

FormworkPress

Professional Formwork News

V/2022



Architectural concrete walls

Quickly formed with StarTec XT – page 14

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Imprint

Site photos show situations which do not always depict the final assembly of formwork with regard to safety regulations. Imprint: Edition V/2022. Circulation: 2350 copies. Publisher: MEVA Schalungs-Systeme GmbH, Industriestr. 5, D-72221 Haiterbach. Layout: MEVA. Print: C. Maurer Druck + Verlag, D-73312 Geislingen/Steige. Reprint and re-use of any editorial content only by copyright permission. We accept no liability for the content of external internet sites, nor for a violation of privacy or any other law arising from these.

"bauma is a melting pot for ideas that inspire us and continuously spur us on to improve. At MEVA we are very much looking forward to it."

Dear Reader,

Finally, after two arduous years full of restrictions necessitated by the corona pandemic, came a glimmer of hope of a return to our cherished way of life before the Covid-19 outbreak. But now we have been engulfed by a new appalling threat. Since 24 February, the day on which the Russian army invaded Ukraine, the headlines have been dominated by missile attacks, hundreds of thousands of refugees fleeing their homes and other dramatic footage.

Once again, the fragility of the global political framework has come clearly into focus. The impact is being felt by all business sectors and the entire population. Massive raw and production materials shortages are stretching delivery chains to breaking point. Supply bottlenecks are driving up the cost of energy, food and everyday goods to new, dizzying heights. Supermarket shelves lie empty. Construction materials too are desperately needed and in extreme demand, but are already a scarce commodity.

At the same time, lots of building work remains to be done – to address the shortage of living accommodation and to implement countless urgent infrastructure projects, for example. So life must go on, somehow. And it is going on, as

signalled by the industry's preparations for this year's trade fair highlight, bauma in Munich. For us, it is much more than a platform to showcase our products and services: it is a yardstick for our competitiveness, a forum for personal meetings and discussions with you, our partners and customers. The bauma is a melting pot for ideas that inspire us and continuously spur us on to improve. At MEVA we are very much looking forward to it.

At the last bauma three years ago, we unveiled the Mammut XT and StarTec XT systems, a new and innovative wall formwork generation that has since proved its credentials on numerous projects and is delighting ever more contractors. One example is featured on page 14 of this FormworkPress.

I should also like to draw your attention to another project described in this issue. Though building information modelling is no longer a complete novelty, it is still in its infancy. On page 16, you can learn about the tangible ways in which BIM-based formwork design simplified construction of a rail bridge in Norway.

Let me wish you a pleasant read.




Florian F. Dinger,
Owner and Managing Director
of MEVA Schalungs-Systeme GmbH

News

Information about MEVA



Museum of the Future opened

After six years of construction, 18 months of which were spent on the spectacular façade alone, the Museum of the Future in Dubai was opened in February. As a global centre for ideas, technologies and innovations of the future, it is likely to become another visitor magnet for the Emirate. On seven floors, interested visitors can gain intensive insights into the research and development work of technology companies and start-ups for an entrance fee of approx. €35 (£30). The think tank also provides the setting for experiential exhibitions about life in space, for example.

The 77 m high oval torus on the magnificent Sheikh Zayed Road is considered one of the most complex buildings in the world. Constantly changing structures and geometries dominate the building with its façade consisting of 1,024 individual parts with engraved Arabic calligraphy. Round, angled, curved, but without columns, the sensational architecture hints at complex construction work. BAM Higgs & Hill LLC used several MEVA systems: Mammut 350 wall formwork, Radius circular formwork, MevaDec and MevaFlex slab formwork, Triplex inclined props and the MGC guided climbing system.



Drinking water reservoir

In Oron-le-Châtel near Lake Geneva amid the picturesque landscape of western Switzerland, WALO Bertschinger used Mammut 350 wall formwork and MevaFlex slab formwork to build a new drinking water storage facility. With a capacity of 1,800 m³, the Réservoir des Clos will secure the regional drinking water supply for decades to come – while all the time remaining invisible. The building was hidden away underground. The constrained excavation pit had offered the experienced team from WALO Bertschinger only little space for installation, storage and material maintenance.

