

DokaXpress

The Formwork-Magazine Issue 2019

doka

DokaXlight:
The new aluminum
framed formwork

Burrard Place:
Success in highrise building
in Vancouver

Digital Services:
Smart tools making
construction more economic



Largest Commercial Project in Canada

81 Bay St., Toronto, Ontario | 04

Content

- 03 Newflash
- 04 Toronto adds state-of-the-art office space
- 06 Super Climber: Reaching new heights in Winnipeg
- 08 DokaXlight
- 10 One Burrard Place soars high with Xclimb 60
- 12 Timeless architecture in Toronto
- 13 Living on top of the city
- 14 In the digital fast lane
- 16 DokaXact – Forming with pin-point precision
- 18 Safety starts in the mind
- 19 Systematic Safety



Dear customers and colleagues,

As the construction industry continues to be strong in Canada, we are excited to be a part of many new projects in all parts of the country. We want to thank all of our customers who put trust into our team, products and services at Doka.

At Doka, we are confident in doing our part by offering formwork solutions that expedite cycle times, reduce complexity, increase safety and maximize labour efficiencies. The current uprising marketplace is demanding and requires contractors and suppliers to continuously improve products and services. We are excited to feature some of our new developments throughout this magazine.

The Greater City of Toronto (GTA) is expanding in all construction sectors at a rapid pace. We are excited to have the opportunity to be partners in several projects, which are scaling new heights or are challenging in complexity, and design. Toronto is currently ranked #1 in tower crane counts in the world and we are noticing an increased use of Self-Climbing Formwork systems in the country. We can proudly say that Doka has become the No. 1 choice for automated Self-Climbing Formwork systems in the industry. Our Doka Xpress features some of our most recent highrise projects where Doka has supplied more than just formwork, but rather a complete solution.

In addition to our proven formwork solutions that are trusted around the World, we have introduced a new modular Slab Formwork system "Ultradek" to the Canadian market. The new system is designed for maximum versatility and safety. Besides new products, Doka is also focusing on "Digitalization" for the Construction Industry, to help improving quality, productivity, and efficiency on construction projects. Doka will once again exhibit at the Canadian Concrete Expo, where many of our new products and services will be featured and demonstrated.

We look forward to helping you meet your challenges on your current and future projects. ■

Markus Mitterlehner / Gunnar Falke
Managing Directors Doka Canada Ltd./Ltee.

Experience formwork solutions

In February 2019, Doka Canada participated for the first time at the Canadian Concrete Expo, it is the only national trade show for the concrete construction industry. The booth design comprised different interactive stations for visitors. An AR/VR demo was offered at the reception table. At the stripping corner station in the front part of the exhibition stand, staff showed the use of Framax Xlife, Frami Xlife and a hydraulic unit throughout the day. This attracted many customers, who took the special chance to get a demo.

The highlight at the booth was Ultradek. Nearly every middle to large size forming contractor was interested in the new system and requested additional technical information about the system. For us, demos are a good way to support visitors in understanding the concrete construction world of Doka. We'll be back – visit us at the Canadian Concrete Expo 2020! ■



Expand your reality

The Doka Augmented and Virtual Reality App gives you an immersive experience of Doka Formwork Systems.

The app offers a range of different viewing options, thus providing interesting insights into Doka's solutions. The virtual reality view is best experienced in combination with integrated VR glasses on your smartphone or with a VR cardboard. Print the plans available in order to project the models via Augmented Reality on the drawings. You can find the respective plans under www.doka.com/ar-vr.



Newsflash



Doka AR-VR app: This edition of the Xpress is supported by the AR-VR app, meaning you can use our free app to maximise your experience and fully unlock our interactive experience, which includes 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 Canada!



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CIBC Square meets high specifications with Super Climber

Toronto adds state-of-the-art office space

With an unobstructed panoramic view of Lake Ontario and the beautiful downtown Toronto skyline, CIBC Square will soon be part of the Toronto scene. As a multiphase commercial office complex comprised of two towers, it also contains a one-acre elevated park which will connect the two buildings. The first of the two towers being built is 81 Bay Street. This tower will have 49 floors and contain 1.5 million square feet of state-of-the-art offices and collaborative spaces.

CIBC Square will be engineered to LEED Platinum and WELL specifications. This means that it was designed not just for resource efficiency, but also with its users' health, wellness and quality of life in mind. This can be attributed to the high-efficiency energy and water solutions, highly optimized air filtration and ventilation, bicycle storage racks and access to shared green spaces.

