

Doka Xpress

The Formwork Magazine | Vol. 15 Issue 1

Custom Built Solutions



The Formwork Experts.

doka

Editorial



Dear Customers and Colleagues,

As we launch into 2015, there is much optimism for growth and prosperity. At Doka, we are

pleased to celebrate the perseverance of our valued customers who endure the troubling economy and we wish you the very best moving forward.

Numerous sources support the sentiment that the U.S. and Canadian economy will experience slow growth in the first two quarters of this year, with a greater pace of growth in the last two quarters and extending into 2016. Every sector of construction, except healthcare, is expected to show spending growth between 2.6 and 14 percent by the end of 2016. Spending increases in nonresidential construction are expected to be 8 percent higher this year compared to 2014, with an additional 10 percent growth expected in 2016. With an average of 200,000 new jobs per month expected for the foreseeable future, consumer confidence is slowly rising. Consumer spending is being attributed to approximately 70 percent of the U.S. economy as rising consumer spending results in a strengthening economy.

For Doka North America, we are celebrating this new economy and growing construction market with a focused commitment on providing safe, cost-effective and labor-saving solutions, which will help you meet the growing workload. We are proud to be starting this year by partnering with contractors on a diverse group of commercial construction projects featured in this newsletter, including a high-tech educational center for Columbia University Medical Center, a new 18-story Hyatt Place inside Chicago's famous loop and the Glenstone Museum in Maryland. In the industrial and transportation sectors, projects include the Panda Patriot generation in Pennsylvania, a massive sanitary sewer project in Ontario, Canada, as well as the \$90 million Route 72 Manahawkin Bay Bridge project. Our custom solutions are helping contractors meet the demands on this challenging economy, and we are excited and honored to be part of your success.

From everyone here at Doka, we look forward to celebrating your success.

Andrew Mair

Chief Executive Officer
Doka USA, Ltd. /
Doka Canada, Ltee.

Index

1321 Mission, San Francisco	03
Columbia University Medical Center, New York	05
Glenstone, Maryland	08
Griffon Power Plant, Pennsylvania	11
Hyatt Place 28 N Franklin, Chicago	13
Manahawkin Bay Bridge, New Jersey	15
Markham/Pickering Trunk Sewer, Ontario	17

Doka News

Muskrat Falls Project in Newfoundland & Labrador, Canada. ▶

Construction progresses at the 824 megawatt hydroelectric generating facility. It will consist of a powerhouse with four turbines, three dam structures, six spillway piers, separation and retaining walls, and service bays, becoming the second-largest hydroelectric facility in the province.



Manulife Tower, Calgary ▶

Concrete contractor Ellis Don chooses Doka on this 27-story, 408' tall, 564,000 sq.ft tower. Designed by world-renowned architects Skidmore, Owings and Merrill, it will be a "AAA", LEED Gold Certified office tower.

◀ 432 Park Ave. Tops Out

At 1,400 ft. tall, it is the tallest residential building in NYC and in the Western Hemisphere. Doka's Super Climber combined with Framax was used as the self-climbing core formwork.





Customer Experience

See the project and hear what our customer, Pankow Builders are saying on YouTube.



<http://bit.ly/1321Mission>

▲ Pankow Builders chose Doka's slab and wall formwork solutions on this 108,000 sq. ft. apartment building project.

Dokaflex Slab Solution

The Panoramic apartment building project located 1321 Mission St. in San Francisco is right across from the Twitter headquarters in the heart of the South Market (SoMa) area of the city. The 11-story high-rise cast in place concrete structure with one below-grade level of basement has floor heights that changed in 3-foot increments for the first three floors and then became typical after that.

The limited jobsite space made it extremely important to cycle material. At one point, three different post shores were in use from the active floor to the reshoring below. To assist in cycling, 12,000 sq. ft. (1 full floor, plus ½ floor) of Dokaflex was used with two levels of reshore at 50-percent quantity. Doka supplied all the internal walls – core walls and shear walls – as well as 17 columns cycled for two uses for floor.

The ability to easily move and cycle all parts using castors, including the multi trip boxes, and RD racks, served as an

important factor in selecting a formwork supplier. "The formwork system that was selected had minimal parts to use and seemed to have a quick learning curve for the field craftsman to learn as well as good customer support," says Frank Murphy of Pankow, the project's concrete contractor. A lookout platform also assisted in moving material out to the edge of the building to get picked by the crane and lifted to the next level. Finish requirements of Class B concrete faces also allowed Frami Xlife to be used effectively. The Frami Xlife provided a finish that did not need to be rubbed or touched up as exposed walls within



The Professional

"The Doka system provided an easy learning curve for our field crew which enabled them to minimize the budget and maximize the schedule time."