The water reservoir was built in accordance with the stringent safety provisions of the SUVA (Swiss National Accident Insurance Fund). The rectangular building is 41.10 m long and 13.80 m wide. A cross-wall divides off the 33 m long reservoir from the 6.60 m high valve room. The external walls, the cross-wall and a centrally positioned longitudinal wall were cast with a thickness of 40 cm. Efficient placement of the tall formwork was one of the challenges posed by the contract. The formwork panels were ganged into large-area units and then craned into position. The tie holes were fitted with water stops, which were left in place as lost components.



Courthouse in Spartanburg

Following a suggestion from the supervisors, Turner Construction used the strong MEVA Imperial wall formwork system to build the new courthouse in Spartanburg, South Carolina.

The new six-storey facility will cover an area of 31,500m² and feature a cast-in-place concrete foundation with the upper levels consisting of a steel structure and a precast façade that will resemble marble. The foundation was designed with wall heights ranging from 6 to 8m, thus requiring a gang form system that could handle the concrete pressures generated when pouring walls to this height. The MEVA Imperial system, which resembles the Mammut 350 system but is tailored especially to the US market, was the first choice in this project: the strongest clamp gang form system offered on the market with a 97 kN/m² pour rating.

The adaptability of the hardware and accessories made the system easy to assemble, producing a more rigid gang during assembly. The foundation was broken into ten pours of more than 18m length, with each pour completed using a truck-mounted concrete pump and taking approx. three hours to complete.

What's new at bauma 2022

The world's leading trade fair for the construction industry, bauma, is taking place this year with a six-month delay due to the Corona pandemic and will attract a large international audience from October 24-30. MEVA will also be there again, presenting new products and innovations with great customer benefits: high safety, economic efficiency, flexibility and easy handling.

As in 2019, the MEVA trade fair stand with 400 m² of space is located in formwork hall B3, stand 236.

According to the organisers at the Munich trade fair, the exhibition space is largely fully booked. At the last bauma three years ago, there were around 3,700 exhibitors in the halls and on the outdoor area. Around 630,000 visitors from more than 200 countries and regions were welcomed to the exhibition grounds in the Bavarian metropolis and made a pilgrimage across the 614.000m² exhibition area.



Tapatíos convinced by MEVA32

Flexible shoring system reliably supports balconies and cantilevers

For the construction of residential buildings in Guadalajara, the MEVA32 shoring system, popular in the USA, was used for the first time in Mexico. The workers were quickly at ease with the handling and flexibility of the system.

Guadalajara, the “Pearl of the West”, is considered a metropolis of Mexican joie de vivre. The city is home to traditions such as the famous hat dance Jarabe Tapatio, where the sombreros are swung, and the famous music of the mariachi bands. The inhabitants call themselves Tapatíos and are considered modern and culturally interested. The Art Park will go down well with them: a new residential quarter with apartment buildings between lots of greenery and water in the popular Zapopan district. The construction company is erecting residential buildings with upscale flats on 13 floors.

