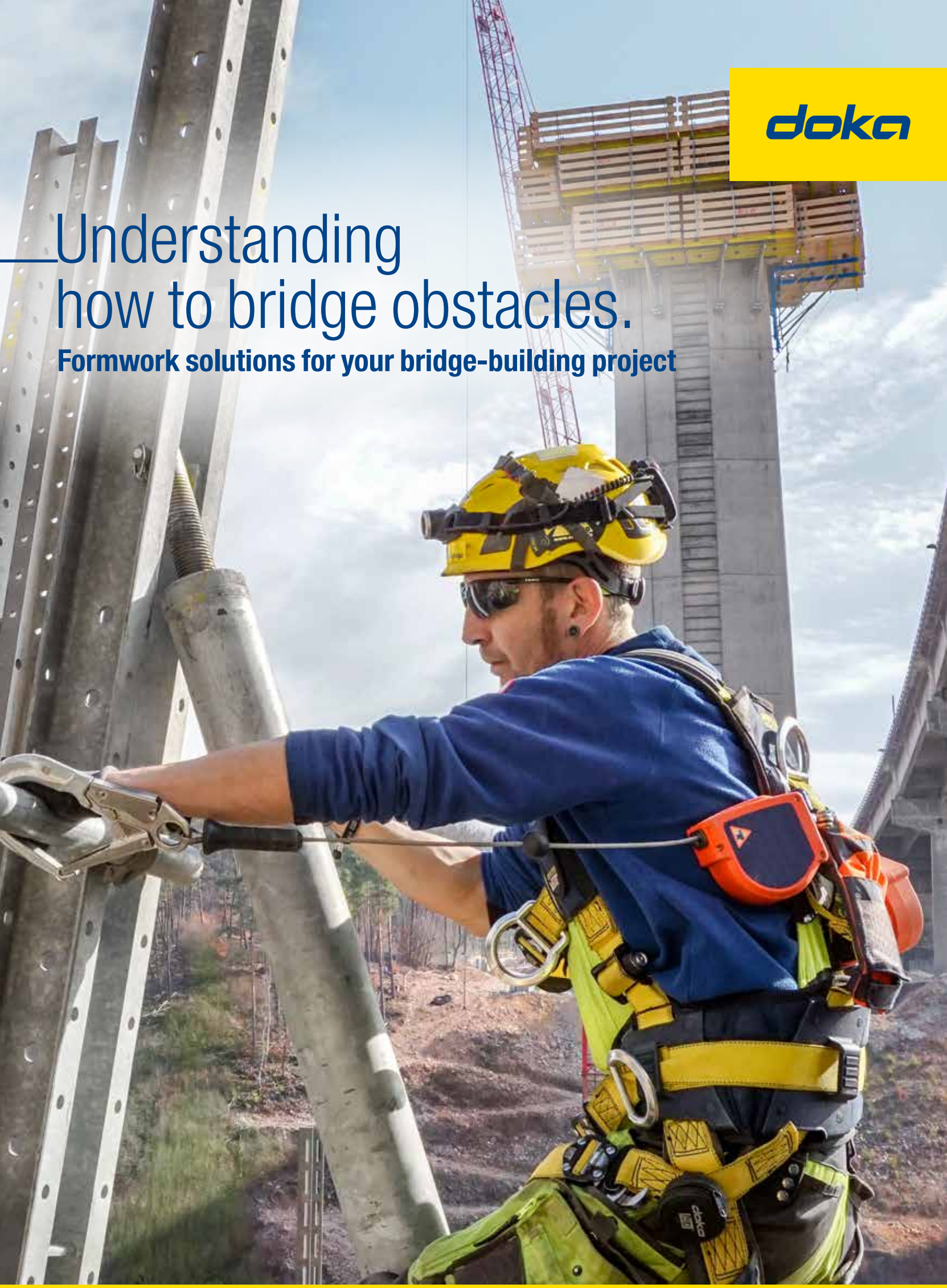


Understanding how to bridge obstacles.

Formwork solutions for your bridge-building project

The Formwork Experts.

_Understanding your bridge-building project as a partner

Find out more on our website:
www.doka.com/bridge

_Understanding how to build bridges. Being partner in the construction industry requires to truly understand and know the construction process. We have this understanding from the initial planning stage through to completion of construction.

This _understanding is based on decades of experience in building bridges. Committed to advance in formwork technology, Doka develops and implements optimisations in all methods of constructing bridges. And Doka services combined with formwork concepts constitute the all-inclusive concept for smooth and speedy progress on the build. Our mindset is customer-oriented, we build the bridges to where you want to go.

With this comprehensive services package, we are well-qualified to be your competent and reliable partner in bridge construction. We successfully accompany you all the way through your construction project.

German Unity no. 8' infrastructure project, new rail link between Ebensfeld and Erfurt (VDE 8.1), 'Froschgrundsee' viaduct, project owner DB Netz AG, project management DB ProjektBau GmbH

Doka is able to look back on a long history of _understanding.

Listening intently, understanding the world as seen through the eyes of our customers, learning to understand all aspects and thinking ahead. We are passionate about not being satisfied with the first solution that might get the job done. Rather, we continue fine-tuning it until we come up with a true benefit for our customers. This is the only way a small woodworking shop could grow into a globally operating formwork company, known by the brand name Doka since 1956.

Everything from a single source – Your bridge project has all the advantages of detailed planning and implementation of climbing formwork for piers and pylons and from widely varying systems for bridges of all kinds. You have a single point of contact, so the close support of Doka experts keeps construction progressing smoothly. With Doka's pre-assembly service, out in the field the systems install reliably and in safety.

_Understanding requirements

Sound advice begins during the project development stage for the structure. Because from this point on, it's all about cost efficiency and having a leg up on your competitor. Which is why our internationally experienced experts make a point of advising you very early, and very thoroughly.

Doka technicians work to put together the most suitable formwork solutions in combination with high-performing service packages, exactly tailored to each individual construction project and method.

Regardless of how different and unique, one thing holds true for all bridge-building projects: our commitment to the entire project solution has one common denominator – to design a construction process that is fast, safe and as good as it can be.

Construction project

WHAT is being built?

Many different structures

Bridge structures are classified by their system of load transfer, for example as girder, arched or cable-stayed bridges. The structural elements are the individual parts of the bridge, for example the piers and the superstructure. Common bridge-building materials nowadays are reinforced concrete, pre-stressed concrete and steel. The combinations are so varied that every bridge is unique.

Temporary states during construction

It is not until they are fully completed that the superstructure's horizontal load-bearers become self-supporting. As construction progresses section by section, the statically sensitive intermediate states need temporary support. It is this complexity of construction that makes bridge-building so challenging.

Construction method

Diverse factors influence the choice of construction method. They include the topography, length and height, type of bridge, structural elements, materials and available construction time. In accordance with the individual requirements, Doka offers comprehensive solutions for all methods of construction and provides support right from the beginning through to successful project completion.

Formwork systems

Your site team and our Doka specialists work closely together to select the right formwork system. Site requirements such as overall construction time, workflow (cycle time) and personnel resources are factors in deciding on the right formwork system.

Safety in every situation

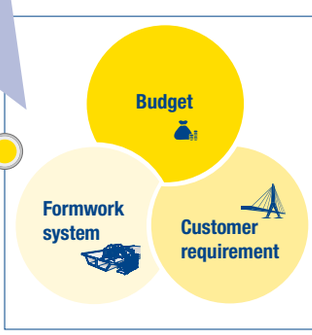
For our customers we develop project-specific safety concepts to permit unimpeded operation, safe repositioning of the formwork and safe and fast access at any height. Safe, smooth work routines speed up the workflow.

HOW is it being built?

Construction method

Site infrastructure

Smooth and efficient construction progress depends on functioning site infrastructure. Well thought-out formwork solutions standardise and speed up repetitive jobs, reduce risk, allow for an ideal work environment and simplify the workflow.



Budget

It pays to invest in quality system formwork. A solution customised to meet your project's unique requirements saves resources, as well as time and money. We accomplish this with quality-tested formwork systems and a custom-tailored project solution.

Workflow planning

Optimised workflow planning is the basis of a cost-efficient formwork concept. Planning takes into account the different structural elements, the construction method, the geometry of the structure, site logistics and all project-specific boundary conditions and it also saves time and money.

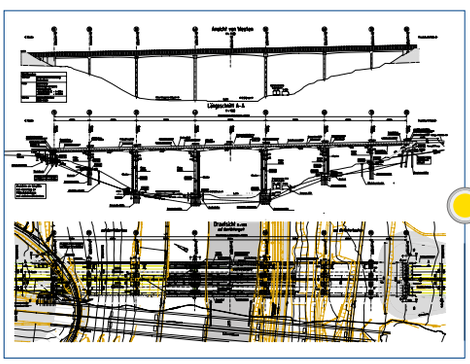
_Understanding effective consultation right from the start

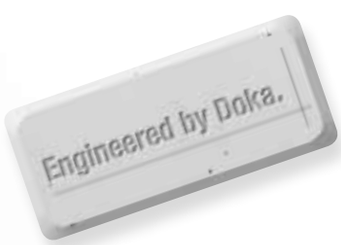
Your project success depends not only on selecting the right formwork solutions. The close support of our experts from the start produces a comprehensive solution concept for your bridge project. Because we provide single-source supply for products, services and planning, project management and logistics.

Every bridge is unique – as is the associated formwork solution. The basis for developing a custom-tailored formwork solution is laid by consultation and support for your project from the very start. Doka experts discuss the requirements in detail with you.

Structural Analysis

Only a solution based on a fundamental analysis of the entire project supports the best possible construction process. It is important to identify the critical requirements jointly, in this early phase of the project.



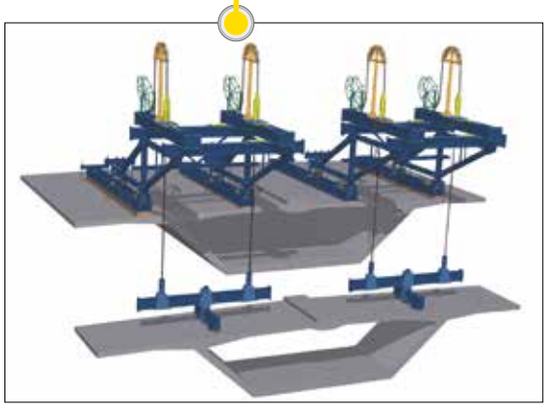


Project requirements

Focused bid planning is based on your site-specific general conditions such as overall construction time, required cycle time, workflow planning and local conditions.

Feasibility study

The formwork concept is elaborated on the basis of the boundary conditions identified beforehand. In this step the custom-tailored formwork solution is determined by our experts and yours working together closely. Minor adjustments in the workflow are identified to help optimise feasibility.



_Understanding engineering :

Efficient planning for a safe project sequence

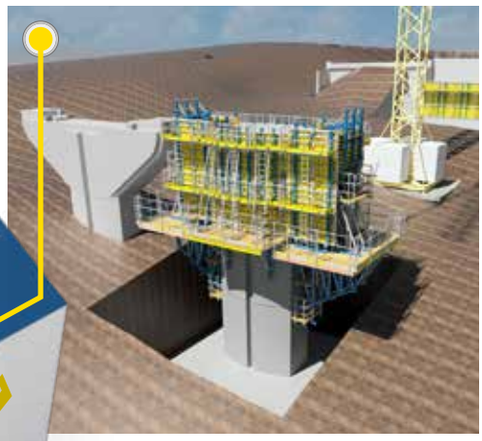
Efficient formwork solutions can be developed economically only if there is an understanding of project requirements and construction processes. This understanding is the basis of Doka engineering services.

Bid submission

Following thorough analysis of the structure, detailing of the project requirements and check of feasibility, the jointly elaborated solution is presented in a detailed bid and elucidated.

Approval planning

Based on the most recent version of the planning documents, final formwork solutions are discussed in detail with you and released in writing.



BIM – bid planning supported by simulation

Intelligent networking of data, reliable planning and significant savings on time are the biggest advantages of the BIM method. We enable 3D design of formwork in Revit and Tekla and 4D simulation of progress from one defined work cycle to the next throughout the construction sequence. The net results are less labour, a better overview and more transparency throughout construction.

Implementation planning

Implementation planning is the basis for fast, safe forming operations compliant with country-specific standards and regulations. It includes the deployment plans and any assembly and fabrication plans necessary to ensure best possible assembly and utilisation.

Statics calculations

Project-specific statics calculations compliant with local standards ensure that the formwork is stable and suitable when used as intended on site. Depending on need, these calculations range from a simple project statics through to exact dimensioning including documentation (structural analysis) and certification that they were checked by a civil or testing engineer (verified structural analysis).

Assembly planning

The plans created and approved by Doka provide you with the individual steps for assembly down to the last detail. These are the guidelines for assembly by the site crew.