The tower is built of steel and concrete with floor-to-ceiling acoustically optimized windows. It is designed with maximum efficiency using open floor plates and state-of-the-art infrastructure. Structform International, the contractor, brought in Doka for this project due to their known reputation for outstanding service and equipment. Additionally, the contractor had confidence in Doka's products.

The building is being constructed using self-climbing gantry suspended core walls that climb 1.6 storeys at a time. The construction of the tower is using a 7.1-meter custom Doka Super Climber SCP self-climbing platform, since CIBC Square requires 6.83-meter lifts for the core walls. With the Super Climber, the entire core formwork is hydraulically raised independently of the crane. During the construction, the cycle time is varied depending on the area. Low-rise uses a 7-day cycle time, mid-rise a 5-day cycle time, and highrise a 4-day cycle time.

Due to the design, it can be difficult to access climbing systems and platforms at some stages, so Doka worked closely with the contractor to find the best solutions for the project.

Tower 1 is scheduled for completion by 2020. ■



« To meet the fast-track timeline, Doka, in partnership with Structform, engineered a climbing formwork solution to complete one-and-a-half floors in one casting step. “It is a unique animal – a system designed to beat the schedule,” Bahou stated, noting that the climber is the first of its kind in the world. »

Leo Bahou, General Superintendent, Structform International Limited

The Challenges

- CIBC Square required 6.83m lifts for the core walls.
- Additionally, it was difficult to access climbing systems and platforms at different stages.

The Solution

- Doka is known for excellent formwork solutions. With their customer-driven service and engineering, Doka and the contractor could work closely together to find the best solutions for the project.
- A 7.1-meter custom Doka Super Climber SCP self-climbing platform was used for the 6.83 meter lifts period.

The Facts

Project Name: CIBC Square

Location: 81 Bay St., Toronto, Ontario

Construction work performed by:
 General Contractor: EllisDon Construction Services Inc.
 Concrete Contractor: Structform International Ltd.

Architect: Design: WilkinsonEyre,
 Architect of Record: Adamson Associates

Developer: Ivanhoe Cambridge, Hines Canada Management Co. ULC

Type of structure: Commercial highrise

Height: Tower I – 780 ft

Storeys: Tower I – 54 floors

Sq. Ft: Tower I – 1.5 million sq. ft.;
 CIBC Square Sq. Ft. Total – 3 million sq. ft.

Construction time: Tower 1 – 2017 - 2020;
 CIBC Square and Elevated Path – 2022 - 2023

Doka systems used: Core: Framed Formwork Framax S Xlife, Large Area Formwork Top 50, Super Climber SCP (self-climbing platform), Xclimb 60, and SKE 100 plus I Reshoring: Doka Superprops I Shoring: Doka Superprops, Eurex props, and Staxo 100



PROJECT

In the city of Winnipeg, a 42 storey condominium building is currently rising to the sky changing the horizon of the downtown area. The 300 Main project is a structural steel building with a concrete core. The core was designed to be built ahead of the structural steel using Super Climber and Frami S Xlife wall formwork.



The Challenges

- This project is a complex structure with changing core geometry and steel/precast members.
- There was limited crane time and lay down area for staging material.
- The concrete core advances ahead of the floor slab.
- The weather was not ideal – cold and windy.

The Solution

- Super Climber allowed the core and placing boom to climb completely automatically – the system used single stroke cylinders (8 in total) to move the core with forms, concrete placing boom, and multiple levels of working platforms up to the next casting step.
- Additionally, an integrated protection screen (Trapezoidal metal sheet) with a 2ⁱⁿ thick insulation foam was used to maintain temperature during winter months.
- A Stair Tower was suspended from the Super Climber for five floors to allow access for workers from the hoist inside the core to the climbing platforms.
- Pre-assembled units were delivered ready-to-go on a site with limited lay down area.
- And, a hydraulic stripping corner was used as it was the fastest way to strip and set a core.

A new skyscraper is transforming Winnipeg's downtown business district.

Super Climber reaching new heights in Winnipeg



« Doka has a good product that offers an economical option for our concrete forming projects, The SCP formwork system was a great fit for our project. »

Kelly Thomasson, Site Superintendent,
Bockstael Construction Ltd.

At the iconic corner of 300 Main Ave. and Graham Ave., the striking 42-storey residential apartment building features a lower portion set aside for retail and office space. The \$165-million environmentally conscious tower pampers its residents with a fitness centre, game rooms, 40th floor sky lounge, outdoor common areas with BBQs, as well as a dog run and pet washing station.