Support to US standards

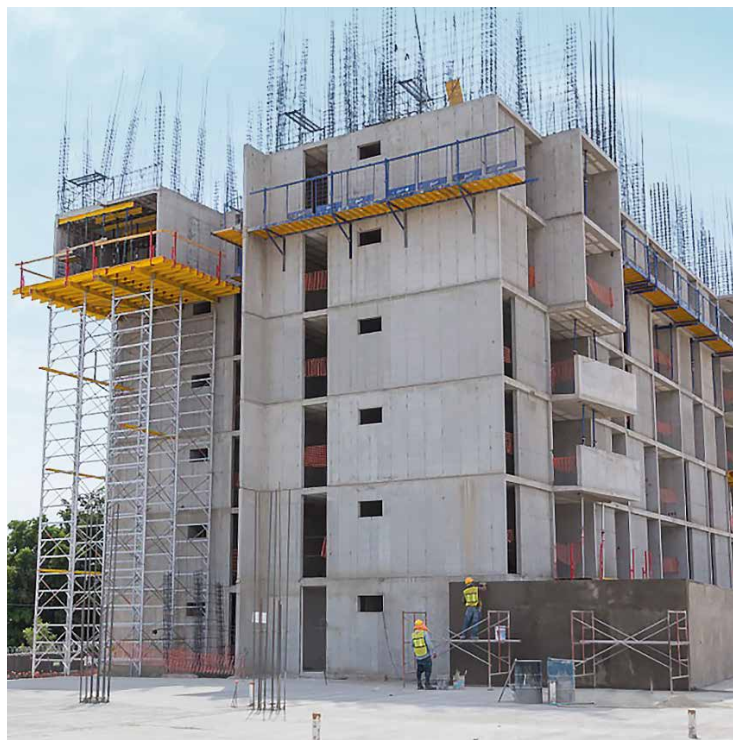
One of the architectural features of the project are the balconies of different geometries, heights and dimensions, as well as the widely cantilevered flat areas that protrude from the building’s walls like oversized boxes. For their safe erection, the construction company relied on the new MEVA32 mo-

dular shoring system. Developed for the US market, this is named after its maximum load capacity of 32 kip (corresponds to 142 kN). It offers a high degree of safety and flexibility on the construction site and is now increasingly conquering new regions outside North America where construction is carried out to US standards.

Flexible and time-saving

MEVA32 is a strong and flexible shoring system, suitable for a wide range of shoring applications, for example the construction of parking decks. It saves labour, time and space on the job site. The aluminium frame is very light despite its high stability. The 6 ft (1.82 m) wide frame modules are available in heights from 4 ft (1.21 m) to 8 ft (2.43 m). The typical 6 x 6 ft frame weighs only 49 lbs (about 22 kg), so MEVA32 can easily be carried and used by just one worker, thus saving effort. The easily adjustable screw jacks are used for fine-tuned height adjustment on the job site. The shoring towers can be erected standing or lying on the ground and quickly flown into position by crane.

Using standard MEP lift truck tables MEVA32 flying towers, tables, and garage applications can all be



MEVA32, here under the cantilever of a flat, provided safety and flexibility on the construction site.

easily moved as a unit without the need for disassembly and reassembly. This saves time, labour and space on the jobsite.

At the completion of a section of a concrete pour, towers can be put on standard MEP trucks and rolled to the next section by one or two workers without being dismantled.

Success on the construction site

In the Art Park project, the system showed off its ease and flexibility. Without a long learning curve, erection, modification and dismantling, as well as the quick relocation and adjustment of the supporting towers were carried out according to the changing positions and geometries of the cantilevers and balconies to be supported.

MEVA's H20 beams, which can be used longitudinally and transversely, also contributed to the success on the construction site. They weigh only 4.6 kg/m, are made of stable 3-ply solid webs and are designed for high durability and performance with impact protection caps, impregnation and web-milling on the opposing side of the core.

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Project data

- **Project**
 - Art Park residential buildings, Guadalajara (MEX)
- **MEVA systems**
 - MEVA32 shoring system
- **Engineering and support**
 - MEVA Sistemas de Encofrado S.A.S., Bogotá, Columbia



