergency Operations Centre (NHEOC) as its first accredited collaborating centre in the Eastern Mediterranean Region.

The accreditation recognizes the centre’s contribution to the growth of national and regional capabilities. Since its completion two years ago, the NHEOC has established a highly effective emergency health management system in the Kingdom of Saudi Arabia, playing a crucial part in the nation’s response to the Covid-19 crisis.

In so doing, NHEOC contributes to the Saudi Ministry of Health’s efforts to realize the



Saudi Vision 2030, especially Goal 3: reducing health risks. “Congratulations to the Ministry of Health for this new milestone.

We are pleased to have supported our client to deliver this critical project which will bring significant improvements to the public health and safety,” said Manal el Sayed, Geospatial Systems Integration Senior Director.

The project’s customized WebEOC-empowered solution, combined with other technologies such as geospatial technology, provides a reliable and efficient central data collection platform.

Moreover, the NHEOC was able to assist other Ministry of Health (MoH) functions, including the national vaccination registry and the national ambulance services operations centre. ■

SUPPORTING SUSTAINABLE DEVELOPMENT IN UPPER EGYPT

Upper Egypt is a strategic region for the Egyptian Government but faces various challenges in economic growth, employment generation, connectivity, service delivery access, and government capacities.

As a result, Khatib & Alami (K&A) has been appointed to a project for the development of GIS infrastructure as part of the Upper Egypt Local Development Program (UELDP), an initiative of the Egyptian Government in the region.

The program, co-financed by the World Bank, intends to promote sustainable local development, create new job opportunities, and raise incomes in Upper Egypt’s governorates of Qena and Sohag.

Commenting on this project, Dr Mohamed Misbah, GSI director for the Middle East and Africa region at K&A, said: “This is a strategically

important project, which will play a vital role in driving sustainable, impactful urban planning and development to support communities in Upper Egypt.” GIS tools will collect the vast amounts of data required to balance competing priorities, help decision-makers solve complex challenges, and identify opportunities to support healthy, growing

communities. GIS will also lay the foundations for asset management systems at the governorate level, integrating them with databases in relevant ministries and central-level government agencies to present statistical and spatial information on a platform that promotes long-term decision-making. ■



EGYPT’S LIGHT RAIL TRANSIT (LRT) IS NEARING COMPLETION



Egypt’s Light Rail Transit (LRT), which will connect Al-Salam, the New Administrative Capital, and the 10th of Ramadan, is close to completion, with construction and finishing works of the first two phases 95% completed.

K&A is responsible for the design review and construction supervision of the LRT as the project’s lead consultant for construction supervision. This trailblazing project is aligned with initiatives by Egypt’s National Authority for Tunnels

(Ministry of Transport) aimed at establishing a more integrated and sustainable transportation system linking metro, railways, monorail, Light Rail Transit, and high-speed rail. For example, at the Adly Mansour interchange station, commuters will be able to switch between five different modes of transport.

During peak hours, the LRT will have a single direction transmission capacity of more than 30,000 people per hour. Its strategic location allows the residents of industrial, residential and city center areas to reach their desired destination within 1 hour. ■

K&A ACHIEVES INTERNATIONAL BIM STANDARDS RECOGNITION

Having gained the BSI BIM Level 2 in 2019, we're delighted to have now attained the next level across all of our design centres.

Khatib & Alami (K&A) has been recognized for its international BIM standards after achieving the globally recognized certification from the British Standards Institution (BSI).

After a company-wide assessment of the firm's projects by the BSI, including client satisfaction and collaborative engagement with the delivery team, K&A can use the BSI Kitemark for achieving BIM for design, construction and commissioning following ISO 19650-1 and ISO 19650-2.

The ISO 19650 standards provide a structured process to support BIM implementation on projects, creating a



common approach that improves collaboration and understanding among the design team while improving cost and time efficiency.

