Maximum safety on Italy’s tallest building

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Dear readers;

The global credit crunch has also started to hit the construction industry. For lack of sufficient liquidity, many projects have either been postponed indefinitely or had work on them stopped, or else are being seen through as quickly as possible under intense cost pressure. This all means that the demands being made of contractors are escalating still further.

In tough times like these, construction firms need – more than ever – to be able to count on the reliability and trustworthiness of the partner firms that supply them. Thanks to its sound corporate structure, its comprehensive offerings of efficient formwork solutions and services and its globe-spanning distribution network, the Doka Group stands for stable and lasting business relationships. With attractive rental solutions, value-for-money reconditioning service for your company-owned equipment and interesting purchase/repurchase solutions, Doka has plenty of good ideas to help you with your construction projects in today’s rougher economic climate as well.

In this edition of Doka Xpress, you’ll find more examples of successful site practice, and tips and tricks from professionals who are profiting from the added value generated by Doka formwork technology. I wish you every success – and assure you that Doka will be a reliable partner for you on all your jobsites!

Josef Kurzmann
Executive Director,
Doka Group

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Fast progress at Mondego River Bridge

The bridge is the centrepiece of the new A17 motorway between Marinha Grande and Mira. Doka Portugal delivered the formwork solution for this 675 m long box-girder bridge.

The facts

- **JOBSITE**: Mondego River Bridge
- **LOCATION**: Portugal
- **REQUIREMENTS**: Box-girder bridge, special shaped piers with rippled surface
- **CUSTOMER**: Vilaplano Construções Lda.
- **PRODUCTS IN USE**:
  - Large-area formwork Top 50, Supporting construction frames, MF 240 climbing formwork

The solution

For the special shaped piers with the rippled surface, Doka selected Supporting Construction Frames to create a series of cantilever brackets around the pier. The Supporting Construction Frames have been extensively used for this purpose and are a safe means of supporting the hammerhead without resorting to the traditional method of shoring. They created a base platform for the Top 50 large-area formwork, also providing access for personnel working in this area of the works. The frames were anchored to the piers by two Doka pigtail anchors at 45° and by a horizontal anchor, for easy and safe assembly of the entire system.

Special shape and rippled surface

Owing to the special shape of the piers and to the variations which had to be executed, the chosen solution was to use custom elements of Doka Top 50 large-area formwork and the climbing system MF 240. Designed for concreting steps of 4.9 m, the formwork was assembled with shaped timber sections to form the final geometry of the piers. The rippled surface was achieved by profiled timber formers that had been fixed on the formply.

The special shaped piers are formed with custom-made elements of Doka Top 50 large-area formwork to achieve the rippled surface.
Automatic climbing formwork SKE 50 is in use for the central core. The protection screen Xclimb 60 maximizes safety for the workers operating the slab formwork.
The construction of the “Altra Sede di Regione Lombardia”, the new administrative centre for Lombardy’s regional administration in Milan, Italy, is proceeding at a rapid pace.

The two high-rise towers of the administrative complex will stand 161 metres tall, higher than any other building in the country. Italian contractors “Consorzio Torre” are using Doka formwork technology to execute the forming operations of the building.

The skyscraper, built in reinforced concrete, consists of two intersecting 42-storey towers. The storeys with a footprint of 1000 m² range in their room height between 3.60 m and 7.20 m. Upon completion, the building will set a new record as the tallest building in Italy with an overall height of 161 m.

**Swift forming of the structure core**

4 steps ahead of the slabs, the structure core is being poured in a weekly cycle using 45 Doka SKE 50 automatic climbers and 930 m² of Top 50 large-area formwork. The SKE 50 system is the ideal solution for this job. As early as one day after pouring, the formwork can be jumped to the next pouring section. This crane-independent lifting operation takes only a few hours and offers maximized safety and considerable independence from adverse weather conditions, since the climbing scaffolds always remain connected to the structure.