_Understanding:
tailored formwork solutions

Individual formwork solutions custom-tailored to your requirements for your bridge project.

Structural elements and methods of construction

Doka system solutions

Concrete monitoring with Concremote 42

Bridge foundation

Foundations and abutments

Foundations and abutments are the transitions from bridge structure to the subsoil. Individual, strip or raft foundations are the most common in bridge-building. They are generally cast on shallow footings (strip foundations, foundation rafts) or deep footings (bored piles, rammed piles, earth anchors).

Abutments:

- structural elements: footing, foundation, chamber wall, bridge seat, wing walls, transitional structure
- large variations in geometry depending on terrain, loads and angles of intersection
- conventional framed or timber-beam formwork is used
- surface finish frequently with boarded structure through to architectural patterning in fair-faced concrete

Foundations:

- large bulk-concrete blocks
- conventional light framed or timber-beam formwork is used
- load transfer of the concrete pressure either by way of prestressed tie rods or directly into the ground
- surface finish frequently with boarded structure through to architectural patterning in fair-faced concrete

▶ Architectural design

For architecturally demanding bridges even abutments are designed in artistic free-form shapes with unusual surface finishes in fair-faced concrete quality. From boarded finishes through to diversified patterning – Doka's straightforward framed and timber-beam formwork is faced with the right sheeting for the project.

The oblique-angled abutments for the Finnentrop project in Germany were cast without difficulty using Doka's Large-area formwork Top 50 and FF20. ▼

Piers and pylons

Widely differing shapes and designs for extraordinary bridges

Piers are erected on footed foundations and carry the supporting structure between the abutments. They consist of foundation, pier shaft and pier head. They connect to the superstructure either monolithically (flexurally rigid) or supported (articulated and/or movable).

Pylons are steel or concrete uprights from which the roadway is suspended on stayed cables. Pylons transfer deflection forces from the suspension cables into the foundations. Pylons come in innumerable shapes such as diamond, A, or H, and so on.

▲ Custom-tailored formwork concept with detailed planning of the union and installation of the cable boxes

▲ High-capacity shoring of the cross-beam

◄ Challenging geometry

Piers and pylons come in a multitude of shapes.

- various heights
- different cross-sections
- solid or hollow cross-sections
- varying wall thicknesses
- tapering and widening sections
- inclinations
- unions
- architecturally challenging free forms and surfaces

► Reinforcement and embedded parts

Climbing working platforms separate the formwork and reinforcement operations. Work proceeds on several levels at once, so the cycle time can be shortened. The installation of cable boxes is one of the factors that have to be taken into account in the planning concept for the working platforms.

◄ Safe access systems

To be able to keep the workers on the climbing formwork supplied in the event of a crane outage, the safety concept for the site includes a stationary system of vertical access.

Doka safety systems ensure safe and reliable up and down access after each climbing operation. This is all allowed for in the formwork concept. Site-supplied access systems and site elevators can also be incorporated into the concept.

- Stair tower 250
- Stair tower d3
- Working scaffolds

Climbing systems

Crane-lifted and crane-independent climbing formwork for widely differing requirements

Doka's modular systems, deriving from decades of experience on widely differing builds, provide the right climbing solution. Crane-lifted or crane-independent, what they all have in common is the high safety standard combined with cost-effectiveness and straightforward, safe handling.

Crane-dependent climbing

Not structure-guided

Firmly interconnected, the shaping wall formwork and the climbing scaffold are quickly crane-lifted as a single unit. The different system versions combine ease of working with trouble-free adaptation to different forms of usage.

- **Climbing formwork MF240** – for structures of any shape and height, with a platform width of 2.40 m
- **Shaft platform** – for the inside formwork of piers and pylons
- **Dam formwork D15 and D22** – for single-sided use, forming solid cross-sections with block heights up to 4.0 m

Structure-guided

Guided at all times on the structure, the climbing system can be repositioned even at high wind speeds. So climbing operations are less wind-dependent, faster and safer.

- **Guided climbing formwork Xclimb 60** – for structures of straightforward shape and any height, with weight-optimised guiding shoes

Crane-independent climbing

Structure-guided and with mobile hydraulic drive

Climbing systems with mobile drives are the first step into the world of automatic climbing. Guided at all times on the structure, they free up the construction crane and can be repositioned even at high wind speeds.

- **Automatic climbing formworkXclimb 60** – for structures of straightforward shape and any height, with innovative mobile hydraulic system

Structure-guided and all-hydraulic

The built-in hydraulics enable simultaneous repositioning of large multiple-platform assemblies without exposed fall hazards. Spacious, high-capacity working platforms are ideal for the construction workflow.

- **Automatic climbing formwork SKE50 plus** – for universal use, with a lifting capacity of 5 metric tons per climbing unit

- **Automatic climbing formwork SKE100 plus** – for high requirements such as greater influences, additional working platforms or live loads, with a lifting capacity of 10 metric tons per climbing unit

Load-bearing systems / shoring

Shoring entire spans with falsework

- the bridge span is shored with falsework that transfers concrete loads into the subsoil
- this temporary structure props the incomplete supporting structure and gives it its shape
- the shoring for a complete span requires a full-area foundation
- economical for limited number of cycles and repositioning processes
- special geometries and very tight radii can be formed and formwork of this kind can deal with steep longitudinal or transverse gradients

◄ Stable

Bridge-building places very high requirements on the stability of load-bearing towers, because usually they are free-standing. Doka Load-bearing towers have welded steel frames and diagonal crosses, so they are characterised by high stability even when propping heavy loads in high wind-speed conditions.

System applications

Load-bearing tower Staxo 100
– high-performing and fast

Load-bearing tower d3 – highly economical

◄ The superstructure can be formed with Large-area formwork Top 50 or Dokaflex, depending on boundary.

► Full-span shoring with load-bearing towers adapts flexibly to project geometry, making this solution ideal for ramp structures with extreme longitudinal and transverse gradients.

Correct stripping, allowing for load shifts in the supporting structure

Planning has to make full provision for the effects of of pre-stressing the supporting structure. Load shifts in the supporting structure cause load shifts in the falsework. Coordination between structural engineer and Doka is essential for the right formwork solution and particularly for the right stripping concept.

Load-bearing tower Staxo 100

The high-performing, high-speed shoring system

With its rugged steel frames, our Load-bearing tower Staxo 100 is designed for high shoring heights and high loads. It combines high load-bearing capacity and safety in every situation.

Find out more on our website:
www.doka.com/staxo-100

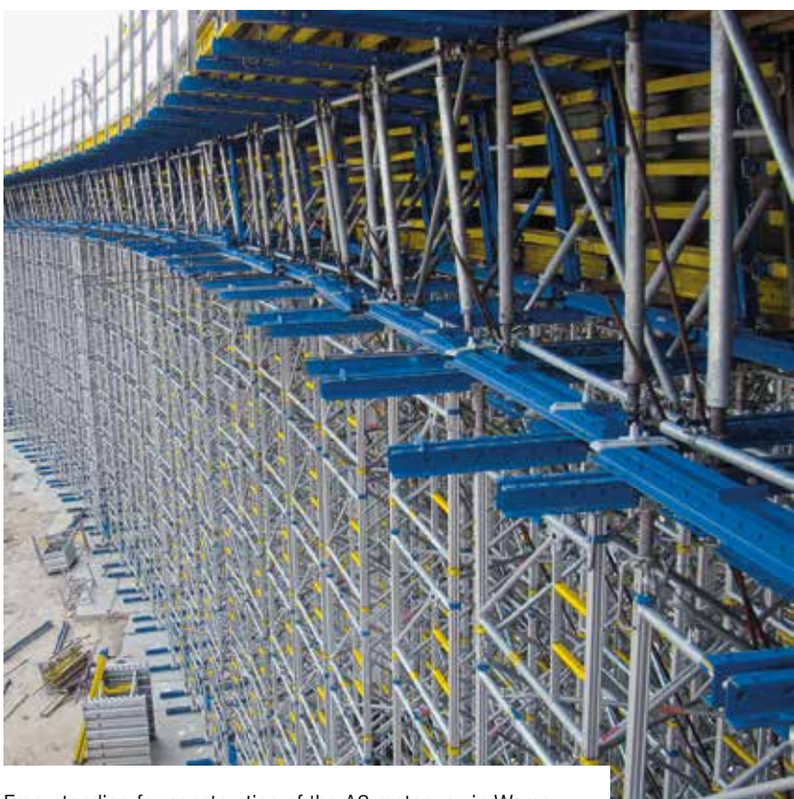
Safe shoring of heavy loads
with load-bearing capacity of up to 100 kN per leg

Fast assembly with integrated connectors

Safe up/down access by ladders with slip-resistant rungs integrated into the frames

Flexible system with variable frame spacing from 0.60 m to 3.00 m and a range of spindle types

◄ Coloured clips and stamped marks clearly indicate length



Free-standing for construction of the A2 motorway in Warsaw, Load-bearing tower Staxo 100 demonstrates the load-bearing capacity of its robust steel frames.

Assembly on the flat

Assembly on the flat makes for safe, fast, ground-level erection. The diagonal braces are permanently connected and the coloured clips and stamped marks make it easy to adjust length, so work proceeds faster and search times are reduced.

Easy adaptation to the geometry of the structure

The spindles are precision-adjustable, so it is easy to deal with widely differing shapes and super-elevations.

Easy stripping

- easy to release, even when under load
- easy to operate, with special thread geometry and integral fixing handles
- height adjustment to the last millimetre

Use as stair tower

The sturdy, stable stair tower can be put together easily and quickly from frames and pre-assembled stairway elements.

Load-bearing tower d3

The highly economical shoring system for widely differing areas of application

Load-bearing tower d3 scores with high load-bearing capacity, speedy assembly and versatility for a wide range of applications, for example in bridge-building, highrise and industrial construction.

▲ Very stable as falsework on bridge-building projects

High load-bearing capacity for widely differing shoring requirements

Durability with hot-dip galvanised steel parts

Speedy erection on the flat or upright, no tools required

Versatile because adapts easily to widely differing requirements and combines with Doka floor systems

Self-supporting load-bearing system / shoring

Bridging entire spans with self-supporting girders

- entire spans are bridged with steel girders or trusses
- grounded load transfer by ultra-strong reshoring props or load-bearing towers
- or non-grounded load transfer into the structure (abutments, piers) by brackets or main support girders
- economical for repeat cycles and repositioning processes
- used when when topographic conditions (valley, slope, road, railway, river, etc.) require bridging

Load transfer

Self-supporting girders can be grounded or structure-supported, depending on requirements. The DokaShore and UniKit systems are geared to the challenges of this construction method and support a smooth workflow.

Correct stripping, allowing for the boundary conditions

Planning has to make full provision for the effects of of pre-stressing the supporting structure. Load shifts in the supporting structure cause load shifts in the falsework. Coordination between structural engineer and Doka is essential for the right formwork solution and particularly for the right stripping concept.

DokaShore

The high-capacity, cost-effective shoring system

Find out more on our website:
www.doka.com/dokashore

Universal for shoring precastings or CIP concrete

High load-bearing capacity up to 430 kN with the robust Prop SL-1

Can be pre-assembled on the flat and lifted safely to the vertical because primary beam and strut are bolted together

Less equipment and erectionwork needed because the number of different parts is small and the system solution adapted

Doka UniKit

The universal cost-saving shoring system for heavy loads

Multi-functional as trusses or for shoring with its extensive modular system

Modular system grid makes it adaptable to different structure geometries

Handling is easy to understand, because there are only 3 basic components: U-channels, splice plates, struts

Single-source 'formwork and scaffold' complete solution, so everything is combinable

High proportion of rentable standard components to reduce cost of investment

Cantilevered bridge

Bridging wide spans with the balance beam principle

Find out more on our website:
www.doka.com/cantilever-forming-traveller

In the free cantilever method of construction the prestressed-concrete superstructure, generally boxlike in section, is cast section by section. Two cantilever arms are built in opposing directions, extending away from the pier head (or 'hammerhead' as it is often termed). In order to ensure that this 'balance beam' does not topple off the head of the bridge pier, the superstructure is connected to the pier in such a way as to remain flexurally rigid, or it is held by temporary supports or temporary piers until the through-beam supporting effect of the superstructure is established by what is known as gap closure. Even though the connection through to the pier is flexurally rigid, the two extensions have to be kept within a precisely defined maximum load delta. Consequently, there can be no more than a minor difference in the lengths and weights of the two cantilever arms.