Chris Theisen,
Field Superintendent, Pankow Builders

The Facts

Location: 1321 Mission St., San Francisco, CA

Type of structure: Apartment building

Square footage: 8,870 per floor, approx.
108,000 total sq. ft.

Developer/designer: Panoramic Interests

Architect: Henmi Architecture & Planning

Concrete contractor: Pankow

Products: Dokaflex slab system, framed wall
formwork Frami Xlife

Project start date/scheduled end date:
April 1-May 1, 2014

The Challenge

The site itself posed a challenge because no room was available for laydown beyond the dedicated footprint. The union-based workforce also made it key for efficient movement of material so concrete contractor Pankow couldn't waste any time dragging material from one side of the building to another.



The Solution

Doka brought Pankow to its training facility in Chicago as first-time customers to set up Dokaflex and Frami formwork and walk the team through the system components. This helped to keep the project on track when it started.



- ▲ Frami Xlife panels are lightweight and easy to handle, so they can be erected very quickly by hand, without the use of a crane. On sites with a crane, it is also possible to lift several panels at a time, in a gang-form.

The Professional

"The Frami system is good. Once you connect it all together you can pick it as one and set it back. You don't have to break it back down and put it back together."

Micky Manual,
Foreman, Pankow Builders



- ▲ Dokaflex floor-slab formwork scores for being very quick and easy to set up, in a logical work sequence.

the structure. The Dokaflex system's hinge columns also offered an easy strip process.

"Doka came to the table with a new perspective and collaborative attitude during the buyout phase of the project," Murphy notes. "Pankow and Doka were able to work together to streamline the formwork design and control cost. Doka stressed customer service during the initial meetings, which made for a comfortable environment to work together by helping each company be successful."

Top 50 SCC

Hear what our customer at DiFama Concrete is "singing" about!



<http://bit.ly/DokaTop50SCC>



▲ Due to the architectural requirement of this column which tapers on both sides, and to achieve a 1/16" tolerance meant developing 3D drawings. Doka's engineering team was able to produce precise column drawings to ensure a successful completion.

Creating the Formwork of a Future 21st Century Medical Education

Recent advances in technology and science meant that the Columbia University Medical Center (CUMC) Graduate and Medical Education Building needed to update its education facilities to provide the best education to be taught in 21st century medicine. Contractors broke ground on the new 14-story glass tower at 171st Street and Haven Avenue in New York, N.Y., on Sept. 16, 2013.

The new CUMC building will have 100,000 sq. ft. of high-tech classroom facilities and serve as an advanced center for immersive, simulation-based medication education. The building itself is significant to the university as well as the planning and innovative techniques being used to construct it. The structure's design included bi-axial bonded post-tension slabs, cobiax void formers, and high-strength self-consolidating concrete (SCC). Use of these systems allows an increase in the structure's strength, but they also create more preparation and planning.

Construction Challenges

The main challenge in forming the V-columns was the demanding architectural requirements. The owner demanded the highest quality finish with the least possible impressions. These V-columns were visible on the first through the third floor on the south side of the structure, and thus were required to be formed without using any ties (the architectural requirement was no noticeable ties, therefore tie-less). They were as large as 4- by 8-foot at the base and up to 28-feet



▲ From the project development stage to the job close out, Doka Account Managers are committed to providing active project support from start to finish.

Kyle Essig, Doka Account Manager

The Facts

Jobsite: Columbia University Medical Center

Location: 104 Haven Ave, New York, NY

Type of structure: Medical education building

Square footage: 100,000 sq. ft.

General contractor: Sciam Construction LLC

Structural engineer: Leslie E. Robertson Associates (LERA)

Designer/architect: DSR with executive architect Gensler

Concrete contractor: Difama Concrete

Products: Large-area formwork Top 50, Dokaflex slab system, Load bearing tower Staxo 100

Overall project cost: \$185 million

Project start date/scheduled end date: August 2013 through June 2015 (23 months)

The Challenge

The use of self-consolidating concrete (SCC) in this project made it more complex because of its thin mix design. The forms needed to be designed water tight. The architectural requirement of the columns were also challenging because the plywood joints had to be located exactly and meet one face to another. This was difficult because the column was tapered in two directions and was not in the same axis of the slab below it.



The Solution

The reinforced concrete super structure was the first in the State of New York to use cobiax void formers, which consist of fixed reinforcement steel elements with integrated void formers, and bi-axial bonded post-tension slabs. The formwork design was completed in Doka CAD 3D. Self-consolidating concrete and rebar were also used as part of the solution.