**Dokamatic tables for complex floor plan**

The slabs of the building are cast in-situ. In order to speed up the workflow and because of the complex floor plan, the Dokamatic table system was chosen. The pre-assembled floor tables are optimized for fast forming operations on large-area projects. The system helps save on both labour and crane-time. Working alone, one man can move up to 12.5 m² of formwork, together with accessories, to the next casting location on the same level. In order to lift the tableforms between storeys without the need for a crane, the contractors have opted for two Doka Table Lifting Systems. The TLS lifts the Dokamatic tables at a speed of 10 m/min. Valuable crane time is saved and can be used for other operations on site, speeding up the entire construction workflow.

**Safety at any height**

To accomplish the slab forming operations under ideal safety conditions and unaffected by bad weather, the lead contractor opted to use the Doka Xclimb 60 protection screen. It provides a total enclosure of the top three levels of the building and can be jumped in large units of 130 m² by a crane or by independent hydraulic units.

**The facts**

**JOBSITE** Altra Sede di Regione Lombardia

**LOCATION** Milan, Italy

**REQUIREMENTS** Italy’s tallest building, Doka formwork systems used for all concrete works

**CUSTOMER** Consorzio Torre

**PRODUCTS IN USE**

- Automatic climbing formwork SKE 50
- Table lifting system TLS
- Protection Screen Xclimb 60

**The solution**

The central cores are climbed in a weekly cycle with Doka SKE 50 automatic climbing formwork. Dokamatic tables are used for the cast-in-situ floor slabs. The tables are lifted from one level to the next by the Table Lifting System TLS. A protection screen Xclimb 60 maximizes safety for the workers operating the slab formwork.

Upon completion, Altra Sede will become Italy’s tallest building with a total height of 161 m.
Varying cross-sections, different widths of cantilever slab and tapering sidewalls together make some very tough demands indeed regarding the adaptability of the formwork solution.

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**The facts**

**JOBSITE**
Bridge over the River Vltava

**LOCATION**
near Prague, Czech Republic

**CUSTOMER**
Skanska DS

**REQUIREMENTS**
Construction of two structures with two different cross-sections and the integration of two access-ramp superstructures

**PRODUCTS IN USE**
Doka cantilever forming traveller, large-area formwork Top 50

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**Crossing the River Vltava in a weekly cycle**

This bridge is one of the most challenging sections on Prague’s new orbital motorway. The two-part bridge deck is characterised by varying geometries, and is being built by Skanska DS.

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**The solution**

With the modularly designed Doka cantilever forming traveller, both the single- and twin-cell decks can be formed and cast with no need for time-consuming, costly modifications. Linking-in the access-ramp superstructure necessitates additional anchor blocks on the inside face of the sidewalks. The Doka “Ready-to-Use” Service crafted exactly fitting anchor-block boxouts and integrated these in the inside formwork.

Whereas the left-hand bridge deck is being constructed with a twin-cell hollow cross-section, the right-hand deck is designed as a single-cell box girder. With the modularly designed Doka cantilever forming traveller, both girders can be formed and cast with no need for time-consuming, costly modifications. This saves Skanska a huge amount of time and enables them to benefit from rapid, efficient construction progress. The advantages of the newly developed tie-rod girder are especially apparent where different deck cross-sections have to be formed: the tie-rods can be freely positioned in a tightly spaced grid anywhere along the entire length of the tie-rod girder, enabling them to be perfectly tailored to the bending moment.

Custom-built anchor-block boxouts for complex pre-stressing
Between the fourth and 13th casting sections, an access-ramp superstructure is built onto the side of each bridge deck with the aid of post-tensioning tendons. Linking-in the access-ramp superstructure in this way necessitates additional anchor blocks on the inside face of the sidewalks. The Doka “Ready-to-Use” Service tackled this construction task by crafting exactly fitting anchor-block boxouts and integrating these in the inside formwork. The fact that the cover-slab anchor blocks are in a different position in each casting section was another challenge which the Doka project technicians solved to the client’s complete satisfaction.
8000 fewer form-tie points

In the Lower Inn Valley in Tyrol, a 1600 m long cut-and-cover tunnel is being formed and poured. Doka supplied two hydraulic tunnel formwork travellers for this job.

The Strabag team has to pour a 20 m long section of tunnel every week. To achieve this, Doka Engineering planned and supplied two hydraulically equipped tunnel formwork travellers assembled from rentable system components.