- spans up to 300 m can be bridged efficiently with conventional cantilevered construction
- used for wide spans (valley, river, sea, nature conservation area, etc.)
- nothing to obstruct traffic (road, rail, shipping) underneath the structure
- the pier head is the starting segment for the pair of cantilever forming travellers and it also absorbs the enormous support moments and loads deltas during construction
- generally a one-week cycle for casting and prestressing each pair of segments
- defined work cycle: process-oriented completion of the sections for high efficiency and quality

► On the Traismauer Danube bridge project in Austria, the cantilever arms extend section by section in accordance with the balance-beam principle

Doka cantilever forming traveller

- Cantilever forming traveller complete with system formwork from a single source
- defined work cycle
- segment lengths up to approx. 5 m
- modular construction-kit principle for adaptation to different cross-sections
- easy, safe assembly
- CE certification
- innovative drive unit

Pier head

- starting segment for the cantilever forming travellers
- constructed using load-bearing tower, timberbeam formwork and framed formwork systems
- extensive safety features for safe working conditions

Gap closure

The closing cycle has to go smoothly, but it is also very important to plan the disassembly or retraction of the cantilever forming travellers.

Optimised interface between Doka and structural engineer

As regards planning the anchor holes for the cantilever forming traveller, close coordination with the structural engineers is essential in order to avoid collisions with the bridge's tensioning-cable system. This method of construction involves relatively large deformations, so super-elevation has to be calculated accurately and conditions checked and adapted after every pouring operation. Doka supplies the structural engineer with the data on system deformations for each cycle.

Cantilever forming traveller

Formwork and supporting structure from a single source

The Doka cantilever forming traveller puts planning and costing dependability alongside optimum on-site progress. The perfect design match between the CFT's shoring structure and the formwork, its high standard of safety and its optimised workplace-ergonomic design together ensure that work can progress swiftly and safely.

Economical complete solution because rentable, with limited number of individual parts and short assembly times

Smooth progress on the project benefiting from close support and rapid availability

Safe casting because the rear carriage anchors are testloaded before each pour

Safety at the workplace because the platforms are fully enclosed

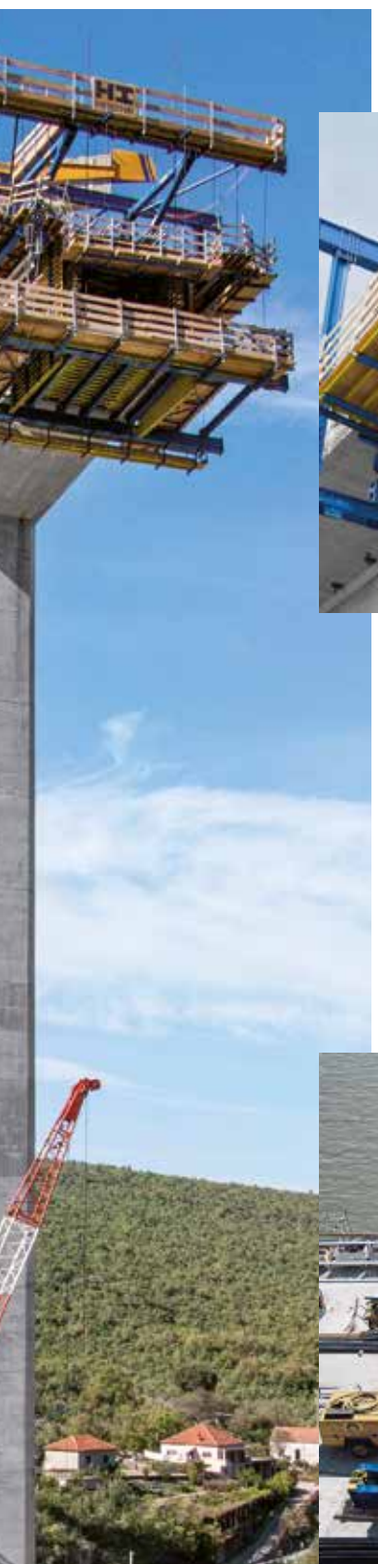
CE certification of the Doka Cantilever forming traveller ensures quality in accordance with applicable standards and regulations.

▲ Optimised longitudinal trusses

- ergonomically designed, with upward-extended longitudinal trusses for more headroom
- pre-assembly on the flat, including ladder system and catwalk, is possible

▶ Universal anchoring cross-beam

- the suspension rods can be flexibly positioned for adaptability to different bridge geometries
- broad working platform from which the suspension rods can be operated safely
- easy pre-assembly, compete with platform



◀ Pre-assembled platform system

- on all work-deck levels
- with integrated ladderways complete with ladder cages and self-locking manholes
- spacious workplace access routes for safe, efficient working

▶ Innovative drive unit

- permanent self-locking with slide bearings to prevent unwanted movement, effective up to a longitudinal gradient of 6 %
- incorrect operation of this safety feature is impossible, as it is always active

◀ Bracing on the outside

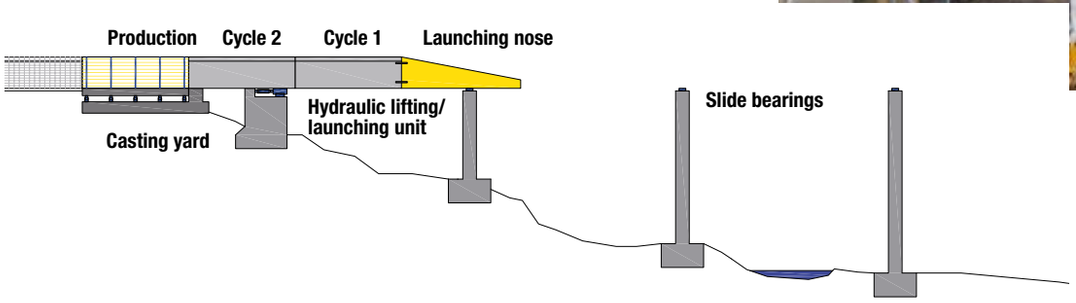
Free accessibility from above for easy, quick placement of reinforcement and concrete

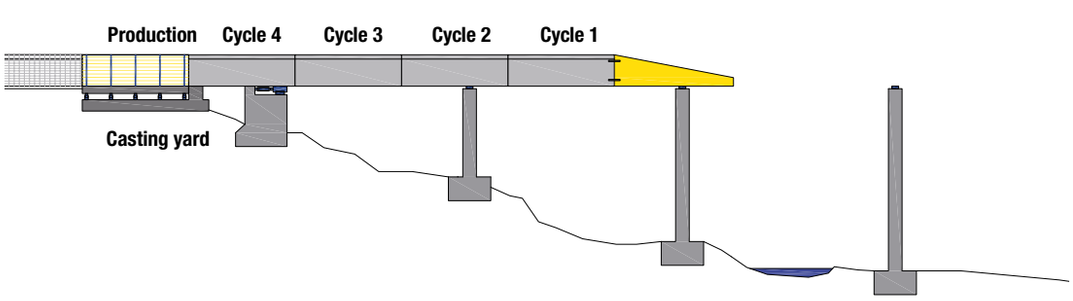
Incremental launching

Producing a cycle in the stationary production facility and launching the entire superstructure

The individual sections of the superstructure, 15 to 30 m long, are cast in a stationary production facility (casting yard) behind the abutment. When the concrete hardens, the new section and the existing superstructure are post-tensioned together with tendons. Then the entire superstructure is advanced across the piers by one cycle length, pushed forward by hydraulic shifting devices and moving on temporary slide bearings (Teflon-coated plates). To reduce the cantilever moments while the superstructure is being launched, a launching nose made of steel is attached to the lead section so that it is already supported by the next pier.

- reinforcing, forming, casting and advancing in the stationary production facility: process-oriented completion of the sections for high efficiency and quality
- the piers are constructed in advance
- Work steps are separated: the trough is cast first, followed by casting of the deck slab
- economical for repeat cycles and repositioning processes
- bridging valleys, rivers, sea straits, nature conservation areas
- nothing to obstruct traffic (road, rail, shipping) underneath the structure





Principle

- reinforcing, forming and casting in the stationary production facility
- post-tensioning of the new cycle and the existing superstructure with tendons
- lowering of the casting yard; the superstructure is advanced by the hydraulic lifting/launching unit
- next cycle is produced

▶ Large-area formwork Top 50 – versatile system for bridge-building

Large-area formwork Top 50 features a stripping lever, so forming and stripping of the entire cycle proceed efficiently and, most importantly of all, economically and rapidly.

▶ Doka's innovative lever design allows the outside formwork of the web to be shifted horizontally as the girder-grid is vertically lowered. This makes forming and stripping considerably faster.

▲ Piers are built in advance

Large-area formwork Top 50 is the dependable solution even when the geometry of the piers is extremely complicated.

▲ fast repositioning of inside formwork on roller brackets for deck formwork

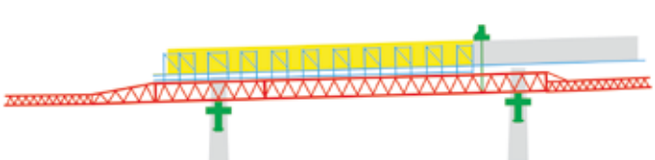
Launching-girder

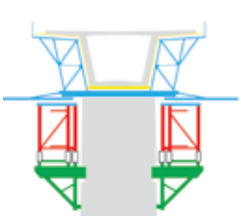
Long, pre-stressed concrete bridges built span by span

The superstructure is built section by section without shoring, carried on launching girders that advance hydraulically to the next section. The forces are immense, so the supports are either heavy-duty load-bearing towers or heavy-duty brackets suspended from the piers. When the concrete hardens, the new section and the existing superstructure are post-tensioned together with tendons. The advancing movable scaffold always has to be supported by two piers, so the launching girders have a trailer behind and a launching nose in front.

- used to build very long bridges to minimise assembly and reduce cycle times
- the piers are constructed in advance
- bridging valleys, rivers, sea straits, nature conservation areas
- nothing to obstruct traffic (road, rail, shipping) underneath the structure
- system formwork from Doka suitable for all the different types of movable scaffold

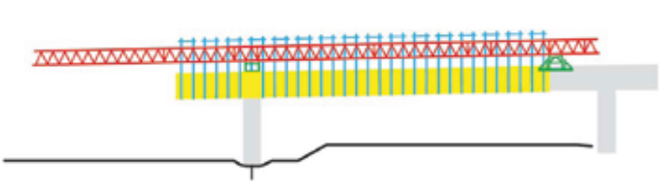
► Span-by-span production projects one fifth of the span into the next section to put the coupling joint at the zero-crossing moment of the future continuous girder and reduce the loads of the movable scaffold.

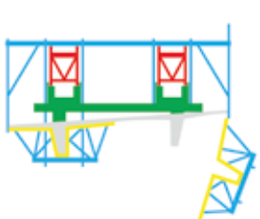




Underslung

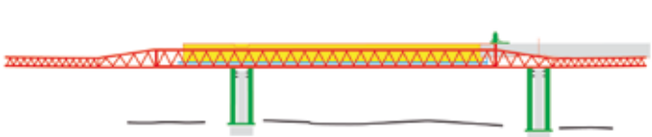
- the launching girders are underneath the superstructure
- the formwork is mounted on the launching girders
- freely accessible from above
- for large radii only

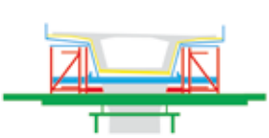




Top running

- the launching girders are above the superstructure
- the formwork is suspended from the launching girders
- suitable for tight radii





Side-mounted

- the launching girders are on the same plane as the superstructure
- formwork and launching girders are on the same level
- more headroom underneath the movable scaffold, for example for rail or road traffic

▶ Large-area formwork Top 50 – versatile system for bridge-building

- the spacing of the beams and steel walings and the tie-rod positions are planned on a project-specific basis to suit the requirements of the movable scaffold
- versatile, modular 'construction kit' system for easy assembly and speedy adaptability

▶ Before the movable formwork advances, the outside formwork units have to be moved aside or opened so that they can pass the piers. Detailed planning by Doka's bridge-building experts and the versatility of the Top 50 system formwork enable these requirements to be met.

Doka's detailed planning and support helped keep work progressing smoothly on the R1 Selenec – Beladice motorway project in Slovakia.

Steel composite bridge

Combining concrete and steel

Steel composite bridges ideally combine the properties of concrete and steel by compression-loading the concrete and tension-loading the steel. This is why the deck slab is concrete and the trough or webs are steel. Shear studs make the shear-resistant connection. Steel composite bridges are an economical alternative and with their low dead weight they are ideal for slender-looking structures.

- steel trough takes its own weight and the dead loads of the concrete
- steel trough or steel girders can be lifted quickly into position, so roads below are closed to traffic for only short periods of time
- composite forming carriage for casting the deck slab
- alternating or 'back-step' sequence for casting the sections of the bridge
- steel composite bridges are often an alternative proposal in tendering

▼ Alternating sequence, 'back step'

At the construction stage, casting section by section in a special, pre-defined casting sequence with appropriate casting section limits sharply minimises the deck-slab cracking that can be caused by longitudinal tension strains (especially in the vicinity of the columns).

◄ Super-elevations as planned

When the concrete is cast the super-elevated steel superstructure deforms to its final shape, so the forming carriage should copy these deformations. The statically flexible system of the composite forming carriage from Doka has the give that allows the formwork to deform along with the steel superstructure, so that the concrete slab lines up cleanly with the steel structure.