▲ Timber beam formwork Top 50 can handle the complicated column cross sections, large column heights, many formwork re-use cycles, and tough specification regrading the concrete finish.



tall. The axis of the column was not square to the slab which was another challenge.

The Top 50 Solution

The formwork construction requirements had to accommodate a very thin SCC mix and be built within a very tight tolerance of 1/16th of an inch. The best solution was a tieless design of Doka's Top 50 timber beam formwork. Due to the architectural requirement

of the project, the only way to get such precision (1/16" tolerance) meant developing 3D drawings. The column tapered on both sides – which meant the 3D drawings would also be important to achieve precision. Doka's engineering team was able to produce all column drawings in 3D to enhance constructability of the form and setup at the jobsite.

The forms had to lock in tight enough to hold water, align perfectly, while still maintaining the pattern of the plywood joints. The forms were made using the Top



▲ Over 9,000 sq. ft. of Dokaflex was used on this project.

50 formwork system with back-screwed face sheets, with high quality/high grade birch plywood. No ties were used on them.

Using Doka's preassembly service, the Top 50 system was preassembled at Doka's Northeast facility and delivered in ready to use condition so that it could go straight from the truck to its casting location on the jobsite.

Top 50 can handle the complicated column cross-sections, large column heights, many formwork re-use cycles, and tough specification regarding the concrete finish. Column formwork Top 50 can be faced with any desired form facing. The pre-assembly service can deliver even the most unusual shapes to the site, on time and ready for immediate use. Due to the unrestricted choice of form-facing, all architectural specifications can be fulfilled, including sharp edges and optimum concrete appearance.

Additional Formwork

At the start of the project, nearly 4,400 sq. ft. of Top 50 column formwork was used in conjunction with nearly 3,600 sq. ft. of Staxo 100 shoring system to form the auditorium slab on the third floor. Following this, about 9,000 sq. ft. of Dokaflex was used to create additional slabs. Load bearing tower Staxo 100 is designed for large shoring-heights and high loads and features built-in tie off points in every frame.

Dokaflex was the optimal choice because of its flexibility and speed. Every floor had varying floor heights and slab thicknesses.

Columbia University is planning this building to meet the Leadership in Energy and Environmental Design (LEED) Gold standards for sustainability so it incorporates green design and building techniques as well as creating a "welcoming environment" and contributes to the long-term sustainability of the entire neighborhood.

Safety and Selection Factors

Safety has always been a top priority with Doka. Sciame Construction, the general contractor, and Difama Concrete, the concrete contractor, are also extremely safety oriented. To ensure safety on the jobsite, the site was frequently inspected and the safety culture was reinforced weekly, if not daily, by the site personnel.

Doka's careful attention to safety, as well as its superior engineering, pre-assembly, and the proximity to New York City all played roles in the contractor's selection of the company's formwork. The tight timeline on the project was also factored into the decision.



Filler neck (Guillotine valve)

Typically the filler neck is placed at the bottom of the formwork, however, due to the congestion of the steel, inclination of the column, and existing finished ceiling, the filler neck was installed at the top of the form. Perfect alignment was vital on the formwork system to hold the self-consolidating concrete.



- ▲ Doka wall formwork systems feature accessories such as this filler neck to accommodate complete project requirements.

The Professional

"Using the Top 50 system, you don't need to put any ties through the wall so you get a smooth and seamless finish. It comes out to be a nice finish on a job that is supposed to be Architectural concrete."

Stanley Conroy,
General Carpenter Foreman, DiFama Concrete

The Facts

Jobsite: Glenstone Museum expansion
(Glenstone II) Potomac, Maryland

Type of Structure: Museum

Client: Clark Construction

Formwork Used: Framed wall formwork
Framax Xlife, Load-bearing tower Staxo
100, Working Platform K

Amount of Formwork: 38,000 sq. ft

The Challenge

This project has many steps and elevation changes, demanded an architectural concrete finish, and slabs and walls had to be poured monolithically with no ties.



The Solution

Doka's advanced planning, engineering support, product quality, along with BIM modeling ensured a successful completion.



▲ The Glenstone Museum expansion has many changes from one wall pour to the next. Advanced planning was required to ensure the most amount of re-use of the formwork on all pours.

Expanding an Art Experience with Framax

The Professional



"Some of the advantages of using Doka formwork are the ability to re-use and recycle panels. Standardizing the formwork system allows you to reuse panels for multiple pours."

Tom Carpenter,
Assistant Superintendent, Clark Construction

The Glenstone Museum expansion is designed to allow contemporary art to be experienced in a new and different way. Located on 200 acres in Potomac, Maryland, Glenstone strives to provide visitors with an experience that seamlessly integrates art, architecture and landscape. The highlight of the expansion will be a series of discrete pavilions surrounding a central water courtyard, with many of the pavilions devoted to single-artist installations.