20 m of tunnel in a weekly cycle

The two CE-marked Doka forming machines are pouring the 1600 m long tunnel in 10 m casting sections using the alternating sequential method. The inside formwork of the traveller comprises Heavy-duty supporting system SL-1 fitted with hydraulically folding elements of Top 50 large-area formwork. Automated workflows are made possible by 8 hydraulic cylinders and 2 hydraulic motors. Setting up and striking the wall formwork elements, lifting and lowering the traveller and then advancing it on rails using flanged wheels – all these steps are performed 100 % automatically.

Reinforced formwork saves on form-ties

To save on form-tie points – and man-hours – the timber-beam formwork elements are of exceptionally rugged design. They use H30 timber formwork beams and WU 16 steel walings in conjunction with the Form-tie system 20.00. For extra-long life, the form-ply around the tie-holes is reinforced with steel discs. Each form-tie point can be subjected to forces up to a maximum of 200 kN. These precautions mean that 50 % fewer form-ties are needed for each linear metre of tunnel formwork. By the end of the 160 casting sections, the site crew will have had 8000 fewer form-tie points to prepare!

The facts

JOBSITE Tunnel H2-2
LOCATION Austria
CUSTOMER Strabag
FORMWORK CONSULTING Tunnels Competence Centre and Doka Inzing (Tyrol) Branch
REQUIREMENTS 1600 m long tunnel in “waterproof tank” quality, with double joint-sealing tapes and membrane sealing
PRODUCTS IN USE Two Doka tunnel-formwork travellers

The professional

“...The Doka tunnel-formwork travellers have been delivering superb results here on my site. We’re making good time-savings and are confident that we can keep to the timetable.”

The solution

The two CE-marked Doka forming machines are pouring the 1600 m long tunnel in 10 m casting sections using the alternating sequential method. The extra-rugged design of the formwork means 8000 fewer form-tie points. The Framax Xlife formwork sheets should still be giving good concreting results after 30 months’ jobsite use.

Doka designed the two formwork-halves as a telescopic three-hinged arch on roller trestles. This enables the outside formwork to be repositioned as a unit and with no need for a crane.
The facts

JOBSITE
Emergency ventilation cavern, Wienerwald Tunnel

LOCATION
near Vienna, Austria

CUSTOMER
JV “Arge Wienerwald Tunnel”

REQUIREMENTS
Construction of a concrete inner shell with many geometrically challenging intersections, transition zones and headings

PRODUCTS IN USE
Doka dam formwork D 15K, Doka supporting construction frames Universal F, Heavy-duty supporting system SL-1, Framax Xlife, Top 50

The solution

A high proportion of rentable components and a high degree of pre-assembly of the formwork equipment, making for efficient construction progress.

Specially tailored formwork elements for the intersections.

Modularly designed formwork saves costs

The widening of the “Westbahn” east-west railway is one of Austria’s biggest current infrastructure projects. The centrepiece of the project is the new twin-tube Wienerwald Tunnel.

With its many geometrically challenging intersections, transition zones and headings, the 35 m long emergency ventilation cavern is one of the most difficult casting sections of the Wienerwald Tunnel. To construct the reinforced-concrete inner shell, the Works Management of the “Arge Wienerwald Tunnel” JV opted for a comprehensive formwork solution from Doka. Alongside the technically convincing formwork concept, the key factors behind this decision were the high proportion of rentable components and the high degree of pre-assembly.

In the first casting step, the site crew are forming the up to 10 m high end-walls using a combination of Doka supporting construction frames and Framax Xlife. Above this, the high-load Doka dam formwork D 15K is in use on the second, 4 m high casting step. Both these systems are fully rentable and are built from pre-assembled system components. “With this formwork solution, we were able to pour the end walls in a safe, fast and cost-effective way”, explains site engineer Robert Uschan.