► Formwork pre-assembly

Easy pre-assembly of large units from the safety of ground level. Then the pre-assembled units are quickly crane-lifted into position.

Composite forming carriage

The adaptable travelling composite bridge-deck formwork from a single source

Find out more on our website:
www.doka.com/composite-forming-carriage

Fast progress because the entire unit is repositioned at one go

Rentable and quickly available with modular standard system parts

Easy pre-assembly of large units from the safety of ground level

The Doka composite forming carriage is the fast, safe way to cast the concrete roadway slab of a steel composite bridge.

Bridge formwork ParaTop

The unpropped cantilever arm formwork for steel-composite and pre-cast concrete bridges

Ideal for special shapes , broadening zones and short bridges

Ergonomic, safe working from the supporting structure

Less crane time used up engaging the cantilever arm formwork, because of the open design of the insert-shoe

Find out more on our website:
www.doka.com/paratop

Doka bridge formwork ParaTop turns Large-area formwork Top 50 into a cantilever arm formwork that can be operated completely from above. The system's innovative insert-shoe makes it easy to erect and compensates for structure tolerances.

Arched bridge

Architectural masterpiece for bridging valleys, rivers and nature conservation areas

Arches are among the oldest shapes in bridge construction. Unlike girder bridges, arched bridges transfer the forces generated solely in the form of compressive forces. Spans up to approx. 400 m have been achieved with concrete arches. There are innumerable designs of arched bridges.

- innumerable designs: widely varying arch curvatures, varying crosssections, solid or hollow, tapering, roadway on top, suspended or cutting through the arch
- construction methods range from full shoring or self-supporting girders, through cantilever construction through to the use of precastings
- bridging valleys, rivers, sea straits, nature conservation areas
- nothing to obstruct traffic (road, rail, shipping) underneath the structure
- architectural masterpieces require enhanced fair-faced concrete quality

The 'Froschgrundsee' viaduct in Germany is 798 m long; its centrepiece is the 270 m arch, which peaks at 65 m above the waters of the lake. Doka supplied the formwork for the piers, auxiliary pylons and the arch built using the cantilever construction technique, ensuring progress on this successful project. ▶

Decades of experience in building arched bridges

Thanks to the expertise and decades of experience of the Doka bridge-building specialists, close cooperation produces the ideal formwork solution for your unique construction project.

▶ Arch forming carriage

With the cantilever technique, during construction each of the two segments of the arch is cable-stayed off its pylon. The forming wagon must allow for cable installation and clear the cables when it moves.

▶ Arch kicker

- starting segment for the arch forming carriage
- the starting angle is steep, so the formwork solution must have high load-bearing capability
- system formwork such as Large-area formwork Top 50 and Heavy-duty supporting system SL-1 are used

Safe casting with Concremote concrete monitoring

The foundation of the arch (arch abutment) has to be extremely solid in order to take the immense supporting forces. A great deal of hydration heat is generated when these solid structural elements are cast. In circumstances like these, the Concremote concrete monitoring system is your ideal tool for quality assurance. Adjusted to the development of hydration heat, pouring rate and, most importantly, concrete cooling can be controlled in real time.

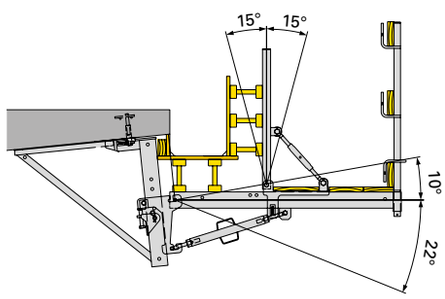
Cantilevered parapets – Edge beams

The finishing touch for the bridge

- cast on top of the roadway slab after sealing
- the parapet is frictionally bonded to the superstructure

Functions of this structural element:

- safeguard traffic on the bridge
- installation of crash barriers
- absorb the impact forces of vehicles straying out of lane
- conceal dimensional inaccuracies of the cantilever arm



▲ High horizontal and vertical flexibility for adapting to the specified geometry

Bridge edge beam formwork T

The fast handset bridge edge beam formwork

Find out more on our website:
www.doka.com/bridge-edge-beam-formwork-T

Simple, fast alignment with plenty of room for adjustment

Stepless, millimetre-perfect height adjustment of the bridge edge beam support

Combines ideally with crane-lifting for short supporting structures, few repositioning cycles, tight radii and complex cross-sections

Forming wagon TU

The underslung bridge edge beam formwork for fast forming of bridge parapets

Find out more on our website:
www.doka.com/forming-wagon-TU

Easy, safe working from the supporting structure because the travelling formwork is underslung

Rentable complete system with pre-fabricated working platforms and parallel girder-frame units

Faster forming and stripping with simultaneous horizontal and vertical pivoting action

For tight radii starting at 250 m

High level of safety with gapless platform decking and all-round edge protection

▶ Reinforcing and pouring operations made easy

Forming wagon TU allows unobstructed access to the workspace from above, so it easier to lift in the pre-assembled reinforcing cages and pouring the cantilevered parapets is much faster.

Forming wagon T

The site-ready, travelling bridge edge beam formwork

Find out more on our website:
www.doka.com/forming-wagon-t

Efficient, fast construction progress

- on long superstructures
- for high numbers of repeat uses
- for 'section-at-a-time' repositioning
- on supporting structures where formwork cannot be suspended from the underside of the cantilever slab
- for rehabbing existing supporting structures
- on bridges with wide radii

Precastings

Prefabricating individual structural components speeds up construction

The precastings used in bridge-building are made of concrete, steel-reinforced concrete or pre-stressed concrete; they are prefabricated in a plant or directly on site and then crane-lifted into position. Concrete precastings are used in innumerable structural elements.

- precastings can speed up progress on the build
- they are used in many structural elements, such as piers, pier heads, hammerheads, cantilever slabs and I-beams through to entire sections of supporting structures and spans
- conventional formwork and propping are used for on-site prefabrication
- systems such as shoring and platform systems are needed for installation of the precastings

▲ Architectural design

High-performing Load-bearing towers Staxo 100 from Doka for safe shoring of the trough elements.

◄ Unobstructed passage for rail traffic underneath the structure

High loads of concrete precastings are transferred with ease by the high-capacity Heavy-duty supporting system DokaShore.

◄ Speed up construction

The box-girder sections are prefabricated in series on the ground directly on site

► Safe working conditions

Doka supplies working platforms for safe working conditions at the heights required for construction of the piers with precastings.

▼ Reduction of loads in movable scaffolding

Post-finishing the cantilever arms enables concrete loads to the transferred to the supporting structure completed beforehand.
Movable Large-area formwork Top 50 forms the roadway slab.

Reconditioning

Bridge reconditioning with system formwork

Maintenance and reconditioning are essential for the upkeep of structures and for extending their lifespan. System formwork from Doka provides ready-to-go solutions for a wide variety of applications.

- repair of damage by corrosion over many years
- damage to the structure caused by increasing volume of traffic
- applies to cantilevered parapets (edge beams), cantilever arms, roadway sealing, roadway drainage, localised surface cracking of the concrete
- close survey of as-is condition for detailed planning
- allowing passage of traffic
- higher safety requirements

▲ Travelling assembly wagon

Platforms made of multi-purpose waling enclose the bridge for demolition of cantilever parapets and cantilever arms. An SL-1 assembly wagon with ample space for working in safety is used for suspending the platforms.

Doka system formwork for bridge repair and rehabbing

- Bridge edge beam formwork
- Bridge formwork ParaTop
- Large-area formwork Top 50
- Heavy-duty supporting system SL-1
- Framed formwork Framax Xlife and Alu-Framax Xlife
- Edge protection system XP
- Working scaffolds
- concrete monitoring with Concremote

► Edge protection system XP for safe working conditions

Edge protection system XP has practical connectors so it is easy to install on an existing structure and offers reliable all-round protection for the site crew to proceed with repair work.

▲ The motorway passing underneath the structure could be closed for only a very short time, so a simple solution was chosen with suspended multi-purpose walings that installed quickly within the specified time window.

◄ Bridge formwork ParaTop also provides a cost-effective solution for rehabbing cantilever arms and parapets.

Concrete monitoring with Concremote

Measuring concrete temperature and strength in real time

With Concremote you can plan your construction project better and no matter where you are, you have round-the-clock access to your real-time data. So you can gauge concrete performance and initiate the necessary measures at exactly the right time.

Save time

Increase safety

Enhance concrete quality

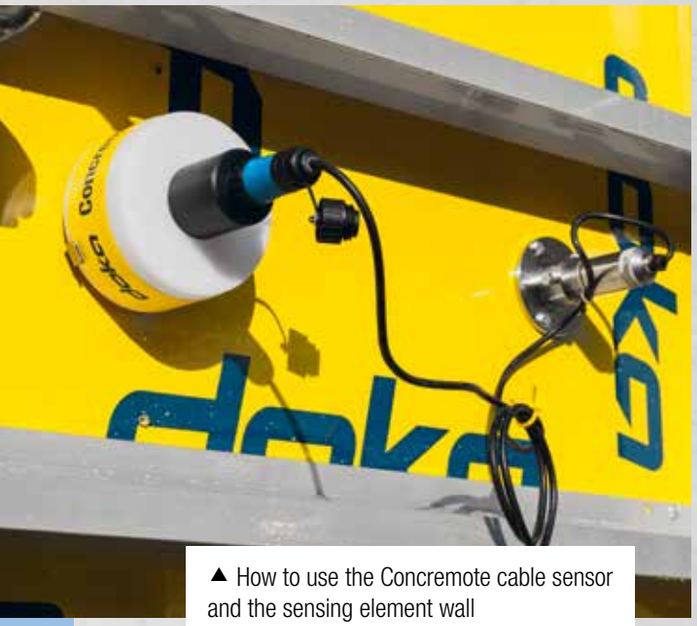
Reduce costs

▲ How to use Concremote slab sensors

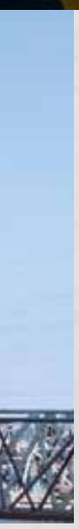
More insights in our video:
www.doka.com/concremote

Generation 2.0

The tried-and-tested Concremote sensor technology is enhanced with new features, including additional networking options (2G, 3G, 4G, Bluetooth Low Energy (BLE), an LED status indicator, rechargeable batteries, and a smaller housing designed to withstand the harsh conditions of construction. The new version is available now as your reliable concrete wizard.



▲ How to use the Concremote cable sensor and the sensing element wall



Proof of thermal stresses in structure to prevent cracking:

- Real-time monitoring of the difference between core temperature and surface temperature with Concremote sensors
- The early-warning system enables measures to be implemented quickly to avoid cracking, e.g. heating, cooling, covering
- Suitable for solid components with high quality requirements, e.g. foundations, mega-columns, shear walls and core walls
- Temperature development is documented and can be called up at any time in the Web portal

Proof of concrete strength for safe stripping and climbing operations:

- Real-time monitoring of strength development with Concremote sensors
- Active notification (by text message or email) when target strength is reached
- Supports earliest possible stripping of the floor slab, so commissioning quantities are optimised
- Supports earliest possible stripping and repositioning of the climbing formwork for shorter cycle times
- Strength development is documented and can be called up at any time in the Web portal

Third bridge over the Orinoco River

Two pylons, each 125.5 metres tall, for the third bridge across the Orinoco River in Venezuela were formed with automatic climbing technology from Doka. The bridge is the road and rail link across one of the biggest rivers in South America, together with its swamps and flood plain.

Challenge:

- pylons 135.5 m high
- the pylons are angled at 18° below the cross beam and at 13° degrees above it
- specific planning of the changes in cross-section, the catwalk between the pylon legs, and an additional suspended platform to provide access to the passenger lift

Location: Caicara del Orinoco, Venezuela
Construction work by: Odebrecht Venezuela
Height of structure: 135.5 m
Formwork solution from Doka: Diamond-shaped pylons

Project solution:

- the adaptability of Large-area formwork Top 50 enables quick alterations in very short times for the continuously changing cross-sections
- high capacity of 10 metric tons per climbing bracket facilitates formwork and reinforcement operations to proceed in parallel on several levels, plus an additional level above the pouring platform
- safe working conditions and protection from falling objects with the working platforms enclosed with trapezoidal sheet or protective netting
- on-site support by a Doka formwork instructor for smooth progress on the build

Products used:
Automatic climbing formwork SKE100, Large-area formwork Top 50, Ladder system XS

Construction time: 2011 – 2015

Location: St. Petersburg, Russland
Construction work by: Joint Venture ICA Astaldi – IC Ictas – WHSD
Overall length: 620 m
Span: 320 m
Formwork solution from Doka: pylons & main piers for cable-stayed bridge

Project solution:

- crane-lifted and automatic climbing formwork was used for the geometrically challenging pylons. Combining the Crane-lifted climbing formwork MF240 and Automatic climbing formwork SKE plus shortened alternation times and reduced construction costs on the first eight pouring sections.
- the formwork combined with telescoping platforms adapts perfectly to the area where the cross-sections of the pylons tapers
- the high-capacity Heavy-duty bracket HDC was used, tailored to the specifics of the project; the bracket has very high load-bearing capacity, it is modular and versatile

Challenge:

- span of 320 m between the pylons
- pylons are inclined 12° and soar 125 m high
- pier heads get wider toward the top
- pylon cross-section tapers from 63 m^2 to 18 m^2

Products used:
Automatic climbing formwork SKE50 plus and SKE100 plus, Climbing formwork MF240, Supporting construction frame, Large-area formwork Top 50, Heavy-duty bracket HDC

Construction time: 2014 – 2015

Korabelny cable-stayed bridge

The 46.6 km Western High Speed Diameter was one of the biggest infrastructure projects in St. Petersburg, Russia. The highway is designed as a high-speed line between the northern and southern parts of the city and the Vasilievsky Island. At the centre of the project is the bridge spanning 620 m across the Korabelny Channel. The lead contractor opted for the project-specific formwork solution from Doka for the two pylons and main piers.