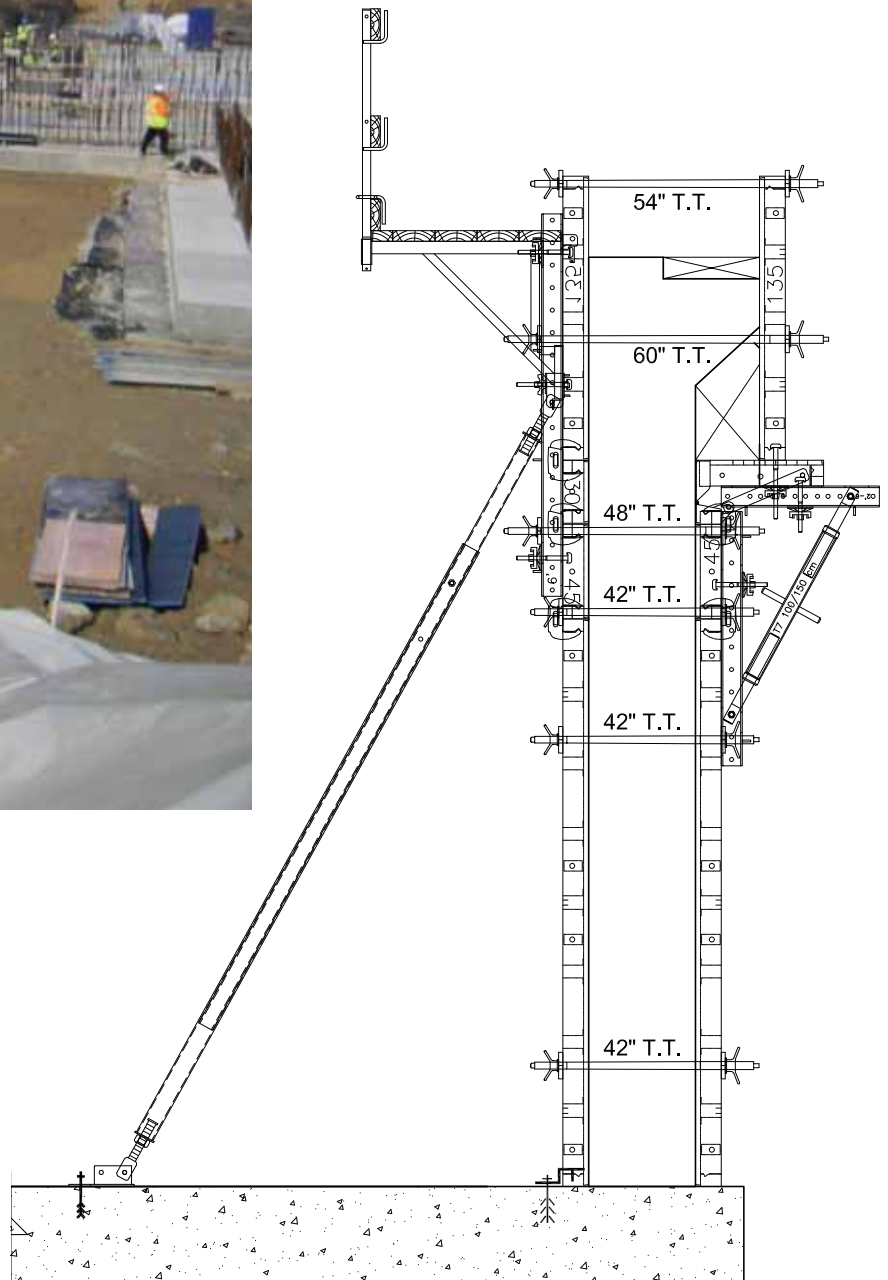


Glenstone Art Museum

Hear about our customer experience using Framax Xlife.



<http://bit.ly/GlenstoneProject>



Building Challenges

The building has many changes from one wall pour to the next. Advanced planning was required to ensure the most amount of re-use of the formwork on all pours. Also, the advanced planning allowed for scheduling the total amount of formwork needed for the entire job. It was necessary that all areas were designed well in advance to have the amount of equipment allocated and scheduled for each specific area.

"Doka has been extremely cooperative and helpful in designing the formwork for this project," said Carpenter. Doka uses a coordinated BIM model with the help of Clark Construction Group to identify and resolve

▲ Doka provides detailed engineering drawings to ensure smooth and successful operation on site. With a small number of easy-to-handle component parts, Framax Xlife helps you speed up progress.



