DokaXpress

The formwork magazine Issue 2021

Scan to learn more

Doka's shareholding in the American scaffolding manufacturer AT-PAC creates a strong global unit that combines international sales strength with decade-long know-how in scaffolding.

2021

Content

To our clients and colleagues,

It gives me great pleasure to write the introduction for this year's Doka Xpress and to share some highlights of the past twelve months, as well as some thoughts on the year ahead.

Having transferred from my role as Managing Director, Deutsche Doka, and as the previous Managing Director of Doka Qatar, the Middle East & Africa is certainly a different climate in every sense of the word. While I may be trading a European winter for warmer weather in the Arabian Gulf, there is no escape from the effects we have shared as an industry as a result of the COVID-19 pandemic. That being said, thanks to the fast and decisive actions taken by our senior management, Doka is well-equipped to continue its role as an industry leader, while also being a key proponent for delivering faster, safer, more cost-effective outcomes thanks to its continued investment in innovative products and systems. In addition, through the hard work and professionalism of our highly skilled and experienced teams, we continue to be a respected partner across the region with an excellent track record of delivery and support from feasibility to handover.

There is no doubt that 2020 has been a tough year, however, through the ongoing commitment of our teams and clients, we are well-positioned to take on the challenges of 2021 with a renewed strength and tenacity, which will allow us to get back to the business of building a brighter and more sustainable future.

Sincerely,

Ralf Bürger
Director Region, Middle East & Africa
Doka Group

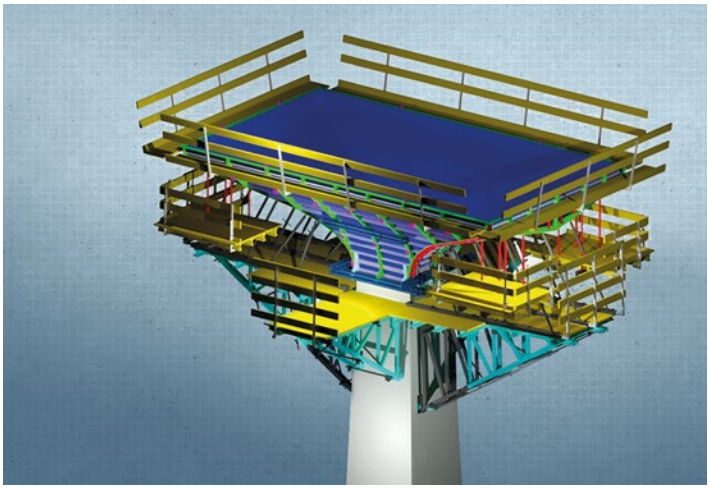
Imprint: Doka Xpress is a publication of Doka. Publisher: Doka GmbH, Josef Umdasch Platz 1, A 3300 Amstetten, Austria. Layout design: COMO GmbH, Linz.
In some cases the site photos show the situation during formwork assembly and are therefore not always complete from the point of view of safety.

Picture Perfect

3D modelling is just an example of how Doka is capitalising on its investment in technology. By using design and planning tools such as BIM, teams are not only able to accurately visualise projects in greater detail, but ensure greater accuracy in the planning stages helping to save time and money.

3D Planning

Find out how we're leveraging technology to improve our processes, while simultaneously providing virtual training for site teams and assembly crews. Visit **www.doka.com/bim** and experience the power of 3D designs for the Cantilever Forming Traveler today. ▪



DokaCAD for Revit

As part of our commitment towards leveraging the most advanced technology in our engineering processes, we are pleased to announce that our latest version of DokaCAD for Revit, with extended features is now available as part of a free update and forges a central part of our Doka Formwork Design Software (DFDS). New features include support for Revit 2020 & 2021, as well as Load Bearing Tower (Staxo 100, Staxo 40, D3, 10k). Visit **doka.com/dfds** to download the software today. ▪

News flash

Doka AR-VR app: This edition of the Xpress is supported by the AR-VR app. Download for free and maximise your experience by fully unlocking our interactive experiences including images, videos and 3D models.

AR Marker Symbol: Use the AR markers to find even more content. Open the AR-VR app on your smartphone or tablet device, scan the image and fully experience the latest developments of Doka MEA!

issuu App: Doka Xpress – everywhere and at any time ready-on-hand on your smartphone or tablet device. With the issuu app, you can access all our Doka Xpress editions from anywhere in the world. To access our current edition, please visit **www.doka.com/xpress.**

PROJECT

1
2

Çanakkale Continued

Since delivering an engineering solution for the monumental Çanakkale 1915 Bridge, Doka Turkey has continued its work on this record-breaking project as it takes another step towards its scheduled completion, in time for the country's centennial in 2023.

Located approximately 200 kilometres to the west south west of Istanbul is a stretch of water known as the Dardanelles, a 50 kilometres channel that separates continental Europe and Asia and a strategic passage providing access from the Aegean to the Black Sea, via the Sea of Marmara.