Bouregreg Bridge

The Bouregreg Bridge in Morocco is one of the most spectacular bridge projects. The two pylons, one 197 m and the other 185 m tall, are striking features of the 952 metre cable-stayed bridge. The inclination and cross-section of pylons change after every single casting section. For each section Doka planned an individual solution based on Automatic climbing formwork SKE100.

Location: Rabat, Morocco
Construction work by: MBEC-COVEC
Span: 376 m
Height of structure: 185 m and 197 m

Project solution:

- The same basic elements are used for each casting section: Automatic climbing formwork SKE100 and Climbing formwork MF240. A very few alterations are all it takes to manage complicated layouts.
- The bridge pylons are each formed with 40 units of Automatic climbing formwork SKE100 and in all, some 220 elements of Large-area formwork Top 50.
- in addition to the great versatility of the climbing system and the fact that it allows rearward inclination, custom components and telescopic platforms were developed and fabricated to deal efficiently with the continuous changes in inclination
- the 45 (48) casting sections, each up to 4 m high, are completed in a 6-day cycle
- the surfaces produced by the formwork systems used were first-rate

Products used:
Automatic climbing formwork SKE100, Large-area formwork Top 50, Climbing formwork MF240

Construction time: 2011 – 2014

Challenge:

- oval pylons, shaped from four curved columns
- the inclination and cross-section of the 197 m and 185 m tall pylons change after every single casting section
- deal with high wind speeds and adhere to the tight construction schedule
- architect-specified aesthetically pleasing fair-faced concrete finish

Replacement for the original Gerald Desmond Bridge

Since 1968, the Gerald Desmond Bridge has been an essential part of the USA's West Coast infrastructure. It is a key feature of a vital trade corridor in Long Beach, California. After 47 years, the original bridge has become outdated and is being replaced by California's first cable-stayed bridge, which will also be the biggest of its kind. With a height of 61 m above water level, the bridge design secures ship traffic for the newest generation of freighters is possible.

Challenge:

- formwork solution for construction of twin tower pylons, with constant adaptation to octagonal, upward-tapering geometry
- high requirements regulating the joint-line pattern and the quality of the finished surface

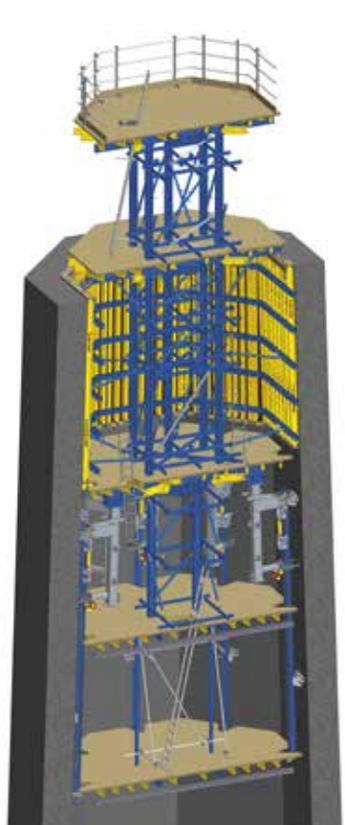
Location: USA
Construction work by: Shimmick / FCC / Impregilo JV
Cycle time: 7-day cycle
Overall length: 610 m
Height of structure: 157 m
max. span: 305 m
Pouring-section height: 5.5 m
Type of structure: tower pylons
Pylon height: 157 m

Project solution:

- modular formwork solution for exterior and shaft areas, with Automatic climbing platforms SKE50 plus and SKE100 plus in combination with Large-area formwork Top 50 to ensure fast and safe climbing from pouring section to pouring section of the octagonal, upward-tapering towers
- easy to clean and light in weight, with all the benefits of crane-independent hydraulic climbing

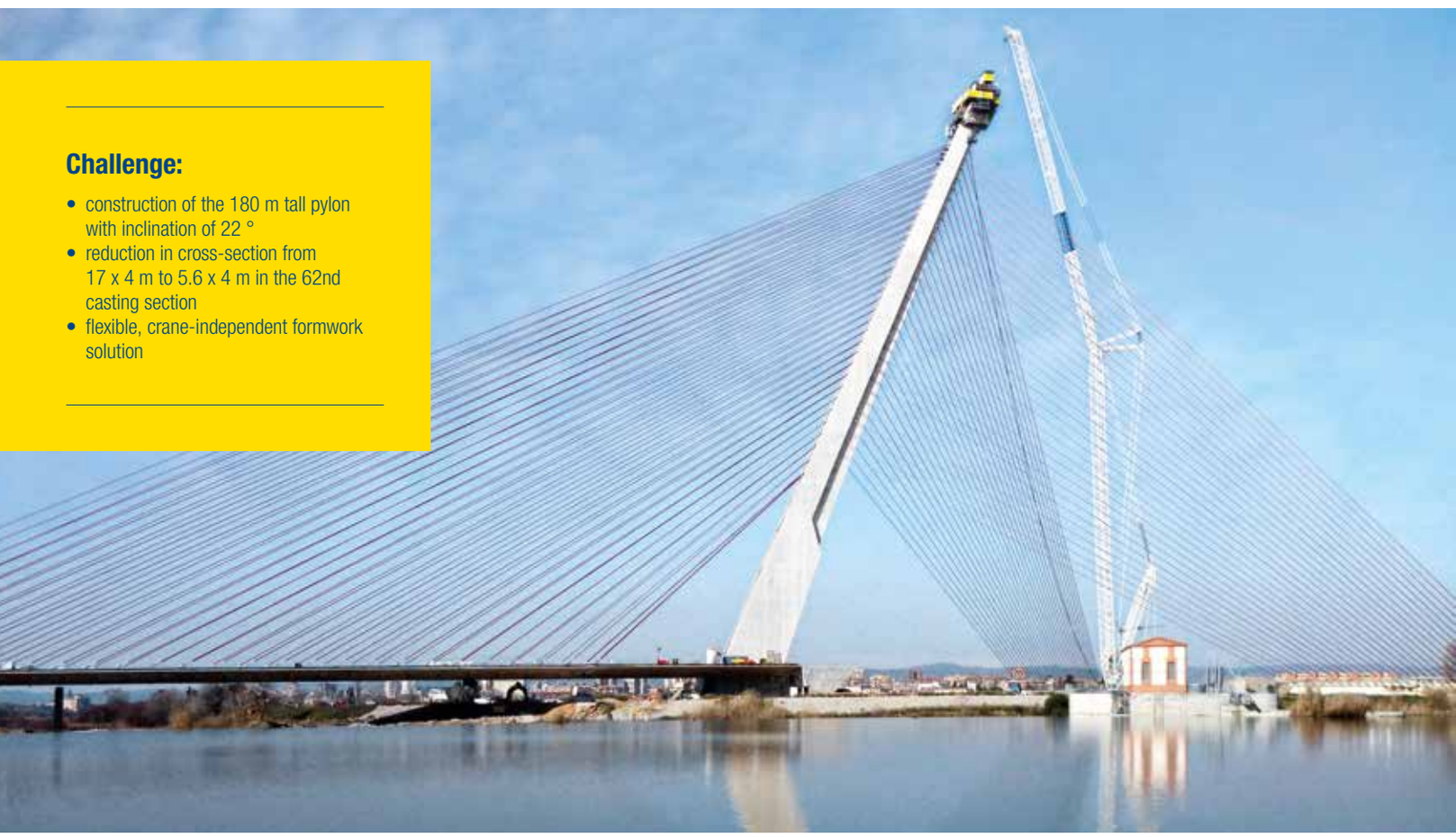
Products used:
Automatic climbing formwork SKE50 plus and SKE100 plus, Large-area formwork Top 50, Framed formwork Frami Xlife

Construction time: 2017-2018



Talavera Bridge

The geometrically challenging pylon of the 318 m long cable-stayed Talavera Bridge in the heart of Spain stands on a foundation of 56 bore piles and is inclined 22 °. Leaning at this steep angle, the tower utilises its own deadweight to balance part of the load of the superstructure bridging the river valley. The innovative, crane-independent and rapidly adaptable formwork solution from Doka scored high on this project.



Challenge:

- construction of the 180 m tall pylon with inclination of 22 °
- reduction in cross-section from 17 x 4 m to 5.6 x 4 m in the 62nd casting section
- flexible, crane-independent formwork solution

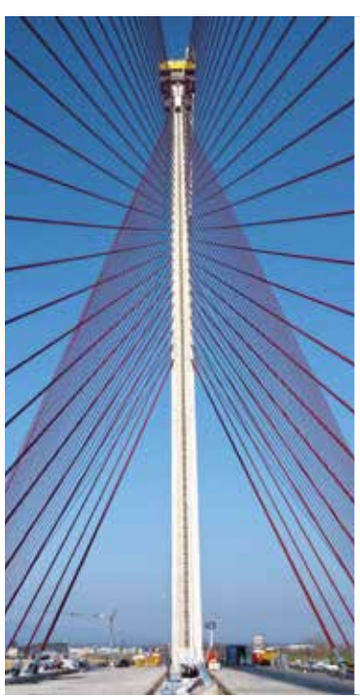
Location: Toledo province, Spain
Construction work by: UTE Ronda Sur Talavera
Pylon height: 180 m

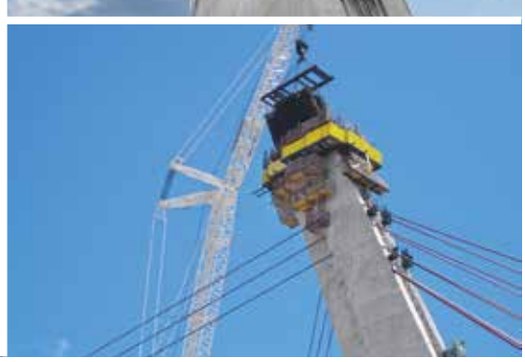
Project solution:

- Automatic climbing formwork SKE100 with high load-bearing capacity configured with several platform levels for optimal separation of reinforcement and formwork operations for faster progress on the build
- a suspended platform adjustable in three dimensions enabled workers to handle the stay cables at the suspension tower's overhanging face
- a 1.5-day cycle was achieved and maintained from the sixth pouring section upward
- pre-assembly of Large-area formwork Top 50 at the Pre-assembly Service centre for fast, safe and cost-effective usage
- on-site support of Doka formwork instructor

Products used:
Automatic climbing formwork SKE100 plus,
Large-area formwork Top 50

Construction time: 2009 – 2011





Challenge:

- complicated geometry, changes in cross-section and climbing in 55 pouring sections from base to tip without major alterations to the working platforms and without replacement of the formwork sheets

Shanghai-Nantong Yangtze River Bridge | Hutong

At 325 metres, the Hutong bridge pylon is the tallest structure of its kind in the world. The Shanghai Yangtze River Bridge is a road/rail link project with a total length of 11,072 metres. With a main span of 1092 metres, this new, two-deck combined road and rail viaduct is the world's largest cable-stayed bridge. The bottom deck carries a four-track railroad, the top level is designed for six lanes of road traffic. The bridge's diamond-shaped, cast-in-place concrete pylons stand 325 metres tall.