▲ To ensure a high quality architectural concrete finish, after each pour, Clark Construction would strip, power wash, spray form oil down, and then set forms for the next pour.



▲ Modular Framax Xlife can accommodate any gang length required for small or tall wall heights.

▲ A consistent 6" increment-grid can be achieved, no matter whether the panels are stood upright or on their sides.



▲ Safety tie off points are standard and built into every Framax panel, meeting OSHA requirements and providing security.

problems before they become issues in the field. An additional challenge was that in the light wells and gallery entrances, slabs and walls had to be poured monolithically with no ties. Doka had to use a gantry system sitting on top of Staxo 100 to support the wall and slab pour. This part of the project was all architectural concrete – no ties were used. To the owner, this was one of the most important aspects, that the design incorporates a lot of natural light.

Doka Solutions

Doka brought in new plywood – the Xlife sheet is used to guarantee a 100% architectural finish. Clark

Construction then took extra care in cleaning the forms to ensure the absolute best concrete finish. Doka Mid-Atlantic Operations confirmed that every form face was of top quality. They inspected every piece of Framax to guarantee the highest quality results for the customer. No patches, gauges, or holes were allowed.

The exterior walls in the galleries and the entry pavilion used Doka's Platform K to set the formwork and give the work area access to tie rebar.

This project has many steps and elevation changes. By designing the system with less rebuild, Doka saved on engineering and reconfiguring from pour to pour. Clark Construction likes the system because they can easily re-use it throughout the project.



▲ Concrete contractor Griffith Company selected Doka to provide formwork for the foundations on the Panda Patriot generation station. Pictured: The crew from Griffith Company.

Natural Gas Ignites a Construction Boom

Not only are many power plants in the Pennsylvania, New Jersey and Maryland market reaching an advanced age, but more than 20 gigawatts of the region's coal-fired power plants are slated for retirement in the next few years. At the same time, the area is experiencing total peak demand growth of over 1.4 percent per year.

To help meet this demand, construction on the Panda Patriot generation station began in December 2013. Located in Montgomery, Penn. and fueled by natural gas, the plant is outfitted with state-of-the-art emissions control technology and uses gas turbines that achieve operating efficiencies of 60 percent.

With plant operations expected to commence by mid-2016, construction of concrete foundation structures on the 85-acre site needed to be complete before winter 2014-15. Extensive surveying and detailed formwork

were required for the project, in order to stay within specified tolerances.

Concrete contractor Griffith Company selected Doka to provide formwork for the foundations. Doka is known for their efficiency and productivity with their formwork system. Doka's ability to design and deliver formwork eliminated the need to work with plywood and reduced the amount of time it took to form, pour and strip the foundations. To keep the project on its aggressive schedule, shop drawings were provided for each foundation, which

The Facts

Location: Montgomery, PA

Type of project: Powerplant

Owner: Gemma Power Systems

Concrete contractor: Griffith Company

General contractor: Plaza Construction

The Challenge

Pouring the wall, columns, beams, and slabs monolithic.

The Solution

A combination of Frami and the contractors own heavy duty shoring. Frami's multiple size panels allowed for exact framing elevations within an inch.





▲ Doka's ability to design and deliver formwork eliminated the need to work with plywood and reduced the amount of time it took to form, pour and strip the foundations.



▲ The ingenious modular design of Frami gives you unlimited possible combinations, in both width and height.



▲ Frami Xlife panels are lightweight and easy to handle, so they can be erected very quickly by hand, without the use of a crane.



▲ Frami Universal Panels provided flexibility on the Hot Box Pedestals.



▲ Main Generator Pedestal. Walls, Slabs, Columns and Beams poured monolithic.

ensured that the product matched contract plans. Doka provided a quick turnaround time from design to installation. Especially helpful was the universal application of the formwork to any foundation.

The cleanliness, safety, and turnaround time are all factors that pleased the contractor. The universal application to use the formwork at any foundation was a necessary factor for this project.



Xclimb 60 With Xbright Sheeting Makes for a Safer Jobsite

The hotel market in the Chicago area has experienced a post-recession rebound, attracting development on a site located at 28 North Franklin Street, inside the Chicago loop and near the city's financial center. Ground broke in early 2014 on the small (8,100 sq. ft.) site and an 18-story Hyatt Place is under construction.

Construction on the building's concrete structure took place between April and October 2014. Because the lot is hemmed in by adjacent high-rises, there was no space for the typical climbing formwork to be installed. There was also little room for equipment assembly on the site, so most equipment was shipped pre-assembled.