Sam Faekk, BIM Manager at K&A, says: "Having a consistent set of internationally recognized standards adds enormous value for design teams, especially

with large-scale projects which frequently involve multinational teams working from different office locations. "It represents an important step within our wider digitalization strategy, which is ultimately aimed at driving continuous improvement in all aspects of our work for clients and end-users." ■

A DOUBLE ACHIEVEMENT: NEW HEALTH AND SAFETY MILESTONES A TOTAL OF 46 MILLIONS MAN-HOURS WITHOUT LTI AT TWO FIRST-CLASS PROJECTS

Khatib & Alami (K&A) was proud to collaborate with Emaar, Majid Al Futtaim and all involved stakeholders in reaching 46 million man-hours without LTI across two first class projects in UAE.

THE ADDRESS RESIDENCES DUBAI OPERA:

A Prime Residential Project

K&A worked actively with its client Emaar, contractor TAV Construction, and all involved parties in reaching the sensational health and safety milestone of 30 million man-hours without LTI at Emaar A Plots - Opera District.

The delivery at Emaar A Plots is an outstanding indication of teamwork towards achieving best safety practice.

TAV's commitment to occupational health and safety



also included securing Covid-19 vaccines for all the project staff.

AL ZAHIA CITY CENTER:

A Stunning new Leisure and Entertainment Destination

We were delighted to mark the opening of Majid Al Futtaim City Centre Al Zahia mall in Sharjah by awarding the contractor, the Consolidated Contractors International Company (CCC), a trophy in recognition of

more than 16 million man-hours without LTI. This accomplishment comes from the commitment of all involved parties to workplace safety, which includes the adoption of stringent safety standards, procedures and systems. ■



K&A TO GEO-ENABLE ERES REAL ESTATE SOLUTION ON ESRI ARCGIS PLATFORM



Khatib & Alami (K&A) is assisting Emirates Real Estate Solutions (ERES) by geo-enabling its services and offerings to the international land development and real estate market.

Harnessing the real-time capabilities of Esri's ArcGIS platform, our geospatial experts are helping investors and regulators gain greater insights on valuable locations, sales assessments, and rent indexes by using contextual tools to visualize and analyze data.

"We are pleased to collaborate with Esri and ERES in this

vital initiative, which provides stakeholders in the UAE's real estate industry with innovative IT solutions, adding more efficiency and transparency to the marketplace," said Faisal Alami, K&A Executive Vice President.

"Our vast experience as a leading geospatial systems integrator will help us bring new levels of visibility and understanding for real estate investors, which will support their decision-making and ultimately drive confidence and growth in the sector." Khalifa Al Suwaidi, ERES CEO and

board member, added: "ERES is pleased to have inked this agreement with Esri and K&A, both of whom are prime leaders in cadastre solutions and the land survey domain."

By incorporating Esri's capabilities for field collection, spatial analytics, and mapping into its infrastructure and solutions, ERES will enable investors and regulators to establish equitable valuation and property taxation through embedded dashboards and maps that provide an instant view of the real estate development market. ■

AMIRA ELSAIED NAMED A 40 UNDER 40: CHAMPION OF CONSTRUCTION 2021



Amira ElSaeed, a Cairo-based architect who is playing a key role in advancing technology and innovation in design at K&A, has been recognized by Autodesk as one of its "40 under 40: Champions of Construction 2021".

Amira is one of just two Middle Eastern nominees on this prestigious list which is revealed by Autodesk every year to celebrate those who

have demonstrated their ability to inspire, educate and advance the industry.

Amira's exceptional BIM skills and her forward-thinking nature leadership were highlighted by Autodesk for helping to deliver superior outcomes for K&A's clients. ■

We hope you enjoyed reading this issue of Inside K&A. The aim of the magazine is to provide a brief insight into our work, people, markets and ideas, drawing on our diverse skills and expertise across the built environment sector.

Our multidisciplinary services span a wide spectrum of industry sectors, including: architecture; city and regional planning; transportation; water and environment; geotechnical and heavy civil; power and renewables; oil and gas; program management services; and geospatial systems integration.

If you would like to find out more information about anything you have read in Inside K&A, or to be put in touch with one of our experts, please email us at marketingandcommunications@khatibalami.com



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