In honour of the nearby city of Çanakkale, which served as the location for a decisive battle between naval forces in March of 1915, the Çanakkale 1915 Bridge was conceived as a major feat of engineering, not only to honour the country's national heritage, but also to serve its people in the future. Stretching 3,563 metres, the bridge was purpose-built to reflect various dates of significance, such as the 1,923-metre main span reflecting the republic's foundation, while simultaneously becoming the centre piece of the $2.8 billion Kınalı-Balıkesir Motorway, which will connect the O-3 and O-6 motorways on the European side to the O-5 motorway in Asia, thereby aiding both trade and commuter traffic.

Having delivered its solution for the bridge between 2018 – 2019, Doka Turkey was called upon once again to continue its work on this extensive corridor across Turkey's western region, this time as a partner on the V01, V06 and V08 viaducts located in Malkara Gallipoli and Lapseki. With a clear brief from the client, Doka Turkey conceived an optimal solution within the scope of time available to deliver a formwork solution to cover the anchorage blocks, approach viaducts and the viaducts themselves.

1 A landscape view of the viaduct which cuts across the Gallipoli Peninsula in south-western Turkey.

2 Ongoing works at the Çanakkale Viaduct, which will provide a valuable commuting route across The Dardanelles upon completion.

3 Cassion part of the project providing a foundation for pier legs in the sea.

3

Measuring 147,750m³ of concrete with 18,400 tons of iron reinforcement, the anchorage blocks required a formwork solution of 27,200m², which was achieved using Frami Xlife, Large Area Formwork Top 50, Load Bearing Tower D2 and scaffolding, equipped with working platforms and stair towers.

For the approach viaducts and viaducts, a 'push and slide' method was used by incorporating two separate, prefabricated bridge moulds of 38 metres, with a total area of 3,500m². As one of the key features, a specially designed, 25 metre edge mould trolley system was created to complete the bridge segment casting without the requirement of scaffolding. In order to save time, the system was fixed to a 500-metre rail resulting in faster progress, without sacrificing safety. Thanks to a highly accurate design provided by Doka Turkey's engineering team, the system worked perfectly and delivered a flawless result within the time allocated.

With occupational safety and security remaining a top priority, the Doka Turkey team used a combination of scaffolding, equipped with pier working platforms and stair towers to provide easy and secure access and an MF240 Climbing System to make fast and effective progress. Large Area Formwork Top 50 was used in combination with Load Bearing Tower D2 to ensure a consistent workflow, while keeping the project on budget.

Commenting on the project, Doka Turkey managing director, Ender Özatay said, "The client had many concerns regarding the project, in particular ensuring that it remained on time and on budget. Thanks to the precision elements used, they were very happy to see that no corrections or amendments were required. Scaffolding also made a highly valued contribution by requiring a minimal team to assemble without further levelling, nor the time-consuming screw-joints associated with traditional scaffolding. As a legacy project, I am proud of the team's contribution towards this feat of engineering and look forward to its completion in just two years from now." ▪

Facts

147,750m³ - the volume of concrete required to complete the bridge

18,400 tons - the weight of the iron reinforcement

27,200m² - the total area of formwork required to complete the proposed solution

3,500m² - the total area of the prefabricated bridge moulds

25 metres - the length of the edge mould trolley system

500 metres - the length of the rail on which the edge mould trolley system was mounted

« Doka provided us with a high-level of support between construction sites; something that was particularly useful when addressing some of the unique and complex challenges involved. »

Yurtsever Arslan
Deputy Production Manager,
FREYSAŞ FREYSSİNET YAPI SİSTEMLERİ SAN. A.Ş.

PROJECT

Photo: CCC - HAC

The four towers of the New Alamein City project in Northern Egypt are tipped to become an attractive draw for international tourism.

Rooms with a view

Nestled on the Mediterranean coast, the New Alamein City will represent a new dawn for Egypt's international tourism, local residences and archaeological communities.

Covering over 50,000 acres and stretching 60 kilometres into the desert, New Alamein has been dubbed a fourth-generation city. Designed to provide three key functions, namely tourism along the Mediterranean Sea, residences for the local population towards the Alexandria-Matrouh International Road and an archaeological site near the Alamein Cemetery, the new city will eventually have capacity for up to three million residents.

Working under the joint venture of HAC – CCC, Doka Egypt was contracted to provide a comprehensive formwork solution for the first four towers to be erected, known as the Coastal Towers LD00. The solution, which included complete design and shop material as well as a team of formwork instructors for the first six months, commenced in June 2018 and ended up using a mixture of new and reconditioned systems that were originally used over a decade ago. While there were some missing spare parts, the client was pleased to see the systems still worked with 100% efficiency.

Reaching 33, 29, 30 and 26 floors respectively, the solution required large volumes of formwork including 14,500m^2 of Dokaflex 20, 611 linear metres of Protection Screen Xclimb 60, 69 sets of Large-area formwork Top 50 for columns, 2,650m^2 of Large-area formwork Top 50 for the core walls and 550m^2 of Framed formwork Frami Xlife.