Dimensionally accurate formwork for complex intersections

The sidewalls were formed with large-area elements of Doka Top 50 formwork on 6 m high Doka supporting construction frames. For the geometrically difficult intersections with the tunnel tubes, the Doka project technicians planned intersection elements which were specially tailored to the complex geometry of the structure. Based on Top 50 formwork, these elements were prefabricated with complete dimensional accuracy by the Doka “Ready-to-Use” Service. A Doka tunnel-formwork traveller is in action for pouring the cavern vault. The traveller is built from rentable standard components of the Heavy-duty supporting system SL-1. Detailed planning of the formwork operations, including verifiable statical calculations, formwork pre-assembly and just-in-time site delivery, round off the extensive spectrum.
The 55-storey Prime Tower offers exclusive apartments with panoramic views out across the sandy beaches of Dubai.

The 227 m tall in-situ concrete core and the punctuated facade are both being built at record speed using the efficient Doka automatic climbing formwork SKE 50. On this project, execution time is the critical factor. What is more, the architect's choice of a punctuated facade constructed in cast-in-place concrete involves much more work and expense in the shell construction phase than would column-supported flat-slab floors with a curtain-wall-type punctuated facade. To make it possible to meet the ambitious timetable of a weekly cycle for each storey, Doka's Dubai Branch worked with main contractors Al Ashram Contracting to design a forming workflow which allows the structure core and the punctuated facade to be climbed separately. In this sequence, the automatic climbing brackets for the punctuated facade, complete with the fitted Doka large-area formwork Top 50, are all “jumped” from one casting section to the next as a single unit.

Nine shafts independently climbed
The 227 m tall in-situ concrete core has a quadratic layout and is being constructed using 49 SKE 50 automatic climbers. The structure core comprises nine shafts that are independent of one another and which are also being “climbed” with SKE 50 automatic climbers. With this comprehensive formwork solution and the meticulously planned forming workflow, the Al Ashram site crew is able to reinforce, form and cast one storey, including the punctuated facade and in-situ concrete core, in only five days.

The solution
49 units SKE 50 in action for casting the central, 227 m tall core. The forming sequence for the punctuated facade is divided into three worksteps. First the slab is cast. Following this, the side elements of the column formwork are folded inwards. The remaining formwork element for the inside of the column is set down on the floor slab, completing and closing the column formwork.
When you unfold your newspaper first thing in the morning, do you dread seeing the latest horror stories from the international business press? No doubt about it, business conditions are very different now from what they were only a few months ago. The world economic crisis has not passed us by either, of course, but nobody ever solved a problem by sitting down and moaning about it. We see crises as opportunities and are looking ahead with realistic optimism! Doka is a rock-solid, well prepared company with highly committed staff, a cost-effective product line and a global distribution network. We have a tightly structured organisation and are confident that together with our customers, we shall make a good job of dealing with the challenges.

What steps have you taken to counteract the effects of the world economic crisis? As in previous years, we are always working very hard on continuously improving our performance and the quality of our relationships with our customers. We have focused our energies and will be enhancing our proximity to the customer and our service offerings still further. We have an even more effective organisational structure, modern technologies and a highly cost-saving product range that gives our customers measurable benefit – more relevant than ever in the present economic climate. This is the basis from which we shall tackle today’s tough challenges.

Doka has a very dense worldwide distribution network. Will you be making any cutbacks in this distribution network in the light of declining construction industry demand? No – quite the opposite! Closeness to the customer has always been a vitally
In its product communication, Doka presents itself with the claim “Safe. Fast. Efficient.”. Just what lies behind these watchwords?

Far from being a hollow cliché, “Safe. Fast. Efficient.” is a byword for high-grade formwork systems that prove their worth on construction sites all over the world, day-in, day-out. We have positioned ourselves as a supplier of innovative formwork solutions that create substantial added value. A good example of this is the combination of Dokamatic tableforms and the Table Lifting System TLS. With it, tableforms can be moved up a floor quickly, safely and independently of the crane. Contractors benefit from a big boost to the efficiency of their forming operations, with freed-up craneage, shorter execution times and lower labour costs.

You have always also emphasised how Doka’s offerings are increasingly characterised by their service content. How much importance attaches to services as compared with formwork sales?