Tourist magnet in the Pacific

Wonder Reef created in situ onboard barge floating on the Brisbane River

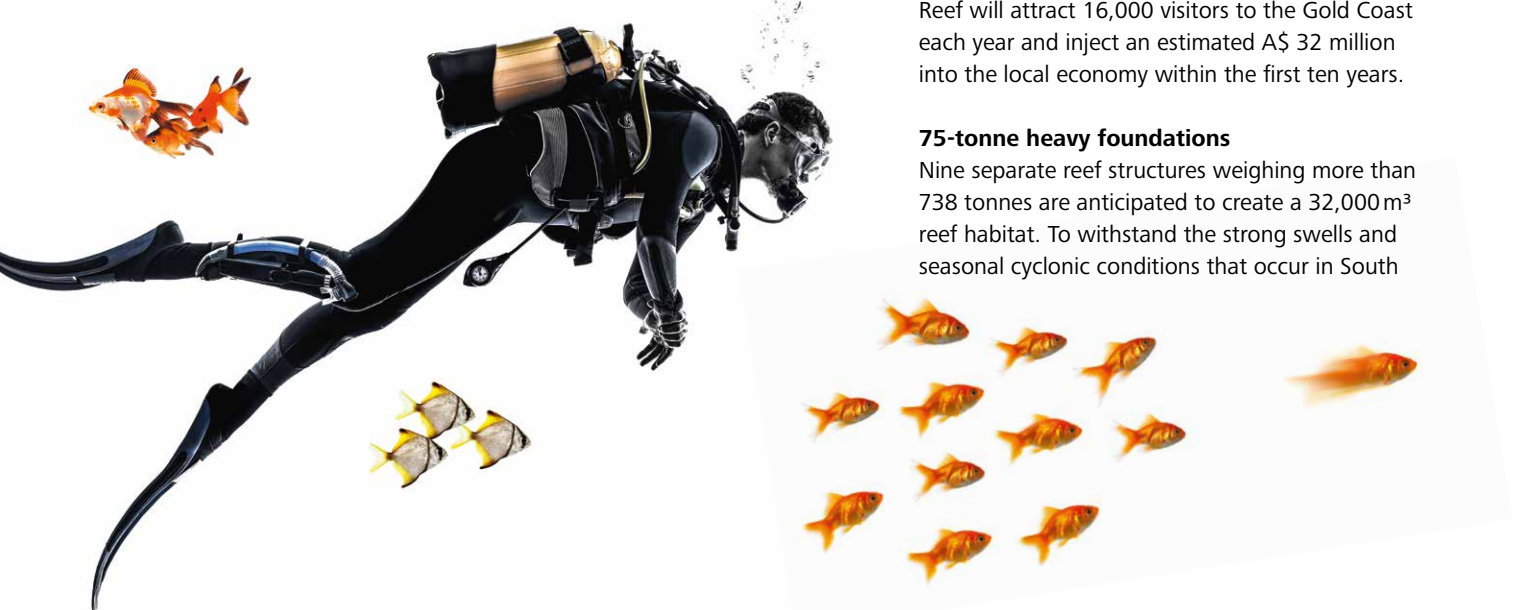
From building sites to the Australian Pacific Ocean: Novatec Formwork Systems partnered with Foreshore Marine to construct a buoyant Reef dive attraction – approximately 1.5 nautical miles south east off the Gold Coast seaway and directly off Main Beach.

Named Wonder Reef, the purpose-built dive attraction is designed to attract a rich diversity of marine

life. It will offer divers of all experience levels an opportunity to interact with the vast and colourful world of exotic marine life that inhabits the Gold Coast's ocean. The A\$5million Wonder Reef – delivered by the city of Gold Coast – was installed in August 2021. The reef was monitored throughout the remainder of last year to enable marine life sufficient time to inhabit the site before opening to the public in early 2022. It is anticipated Wonder Reef will attract 16,000 visitors to the Gold Coast each year and inject an estimated A\$ 32 million into the local economy within the first ten years.

75-tonne heavy foundations

Nine separate reef structures weighing more than 738 tonnes are anticipated to create a 32,000m³ reef habitat. To withstand the strong swells and seasonal cyclonic conditions that occur in South





© Novatec



© Novatec

East Queensland, the sculptural reef flutes that range in size up to 8 metres are attached to 75-tonne pyramid-shaped foundations made of concrete and reinforced steel. The reef sculptures were designed by Queensland artist Daniel Templeman, who worked with marine engineering experts Subcon Blue Solutions to create the distinctive structures. The Queensland state government has invested \$2.5 million in joint funding under the Growing Tourism Infrastructure Fund and provided a 50-year lease on the site.

Novatec Formwork Systems were contracted to design and supply the formwork for the concrete base structures that support and secure the four bouyant reef structures. Due to the steel domes being retrofitted to the concrete bases, the complete formwork designs required precise dimensional properties. In all a total of 14 sets of formwork ranging in size from 5.0 x 5.0 x 1.5 m to 3.0 x 3.0 x 1.5 m were required. Novatec StarTec Panel formwork shutters were used to form the majority of the base structure. However, in line with the precise requirements of the finished structures, each set of formwork required “conventional” infills to complete the form. The team at Novatec QLD provided a pre-fabricated conventional solution to complete the finished forms.