The client was highly satisfied with the work and particularly that the old stock worked so well. Speaking on behalf of Doka Egypt, managing director Mohamed Aiesh said, "Having worked with the client before, we were pleased to reunite on this project, particularly one which will provide so much benefit for Egypt's socioeconomic development. While the project is still in progress we anticipate handing over our part of the project shortly, with the first residences being scheduled for handover in the next year." ▪

« From the moment we started receiving material, Doka Egypt's team provided first class technical and logistical support at site - no wonder Doka is the number one choice in the scaffolding and formwork market. »

Eng. Mahmoud Shaltout and **Eng. Khaled Rashad**, Project Managers, HAC/CCC JV

« Having worked with the client before, we were pleased to reunite on this project, particularly one which will provide so much benefit for Egypt's socioeconomic development. »

Mohamed Aiesh,
Managing Director, Doka Egypt

Police Academy x2

Doka Muscat gets to work with the long arm of the law on these two separate projects in Oman

Located approximately 140 kilometres south-west of Muscat lies Nizwa, one of Oman's oldest cities. Thanks to its position at the foot of the Western Hajar Mountains and subsequent access to fresh water, Nizwa developed an agricultural community famed for its dates and soon became a strategic crossroads between the coast and the interior of the country. Once described by Ibn Battuta as, "a city at the foot of a mountain, enveloped by orchards and streams, and with fine bazaars and splendid clean mosques", today, it has become a popular destination for tourism and has diversified its offering to include several colleges and the country's only non-profit university; University of Nizwa.

In line with any expanding community, there is always a requirement to develop the capacity of its civil service, in this case on behalf of the Royal Oman Police. Working with main contractor Saif Salim Essa Al Harasi & Co and architectural firm Espace Engineering Consultants, Doka Muscat was awarded the contract to provide a formwork solution for 'Package C', which included cadets accommodation, recreation facilities including kitchen and dining facilities, a sports complex and a mosque. Covering an area of 40,000m² with a slab height of five metres, the team used a combination of Framed formwork Frami Xlife and Dokaflex for the columns and walls, which worked very effectively. The two primary challenges were to ensure the correct training and execution of the formwork design while keeping the project on schedule so as to avoid unnecessary rental costs for the slab formwork. As a G and G+1 project, safety risks were kept to a minimum and having started the project in November 2018, it is now almost complete.

During work on this project, Doka Muscat successfully won the bid to provide formwork services for another section of 'Package C', the Officers Training Institute. Working with the same contractor and architect, this section of the project commenced in April 2019. As a single-storey project covering 29,000m² with a slightly higher slab at 5.5 metres, it employed an almost identical solution to the academy, with swift progress being made possible thanks to the services and timely planning of the materials on site. Speaking on behalf of Doka Muscat, Chris Jardine, managing director said, "We've been very fortunate to work across Oman on a variety of projects but certainly working in Nizwa makes you appreciate the spectacular scenery. It makes a change from our usual environments that are typically urban or industrial." ▪

Jayashankar S.
Project Manager, Saif Salim Essa AL Harasi & Co. LLC
Project: Package – C,
Police Academy at Nizwa

We have chosen Doka as our main formwork supplier due to its high quality products and durability, excellent services and robust technical solutions.

Site teams outside the newly built facilities designed for the Royal Oman Police.

PROJECTS

Self-climbing in Baku

When North West Construction LLC started looking for a professional formwork solution for its prestigious Port Baku Residence Project, they chose Doka based on its considerable experience in country and its reputation for finding solutions to difficult challenges; in this case, battling the elements.

Located on the edge of the Caspian Sea, the Azerbaijani capital of Baku is an extraordinary city for several reasons. Firstly, it rests at 28 metres below sea level making it the lowest lying national capital in the world. Secondly, due to its location on the southern shore of the Absheron Peninsula, it is susceptible to very harsh winds, hence its nickname, the "City of Winds" – even the etymology of its name comes from the Persian, Bâd-kube, which literally translates as 'wind-pounded city' and while this makes it an enchanting destination for tourism, it represents several challenges when constructing a high-rise, multipurpose building.

In order to maintain progress on the project, Doka opted to use its automatic climbing formwork solution, SKE50 plus. With its modular design concept, this crane-independent system, which includes an all-round enclosure ensured that teams could continue to operate while remaining protected from any inclement weather and thanks to its all-hydraulic equipment, a large number of climbing units could be repositioned at the same time. According to the local experts, the weather made operating a crane only possible approximately three times a month, however with Doka, the project was able to progress at a rate of five floors per month. In addition to the formwork system itself, Doka also provided six months-worth of training to the site team, ensuring they were able to use the equipment both efficiently and safely.

Commenting on the project's progress, Doka Turkey Managing Director, Ender Özatay said, "By using the SKE50 plus system, the project benefitted from a fast operation, which provided total safety for the site teams; in spite of the often-adverse conditions. ▪

Building in the 'City of Winds'

« By using the SKE50 plus system, the project benefitted from a fast operation, which provided total safety for the site teams; in spite of the often-adverse conditions. »

Önder Kaygısız, Construction Manager
PBT-2 Project North West Construction LLC

Climbing formwork 150F and Top 50 played an important role in the timely delivery of Al Adan.