Bockstael Construction had previously worked with Doka and knew that Doka's solutions were the most cost-effective method of completing the type of work being performed. For this project, Doka offered modular systems with preassembled components that minimized the time spent on the initial formwork setup. Additionally, the availability of onsite field service to provide training and certification on Doka systems was a big advantage for the contractor.

300 Main Ave. is a complex structure with changing core geometry and steel/precast members. One of the challenges was the limited crane time and lay down area for staging material. Furthermore, during the build, the concrete core advances ahead of the floor slab.

During construction, Doka's Super Climber allowed the core and placing boom to climb completely automatically. The system used single stroke cylinders to move the core with forms, concrete placing boom, and multiple levels of working platforms up to the next casting step. The Stair Tower was suspended from the Super Climber for five floors to allow access for workers from the hoist inside the core to the climbing platforms.

Construction of 300 Main Ave. began in 2017 and completion is expected in 2020. ■

The Facts

Project Name: 300 Main South Tower

Location: 300 Main Winnipeg, Manitoba

Construction work performed by:

General Contractor: Marwest Construction

Concrete Contractor: Bockstael Construction

Architect: Ray Wan Architects

Developer: Artis Reit

Type of structure: Highrise/ apartments

Height: 564 ft. 8 in.

Storeys: 42 floors

Cycle time: 9 days

Doka systems used:

Core: Super Climber with Frami S Xlife wall

formwork, Shear walls – Frami S Xlife

Reshoring: Eurex floor props

Shoring: Dokaflex S – core floor slabs

Other: Framax Xlife stripping corner

with Hydraulic Unit V4



1

DokaXlight

The new aluminum framed formwork is lightweight and easy to use

DokaXlight is the lightest framed formwork in the Doka product range and, best of all, impresses by combining very low weight with a high degree of durability. One person can handle it without the need for a crane, and the integrated handles make forming operations easier and faster.



3



- 1-2** The universal hand-set DokaXlight can be handled by just one person and without a crane.
- 3-4** Integrated handles make handling much easier and speed up forming operations. A built-in tie-hole protector in the cross profiles ensures a high number of uses.

Whether used in new or existing buildings, at 22.6kg (49,7lbs) per main panel (0.75 m x 1.50 m), the durable DokaXlight is a simple and cost-effective option for concrete components of all shapes and sizes. The DokaXlight can be used by one person alone without the need for a crane, so forming operations can be completed at the same time as other work and resources can be used more productively. With a concrete pressure of up to 50 kN/m² with wall formworks and up to 75 kN/m² with column formworks, the universally deployable hand-set formwork also enables higher pouring rates.

“Because each 0.75 m x 1.50 m main panel weighs just 22.6kg (49,7lbs), the DokaXlight hand-set formwork is easy for my team to use. This allows fast and cost-effective use in many fields of application!” emphasises Ralf Mang, foreman, Spiluttini Bau GmbH.

In addition to its low weight, the integrated handles also make the formwork easier to manipulate, so you can “take it easy” with DokaXlight. From April 2020, integrated element connectors will be available to reduce the time spent searching and fetching on the construction site. Despite its low weight, the framed formwork is extremely durable and can be used in many situations. The stable Xlife panel with its aluminum frame provides the formwork panel with all-round protection and a built-in tie-hole protector in the cross profiles ensure a high number of uses. Sustainability hasn't been forgotten in the DokaXlight: used material can be used to manufacture new products or for thermal energy production.

Successful premiere at bauma

The universal aluminum framed formwork was introduced to the public for the first time at bauma in April. The level of interest was staggering. An eventful and successful presence at the trade fair in Munich resulted in nearly 450 specific customer requests. The ultra-lightweight framed formwork was also used in live product demonstrations by the world champions and runners up in concrete construction work (WorldSkills 2017). Three times a day, they competed against the clock on the Doka campus and bettered their own performance each day – 27 m² DokaXlight were formed in a record time of 06:07:93 minutes.

DokaXlight is currently in use on test sites in France, Canada, Austria and Sweden. ■



PROJECT



The Challenges

- The building has a waffle pattern slab edge and column façade with tapering faces that die into each other. The columns never repeat in the same position as it builds up.
- The client needed a solution that kept everything on plane safely, easily and reliably, but also could be easily repositioned on each floor.