Adjustable Forms Concrete Construction, the concrete contractor, selected Doka as the formwork provider

because, based upon the longstanding relationship between the two companies, they knew Doka had the knowledge and equipment to make the job work. Doka was able to supply the necessary equipment for the job as well as the pre-assembly service, all for a competitive price.

Safety precautions included using taller-than-normal handrails (all at 6 ft.) and avoiding the use of lumber for handrails. The general contractor allowed no lad-

The Facts

Jobsite: Hyatt Place, 28 North Franklin Street, Chicago

Customer: Adjustable Forms Concrete Construction

Products used: Framed formwork Frami Xlife, Supporting Construction A Frames, Large area formwork Top 50, Climbing formwork MF240, Protection screen Xclimb 60

Total Formwork Used: Approx. 6,000 sq. ft. of Frami for foundation walls and core walls; A-frames for foundation walls; 2,300 sq. ft. of MF240 platforms with 36 brackets; 3,700 sq. ft. of Top 50 on the perimeter shear wall; 9,500 sq. ft. of Xbright protections screens on 2 1/2 sides of the building.

The Challenge

Safety precautions included using taller-than-normal handrails (all at 6 ft.) and avoiding the use of lumber for handrails. The general contractor allowed no ladders on-site and, in order to provide safe access to shoring, built the building stairways in advance of the decking.

The Solution



A major aspect of jobsite safety was the Doka Protection screen Xclimb 60 with Xbright sheeting. This fall protection system allowed construction to be completed safely even at the top levels of the high-rise and offered weather protection, too.





Protection Screen Xbright

See the system in action and hear about our customers experience.



<http://bit.ly/Xbright>



- ▲ All protection screens were installed in just two days, thanks to the pre-assembly service.

ders on-site and, in order to provide safe access to shoring, built the building stairways in advance of the decking. A major aspect of jobsite safety was the Doka Protection screen Xclimb 60 with Xbright sheeting. This fall protection system allowed construction to be completed safely even at the top levels of the high-rise and offered weather protection, too.

The Doka systems were able to accommodate the tight schedule. All protection screens were installed in just two days, thanks to the pre-assembly service. The finished hotel will house 206 rooms and approximately 3,000 sq. ft. of meeting space.



- ▲ The full-area enclosure around the perimeter of the building enables all work to be carried out in complete safety, protected from all weather conditions.



- ▲ A loading platform can be integrated into the protection screen for straightforward, safe repositioning of slab formwork, tools and other materials.



Manahawkin Bay Bridge

Hear what our customers are saying.



<http://bit.ly/Manahawkin>



▲ The all steel, modular form system is a water-less, large size panel system that is best suited for columns, piers, pier caps, beams, retaining walls, foundation walls, and culverts.

Bridge Construction with Steel Girder

The Route 72 Causeway in Ocean County, New Jersey connects Long Beach Island with the mainland, carrying traffic over the Intracoastal Waterway on the Manahawkin Bay Bridge and three trestle bridges.

The \$90 million Route 72 Manahawkin Bay Bridge Project involves the construction of a new structure parallel to and south of the existing Manahawkin Bay Bridge, rehabilitation of the existing Manahawkin Bay Bridge, and the rehabilitation of three trestle bridges.

Contractor Schiavone selected Doka to form the new bridge because of the formwork quality, speed and ease of use, fast lead time, and services.

Custom Girder Formwork Solution

On the Manawakin bridge pier and caps, custom fabricated steel girder panels were painstakingly designed to handle the slope, radius and taper of the new pier. Designing and fabricating the form with both a radius and taper were quite challenging. Doka Sales Support Manager, Brian Kent, proposed the initial



The Professional

"With the Girder forms we don't have to put up any shoring to let it cure for the 21 days it's required. We can just leave the form up there and jump up to the top to do all the beam seats. So it's another time saver for us."

Rob Stlevins,
Dockbuilder General Foreman, Schiavone

The Facts

Jobsite: Route 72 Manahawkin Bay Bridge, Ocean County, New Jersey

Type of structure: Bridge pier and caps

General contractor: Schiavone

Product: Doka Steel Girder Formwork

The Challenge

Designing and Creating Custom formwork for tapered radial pier stems and caps.

The Solution

Custom Steel Girder's design allowed Schiavone to span large distances without any additional support or shoring. The forms are modular and can be ganged and picked in large sections increasing production time.



The Professional

"Here at Schiavone, we choose Doka over the others because it's just a fast system. We get a better product with faster results. More production means we make more money."