Surgical precision at Al Adan

Adding to the existing facilities, Doka Kuwait has been helping to deliver what will become one of the largest and most advanced hospitals in the Middle East.

Located in the Mahboula-Fahaheel area, Al Adan Hospital was originally constructed in 1981 to meet the healthcare requirements for the estimated 600,000 residents in the Al Ahmadi region. In 2016, the facility was given an extra 20,000m² on which to build a 632-bed extension that would provide an additional 14 floors and 280,000m² for support facilities such as a general surgical unit, same day surgery and hospital administration.

In terms of its design, the main hospital will include a large atrium and feature soft, undulating ribbons on the façades in the form of fixed sunscreens, while the podium level will feature a winter garden designed as a recreational play zone and relaxation space.

Working with main contractor, Sayed Hamid Behbehani & Sons Co, the construction of this $766 million extension included several other buildings such as the Women and Children Hospital, Surgical and Central Services, Physical Therapy and Rehabilitation, Health Region and Administration, Physical Therapy and Rehabilitation, Emergency Car Park and Strategic Stores.

One of the most challenging elements of the overall project was meeting the schedule for the Women and Children Hospital. Based on the contractor's estimates, Doka Kuwait needed to build all twenty-five core walls at the same time. Fortunately, Doka's solution meant the core ended up climbing faster than the slab by several floors meaning the team had to bear in mind the possibility for wind exposure. Using a combination of Climbing formwork 150F and Top 50, the team integrated a wind brace to ensure safe execution. Frami Xlife was used for the columns meaning no plywood was required for the entire project, while the system's 'ready-to-use' design meant work could be completed quickly.

Speaking on behalf of the contractor, Waleed Barakat, project director said, "Thanks to Doka Kuwait's engineering solution, we were able to shorten the construction schedule. In addition, the team on site were very professional at offering support where needed in order to keep the project running smoothly."

At the time of writing, the civil works are scheduled to be completed in Q4 2020 while the final handover is scheduled for 2023. ▪

« Frami Xlife's modular design made it possible to complete works both effectively and efficiently. The modular system is fantastic, as it allowed us to perfectly tailor and adjust the formwork to our requirements on site. Due to this and the many reuses that Frami Xlife guarantees, we could record significant time and cost savings. »

Walid Khalid Mousa Barakat, Sayed Hamid Behbehani & Sons Co

« Thanks to Doka Kuwait's engineering solution, we were able to shorten the construction schedule. In addition, the team on site were very professional at offering support where needed in order to keep the project running smoothly. »

Bashar Dib, Construction manager, Sayed Hamid Behbehani & Sons Co

PROJECT

1

Efficiency Expressway

Innovative design and customised solutions ensured the timely delivery of this commuter corridor.

1 Load-bearing tower d3 played a crucial role in meeting the delivery schedule of the Expressway.

2 Doka's solution meant shoring equipment could be moved to the next bridge in a timely manner.

Stretching from Mina Abdullah Port, approximately fifty kilometres south of the Kuwaiti capital to the city of Al Wafrah just to the north of the Saudi Arabian border, the RA/238 road has been under development since 2016 and is now nearing completion. Working with main contractor Alghanim International, Doka was tasked with delivering a formwork solution for the full four-lane dual expressway whose scope included seven interchanges, storm water drainage, sewers and eight overpasses.

Covering a length of forty kilometres under a tight schedule, Doka was required to find a solution that would keep up with the contractor's timetable while offering excellent value through its high-quality products and innovative formwork designs. After defining the formwork quantities with the contractor, Doka created an optimised shoring design with a high-load capacity, minimising the number of shoring legs and thereby reducing the number of concrete blocks required, as well as the assembly/ dismantling times. The team then designed an innovative custom-made, curved decking area, which circumvented the requirement of forming timbers, again allowing for quicker and easier pre-assembly. In addition to the unique designs, Doka's high-quality galvanised shoring equipment meant the client will be able to continue enjoying the benefits of the system up to three times longer when compared to products made from conventional material.

2

Utilising more than 70,000m^3 of d3 and 10,000m^2 of Top 50, Doka's solution meant that after casting the concrete, the shoring equipment could be removed first in order to start the assembly of the shoring material on the next bridge. The decking units were then lowered using electric winches and the full units were transported to the next bridge before being lifted on top of the already assembled shoring towers.

Safety remained a high priority throughout the project, particularly with IC09 Bridge 3 which had to work around a slope of 6% with live traffic passing underneath it during construction.

Speaking on behalf of the contractor, project director Hassan Hadidi said, "Doka's team were able to provide a solution that fitted perfectly with our construction schedule. In addition, their team was always on hand to provide assistance as necessary while continuing to find optimal solutions as the project progressed." ▪

Kuwaiti mega-bridge opens to the public

Delivered in less than six years, this $3.6bn commuter causeway has been heralded as a major accomplishment for the country's infrastructure targets.