Due to the nature of the project, recycling the formwork was not possible, resulting in a total of 124 separate conventional forms being fabricated and supplied. Each set of formwork was meticulously erected on board the client’s barge based in Hemmant, Port of Brisbane, prior to shipping and placement off the Gold Coast. The submerged weight of each of the larger reef foundations is approximately 42 tonnes.

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Project data

- **Project**
 - Wonder Reef, Gold Coast (AUS)
- **Contractor**
 - Subcon Blue Solutions (AUS)
- **MEVA systems**
 - Wall formwork StarTec
- **Engineering and support**
 - Novatec Formwork Systems (AUS)

No frowns with RentalPlus

High volume and complexity at a hospital expansion in Denmark



Glostrup Hospital is expanding with a brand new neurorehabilitation building of 25,000 m², with five main buildings up to five storeys high, requiring several thousand sqm of MEVA formwork. MEVA Denmark supplied the formwork to Arkil, which was responsible for the in-situ building contract.

Large and wide foundations, walls with cast-in columns, cores for elevator and stair shafts with stripping corners and relief beams: these were some of the special structures needed for the extensive hospital expansion.

Foundations with AluFix

Construction of the new hospital wing had to start as soon as possible. So, the day after the order was placed, MEVA delivered the AluFix 150/90 formwork for casting the foundations. The clever thing about AluFix is the combination of flexibility and low weight, making it an obvious choice when quality results are required without using a crane. The foundations were constructed with tie rods above the formwork and bottom shoes, and AluFix helped save a lot of time during the start-up phase. And when the crane was brought into play later, it was able to lift the formwork onto the next casting cycles. Quickly and efficiently.

Walls with cast-in columns

More complex was the construction of the walls, which had to have a series of cast-in columns. The columns each had to support some precast concrete beams, which were installed afterwards, and the distance varied from column to column. This made the design and casting more challenging than usual, because everything had to fit together. The job was solved by combining AluStar and StarTec formwork, and MEVA ended up supplying over 1,000 m² of formwork for the external walls throughout the rehabilitation building.

Cores built with stripping corners

In the complex, where three of the buildings extend from the basement level all the way up to the 5th floor, cores with elevator and staircase also had to be cast. The cores had to be relatively small and it was necessary to strip the inside using stripping corners. In this way, the entire inner core could be lifted out and quickly moved on to the next casting. The external part of the core was the

Relief beams resembling noses had to be cast into the core structure and supported with AluStar and StarTec formwork.

most complicated because a series of relief beams resembling noses had to be cast into the core structure and supported with formwork. Again, AluStar and StarTec were used to complete the job.

Most durable solution on the market

Overall, more than 3,000 m² of formwork were supplied for the construction of the new rehabilitation centre at Glostrup Hospital. All products included the alkus all-plastic facing, which guarantees a high-quality concrete finish, even after heavy use. With a durability of up to 1,500 uses – without replacement – the alkus sheet is particularly suitable for concrete casting. The long lifetime helps reduce the environmental impact and old facings are simply cut up and recycled to further contribute to a green energy cycle.

RentalPlus: Fixed low price – no extra costs

All MEVA formwork supplied for this project was covered by the RentalPlus package insurance. It offers cost certainty from the very outset. All ancillary services, such as cleaning and repairs, are covered by this package. Only lost parts and irreparable damage are invoiced separately. The RentalPlus package can be separately agreed upon on a project-specific basis.