Location: China
Construction work by: China Railway Major Bridge Engineering Group
Cycle time: 5-day cycle
Overall length: 11,072 m
Height of structure: 325 m
max. span: 1,092 m
Pouring-section height: 6.0 m
Type of structure: Diamond-shaped pylon
Pylon height: 325 m

Project solution:

- 30 Automatic climbing units SKE100 plus with telescoping working platforms in combination with Large-area formwork Top 50 handle changes in the geometry of the pylon legs quickly, easily and safely
- A single Hydraulic unit V140 enables simultaneous climbing of all the platforms. In full compliance with the most stringent safety requirements, the working platforms remain fully enclosed at all times
- Large-area formwork Top 50 with Doka Xface formwork sheets ensures high numbers of use cycles

Products used:
Automatic climbing formwork SKE100 plus, Large-area formwork Top 50, Formwork instructor

Construction time: 2016-2019

Challenge:

- construction of a new bridge between two already existing bridges in full use

Varoddbrua 2

Norway's E18 highway crosses the Topdalsfjorden in the Kristiansand municipality on two bridge structures. Doka was awarded the contract for the new Varoddbrua 2 bridge, 654 metres in length overall and 18 metres wide, positioned between the two already existing bridges.

Location: Norway
Construction work by: PNC Norge Infrastructure
Overall length: 654 m
Radius: 3,500 m
Cross-sectional shape: double-cell cross-section with vertical webs
Width of superstructure: 18.01 m
Heigth of superstructure 13.4 m
Pouring-section length: 5.0 m
Max. pouring-section weight: 325.5 t

Project solution:

- The modularity of the CFT permits precision adaptation to the specifics of the situation, so that traffic flow remains undisrupted.
- complete concept with planning, sourcing and logistics from a single source
- to shorten the cycle times even though the webs are 12 metres in height, pre-assembled units were used to optimise placement of the reinforcement
- enhanced safety on account of the new Hydraulic system V70, which operates in the medium-pressure range

Products used:
Supporting construction frame, Climbing formwork MF240, Wall formwork FF20, Large-area formwork Top 50, Bridge formwork ParaTop, Cantilever forming traveller, Load-bearing tower Staxo 100

Construction time: 2017-2019

Location: Čapljina, Bosnia-Herzegovina
Construction work by: Hering (sub-contractor OHL)
Overall length: Studenčica 555 m, Trebižat 365 m
Height of structure: 85 m

Project solution:

- elimination of 8 casting sections in all by extending the originally planned section length to 5 m
- each section of the cantilever construction had to be individually planned because of the constant change in transverse gradient and the tapering of the walls. A solution with re-usable and removable panels in the inside formwork ensured a high reuse ratio of the equipment deployed.
- columns were constructed using Crane-lifted climbing formwork MF240 and Framed formwork Framax Xlife
- horizontally suspended supporting construction frames transferred the heavy load of the pier head
- high level of workplace safety at 85 m above ground level thanks to integrated working and safety platforms in the Cantilever forming traveller

Products used:
Cantilever forming traveller, Load-bearing tower Staxo 100, Climbing formwork MF240, Framed formwork Framax Xlife, Supporting construction frame

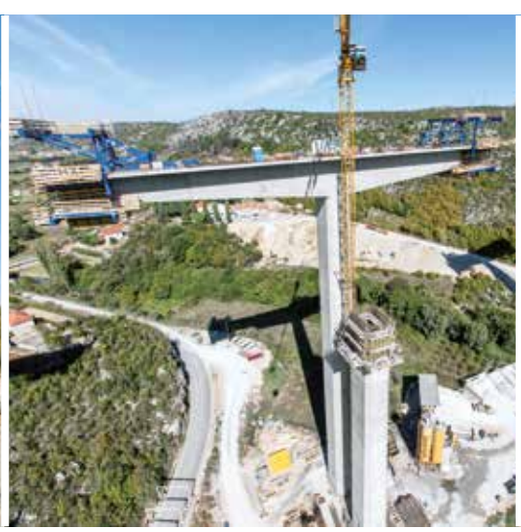
Construction time: 2013 – 2014

Korridor Vc

Maximum speeds were achieved on the 'Corridor Vc' project in Bosnian Čapljina. In all, ten Doka Cantilever forming travellers were deployed there at the Studenčica and Trebižat Viaduct builds. By extending the casting sections to 5 m, the contractor cut eight sections off the total.

Challenge:

- safe working at 85 m above ground level
- pier heads only 8 m in length, so space on top is cramped
- cycle planning and site logistics for 5 pairs of Cantilever forming travellers operating simultaneously on 2 bridges with a total of 8 piers



Schiphol Amsterdam

This large-scale project called for construction of three bridges across the Amsterdam-Rhine Canal with an aggregate span of 142 m and a total length of approx. 284 m. Maintaining shipping traffic on this important trade route during and after construction of these bridges is essential.

Location: Amsterdam, Netherlands
Construction work by: VolkerWessels, Boskalis, Hochtief, DIF
Type of structure: monolithic
Structure length: 284 m
Height of structure: 41 m
Cycle time: 7-day cycle

Project solution:

- start by building the piers and pier heads at both banks
- thanks to the Cantilever forming traveller, traffic below was unimpeded during construction of the south, north and centre bridges with their respective widths of 17.60 m, 21.50 m and 11.50 m
- the modular, rentable construction adapts flexibly to the project-specific shapes of the three bridges
- construction of the 14 bridge sections up to approx. 5 m in one-week cycle
- integral fall protection systems and ladders for safe working conditions

Challenge:

- restricted clearance – keeping ship traffic flowing below
- construction of three bridges at the same time

Products used:
Cantilever forming traveller, Load-bearing tower Staxo 100, Framed formwork Framax Xlife, Large-area formworkTop 50, Climbing formwork K, Dokaflex, Platform system Xsafe plus, Edge protection system XP, Ladder system XS

Construction time: 2014 – 2015

Tverlandsbrua

Heavy swells in the North Sea Doka made its mark with four Cantilever forming travellers for construction of the 670-m long Tverlandsbrua bridging a fjord with seven spans and six piers of up to 13 m in height. Waves up to 10 m high were a severe test for the site crew. The new bridge will shorten travel time between Løding and Bødo.

Challenge:

- longitudinal gradient up to 4.5 %
- spiral transition curves with changing radii
- seven spans and six piers up to 13 m high, three of them as twin piers
- logistics planning for equipment and partial re-use of material recovered beforehand

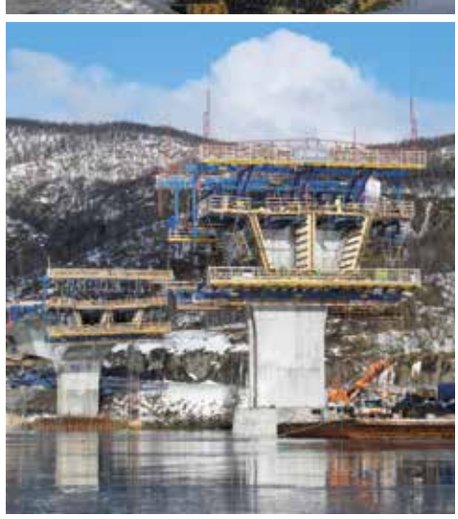
Location: Løding, Norway
Construction work by: Reinertsen
Mode of construction: twin-cell box girder, slanted webs
Overall length: 670 m
Width of superstructure: 22.6 m
Longitudinal gradient of roadway: max. 4.5 %
Transverse gradient of roadway: max. 6 %
Formwork solution from Doka: piers, pier heads, superstructure/supporting structure

Project solution:

- at 22.6 m the structure is extra-wide, so the cantilever forming travellers, four in all, were fitted with three longitudinal trusses for were rentable
- the slanted webs made it necessary to widen the bottom formwork, so the bottom grid complete with platforms had to be slide-mounted. This enabled the site crew to adapt the bottom formwork to the next segment quickly and safely.
- the modular design of the Cantilever forming travellers enabled efficient and cost-effective adaptation to the structure's cross-sections
- the pier head was built with Supporting construction frames, distributor cross-beams of the cantilevered system, and Bridge formwork ParaTop

Products used:
Cantilever forming traveller, Bridge formwork ParaTop, Cantilever forming traveller, Large-area formwork Top 50, Wall formwork FF20, Load-bearing tower Staxo 100

Construction time: 23 months, 2011 – 2013



Lahntal Bridge

The cantilever method was used to build the new Lahntal Bridge across the Lahn River as part of the A3 motorway near Limburg, Germany. Six pairs of round, slender piers for two-lane carriageways in each direction support the separate superstructures of the bridge. Doka's pre-assembly on site team quickly and efficiently handled the assembly, disassembly and repositioning operations of the two steel-girder grilles and the four Cantilever forming travellers.

Location: Limburg, Germany
Construction work by: Max Bögl Bauunternehmung GmbH & Co. KG
Overall length: 450 m
Width of superstructure: 22.50 m
Longitudinal gradient of roadway: 2.0 %
Transverse gradient of roadway: 2.5 %
Max. pier height: 55.0 m
Pier diameter: 2 m, 2.40 m and 2.80 m
Formwork solution from Doka: piers, pier heads, superstructure/supporting structure

Project solution:

- Doka experts pre-assembled the steel-girder grillage for the pier heads and prepared the Cantilever forming traveller
- The hydraulic version of the Climbing formwork Xclimb 60 was used for the piers
- the cantilever technique is used, with the box girders extending steadily in both directions away from the piers
- box sections as haunched, longitudinally prestressed concrete continuous girders
- Doka was the single-source supplier handling project-specific planning of the steel-girder grillage and pier-head formwork, so everything went smoothly
- fewer interfaces between shoring and formwork producers

Products used:
Cantilever forming traveller, Climbing formwork Xclimb 60, Stair tower 250, Large-area formwork Top 50

Construction time: 2013 – 2016

Challenge:

- six pairs of round, slender piers for two-lane carriageways in each direction support the separate superstructures of the bridge
- safe working at 55 m above ground level
- superstructures consist of single-cell box girders with structural height of 2.50 m in mid-span and 5.50 m in the end spans
- short cycle times for twin-cell box sections

Danube bridge at Traismauer

The 356 m long bridge with two separate, statically independent parallel superstructures crossing the Danube is the centre-piece of this major construction project; it was constructed by Alpine Bau GmbH. Starting from four pier heads, the bridge was erected using the balanced cantilevering method, cast in 59 sections per superstructure with the Doka cantilever forming traveller.

Challenge:

- cycle planning for Cantilever forming travellers with staggered starting times
- planning of just-in-time deliveries and on-site assembly
- clearance and strict safety requirements for vessels navigating the Danube
- short scheduled closure of river to navigation so that the Cantilever forming travellers can be moved to the next pier axis
- gap of a mere 32 cm between the parallel structures

Location: Traismauer, Austria
Construction work by: Alpine Bau GmbH
Overall length: 356 m
Span: 156 m
Cross-sectional geometry: single-cell box girder, straight webs
Width of superstructure: 15.24 m

Project solution:

- adherence to the tight schedule with optimised system solution
- web outside formwork divides, so compliance with the clearance specification for navigation on the river
- smooth repositioning of large units on to second pier head with navigation interrupted only very briefly
- thanks to Doka's Pre-assembly Service, pre-assembly on site and support from the formwork instructor, formwork and traveller units were ready for use right on time
- cantilevered parapets were cast using Forming wagon TU

Products used:
Cantilever forming traveller, Large-area formwork Top 50, Load-bearing tower Staxo 100, Forming wagon TU, Stair tower 250

Construction time: 11 months, 2010 – 2011

Challenge:

- very tight construction schedule, because both bridges built at the same time
- site logistics - simultaneous deployment of movable scaffold and cantilever forming travellers
- compliance with ecological stipulations for protection of the environment
- 2 bridges with minimal spacing of 0.9 metre

Motorway bridge SO 223

More than 1 km in length, the bridge on the D3 motorway near Žilina, the fourth largest city in Slovakia, eases the traffic situation in the country's north-western region. Two separate bridges, each with a carriageway width of 11 m, will carry the motorway across a reservoir on the River Vah. On account of the project's complexity, various formwork solutions were used for the substructure, the bridge piers and the superstructure, so Doka was a full-service provider on this project. Collaboration from an early stage between bridge planner, Česká Doka in the Czech Republic and the specialists at Doka headquarters in Amstetten ensured streamlined processing and efficient modification of the cantilever forming travellers.

Location: Žilina, Slovakia
Construction work by: Eurovia CS a.s.
Overall length: 325 m
Radius: 760 m
max. span: 110 m
Cross-sectional shape: single-cell cross-section with vertical webs
Width of superstructure: 13.10 m
Heigth of superstructure 6.0 m
Pouring-section length: 5.0 m
Max. pouring-section weight: 168 t

Project solution:

- 8 cantilever forming travellers enable forming of 40-metre sections of the bridge's supporting structure in a one-week cycle
- tailor-made Top 50 formwork solutions for cantilever forming travellers and movable scaffolding system
- the system hydraulics are configured to operate with biodegradable hydraulic oil
- ingenious solution for operation of the formwork despite the limitations imposed by the tight 90-cm spacing of the superstructure girders

Products used:
Dokamatic table, Framed formwork Frami Xlife, Concremote, Load-bearing tower Staxo 100, Supporting construction frame, Cantilever forming traveller, Large-area formworkTop 50

Construction time: 6 months, 2017

Challenge:

- safe and economical formwork solution for incrementally launched bridge-building
- very tight 300-metre radius of the bridge's curvature

Fv 505 Skjæveland - Foss Eikeland / Brunnholen Bridge

By spanning 250 metres, the Brunnholen Bridge is a key feature of the Sandnes bypass south of Stavanger. Since its completion, it has been the four-lane motorway link between Highway 44 Skjæveland and the E39 Bråstein. Incremental launching was the method of choice for construction of this viaduct. Sections up to 34 metres long were constructed in the casting yard and launched incrementally over the bridge piers after the concrete had hardened. Time savings are a big advantage of this method of bridge-building. On this project work proceeded on both bridge structures (north and south) at the same time.