Doka is a full-line supplier for all areas of cast-in-place building construction. In addition to our comprehensive line of formwork products we also offer a package of services that is tailor-made for our customers’ needs. As always, formwork planning is still at the heart of this package. We always try to maximise the added value for our customers by adapting the formwork solutions to the customer’s own value-adding input in a situation-specific way. In the implementation phase, our field service technicians ensure that the site-crew make optimum use of the formwork systems. The Doka “Ready-to-Use” service pre-assembles custom formworks as needed for our customers’ special requirements. After a construction project has finished, our on-site acceptance inspection ensures complete transparency when finalising the rental account.

Construction firms will be paying even more attention to their suppliers’ prices than before. How will you be responding to this expected price sensitivity?

I’m firmly convinced that when you’re investing in new formwork equipment, it’s not enough to look only at the purchase price. This is certainly not the approach our customers take. What counts is a convincing price/performance ratio. With the advanced technologies and systems that we use to produce, develop and distribute our products, we have nothing to fear from any price comparison. Our high manufacturing quality also delivers measurable added value to clients who rent formwork equipment. For example, the maintenance intervals are a lot longer, and fewer costs are incurred for subsequent finishing-work on the concrete. Customers who focus on the total costs when buying or renting formwork equipment go for Doka because they know that we can give them a complete, cost-saving solution for all areas of building construction and civil engineering.

You received a number of awards for your products last year. What product innovations can the construction industry look forward to in the foreseeable future?

With our newly developed Cantilever Forming Traveller, launched in 2008, we made a major developmental leap-forward in the field of cantilevering. And there have also been significant improvements with less “spectacular” products. A good example is the new “Eurex top” floor prop, which distinguishes itself from its predecessor model by its longer service life and much greater ease of handling. Its integral impact protector and reduced dead weight give construction firms measurable additional benefit. We currently have several development projects in the pipeline which will underpin our position as the formwork sector’s innovation leader for years to come. We are working hard on product innovations that will give our customers substantial added value, and thus a substantial competitive edge.

“We are not interested in short-term revenues at any price, but strive for lasting long-term business relationships offering win-win constellations. This is why ‘good-as-our-word’ integrity, fair and transparent pricing and a rigorous focus on solutions are values that take pride-of-place at Doka.”
In the Malaysian City of Putrajaya, two 40-storey government buildings are being erected by Sunway Construction using Doka automatic climbing formwork Xclimb 60 and Dokamatic tables.

A total of 52 Xclimb 60 automatic climbers, with four separate platform levels and around 2000 m² of customised timber-beam formwork elements, are in service as the formwork for the two cores. Once they are anchored in the concrete, the platform units can be “jumped” cranelessly using handy, portable hydraulic units. The vertical profiles are guided up the side of the structure in “guiding shoes” fixed to the wall by suspension cones. This means that the

The facts

JOBSITE Government buildings 4G10 and 4G11
LOCATION Putrajaya, Malaysia
REQUIREMENTS Casting of the central cores and in-situ slabs of two 40-storey-buildings. Only limited crane capacity on site.

CUSTOMER Sunway Construction
PRODUCTS IN USE Automatic climbing formwork Xclimb 60, large-area formwork Top 50, Dokamatic tables and TLS
The solution
All forming operations on the site are independent of the crane. A total of 52 Xclimb 60 automatic climbers, with four separate platform levels and around 2000 m² of customised timber-beam formwork elements, are in service for the two cores. Dokamatic tables are being used to form the slabs, and are vertically bolted to these floor-beam plates. This saves time, as the edge tables can then be shifted from one storey up to the next with the drop-beam formwork still mounted.

Ready for operation right away – portable hydraulic cylinders
In Putrajaya, only one hydraulic unit is needed to operate four hydraulic cylinders plus lifting mechanisms. It only takes 20 minutes to simultaneously migrate two standard platforms to the next casting section, overcoming a typical storey height of 3.90 m. In order to shorten the forming-times even further, Doka also planned extra-large units for repositioning, in addition to the standard platforms. These max. 13.5 m long platform units are based on three climbing brackets, and can be repositioned in one piece.