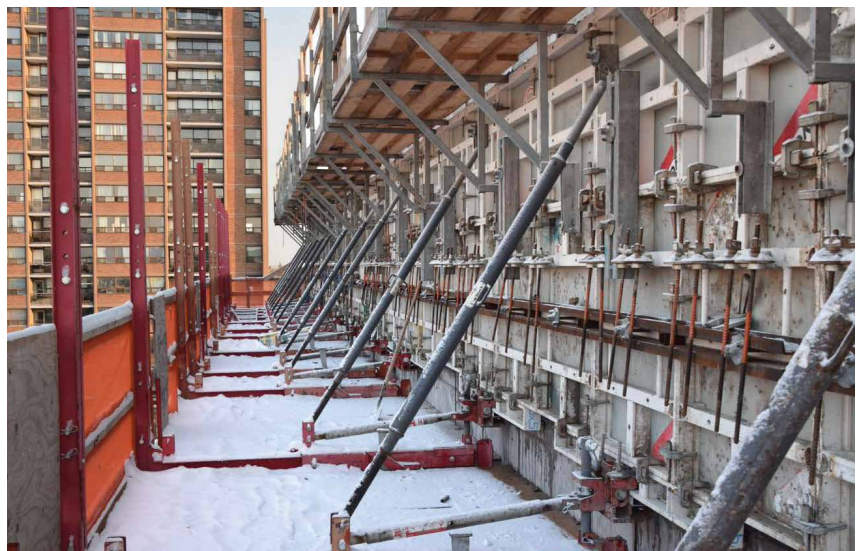
On the project in Glostrup, there were no extra costs associated with additional cleaning or replacement of formwork facing.



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Project data

- **Project**
 - Rehabilitation centre, Glostrup (DK)
- **Contractor**
 - Arkil A/S, Greve (DK)
- **MEVA systems**
 - AluFix wall formwork
 - AluStar wall formwork
 - StarTec wall formwork
- **Engineering and support**
 - MEVA Denmark, Køge/DK



One project – four MEVA systems

Proven technology and a debut for the Mammut XT formwork system

In November 2020, Horizon Concrete Construction began building the foundation and concrete frame for the Ophelia, a new ten-storey multi-family condominium project located in Kitchener, Ontario. The new Modern Miesian design condominium was named after one of two locally famous swans that live nearby in the lake at Victoria Park.

The project posed multiple challenges that included pouring shear walls, columns and cast-in-place concrete slabs. Since shear walls are located on both exterior ends of the building, the formwork would require climbing ten floors. The MGC-F (MEVA Guided Climbing Foldable) system was selected, primarily since it allowed the formwork and the platform to be lifted together, without ever leaving the wall. The system has rails that remain secured to the wall and features a “click-clack mechanism” that permits the rails to pass securely through shoes that are anchored to the wall when climbing. Not only is the MGC-F faster to cycle than a regular jump form system, but it also requires fewer workers and is safer to lift when higher wind conditions prevail. The platforms are 2,60 m wide, which permits the formwork to be easily rolled back by 70 cm, providing a safe area of access for the workers, especially when setting rebar and pouring the concrete.

At the request of Horizon, the platforms were pre-assembled by MEVA before delivery to the jobsite. Because the MGC-F are foldable, more platforms can be loaded onto the truck when shipping to

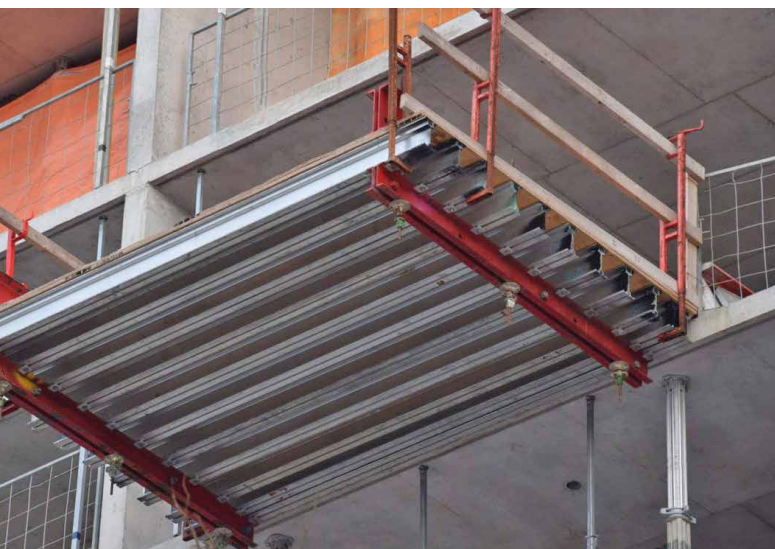
the jobsite. Once the platforms arrive on site, the contractor can pick them off the truck and hang them directly on the wall.