Commissioned by the Ministry of Public Works under the Kuwait National Development Plan 2035, the Sheikh Jaber Al-Ahmad Al-Sabah Causeway is indisputably one of the region's most ambitious infrastructure projects and now after almost six years and a massive consolidated effort from some of the world's top engineering companies, this colossal causeway is now finally completed, and at 48.5 kilometres long, enters the record books as one of the world's longest bridges.

Named in honour of the late Sheikh Jaber Al-Sabah – 13th Emir of Kuwait, to commemorate his contribution towards the country's development, the causeway's primary role was to cut commuting time by around two-thirds for those traveling between the capital in the south and Subiya to the north; the location of the highly anticipated Madinat al-Hareer, or "Silk City", another initiative of the National Development Plan 2035.

Working with main contractor, Hyundai Engineering & Construction Co, Doka Kuwait's primary focus was on the main pylon, which is considered by many to be the most iconic feature of the 36.4 kilometres-long main link. Designed in the shape of a main sail and standing at a height of 150 metres it can be clearly seen from every direction. Given the exposure of the project, Doka Kuwait's team had to come up with a customised solution that could withstand winds of up to 164km/h, while delivering a high-quality finish. By utilising a combination of Top 50 and SKE100 brackets, Doka was able to provide the right solution in order to meet the complex curved shape of the pylon, while ensuring the construction site would be safe from any adverse weather.

Finally delivered, the bridge is formally recognised as one of the longest beam bridges in the world and arguably Kuwait's most ambitious construction feat to date. ▪

Facts

36.4 kilometres - the length of the Sheikh Jaber Al-Ahmad Al-Sabah Causeway's main link

164km/h - the highest wind speed recorded at site

150 metres - the height of the main pylon

The Sheikh Jaber Al-Ahmad Al-Sabah Causeway, featuring the iconic-shaped, central pylon.

PRODUCT

Ringlock

One Scaffold System. Limitless Applications.

Doka now stands for formwork and scaffolding. While much of the construction industry has remained stagnant for the past forty years, some businesses, such as Doka have continued to invest throughout their development in order to provide, faster, more cost-effective and safer products for their clients.

PROVIDING AT-PAC COMPLETE SCAFFOLDING SOLUTIONS

1

Sharing this ethos is AT-PAC, a US-based business with over 25 years of global experience, which has solely focused on developing and enhancing its Ringlock product to meet performance-based demand, while gaining significant experience in the industrial sector, something that was clearly identified by Doka as it sought to capitalise on the synergies of formwork and scaffolding.

Designed as a versatile, high quality performance system, Ringlock provides a reliable solution for today's fast-paced market, where time, efficiency and safety are paramount towards ensuring that business is able to operate effectively, not to mention profitably in the post-COVID economy.

As a modular system, Ringlock is designed with 30% fewer main components when compared to traditional scaffolding, while offering a multifaceted system, for which up to 80% of its components can be used for different applications. Not only do the minimal components mean a reduction of commissioning quantities, it is also 30% lighter per m^3 and 50% faster to assemble when compared to other scaffolding systems, making it easier to handle while enabling a faster turnaround on projects.

Besides Ringlock, Doka is now able to provide a State of the Art Scaffold Management Software, Hi-Vis®. This software is widely compatible with other scaffolding systems, its value as a digital management tool for Ringlock means project managers can monitor real-time scaffolding requests, management processes and up-to-the-minute data on resources, labour and existing material deployed.

Certainly, as the world continues to assess the fastest return to economic stability after the challenges faced in 2020, products such as Ringlock and Hi-Vis® will ultimately support the construction and industrial sectors by providing a clear and transparent way to assess the volume of material used or required; a lean and efficient use of manpower and a safe and practical product that prioritises the welfare of site teams, as well as the sustainability of our environment. ▪

2

3

4

With this strategic partnership we offer much more than just scaffolding. We are now offering, as we have been doing in the formwork sector for decades, well thought-out scaffolding solutions and services for our customers.

Harald Ziebula, CEO Doka

With Doka we have a strong partner in the construction industry. This strategic partnership means that Doka's customers can benefit above all from the fact that they get everything from a single source.

Jeff Davis, CEO, AT-PAC

1 One scaffold system, limitless applications.

2 Thanks to its sturdy build quality, Ringlock can safely reach a height of 80 metres.

3 Fast and easy to use, Ringlock offers a cost-effective scaffolding solution for MEEAP's industrial sector.

4 Thanks to its multi-node connection points, Ringlock offers great versatility for various applications.

5 Hi-Vis' scaffolding management software provides real-time requests and management processes for the entire project.

6 Ringlock is made using hot dip galvanisation on structural components, meaning a safer, more durable product.

5

6

Ringlock References

Limitless Applications.

1

2

Four proven products for the digital age of construction

With increasing pressure for contractors to stay on top of expenses, Doka has been evaluating the performance of its digital products that aid site performance and how they've helped to keep costs to a minimum while increasing accuracy and efficiency for its clients.