Joe Barbado,
Dockbuilder Foreman, Schiavone

concept, which set Doka apart from the competition. The engineering team did the difficult work developing the concept into something that would work in the field. Doka supplied custom forms and standard Girder material for two of the tallest piers. Self-spanning Girder panels were also used for the massive caps. On this project there is approximately 10,000 square feet of rental formwork and custom steel radius soffit forms.

The all steel, modular, waler-less, large-size panel system is best suited for columns, piers, pier caps, beams, retaining walls, foundation walls and culverts. It achieves faster pour rates and quicker assembly, while spanning large distances without intermediate support.



▲ The large tie spacing - a standard 12' wide Girder form can provide 96 sq. ft. per tie (48 sq. ft. per side)



▲ The design of Doka's Steel Girder allows spanning large distances without any additional support or shoring.



▲ Each part of the project required custom formwork elements that were highly complex with different shapes and sizes.

Building Bigger Sewers in Ontario to Accommodate Growth

In Southern Ontario, Canada, immediately east of Toronto in Durham Region, is the growing area of Markham/Pickering. This area is designated to receive more development and population in the coming years, straining the current sanitary sewer resources. To handle the upcoming growth, a trunk sewer was contracted to accommodate the additional sanitary sewer flows projected from the future growth.

The goal of this sewer project is to carry 100 percent of the 2036 design sanitary sewers flows projected from future growth. The new SEC trunk sewer is approximately 14 km in length. The sewer is to be constructed at depths of 5m to more than 40m below the ground surface.

A major challenge of this project was to ensure that the pipeline stayed within the Newmarket Till soil stratum, which is more conducive material for tunnel construction. To do so, a substantial drop in elevation

of the pipeline over its length was needed. The use of an Earth Pressure Balance Machine as a tunnel boring machine allowed for different modes of operation to accommodate the changing soils conditions.

Custom Formwork Solution

Doka was able to secure this project due to their expertise in 3D engineering design and custom built formwork solutions. Strabag, the contractor, relied on



▲ Custom Top 50 can be constructed to accommodate any wall design and produces excellent finish results as depicted here.

The Facts

Jobsite: Markham/Pickering, Ontario, Canada

Type of structure: Trunk Sewer

General/Concrete Contractor: Strabag

Product: Custom-designed Large Area Formwork Top 50

The Challenge

Providing custom formwork solutions on 13 ventilation shafts ranging between 10 to 60m depths that were all different shapes and sizes and highly complex designs.



The Solution

Large Area formwork Top 50 can be assembled in any configuration for a wide range of applications. Doka's Toronto branch supplied engineering and pre-assembly for each formwork element to highest quality standards and delivered each piece to the jobsite in ready-to-use condition.

STRABAG
TEAMS WORK.



- ▲ Using custom Top 50 formwork panels allowed Strabag to pour the "U-shaped" benching at the bottom of each ventilation shaft connecting the newly drilled tunnel opening with each other.

Doka to meet extremely tight project deadlines and to deliver high quality custom built formwork panels ready-to-use on site.

Doka supplied the custom benching formwork for 13 ventilation shafts in total, ranging between 10 to 60m depth. The custom formwork panels allowed Strabag to pour the "U-shaped" benching at the bottom of

each ventilation shaft connecting the newly drilled tunnel openings with each other.

These custom formwork panels were based on Doka's Large Area Formwork Top 50, including wooden gussets and custom splices. Each custom formwork element was highly complex and different in shape and size, but the Doka pre-assembly team of Toronto



Doka supplied custom benching formwork for 13 ventilation shafts in total, ranging between 10 to 60m depth. ►



To achieve a high standard concrete finish, Doka's custom formwork panels were epoxy coated during the assembly process. This met the project requirements, and eliminated the need of installing a form liner on every element prior to a concrete pour.

rose to the challenge and met all customer needs. Every single formwork element was hand built and assembled to the highest possible standards in the formwork industry.

Doka's local engineering department, together with the Competence Centre in Austria, played a key role in successfully designing this challenging custom formwork solution for Strabag.

Meeting Town Requirements

The final concrete finish was also extremely important to the client. The town of Markham required the use of Zemdrain, a form liner to be installed on every formwork element prior a concrete pour. Doka's custom formwork panels were epoxy coated during the assembly process and shipped to site ready to

use. The achieved concrete finish was of high standard, comparable to Zemdrain, and was therefore accepted by the client. Doka's custom formwork solutions and the good teamwork between Doka and Strabag made this project an overall success.



▲ Doka was able to secure this project due to their expertise in 3D engineering design and custom built formwork solutions. Each custom formwork element was pre-assembled at the Doka Toronto branch to the highest possible standards in the industry.