Having owned MevaLite since 2011, the longtime MEVA customer Horizon chose to use the system on the exterior shear walls for two reasons: first, the 2,75 m panels were the same height as the shear walls, and second, by using MevaLite, they were able to reduce the combined weight of the formwork and the climbing platforms. Thanks to the reduction of weight, Horizon did not have to increase the load capacity of the crane just to lift the forms and platform at each end of the building. MevaLite was also selected as the forming system for the columns on this project.

Horizon Concrete Construction is owned by Jerry Postma, who has a long history of working in the formwork industry. In fact, his family owned a concrete company when he was growing up in British Columbia. The company included a formwork yard that rented forms and as a young boy, Jerry would wander over to spend time with his grandfather in the formwork yard. Since he grew up in the business, he has always looked for innovation when completing his projects. As an example, when Jerry was looking for a formwork solution for forming the interior shear walls on the Ophelia, his goal was to minimise as much labor as possible.

One-sided tying with Mammut XT formwork

Through discussions with his MEVA sales representative, Tamer Gerges, Jerry became interested



in the Mammut XT wall formwork system. After much research, he realised that if he bought this wall formwork, his workers would be able to save labour and time since they would only access one side of the formwork while placing and stripping the ties and articulated tie nuts. As a result, Horizon is now the first company in North America to have purchased and used the Mammut XT. In addition, since Horizon was going to have to cycle their equipment ten times on this project, they started to analyse the most efficient method for cycling the formwork and rebar as they climbed the ten-storey building. Again, Jerry came to MEVA, who designed the MEVA landing platforms that sit outside of the building and help in the movement of materials as they continue to move up from floor to floor.

Over the years, Horizon has brought several innovative ideas to fruition through using their MevaLite. From colour coding the back of each panel size, to building transportation baskets with casters that permits their team to move the formwork from pour to pour, Horizon continues to strive to improve their process.

Looking to the future, Horizon's success includes assembling a committed team of key personnel who have each contributed to building the culture at Horizon to become the company it is today. The team members include a second generation of Postmas who have joined the team. Jerry's son Ben is now a project manager, his son Chris is one of a group of five forepersons who assume a role of