Whole building formed without needing a crane
The Doka Table Lifting System TLS is also in action here. This means that the floor-slab formwork, too – consisting of large-area Dokamatic tables – can also be moved up to the next floor without needing the crane. For this, the Table Lifting System is mounted to the outside edge of the building, as a climbing unit. The valuable crane time freed up by the TLS is then available for other work, such as lifting in reinforcing steel. This loosens the “crane bottleneck” and greatly speeds up the construction workflow. Around the slab-edges of both buildings, there are great many edge-beams to be cast. This is no problem, as floor-beam plates can easily be bolted into the closely spaced hole-grid of the steel table waling. The drop-beam formwork, in turn, is quickly and safely bolted to these floor-beam plates. This saves time, as the edge tables can then be shifted from one storey up to the next with the drop-beam formwork still mounted.

We are very happy with our decision to invest in Doka systems - Xclimb 60, Top 50 and Doka-matic. Seeing how it works, I am more convinced than ever that Doka is the right system!
Fully rentable system for complex shape

Near Kösten in northern Bavaria stands a unique composite bridge based on a tubular-steel truss – the only bridge of its kind in the whole of Germany.

With a span of nearly 100 m, this bridge carries a district road across a newly built 4-lane wide motorway, with no mid-span support. Doka assisted contractors RAAB by planning and supplying an overslung parallelogram-shaped composite forming carriage.

This steel composite bridge across a 20 m deep motorway cutting comprises a haunched frame structure with two steel trusses on which rests a 10.35 m wide reinforced concrete composite slab.

Rather than a classic falsework solution, the Doka Formwork Experts recommended using a composite forming carriage. Doka composite forming carriages ensure fast, safe casting of concrete deck slabs on the steel superstructure of composite bridges.

Low-cost custom solution from Doka’s modular “construction kit”
Based on a modular design principle, they are assembled from a load-bearing steel construction and formwork elements. This makes it possible to adapt them individually to any deck slab, almost entirely with rentable standard components, saving time and money. The forming carriage was made up entirely of rentable components from the Doka “construction kit”, and so was relatively inexpensive. The only custom components were the junctions between the longitudinal truss and the transverse framework. Roller trestles mounted on roller-trestle bearing supports made it easy to tow the overslung composite forming carriage.

The facts

JOBSITE Composite Bridge near Kösten
LOCATION Germany
CUSTOMER RAAB Bauges.mbH & Co KG
REQUIREMENTS Construction of a four lane bridge with a span of nearly 100 m and no mid-span support
PRODUCTS IN USE Doka composite forming carriage, Top 50 formwork

The solution

Despite being designed with a parallelogram-shaped ground plan, the 13 m long composite forming carriage consists almost entirely of rentable components from Doka’s modular “construction kit”.

▲ The cross-members of the Kösten steel composite bridge run parallel to the motorway, at an angle of approx. 68° to the longitudinal members of the steel truss.
Valuable construction time made up with Doka

To build the technically challenging Twin Palm Towers in Doha, contractors Al Seal opted for automatic climbing technology from Doka and are profiting from smooth, safe forming operations.

The two identical 246 m Twin Palm Towers in the West Bay District of Doha are modelled on the silhouette of a desert palm and characterised by a polygonal layout. Following technical complications with the formwork concept from a local supplier, and severe delays in construction progress, the Al Seal Contracting Company opted for a high-performing self-climbing formwork solution from Doka. Doka’s high technical problem-solving capability, gained from over 250 automatic climbing projects all over the world, and Al Seal’s positive experience with Doka in the building of the Al Seal Residential Tower and the Zig-Zag Twin Tower, were among the key factors behind the award of the contract.

Automatic climbing formwork for complex cross-sections
For the building operations on the two in-situ concrete cores, each comprising 57 typical storeys, 180 Doka SKE 50 automatic climbers are in action. The automatic climbing formwork is designed for maximum flexibility, providing optimum accommodation to the geometrically challenging cross-sections of the two in-situ concrete cores. The automatic climbers are fitted with Doka large-area formwork Top 50, large gangs of which are “jumped” by hydraulic cylinders from one casting section to the next – swiftly, safely and independently of the crane.

Safe working conditions in every stage of construction
The fact that the climbing brackets are always anchored in previously cured concrete, and that the – generously sized – working platforms are railed-in on all sides, means that safe working conditions are guaranteed in every phase of the forming assignment – even in windy conditions. The Site Management also opted for a complete enclosure of the main working platform. As well as making the crew feel much safer, this also reduces to an absolute minimum the hazard potential from dropped tools or rebar.