The Solution

- Doka provided hydraulic Xclimb 60 platforms to carry custom column and slab edge formwork.
- The columns never repeat positions, so the formwork was attached to rolling tracks on the MF240 rollback brackets, in order to reposition the columns horizontally for each pour. The column faces are on rollers that reposition underneath a fixed slab edge at the top of the formwork.

Quorum is using a custom Doka Hydraulic Xclimb 60 solution to help form a complex chamfered slab edge and column design where the column locations are random and never repeat.

The new residential structure defines a new neighbourhood

One Burrard Place soars high with Xclimb 60

In Vancouver, British Columbia, a new residential building will rise to cover a full city block. Vancouver is known as a bustling west coast seaport and, is among Canada's densest, most ethnically diverse cities. It's surrounded by mountains, and also has thriving art, theatre and music scenes. One Burrard Place will be the center piece of the city.

Facts

Project Name: Burrard Place

Location: Downtown Vancouver, BC

Construction work performed by:

General Contractor: ITC

Concrete Contractor: The Quorum Group

Architect: IBI/HB Architects

Developer: Reliance Properties and The Jim Pattison Group

Type of structure: Residential Highrise

Height: 551 ft.

Stores: 54

Cycle time: 5 days

Doka systems used: Façade: Xclimb 60

Doka was brought into the project because of previous work with concrete contractor, The Quorum Group, on the Telus Sky project in Calgary. The Quorum Group was also familiar with Doka's Xclimb system, as they had been using a crane lifted windscreen. Additionally, they had an SCP onsite at Telus and were familiar with Doka's hydraulic systems. For this project, The Quorum Group wanted to combine those systems to create an automated solution for the complex set of forming issues for the Burrard Place façade.

IBI/HB Architects designed One Burrard Place with a waffle pattern slab edge and column façade. The tapering faces fade into each other. The architect never repeats columns in the same position as the structure builds upward. To maintain safety, The Quorum Group knew they needed an exceptional solution. It was also necessary to be able to reposition on every floor.

Doka worked with The Quorum Group by providing the hydraulic Xclimb 60 platforms to carry the custom column and slab edge formwork. By using Xclimb 60, it allowed The Quorum Group to build the columns that never repeat positions. The formwork is attached to rolling tracks on the MF240 rollback brackets in order to re-position the columns horizontally for each pour. In this unique solution, the column faces are on rollers that re-position underneath a fixed slab edge at the top of the formwork.

Construction has been proceeding on One Burrard Place. When complete, the structure will be the third tallest residential tower standing in Vancouver, at 54 storeys. The project is scheduled for completion in 2020. ■

PROJECT

Park Avenue and its two towers

Timeless architecture in Toronto

A modern residential space is created in Vaughan. Park Avenue offers not only living space but also great locations for leisure time activities.

Vaughan, Toronto gets a new masterpiece of timeless architectural design created by Graziani & Corazza Architects. Park Avenue is two buildings consisting of state-of-the-art residential space, offering a theatre room, party room with bar and lounge and outdoor terraces. In total, it will offer 568 apartments spread over 23 storeys in Tower I and 20 storeys in Tower II.

Verdi Inc. carried out the construction work. One of the highlights in the building process is the first use of the new slab system Ultradek. This new system was used for parking levels and infill areas on the top floors.

DokaTruss Tables were chosen in order to reach high-speed construction cycles. It offered the possibility to set and strip large slab formwork within a short amount of time. Planned end date is spring 2020. ■



The Facts

Project Name: Park Avenue

Location: 9075 Jane Street, Vaughan, Toronto

Type of structure: Residential, Highrise

Height: Tower I: 205 ft., Height Tower II: 235 ft.

Storeys: Tower I: 20 floors, Tower II: 23 floors

Construction work performed by: Verdi Inc.

Architect: Graziani & Corazza Architects Inc.

Doka systems used: Framax S Xlife, Eurex prop 350, Doka Super Prop Slab – Ultradek, Dokadek 30





Five towers rise above Burnaby's skyline

Living on top of the city

Station Square creates a new place to be in Burnaby, British Columbia. Once complete it will be comprised of five residential towers.

The Facts

Project Name: Station Square Site 5 and 6

Location: Burnaby, British Columbia, Canada

Type of structure: Residential and Retail highrise

Height: 172.20 metres, 52 storeys

Contracting Company: Anthem Properties and Beedie Living

Construction work by: Two Pillars Construction

Architect: KPF (Kohn Pedersen Fox Associates)

Doka systems used: Top 50, Framax/Frami columns, Dokadek 30



It will be the location for retail spaces and city living in highrise condominiums. Anthem Properties and Beedie Living together with Two Pillars Construction realize Station Square Site 5 and 6. KPF architects designed the building. Its glazed façade provides flats, offices and shops with bright light.