If there was a general takeaway from the bauma 2019 construction trade fair, it was that the industry is finally embracing the digital revolution and understanding the extensive cost benefits of leveraging technology to improve accuracy and efficiency. At Doka, its R&D teams were ahead of the game, having spent the previous few years listening to the valuable feedback provided by site teams and clients in order to understand the prevailing industry challenges and how they could be overcome through new devices, products or systems. Having been in the market for over a year, here are just four of Doka's digital products that have been well-received on projects around the world and why they offer such great value.

1. Doka Contakt

Using a proprietary platform and on-site IoT sensors, Doka Contakt provides live data that helps to manage activities and support site optimisation. By supporting managers to coordinate almost all facets of the project from personnel to material, Doka Contakt's sensor system yields performance data that provides valuable, real-time analytics, which supports a proactive decision-making process, allowing site teams to be as agile as possible to changing site conditions. Providing an unparalleled level of transparency, contractors are given the power to improve their workflows based on factual information, thereby helping to maximise cost and efficiency from a centralised platform.

2. Smart Pouring

Similarly, to the app based Contakt, Smart Pouring optimises the entire concrete process, from the initial order to the actual pouring. In providing all the necessary parameters, including compressive strength, exposure class, deliver time, delivery site and placement method, Smart Pouring not only ensures that cast-in-concrete orders are placed accurately, but furthermore delivered to the right formwork location thanks to an integrated Bluetooth

3

4

beacon system. By ensuring that all stakeholders involved in the process from the foreman to the driver are using the app, gapless documentation can be managed automatically, meaning a smoother process with a significantly reduced risk of human error.

3. Remote Instructor

Designed for projects which are either technically challenging, or require the direct support of Doka's experts, Remote Instructor is a video collaboration tool for on-site calls, which enables clients to seek direct support, rather than make potential mistakes and cause unnecessary delays. Remote Instructor is not only compatible with both Android, iOS and Windows, but also in combination with a head-mounted tablet, providing a highly useful, hands-free solution when trying to explain a situation on-site. Equipped with zoom functionality to capture even the most minute details, Remote Instructor's forthcoming updates will include a display capable of 3D models for visual support and working steps discussed, as well as continuous compatibility updates with a wide range of hardware solutions such as HoloLens2.

4. DokaXact

DokaXact is the first interactive sensor-based system used for the accurate positioning of wall formwork elements for vertical structures, such as high-rise concrete cores. In assisting site crews and surveying engineers to find a quick and accurate method of aligning wall formwork for automatic climbing systems, its sensors are wirelessly connected with a central processing unit, which provides real-time data within a margin of just two millimetres, ensuring maximum precision from start to finish. ▪

1 **Contakt:** By collecting and evaluating data to help foremen and site supervisors keep track of performance data, cycle planning can be coordinated much more efficiently.

2 **Smart Pouring:** Optimising the entire in-situ concrete process through a mobile app.

3 **Remote Instructor:** Video collaboration for remote supervision, enabling faster, on site problem solving. Hands-free option available through a head-mounted tablet.

4 **DokaXact** is the first interactive sensor-based system for accurate positioning of wall formwork elements for vertical structures, such as high-rise concrete cores.

PRODUCT

Under pressure

When it comes to Concremote, many project managers and consultants will be quick to mention its ability to shorten cycle times as one of its leading properties, this, however, only becomes a real asset when building multi-storey buildings and high-rises. In this article we take a look at how Concremote can add value to low-rise buildings by sharing data that can ensure the integrity and quality of the building from its early stages.

It's been six years since Concremote first debuted in the Middle East & Africa region, since which time it has become a popular choice for contractors and consultants alike. By accurately measuring the in-situ concrete maturity gradient, users are able to assess the earliest time to commence deshuttering, thereby saving precious hours or even days per cycle, and while this is of great benefit to high-rise construction, it becomes less of an asset when dealing with low rise property.

When considering construction methodology and urban planning, they both typically cater to the demands of the environment, for example in cities such as Dubai, which has seen exponential growth over the past two decades, skyscrapers were developed to provide housing for the burgeoning population in order to maximise its footprint for its estimated 3.33 million residents. Just a few hundred kilometres south, and Oman faces a similar challenge in terms of its 4.6 million, except with a far larger area of land, meaning less of a requirement to build up, but rather build out.

One of the things these two places share in common, at least where construction is concerned are the searing summer temperatures which can exceed 50 degrees in July and August. As any engineer will tell you, concrete matures at different speeds depending on several factors, but most prevalently the mass of the concrete being set, the specific mix being used and the outside temperature.

In the case of large masses of concrete, the central temperature will rise quickly in the early stages due to hydration heat and remain so for some time due to its low thermal conductivity. This, however, can become

Measurement process of Concremote device

By continuously measuring the concrete temperature, information is transmitted wirelessly via 2G, 3G, 4G and Bluetooth BLE where the strength gain is calculated in the Concremote web portal.

problematic in warmer climes as higher external temperatures typically accelerate the early age strength development, however, reduce the long-term strength development by inducing porosity and increased microcracking in the cement paste.