In Brief



Topping out Ceremony

During the 432 Park Avenue topping out ceremony, developer Harry Maclowe was presented with a Framax Xlife wall formwork panel signed by all the construction workers to commemorate the concrete completion of the project. See it on YouTube, along with some amazing helicopter views of the project!
<http://bit.ly/432ToppingOut>



Staxo 100 Video

With its rugged steel frames, Staxo100 is designed for large shoring-heights and high loads. See what makes Staxo 100 a high-capacity, fast shoring system.
<http://bit.ly/DokaStaxo100>

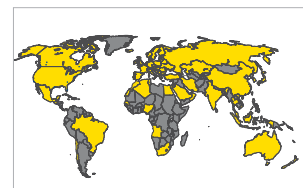
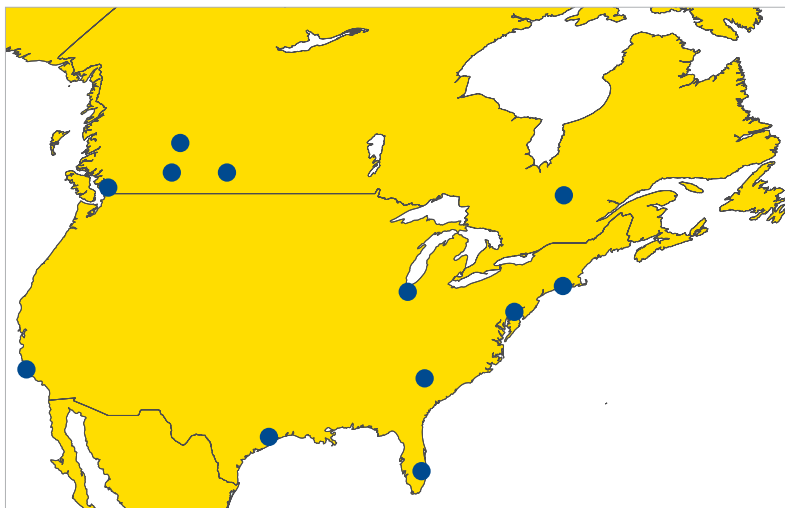


USA Headquarters

Doka USA Ltd.
214 Gates Road
Little Ferry, NJ 07643
T (201) 329-7839
T (877) DOKA-USA
F (201) 641-6254
usa@doka.com
www.dokausa.com

Canada Headquarters

Doka Canada Ltd./Ltee
5404 - 36th Street S.E.
Calgary, Alberta T2C 1P1
Canada
T (403) 243-6629
F (403) 243-6787
canada@doka.com
www.doka.ca



▲ Doka offices worldwide.

The Doka sales network with more than 160 sales and logistics centers in more than 70 countries.



www.twitter.com/doka_com



www.facebook.com/DokaNorthAmerica



www.youtube.com/DokaNorthAmerica

Imprint: "Doka Xpress" is a publication of Doka USA, Ltd.

Publisher: Doka USA, 214 Gates Road, Little Ferry, NJ 07643. **Editorial:** Diana Sanicki, Marketing, Doka USA, Ltd. **Layout Design:** Geri Bearden Design.

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.

New York (Northeast Area)

Doka USA, Ltd.
208 Gates Road
Little Ferry, NJ 07643
Tel. (877) DOKA-USA

Chicago (Midwest Area)

Doka USA, Ltd.
22901 West Winchester Drive
Channahon, IL 60410
Tel. (815) 521-3700

Atlanta (Southeast Area)

Doka USA, Ltd.
105A Boulderbrook Circle
Lawrenceville, GA 30045
Tel. (888) 618-4700

Baltimore (Mid-Atlantic Area)

Doka USA, Ltd.
3665 Benson Avenue
Baltimore, MD 21227
Tel. (410) 368-8390

Los Angeles (Far West Area)

Doka USA, Ltd.
6901 Central Avenue
Riverside, CA 92504
Tel. (951) 509-0023

Houston (Southwest Area)

Doka USA, Ltd.
10822 Mahaffey Road
Tomball, TX 77375
Tel. (281) 516-2211

Miami (Florida Area)

3411 SW 50th Ave
Davie, FL 33314
Tel. (888) 618-4700

Winnipeg (Manitoba)

Doka Canada Ltd./Ltee
Tel. (204) 930-6307

Toronto (Eastern Canada)

Doka Canada Ltd./Ltee
12673 Coleraine Drive
Bolton, Ontario L7E3B5
Canada
Tel. (905) 951-0225

Edmonton

(Northern Alberta)
Doka Canada Ltd./Ltee
Tel. (780) 974-3913

Vancouver

(British Columbia)
Doka Canada Ltd./Ltee
Tel. (778) 991-9405