Doka won the contract for this site thanks to the already existing relationship and former projects with Two Pillars Construction. This is the fourth tower within this project that has been worked on together. One of the challenges was the tight construction schedule, which was mastered by good planning and the use of effective Doka systems.

The Top 50 formwork can be adapted to suit any requirement. It was used for easy installation of taper ties through huge zones of rebar. The company benefits from Framax and Frami column formwork. These systems reduce commissioning quantities and costs by usage of panels that are already on-site. The floors were built by means of Dokadek 30 that allowed fast work due to its 3m² large panels. While at the same time, Dokaflex allowed flexibility in the infill zones. The cycle time was one storey per week. Construction started in 2018 and the opening for the public is scheduled for 2021. ■



Three smart tools making construction more economic

In the digital fast lane

More efficient. More productive. Working at ever-increasing speeds with no loss of precision. These are the challenges that construction companies face today. At the same time, planning and execution are becoming increasingly complex.

To address these challenges, the construction industry is progressively integrating more digital solutions with the declared goal of implementing lean construction. The nucleus, where all the construction data is stored, is BIM (Building Information Modelling). New digital solutions designed to boost the industry's profitability on the basis of BIM are gradually emerging on the market. These three smart tools developed by Doka in cooperation with its customers illustrate what this can look like in practice.

As the 2019 bauma construction trade fair clearly showed, construction sites are becoming increasingly digital and more and more processes are being automated, from planning and execution to building management. The focus here is not on isolated solutions, but on a holistic network of integrated systems and applications that interact and effectively "communicate" with each other (Internet of Things, or IoT). This allows important but time-consuming and sometimes error-prone processes to be streamlined and simultaneously made more precise and transparent – including documentation.

The solutions must not only be practical, however, but user-friendly and customer-oriented as well. There is no way they will become established and generate real added value unless they are

developed with the everyday working routines in mind, without requiring lengthy technical training. This is why Doka has worked with its customers to develop a wide range of digital solutions designed to tackle the construction industry's most common "gripes" in planning and implementing a project and to help it work more economically.

Contact: Precise daily cycle planning, clear assignment of tasks and target-performance comparisons

How can you ensure that you have the most productive takt planning, team allocation and material disposition during planning and construction? In addition, how to ensure that the best solutions are systematically identified on construction sites and made available to everyone in the company during the construction of similar projects?

New in 2020

- 1 Contact:** Collecting and evaluating data to help foremen and site supervisors keep track of performance data on the construction site, allowing cycle planning to be coordinated much more efficiently.
- 2 Keeping track of the construction yard:** Use the cockpit function of the Yard Management application for a quick overview of the availability and whereabouts of company-owned and rental equipment.
- 3 Smart Pouring:** The entire in-situ concrete process being optimised by a mobile app.



The sensor-supported software solution Kontakt provides direct support during execution on the construction site. With it, foremen and site managers can plan, allocate and compare personnel at the takt level, and draw valuable conclusions from them. Sources for all the actual data to be recorded are a sensor unit attached to the formwork and the construction workers. It communicates independently with the software platform, on which all teams work much more productively. The teams benefit, among other things, from automatic progress reports and early detection of deviations.

Digital yard management with the (upgradeable) myDoka app

Good construction site planning starts with your own building yard: What materials are available and in what condition? What is on which construction sites for how long, i.e. when will which materials be