One of Concremote's lesser known benefits is its ability to provide valuable data during the planning stages. Thanks to its calibration system, site teams are able to simulate the strength gain and temperature development for each concrete mix and ready-mix plant in advance, meaning there are more options for selecting a concrete mix based on fast strength development vs. high-cost mixtures, or slow strength development vs low-cost mixtures.

"The effects of temperature early in the life of concrete can strongly influence long-term stability. In general, concrete temperature peaks at 48 hours and remains constant for seven days. The larger the concrete structure, the more heat it will likely generate. Differential temperature, air temperature and concrete mix temperature are all important factors. Monitoring the temperature of concrete during the curing process is a critical factor in making sure the product sets to its full strength and knowing when it is safe to build on.

A great example of this in action was on the Duqm Refinery, a mega project located in the Special Economic Zone of Duqm (SEZAD), about 600 kilometres south of Muscat. As with all major infrastructure projects, ensuring the quality and durability of the concrete structure was essential and by using Concremote to consistently measure the temperature, we were able to avoid issues such as thermal cracking and share the results with the consultant."

According to concrete experts, there are four primary issues when dealing with high concrete temperatures. An increase in the demand of water and therefore cost, an increased chance of shrinkage leading to cracking, decreased concrete strength after 28 days and an increase for potential corrosion of reinforcements.

"Failure to properly monitor the temperature of mass placements during the heat dissipation phase can result in the mass concrete elements being rejected. Rejected concrete elements usually must be removed at the contractor's expense." ▪

Concremote 2.0 enables clients to make decisions based on real-time information, thus improving the utilisation of formwork and the optimisation of concrete mixes.

Ender Özatay,
Managing Director, Doka Turkey

Concremote is the only real-time wireless concrete monitoring and forecasting device for monitoring concrete temperatures for thermal stresses as well as real-time compressive strengths.

Mark Robertson,
Business Development Manager
Digital Service Overseas

PROJECT

Seal of luxury in Lusail

Described as the 'hospitality icon of Qatar,' Katara Towers' crescent design aims to translate the country's national identity into an architectural landmark.

Located at the southern-most point of Qatar's 38km^2 future city of Lusail, the silhouette of Katara Towers post-construction will be unmistakeable. Symbolically intertwined with the country's heritage and its outlook as a destination for luxury travel, the iconic design integrates the traditional scimitar swords from the national seal, delivering two distinctive, symmetrically arched towers rising 36 floors from the podium, reaching a height of 211 metres.

Of course, delivering such an extraordinary structure requires an equally extraordinary formwork solution, which is why main contractor Hamad Bin Khalid Contracting Company (HBK) chose Doka Qatar to deliver on this multi billion-dollar project. Based on the structural design, the biggest immediate challenge was to form the cantilever slabs that were required to change location on each floor, while ensuring the construction timetable could be adhered to.

Another significant challenge of the project was the timely construction of the three core walls in each of the towers. Thanks to Doka's extensive experience in high-rise, it was able to provide the right equipment and expertise for the job offering the most efficient solution possible, in this case, the SKE50 hydraulic climbing system. Having been used with much success on other major projects in the country, HBK management were confident it would meet the tight delivery deadlines without sacrificing quality or safety.

In order to increase the speed of the slab cycle, Doka's Table Lifting System was implemented to move up two levels of Dokaflex tables in the two high-rise towers while Staxo 40 load-bearing towers were used to meet the 6.10 metres floor-to-floor height of the ground floor mezzanine. With typical floor heights starting from the second level, Dokaflex tables were used throughout although had to be transported in smaller sizes to make them as flexible as possible for the design which covers more than 10,000m^2.

Speaking on behalf of the developer, Sheikh Nawaf bin Jassim Al Thani, chairman of Katara Hospitality said upon the launch of the project, "With today's Phase 2 awarding to HBK begins the next phase in Katara Hospitality's journey of developing the hospitality icon of Qatar. Our vision for Katara Towers is to set new standards that go beyond the borders of the hospitality industry and will provide an architectural landmark that is instantly recognised and understood right across the globe."

At the time of writing, Katara Towers is anticipated to be complete by May 2021. ▪

We are pleased to work with Doka on this project as they've developed a reputation in country for being able to deliver formwork solutions that aid the delivery of the overall project. In the case of the SKE50 hydraulic climber and delivering the core walls we're moving faster than anticipated, which is of great help.

Jawan Medinas,
Senior Construction Manager
HBK Contracting Co. WLL

1 The crossed swords of the national seal have been architecturally rendered into twin arched towers that stand elegantly from the podium level, representing the symbiosis of the country's heritage and its outlook as a destination for luxury travel.

2 Teamwork at its best. L-R: Usama Alsaleh (Doka), Zoltan Vergara (Doka), Luis Lopes (HBK), Jawan Medinas (HBK), Hasan Al-Saber (Doka).