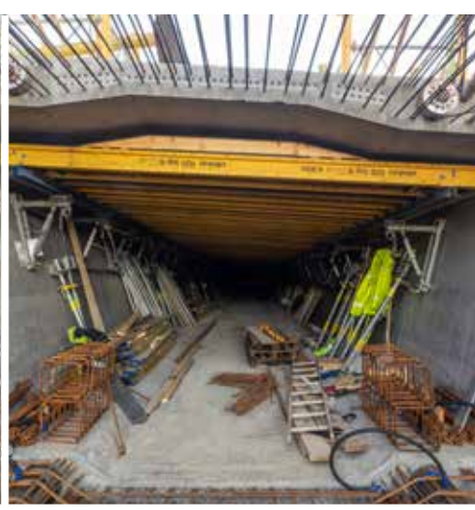
Location: Sandnes, Norway
Construction work by: SV Betong AS
Cycle time: 2 launching cycles per 14-day period
Overall length: South: 255 m / North: 244 m
max. span: 55.5 m
Superstructure width: each 11.5 m
Cross-section height: 3.5 m
Type of structure: single-cell cross-section with inclined webs
Number of sections: 9 per supporting structure
Section length for incremental launching: 32.85 m
Casting yard: 34 m

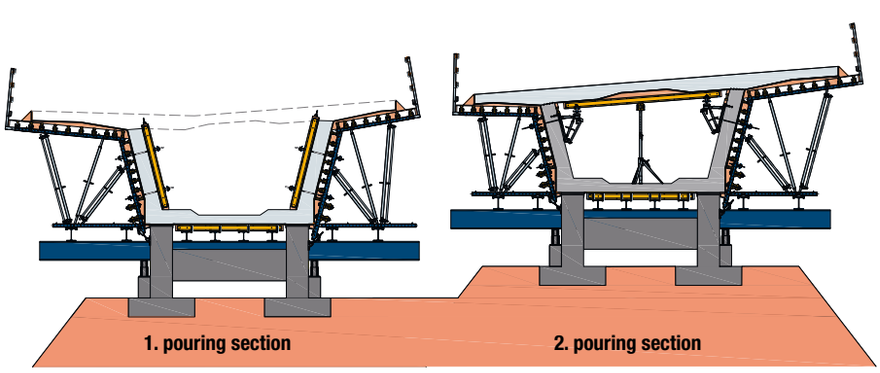
Project solution:

- an ingenious mechanism with a swivel opening action enables the formwork to lift quickly up and clear, without marking the finished structure
- optimised formwork solution to enable incremental launching of the structure, despite the bridge's extremely tight radius of curvature
- complete solution from Doka and experienced bridge-building partners, including cantilever carriage, casting yard, formwork for piers, foundations, platforms and outer parapets

Products used:
Large-area formwork Top 50, Forming wagon T, Load-bearing tower Staxo 40, Working scaffold Modul

Construction time: 2017-2018





Northern Marmara motorway

The Northern Marmara motorway is a bypass for a city with severe traffic congestion – Istanbul. From Akyazi on the Asian side, the motorway crosses the Bosporus Straits on the newly built Third Bosporus Bridge. From there, the motorway continues north-west on the European side of the straits to Istanbul's new third airport. The Çayırköy section includes two bridges, both built by the incremental launching method.

Challenge:

- continuous changes in cross-section geometry and longitudinal inclination of the bridge
- Safe, fast access to all pier heads so that the temporary slide bearings are easy to reach and operate for the launching operations.

Location: Istanbul, Turkey
Construction work by: FREYSAŞ FREYSSINET YAPI SISTEMLERI SAN.A.S.
Type of structure: single-cell cross-section with inclined webs
Overall length: 756 m
max. span: 55.29 m
Number of sections: 29 sections per bridge
Width of supporting structure: 21.5 m
Casting yard: 32 m
Cross-section height: 3.93 m

Project solution:

- adapted Large-area formwork Top 50 with adjustment zones and closure zones
- optimised formwork solution specifically for incremental launching, with integral formwork closing and opening mechanism
- complete formwork solution, including the specified platform solutions and vertical-access amenities for all the tasks necessary for the construction process, such as placement of the reinforcement, formwork operations and incremental launching

Products used:
Large-area formworkTop 50, Load-bearing tower d2, Edge protection system XP, Stair tower

Construction time: 2018

R1 Selenec - Beladice motorway

Movable scaffolding was used to build a 960-metre bridge as part of the Nitra West – Selenec section of the R1 motorway. The formwork solution for the 40 piers of different heights and with architectural details, and for the inside and outside formwork of the movable scaffold, was implemented with the flexible systems from Doka.

Challenge:

- planning and construction of 40 piers in different heights and with architecturally challenging geometries
- high requirements for safe working conditions
- flexible formwork solution for the movable scaffold for building the bridge

Location: Beladice, Slovakia
Construction work by: EUROVIA CS a.s.
Overall length: 960 m
Number of piers: 40

Project solution:

- construction of the architecturally specified pier geometries with Large-area formwork Top 50 and Climbing formwork MF240
- one single casting operation for each pier – all levels easily accessible by the quickly installable Ladder system XS
- in all, 1,600 m² of Large-area formwork Top 50 panels on the movable scaffolding
- 3-week cycle for the 69-m long casting sections
- cost-efficiency with a system that adapts easily to complex cross-sections and different loads
- construction of CIP concrete piers 40 m tall and 17 bridge spans in the short time of 24 months allowed for the build

Products used:
Large-area formwork Top 50, Load-bearing tower Staxo 100, Stair tower 250, Climbing formwork MF240, Ladder System XS, Folding platform K

Construction time: 24 months, 2010 – 2011

Challenge:

- flexible formwork solution for the movable scaffold for building the viaduct
- detailed logistics planning for dealing with several construction sections involving different methods of construction (bridge, tunnel)

A11 Belgium

A variety of widely differing techniques were used to construct the 12-km A11 motorway link between Bruges and Westkapelle. Construction of the 1.5-km long viaduct involves movable scaffolding, and the railway tunnels are cut-and-cover. A logistical infrastructure project in a class of its own.

Location: Belgium
Construction work by: Jan de Nul NV, Franki Construction NV
Viaduct: 1.5 km

Project solution:

- construction of the one-and-a-half kilometre viaduct on the far side of the first motorway intersection in Bruges by the movable scaffolding technique
- flexible Large-area formwork Top 50 adapts quickly and easily to the project-specific requirements in the supporting structure
- use of the extra-high-capacity Strut SL-1 with Large-area formwork Top 50 for the flyover above the railway lines
- installation of superstructure for the railway flyover using the Heavy-duty supporting system SL-1 and Doka formwork sheets 3-SO when operations are on hold at night-time so as not to disrupt rail traffic

Products used:
Heavy-duty supporting system SL-1, Framed formwork Framax Xlife, Large-area formworkTop 50

Construction time: 2014 – 2017

Saale-Elster Viaduct

Keeping the natural landscape in mind, the Saale-Elster Viaduct was built south of the city of Halle as part of the Nuremberg-Berlin rail link. Movable scaffolding was used to cross over several nature conservation areas and bird sanctuaries for construction of the 8.6-km viaduct.

Challenge:

- build an 8.6-km long rail tunnel with a flying junction in an ecologically sensitive area
- ZTV-ING-compliant fair-faced concrete requirement

Location: Schkopau – Halle, Germany
Project owner: DB Netz AG
Construction work by: HOCHTIEF Construction AG, Adam Hörnig Baugesellschaft mbH & Co. KG, GERDUM u. BREUER Bauunternehmen GmbH
Length of bridge: 6.4 km + 2.1 km
Number of piers: 220
Pier height: 6 m – 17 m

Project solution:

- construction of the abutments with fully preassembled Wall formwork FF20 with additional board decking
- direct delivery of the pre-assembled panels for a smooth construction workflow
- construction of the rectangular piers with a 50-cm chamfer, built with Large-area formwork Top 50 and Climbing formwork MF240
- the constantly changing cross-sections were handled without major modifications to the formwork

Products used:
Wall formwork FF20, Large-area formwork Top 50, Climbing formwork MF240

Construction time: 2006 – 2012

Challenge:

- construction of low and tall pylons in unusual shapes
- fast, safe assembly of the Composite forming carriage
- adherence to tight construction schedule

D3 Svrčinovec – Skalité

The high-point of the D3 motorway section Svrčinovec – Skalité in the north-west of Slovakia was construction of the 422-m long Vŕšok steel composite bridge. Doka supplied the project-specific formwork solutions for construction of the piers and deck slab.

Location: Svrčinovec – Skalité, Slovakia
Project owner: Doprastav Export s.r.o
Construction work by: VÁHOSTAV-SK, Doprastav, STRABAG, METROSTAV
Structure length: 422 m
Width of bridge: 13.41 m

Project solution:

- construction of geometrically challenging piers
- a combination of Large-area formwork Top 50 and Climbing formwork MF240 was selected for the low piers. The taller piers were formed quickly and efficiently with hydraulic Automatic climbing formwork Xclimb 60.
- incremental launching of the steel trough, followed by casting of the deck slab with the Composite forming carriage from Doka
- fast assembly, because the formwork units were largely pre-assembled, with the work done on-site on ground level for safety
- the modular system 'construction kit' means that as soon as the bridge is completed, the Composite forming carriage is immediately available for reuse on the next project

Products used:
Composite forming carriage, Framed formwork Framax Xlife, Climbing formwork MF240, Large-area formwork Top 50

Construction time: 2015 – 2016

Nuttlar Viaduct

The single-cell steel composite bridge is part of the new section of the A 46 motorway between the Bestwig-Velmede and Nuttlar junctions. It crosses the valley of the Schleborn Brook, in Germany's Sauerland region. The round piers are paired and lean slightly inward; Doka developed a custom-tailored formwork solution for their construction and supplied four under-slung Composite forming carriages for the superstructure of the Nuttlar Viaduct.

Location: Nuttlar, Germany
Construction work by: Max Bögl Bauunternehmung GmbH & Co. KG
Overall length: 660 m
Constant transverse gradient: 4 %

Challenge:

- pairs of inward-leaning round towers with cross-connections
- casting a 28.60-m wide and 660-m long deck slab with constant 4 % gradient and around 9-m wide cantilever slabs on single-cell steel superstructure (closed trough)
- safe up/down access at heights in excess of 100 m

Project solution:

- the inward-leaning pairs of round piers were constructed with Doka automatic climbing formwork
- fresh-concrete pressure transferred by ring tensile force in the outside formwork
- shape and the cross-beam duly factored into detailed planning and design of the Automatic climbing formwork
- underslung Composite forming carriages on each side of the bridge ensure rapid construction progress
- the formwork dispenses with form-ties, without penetrating the deck slab. So there is nothing to obstruct work from above for reinforcing, casting and screeding.
- load-bearing capacity of the steel composite longitudinal girders is limited, so the main focus for design was a statically and weight-optimised structure
- six synchronised hydraulic cylinders per Cantilever forming traveller were used so that the diagonal struts could be passed quickly in the forming and stripping operations.
- safe up/down access at heights up to about 100 m by the Stair tower 250

Products used:
Composite forming carriage, Large-area formwork Top 50, Automatic climbing formwork systems, Stair tower 250

Construction time: 10 months, 2014

Junglinster Bridge

North-east of the city of Luxembourg, the consortium consisting of the Félix Giorgetti – BAM Galère – Victor Buyck companies built a steel composite bridge that is 444 m long and 17.60 m wide as part of the E 29. The formwork solution from Doka made it possible to complete the bridge within the tight schedule specified and in the required fair-faced concrete quality.