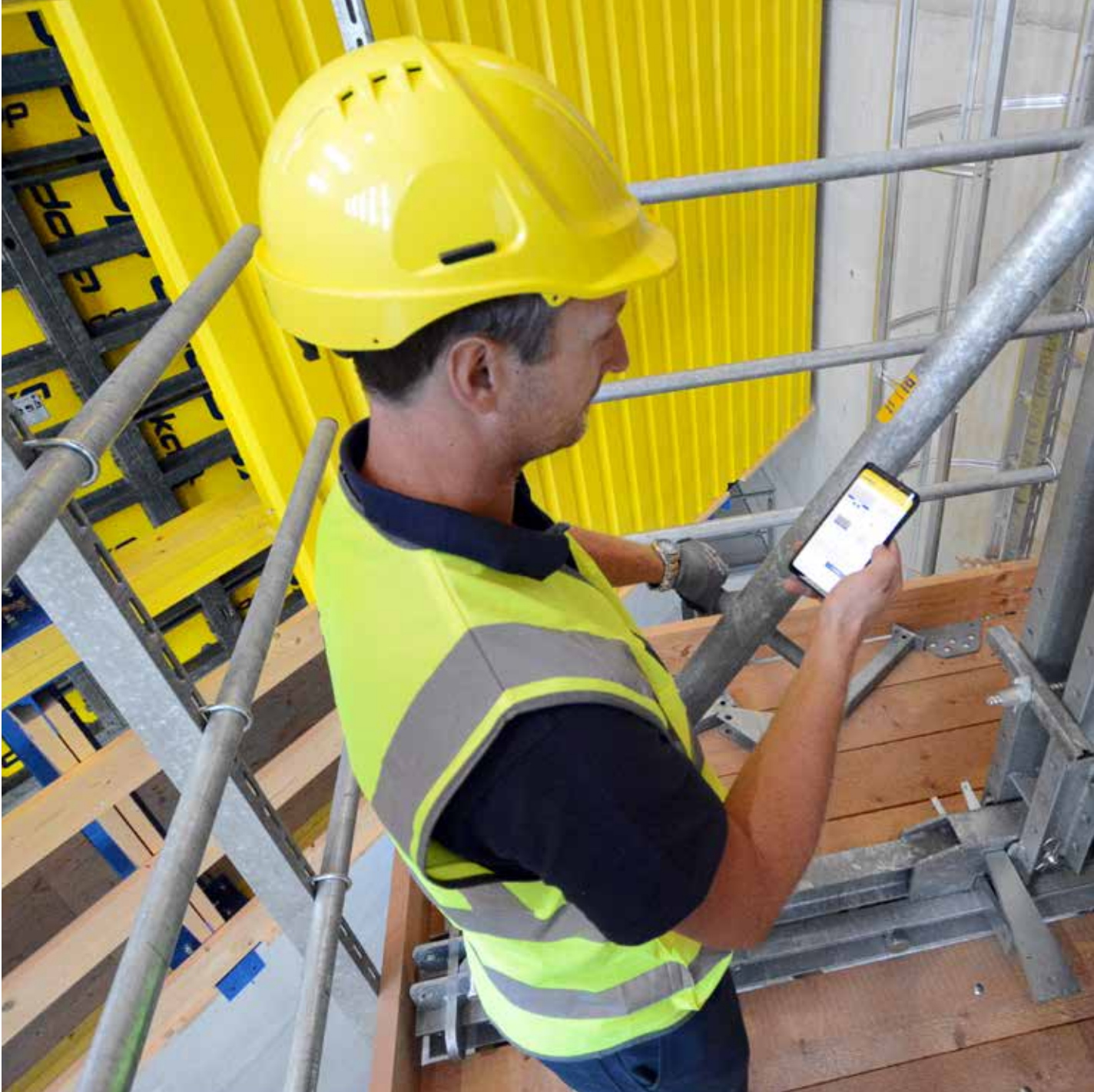
available again? Which materials are owned by the company, which have been rented (and when do they have to be returned)? Construction companies will be able to see and manage all of this via the upgraded myDoka services starting in spring 2020. The basic version (managing the formwork rented from Doka) has been available since 2012, and this web app has now been upgraded to include two versions: myDoka+ can be used to manage both rental and company material, and myDoka top also offers KPI evaluation options for additional formwork optimisation (selection and capacity utilisation). The basic version myDoka is free; both upgrades are subject to a fee. In addition to project, construction site and product management, the platform also offers numerous other features, such as automated links to the online shop or to classic services such as freightage, re-conditioning and storage, which can be selected as modules.

Mix & Match: Smart Pouring ensures that the ordered concrete goes in the right component

As of 2020, a mobile application will also be available to handle and document the entire order and delivery process for in-situ concrete. The idea for this was born from talks with construction companies, which revealed two fundamental problems: ordering by telephone repeatedly leading to misunderstandings and mix-ups sometimes lead to concrete being poured into the wrong component – which is an enormous problem for safety reasons alone. So Doka has developed Smart Pouring, a supplier-independent app that foremen can use to enter the key data for the concrete they need (compressive strength, exposure class, delivery site, etc.) and order it straight away. The supplier receives the order, checks it and sends an order confirmation. The driver receives all the necessary information, including the designated unloading site, as soon as the delivery is due. When the driver arrives at the specified delivery point with the ordered concrete, the team is notified and is ready to accept the order. Further down the process chain, the customer can use a digital comparison system to check whether they were pouring all their concrete into the correct formwork.