The solution
The in-situ concrete cores of the identical twin towers are being raised in a five-day cycle using the versatile SKE 50 automatic climbing formwork from Doka. Railed-in working platforms and climbing brackets that are always anchored in the concrete ensure safe forming operations.

The professional
With the SKE 50 automatic climbing formwork, we can carry on forming non-stop. The Doka field service technician showed us how to work efficiently right from the beginning. We can exploit the advantages of the automatic climbing formwork to the full, which is helping us to make up for the delays we had at the start of the project.

Topping out at 246 m and with a facade planned in the shape of a palm tree, the Twin Palm Towers are among the most spectacular high-rise projects currently underway in Doha, Qatar.
The Doka protection screen Xclimb 60 safeguards four storey levels at a time. This ensures the very maximum of workplace safety for the slab-forming operations.
Rapid cycle times and safe slab-forming

Doka offered a comprehensive, safe formwork solution and a convincing all-in-one concept for the St. Paul’s Place development in Sheffield.

The 101 m tall St. Paul’s Place development will add a new landmark to the skyline of Sheffield. Shepherd Construction is the main contractor and Northfield Construction has been contracted to carry out the works on the structure shell. On this project, top priority was given to ensuring short execution times, maximum workplace safety and optimal use of limited craneage. The automatic climbing formwork SKE 50 and Climbing formwork GCS systems score for short forming-times, while the Protection screen Xclimb 60 ensures maximum safety in the slab-forming operations and the Table Lifting System greatly lessens the workload for the crane. “Using these efficient formwork systems from Doka, we’re achieving fast cycle times within an extremely safe working environment” says Northfield’s Managing Director Phil Bryan. The 101 m tall in-situ concrete core is being “climbed” by 24 SKE 50 automatic climbers in 35 casting steps. This allows the site crew to form two casting sections in a weekly cycle.

Protection screen Xclimb 60 for safe slab-forming operations
To ensure maximum workplace safety during the slab-forming operations, the Site Management decided to use the Doka protection screen Xclimb 60 on the broadsides of the building. The protection screen completely encloses three storey levels at a time. In addition, the fourth storey is safeguarded with 2 m high segments. The protection screen is structure-guided at all times and so can still be safely raised even in winds of up to 72 km/h (44 mph). Using hydraulic cylinders, the protection screen is safely “climbed” upward independently of the crane. At St. Paul’s Place, the floor-slab formwork “jumped” swiftly from one storey to the next with no need for the crane at all. The Site Management opted to use the Doka Table Lifting System (TLS), which was integrated in the protection screen. Attached to the outside of the structure, the Table Lifting System means that the crane was no longer needed for hoisting the floor-slab formwork.

The facts

**JOBSITE**
St. Paul’s Place development

**LOCATION**
Sheffield, UK

**CUSTOMER**
Northfield Construction

**REQUIREMENTS**
Top priority was given to ensuring short execution times, maximum workplace safety and optimal use of limited craneage.

**PRODUCT USED**
Automatic climbing formwork SKE 50, climbing formwork GCS, Framax Xlife, Dokaflex 1-24, Protection screen Xclimb 60, Table Lifting System TLS

**The solution!**

Automatic climbing formwork SKE 50 and Climbing formwork GCS for short forming-times, Protection screen Xclimb 60 for maximum safety in the slab-forming operations. The Table Lifting System greatly reduces craneage times on this site. Moreover, the professional instruction given to the site crew by experienced Doka field service technicians has helped work move ahead swiftly and smoothly.
Large tableforms – fewer cranelifts

The TV Towers are a joint venture between the developers, Concord Pacific, and the Canadian Broadcasting Corporation (CBC) to re-develop the area into a residential and commercial complex.

The facts

**JOBSITE** TV Towers  
**LOCATION** Vancouver, Canada  
**CUSTOMER** IQC Concrete Forming Ltd.  
**REQUIREMENTS** Building two towers, one of 28 storeys and the other of 38, incl. six underground parking levels, on a 3020 m² footprint.