Facts

Project Name:
Katara Towers

Location: Lusail City, Qatar

Construction work performed by:
HBK Contracting Co. W.L.L.

Architect: Das Al-Handasah

Developer: Katara Hospitality

Start of Constuction: Sept 2018

Scheduled completion: May 2021

Type of structure: Highrise, Hotel

Height: 211m

Storeys: 36 levels (including podium)

Cycle times:
Tower level 1 to 15: 14 days
Tower level 15 to 36: 8 days

Doka system used: SKE50 self-climbing formwork, 150F climbing formwork, Top 50 large-area formwork, Dokaflex table, d2, d3 and Staxo 40 load-bearing towers, Table lifting system TLS, Universal support block, Safety Net Fan

eCOMMERCE

Doka to expand its trendsetter position in construction site digitisation

Whether Concremote, BIM or E-Commerce, Doka utilises the potential offered by digitisation so that construction companies can design their processes for even greater productivity. In support of the ever growing popularity of B2B e-commerce, the Doka Online Shop has a wider reach than ever before, enabling its clients to gain fast and direct access to its products without having to pick up the phone. Whether you're looking to buy floor props, safety products, formwork beams or multi-ply formwork sheets, our dedicated team members are on hand to support your purchases, no matter where you're located. ▪

Meet the Middle East & Africa Online Shop representatives from across the region

Marlane Obando,
Qatar

Sandra Cruz,
United Arab Emirates

Sedat Noyan,
Turkey

A client from Qatar also shares his experience of having purchased in the Online Shop

Ahmad Rabbo,
Director - Projects,
DRAIEH Contracting WLL

« Doka's Online Shop has made browsing and purchasing formwork components and accessories both simple and easy-to-use, particularly as it's open around the clock. »

ONLINE SHOP

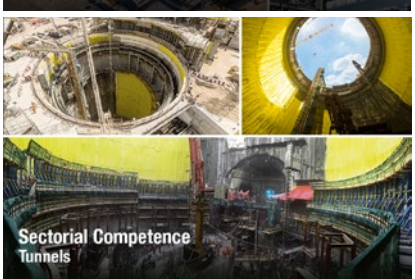
B2B eCommerce is tipped to expand at a CAGR of 17.5% between 2020 - 2027.

Source: ResearchAndMarkets

Doka keeps its audience regularly updated on its sectorial competences

Share, Like and Follow Doka Middle East & Africa on LinkedIn - www.linkedin.com/company/doka-middle-east-africa

Equipped with a global team of highly experienced and qualified engineers, Doka has carved out a reputation as one of the world's forefront experts when it comes to certain areas of construction. Throughout the past year, we've been delighted to share these strengths with our wider LinkedIn audience, in particular when it comes to bridges, tunnels and highrise. Here is a selection of some of our best performing posts over the past year.



Sectorial Competence - Bridges and Vertical Formwork
#FramiXlife is just one example of Doka's sectorial competence when it comes to designing bridge-building systems that are produced to withstand concrete pressure of up to 80kNm^2. #WeAreDoka #Formwork #DokaSolutions #DokaSystems #DokaExpertise

Sectorial Competence - Bridges | Deck & Formwork
Having worked on and delivered some of the world's most unique bridges, Doka has continuously developed its products and systems, such as Large-area #Formwork Top 50, to ensure the fast and safe construction of your project. #CivilEngineering #Engineering #Bridges #Infrastructure #BridgeProkect #BuildingBridges #WeAreDoka

Sectorial Competence - Residential and Commercial
No matter the project, Doka provides an optimised construction process, cost efficiency and a high level of safety across both commercial and residential properties. #Residential #Commercial #Formwork #Engineering

Sectorial Competence - Highrise
#Didyouknow that Doka has successfully worked on more than 1,000 high-rise projects, including the world's tallest building, the #BurjKhalifa? Find out how we're supporting the next generation of super tall structures #WeAreDoka #MiddleEast #Turkey #HighRise

Sectorial Competence - Industrial Sector
The industrial sector has evolved over the past twenty years particularly when it comes to safety specifications and project durations. Doka's #formwok and #scaffolding solutions are custom engineered to suit project-specific requirements. To learn more about how Doka can support upcoming industrial projects, connect with us. #IndustrialSector #Formwork #Scaffolding #RinglockScaffolding #WeAreDoka

Sectorial Competence - Tunnels
From underpasses to metro systems, Doka's extensive experience in delivering complex engineering solutions for tunnel projects around the world has helped to establish itself as one of the leading formwork providers in the sector. Thanks to its highly skilled engineering teams who are able to provide valuable insights, often before the project has even started, Doka provides the flexibility needed in order to make these often complicated projects run smoothly. #Tunneling #Infrastructure #WeAreDoka ▪


doka
Ringlock
One Scaffold System.
Limitless Applications.
Scan me...
...to learn more
about Ringlock!
PROVIDING
ATRAC
COMPLETE SCAFFOLDING SOLUTIONS
www.doka-me.com