All these applications have the goal of streamlining workflows, improving clarity and boosting execution quality. Doka has therefore set up its own Digital Services business unit, which develops and markets solutions for more cost-effective planning, procurement, management and execution: upbeat construction – digital services for higher productivity. ■





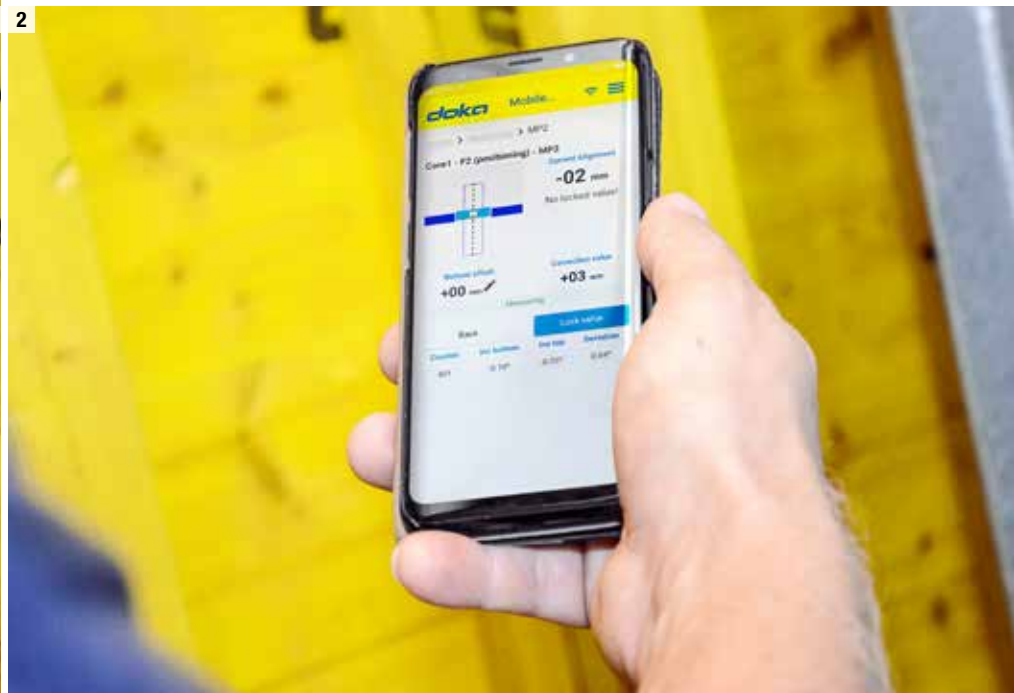
Sensor system for positioning and aligning wall formwork of highrise cores

DokaXact – Forming with pin-point precision



DokaXact is the first interactive sensor-based system for precise positioning of wall formwork elements for highrise cores. With this new product, Doka offers an important component for digitizing construction site processes and in doing so takes an important step toward smart construction sites.

DokaXact is a tool for surveyors and crews, which allow site teams to quickly and precisely plumb and align wall formwork used with core formwork climbing systems. It consists of a wireless centralised processing unit, which communicates with multiple sensors attached to defined surveying points of the wall formwork.



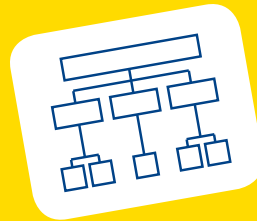
When calculating the required position of formwork elements, the actual known as-built of the preceding casting section serves as the base, then the DokaXact app provides the site crew with instructions during the positioning process so that the formwork is plumbed and aligned with pin-point precision for the next casting section. By accessing the cloud, all stakeholders are able to view and record the live information related to plumbing and alignment, regardless of location.

The live monitoring function can also show how all measuring points in the same formwork section change when individual measuring points are plumbed and aligned. This is not an option when aligning formwork points with traditional sequential methods. The sensor system is accurate down to $\pm 2\text{mm}$, therefore allowing the structure to be

built more easily within the predefined structure tolerances. Time-consuming finishing work and resulting expenses for subsequent trades, such as from lift installers, are reduced.