Challenge:

- high fair-faced concrete quality
- tight construction schedule necessitated a weekly cycle
- safe working conditions for the entire site crew

Location: Junglinster, Luxembourg
Construction work by: Félix Giorgetti, BAM Galère, Victor Buyck
Length of bridge: 444 m
Width of bridge: 17.60 m

Project solution:

- the harmonised formwork solution consisting of ParaTop and Composite forming carriage ensures orderly progress
- high requirements for fair-faced concrete were met by DokaPly Birch form-ply
- the cantilever arms in the abutment zone and adjacent 20 m long deck-slab area were built without falsework support using Bridge formwork ParaTop
- all operations for forming, plumbing, reinforcing, pouring and stripping are carried out from above
- Simple, safe assembly with the innovative insert-shoe
- two transverse trusses and an adjustment area between them ensure adaptation of the Composite forming carriage to lane width and deck-slab width

Products used:
Composite forming carriage, Bridge formwork ParaTop, Large-area formwork Top 50

Construction time: 2014 – 2015

Odertal Bridge

Doka composite forming carriage masters tough requirements for a 4-lane viaduct over the River Oder in Germany's Harz Mountains as part of the B 243 Barbis bypass. This 496 m long steel composite bridge is being built with a massive 20.36 m wide and up to 58 cm thick deck slab that has a six percent longitudinal gradient and a transverse gradient as steep as five percent.

Location: Bad Lauterberg, Germany
Construction work by: Sächsische Bau GmbH
Overall length: 496 m

Project solution:

- various different distance-pieces and shims are used on the roller-trestle bearing-supports to compensate for the variation in the transverse gradient of the structural steelwork and keep the 25-m long composite forming carriage horizontally aligned
- planning makes provision for the continuous changes in radius and transverse gradient
- assembly and disassembly on site by Doka formwork pre-assembly team
- project support and consultation from planning through to successful project completion

Products used:
Composite forming carriage, Large-area formwork Top 50

Construction time: 10 months, 2014

Challenge:

- back-step sequence technique with 24 casting sections, max. length 23 m per section
- different load states due to constantly changing radius and transverse gradient
- fast, safe modification of the Composite forming carriage

Koralmbahn, steel composite bridge

Know-how and a custom-tailored formwork solution are required for building a crossing over a busy road right on Klagenfurt's southern ring road, because space is at a premium. Not once was the road below closed to traffic, not even when the concrete was poured for 52-m long steel composite bridge. Given these conditions, the ordinary bridge-building methods were not an option. The system used was ParaTop, the innovative bridge-formwork system that can be operated entirely from above.

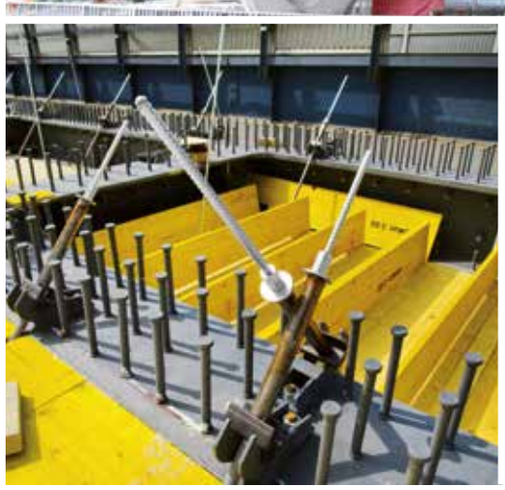
Location: Klagenfurt, Austria
Construction work by: MASSIVBAU GesmbH
Overall length: 52 m

Project solution:

- with the unpropped Bridge formwork ParaTop, supplemented by Large-area formwork Top 50, the entire cantilever arm formwork could be operated from above
- the smart insert-shoe enables the pre-assembled Top 50 platforms to be mounted easily and quickly and also compensates for installation inaccuracies
- all operations for forming, plumbing, reinforcing, pouring and stripping are carried out from above
- the supporting structure and cantilevered parapet are made using the same formwork system, dispensing with the need for additional formwork
- the deck slab was formed without protruding form ties using a solution consisting of a special steel pipe and a plastic tube

Products used:
Bridge formwork ParaTop, Large-area formwork Top 50

Construction time: 3 months, 2015



Challenge:

- traffic passing underneath severely limits space for building the steel composite bridge
- slab formwork without protruding form ties

Rathausen Bridge

ParaTop requires little space underneath the bridge, so it was ideal for construction of the steel composite bridge with an overall length of 75 m and width of approx. 9 m that had to be built across the Reuss River with its sharply fluctuating water levels.

Challenge:

- construct the bridge above the fluctuating water levels of the Reuss River

Location: Emmenbrücke, Switzerland
Construction work by: Anliker AG
Structure: steel and concrete composite bridge
Type of structure: partially monolithic
Structure height: approx. 1.5 m
Span: 2 x 37 m
Overall length of bridge: 74 m

Project solution:

- pre-assembly on site by Doka to save time and costs
- safe, cost-effective forming of cantilever slab with the unpropped Bridge formwork system ParaTop
- the innovative system enables all operations such as forming, adjusting, reinforcing, casting and stripping to be carried out from above
- no additional accesses and/or scaffolds needed for the underside
- the formwork is low, so to a large extent work can proceed regardless of the water level

Products used:
Bridge formwork ParaTop

Construction time: 5 months, 2013 – 2014

Challenge:

- unusual geometry
- high fair-faced concrete quality required

Rheinbrücke St. Margrethen – Lustenau

In the course of the cross-border extension of the St. Margrethen - Lustenau rail link, the aesthetically pleasing steel composite bridge was built around 12 m south of the existing bridge. Including the on-shore structures, the bridge is 275 m long and was built in attractive fair-faced concrete quality with three different formwork sheets and an overall concept developed by Doka.

Location: St. Margrethen, Switzerland – Lustenau, Austria
Project owner: ÖBB Infrastruktur AG
Construction work by: Strabag AG, Direktion IE
Structure length: 275 m

Project solution:

- custom-tailored formwork panels supplied by Doka's Pre-assembly Service for the six oval, conical piers, the trough supporting structure and and the bridge-arch formwork
- construction of the elliptical, downward-tapering piers with the custom-tailored Large-area formwork Top 50 as inside and outside formwork (tall piers with wall-thickness from 60 to 90 cm)
- with Formwork sheet 3-SO used in the outside formwork it was possible to achieve the finely grained finish for the fair-faced concrete structure
- the formwork solution with pre-assembled panels sized approximately 5.90 x 2 m meant that stripping above the river was a simple matter of pulling out entire formwork panels

Products used:
Large-area formwork Top 50,
Framed formwork Framax Xlife,
Piers: Formwork sheet 3-SO,
Supporting structure: Dokaplex formwork sheet,
Bridge arch: planed-board formwork

Construction time: 2010 – 2013

Froschgrundsee Viaduct

Just north of Coburg in Bavaria stands one of the biggest concrete arched bridges in Germany: the viaduct across the Froschgrundsee reservoir is part of the new ICE high-speed railway line between Nuremberg and Berlin. The centrepiece of this 798 m long viaduct is its 270 m arch, which spans the waters of the Froschgrundsee at a height of 65 m. Doka supplied the formwork solutions for the piers, the auxiliary pylons and the arch built using the cantilevering technique.

Challenge:

- construction of conical piers
- telescoping outside and inside arch formwork
- arch with hollow cross-section, tapering in height and width
- thickness of arch walls changes from 90 cm to 45 cm in the seventh casting section

Location: Coburg, Germany
Construction work by: Adam Hörnig Baugesellschaft GmbH & Co.
Overall length: 798 m I **Span:** 270 m
Formwork solution from Doka: piers, arch

Project solution:

Conical piers:

- The outside formwork was faced with board sheeting and was telescoping. The crane-dependent Climbing system MF240 climbed with a load-bearing capacity of 50 kN per bracket.

Auxiliary pylon:

- Built with a formwork solution made up of Doka Framax and Alu-Framax framed formwork. The inside formwork for the 1.18 m x 0.90 m shafts incorporated Framax stripping corners I, so it could be repositioned extremely quickly with no need to dismantle it first.

Arch supporting structure:

- The rentable Large-area formwork Top 50 mounted quickly and easily as the outside formwork for the arch forming carriage. The entire inside formwork adjusted quickly with the hydraulics.

Products used:
Large-area formwork Top 50, Climbing formwork MF240, Framed formwork Framax Xlife, Heavy-duty supporting system SL-1, Texture sheet 3-SO

Construction time: 2007 – 2008

_Understanding:
Creating a project sequence that is safe

From planning stage through to project completion, Doka experts provide help with professional consultation in case of any questions. Safe use of formwork systems is achieved not only by the system, but even more so by using their components correctly. Documents, practical tips, training right on site and verified systems support a safe project sequence.

Documentation

The following technical documentations ensure that your project solution can be calculated, configured, commissioned and dismantled safely and as intended:

- Planning documents
- Statics calculations
- User Information booklets
- Operating Instructions for CE-compliant systems
- Safety posters / checklists
- Video clips of system in use

Formwork instructor

The Doka Formwork Instructor is a specially trained and experienced practitioner on the site. He provides the site crew with support in efficient and safe formwork use on the construction site. As a result you are ensured the best possible use of resources in terms of personnel and systems.

Training on-site

Doka offers you detailed product and system training. This on-site training helps with keeping on schedule and gives the trained site crew more confidence for handling the systems. So speed and efficiency are implemented right away in everyday work on the site.

Standard-compliant and verified systems

Certificates and awards issued for standard-compliant Doka formwork systems are your guarantee for high quality and safety. Additionally, all products are tested regularly at Doka's Test Center in Amstetten.

CE | Deutsches Institut für Bautechnik DIBt

cen European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

GSV geprüft Güteschutzverband Betonschalungen

_Understanding the importance of time:

Logistics network for fast global availability

To ensure a smooth construction workflow, the entire logistics network has to mesh like clockwork. Doka logistics experts plan and provide on-site support of deliveries and return shipments, site logistics on the site and much more.

Delivery and return delivery just in time

Precisely scheduled deliveries to the right locations simplify your construction workflow on sites with different construction sections and masses of formwork equipment. Doka has the worldwide logistics distribution centres and the necessary routine and practice to optimise standard shipments and also special shipments and wide/oversize loads.

Site logistics

Highrise projects require high volumes of materials. So logistical control of formwork in construction operations is a requirement. Doka supports you with logistics concepts for intermediate storage and repositioning of formwork.

Formwork returns

The rental formwork is inspected jointly right on the site or at the Doka branch. So reconditioning and maintenance measures are defined together and transparently listed in a report.

Cleaning and reconditioning

At Doka Reconditioning, your formwork is cleaned and perfectly reconditioned in keeping with Doka quality standards. Any needed repairs are carried out and replacement parts properly installed. This extends the lifespan and ensures safety and reliability for the next formwork assignment.

myDoka

myDoka is the electronic customer portal for your project-specific data. myDoka provides you with 24/7 access to your latest inventory and transaction data, giving you an overview of all key information. From planning to evaluation, from contracts all the way through to controlling: you will find all your data displayed at a glance and always up-to-date.

_Understanding what happens on site:

We are right by your side.

We back up our promise on site. When it is time to put the made-to-measure formwork concept for your bridge project into practice, our formwork experts are by your side. This is how we ensure that construction workflows and schedules can be kept and the project successfully realised.

Formwork instructor / technician

The Doka Formwork instructor is a specially trained and experienced practitioner on the site. He provides the site crew with support in efficient and safe formwork use on the construction site. As a result you are ensured the best possible use of resources in terms of personnel and systems.

Pre-assembly on site

Formwork utilisations that are out of the ordinary require specially trained personnel for pre-assembly, operation and dismantling. Doka experts handle these tasks for you directly on site. All this ensures a smooth start of formwork operations.

Formwork inspection as assembled

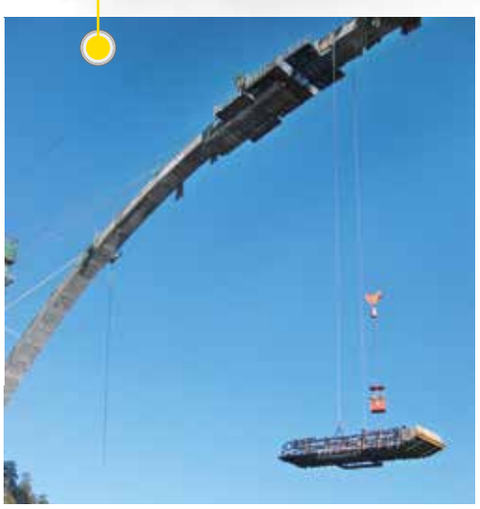
The Doka Formwork instructor or technician checks the site in your company so you know that the formwork is correctly assembled. Faulty utilisation is identified immediately and can be corrected before pouring commences.

Customer service

Proper servicing and preventive maintenance of electrical and hydraulic formwork equipment by Doka specialists ensure troublefree operation on site.

Dis-assembly

Formwork units are disassembled and sorted in the Doka-Pre-assembly Service centres. Any non-reusable formwork equipment can be disposed of properly on request. So on site your crew can concentrate on the essentials of forming and concreting.



Understanding what the future holds

We invest every day in further developing our products and services so we can always continue to find the best solutions for our customers. Valuable information is gathered in each and every project and incorporated as soon as we work on the next one. Thus we are equipped for the future and always ready to take our customers to the next level.

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Art. no. 931111502// 03/2019 en