**PRODUCTS IN USE**  
Dokaflex tables, handset  
Dokaflex S, Framax Xlife

The solution

To increase the site safety and decrease the number of crane lifts, Doka delivered customized perimeter tables up to 8.5 m x 3.3 m equipped with handrail posts. The perimeter walls in the parking levels were constructed with Doka’s Framax Xlife framed formwork, supported by the D22 single-sided starter unit.

Doka was part of the construction success right from the beginning and supplied all the formwork from the parking level to the top level of the towers. The contractor, IQC Concrete Forming Ltd., had used Doka’s products successfully on other worksites. The structure consists of six underground parking levels, comprising a total area of approximately 3020 m² per level. After the intermediate levels, the building splits into two towers. Tower 1 has 28-stories and a slab area of approximately 830 m²; Tower 2 features 38 stories and a slab area of approximately 690 m². Between the two towers are three levels of townhouses.

Dokaflex Tables Speed Construction

For Tower 1, Doka designed customized perimeter tables, equipped with handrail posts, which provided safety on each step of the construction cycle. These tables eliminated the need for workers to have to go to the slab’s edge and manually erect the formwork. For Tower 2, Doka designed customized Dokaflex tables, up to 8.5 m x 3.3 m, to decrease the crane lifts and save even more time. With Doka’s designed slab solutions, IQC’s requested four-day pouring cycle was achieved quickly and safely. The contractor was especially pleased with how easy it was to use Doka’s equipment.
The 72-storey tower was Doka's first application of the Xclimb 60 Protection screen in the US.

Given Chicago's harsh weather environment and the close proximity of other structures, constructing The Legacy presented its own set of challenges.

The contractor, Walsh Construction, wanted to create a closed working environment that would not only increase production, but would also ensure worker safety. Since the Legacy’s design is radial (curved) on one side, configuring and anchoring the protection screen posed another challenge. The protection screen would also have to be reconfigured as the building progressed higher and the perimeter got smaller. Doka was ready to meet this challenge by creating a customized solution for the contractor.

Protective trapezoidal sheeting
Doka pre-assembled the entire protection screen system at its local branch and delivered it ready-to-use to the condominium worksite. Made of trapezoidal sheeting, each protection shield unit consisted of two panels. Panels are placed on the wall and spliced to create one protection screen unit, and are securely anchored to the structure. Doka was able to set 26 units to cover the entire perimeter, enclosing the top four floors at one time and safeguarding the slab-forming operations on the structure shell.

All-around safety
The room-high enclosure provided complete protection around the perimeter edges of the floor slabs where edge falsework and column forming operations are performed. The protective screen sheeting is available in a perforated sheet for warm weather conditions and as a solid sheet for colder climates.

The facts
JOBSITE
Legacy at Millennium Park
LOCATION Chicago, IL
CUSTOMER Walsh Construction
PRODUCT USED Xclimb 60 Protection Screen
TOTAL FORMWORK USED 26 units around the perimeter

The professional
"The Xclimb 60 system gave our working crew ideal protection. A safe working environment leads to better productivity, erasing any fears from heights or falling. In a safe, 'feel-good' working environment like this, it's no surprise that the forming operations moved ahead so quickly."

Dan Reagan, Concrete Manager for Walsh Construction

The solution
The Xclimb 60 protection screen's modular panel system adapted very well to the building's unusual design. The protection screen enclosed four floors at one time, protecting workers and preventing material from falling off the work area.
Doka Xpress

In brief

News, dates, media, awards

DOKA RECEIVES NOVA AWARD
Doka’s Table Lifting System recently received the NOVA Award from the Construction Innovation Forum. This prestigious award symbolizes Doka’s strong commitment to innovation. The TLS is an electric-powered lifting platform that allows slab formwork to cycle between floors on a building structure without the need for a crane. This decisively speeds up the entire construction workflow, making costly downtime due to non-available craneage a thing of the past.

DOKA AT THE WORLD OF CONCRETE
From 3rd – 6th February, Doka USA and Doka Canada exhibited at World of Concrete, with a 500 m² stand. 65,000 visitors flocked to the US construction sector’s biggest trade-fair. Live demonstrations showing the easy handling and efficiency of Doka formwork systems attracted lots of potential customers.

IMPRESSUM:
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