The system's intuitive operation gives site crews more autonomy when plumbing and aligning formwork of highrise cores. This process yields up to 75% savings in surveying services, as the majority of plumbing work can be undertaken without the need for a surveyor. The surveyor is most typically only required now for the as-built surveying, thus accelerating casting section production and potentially reducing downtime while inspectors attend. Digitising the process of plumbing and aligning the formwork also allows for seamless documentation that can be accessed by defined user groups regardless of time and location. ■

- 1 DokaXact takes an established process and enables the construction companies to form concrete cores with a state-of-the-art technology.
- 2 When using the DokaXact app, formwork can be positioned and aligned for the next casting section with pin-point precision.
- 3 Multiple sensors attached to defined surveying points of the formwork measure redundantly the actual inclination of the formwork and communicate wirelessly with a centralised processing unit.

The **STOP** principle**S**
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Safety starts in the mind

Safety is associated with a high level of responsibility. Compared to other industries, construction sites are certainly among the most dangerous workplaces. However, occupational safety does not start at the construction site rather it starts much earlier.

Construction workers are exposed to high accident and health risks in their daily work, because construction projects grow and are continually changing the work environment. The site crew often has to work under considerable strain, in difficult weather conditions and under major time pressure. In order to avoid dangerous situations in the best possible way and to make construction sites a safe place to work, the appropriate measures must be taken. What this means can be illustrated quite well by the inverted STOP principle.

The **person (P)** is at the centre of all activities. Accidents on construction sites are often caused by behaviour. It is therefore important to know where dangers lie and to make the site crew aware of these dangers. The correct assessment of risks and estimation of consequences are essential skills.

The second aspect involves the **organisation (O)**. The issue of occupational safety must be anchored firmly in the corporate organization, and lived and supported by the entire company. Corresponding guidelines and people who drive the issue forward are critical to success.

The right **technical solutions (T)** are another point. The focus is on protective measures and facilities that make the workplace safe. On the construction site, falls can usually be prevented with the right safety devices, such as railings, protection screens or non-slip surfaces. Choosing the right products and the right safety features is the key. Formwork and safety systems must always comply with the latest standards and regulations, and may only be operated by trained personnel. Products that can no longer be used must be replaced in a timely manner. On the construction sites, Doka supports its customers with ergonomic solutions. For example, ease of use for formwork is of prime importance. Doka systems are designed to save both time and effort. Health is an indispensable prerequisite for performing safe, productive and high-quality work.

With **substitution (S)**, the primary objective is to prevent hazards and risks from arising in the first place. This is where the impact can be felt from regular safety checks and the proper maintenance of products, but above all also training and education. Well-trained employees are the best precaution for ensuring safe construction sites with high productivity.

Doka offers a comprehensive training programme that keeps construction companies up to date with the latest developments in formwork technology, construction-related topics and occupational safety. User information, operating instructions, safety data sheets and application videos, which can be downloaded from www.doka.com, also ensure the correct and safe operation of Doka systems on construction sites. ■

**Did you know ...**

... that you can book Doka Special Training all year round? No matter which topic you choose, the focus on safety is integrated into all our seminars.



www.doka.com/training



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Systematic Safety

Doka understands safety as a holistic concept. Safety starts with product development and extends from safety consulting to a comprehensive range of formwork planning, safety products, and services.

Installation of safety systems at a construction site is often associated with an inhibition threshold due to the additional work required. For this reason, Doka has developed quick and easy-to-operate safety innovations for every type of forming assignment. Many Doka complete systems for slab, wall or column formwork already incorporate safety features such as working platforms with edge protection or access systems. This ensures safety right from the outset.

The Protection screen Xclimb 60 carries out construction work in the top building-levels of high-rise projects in great safety, and protects from the weather. It is a hydraulically climbed system that can also be quickly repositioned by crane if sufficient craneage is available.

The Dokadek 30 panel slab formwork ensures ergonomic, fast and safe forming of slabs. The panels are erected from a safe base, i.e. the construction workers do not have to enter the slab formwork. This en-



sure particularly safe working. The excavation safety device integrated into the Dokadek 30 head prevents elements from falling down accidentally.

The edge protection system XP is the universal safety solution for all edge protection needs. It fits in ideally with Doka systems – such as wall or floor-slab formwork – for safeguarding slab-edges or as fall-arrest barriers on the structure shell.

FreeFalcon is one of the newest products related to safety. It closes the gap in the area of flexible overhead anchor points on construction sites and is the perfect synthesis of safety and freedom of movement. This mobile personal fall-arrest system secures workers where the risk of a fall is most critical. This significantly enhances user safety without sacrificing mobility, helping to minimise the risk of falls from height. ■



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- 1 Doka's safety systems are flexible and easy to use.
- 2 Dokadek 30 panel slab formwork
- 3 Protection screen Xclimb 60
- 4 FreeFalcon
- 5 Edge protection system XP

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