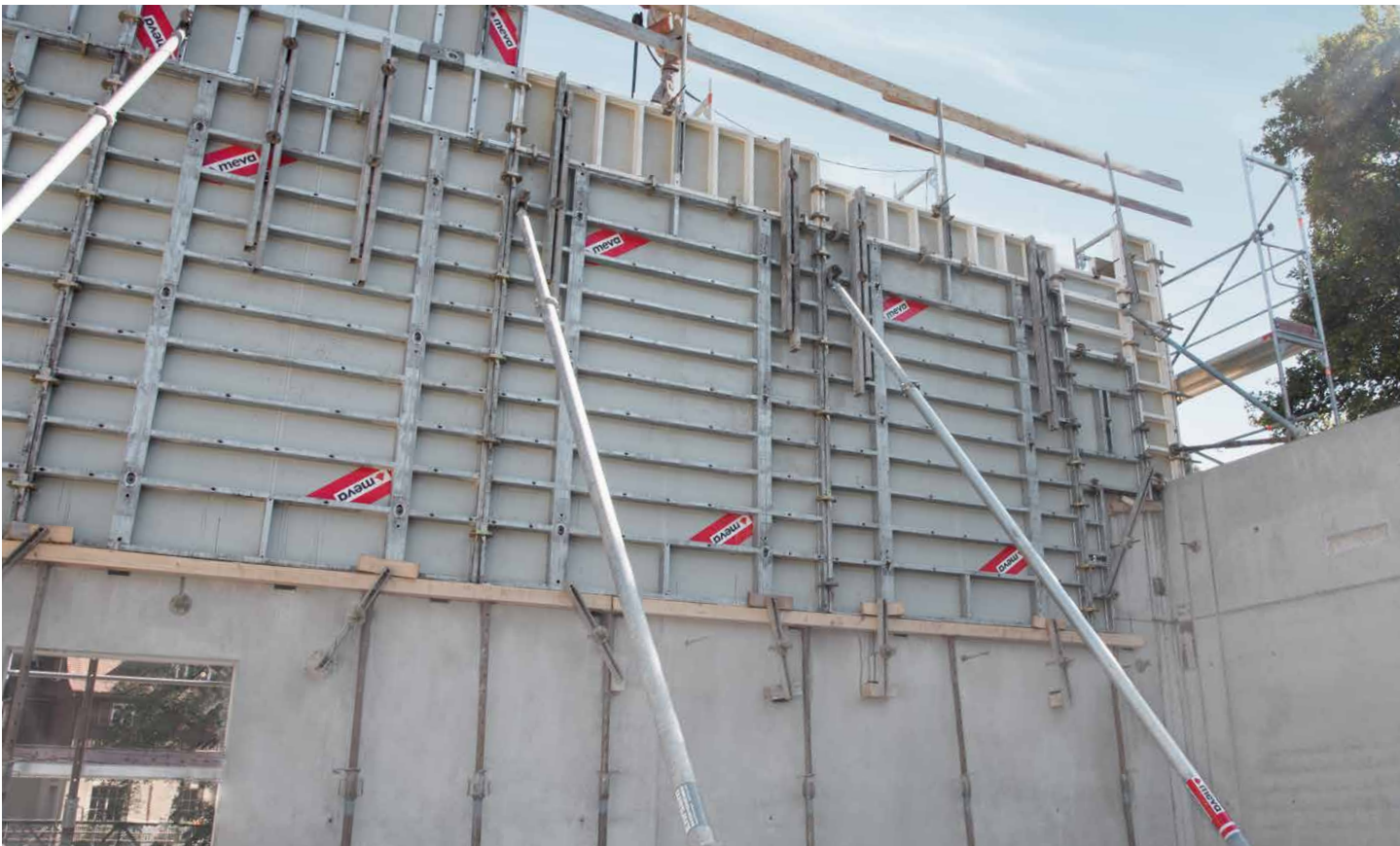
leadership managing the work that is completed on site. Finally, Jerry's daughter Karmen has risen to new heights by getting her operator's license to now join a team of two other tower crane operators, who operate company-owned tower cranes on their various jobsites.

MEVA would like to thank Horizon and Jerry Postma for their continued support in MEVA through the ownership of our products and for their willingness to continue to push for innovation using our products on their jobsites.

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Project data

- **Project**
 - Ophelia, Kitchener/ON CDN
- **Contractors**
 - Horizon Concrete Construction
- **MEVA systems**
 - MevaLite wall formwork
 - Mammut XT wall formwork
 - Guided Climbing System MGC-F
 - MEVA Custom landing platform
- **Engineering and support**
 - MEVA Formwork Systems
Springfield OH/USA



Briskly built architectural concrete walls

StarTec XT with large 330/270 panels reduces labour and time requirements

A contract for an agricultural equipment dealer involved construction of an exhibition hall with imposing fair-faced concrete and glass surfaces. Large-format StarTec XT wall formwork panels helped to achieve on-time completion of the structural shell with its homogeneous finishes.

As an experienced contractor, Erich Ehrsam knows from many projects that rapid progress on site and top quality down to the last detail are not mutually exclusive. To speed up the works on the project in the Black Forest town of Altensteig, the Nagold-based company – as on many other commercial and residential contracts – deployed the biggest StarTec XT wall formwork panels from its own stock.

"Standard panel heights are often too small for the specified storey heights," explains site manager Andreas Ehrsam. "With our large-format 330/270 panels and associated fillers, we don't have that problem. The need for fewer vertical extensions shortens assembly times." This also paid dividends on the site in Altensteig. The 4.50 m high rear wall

of the building is surmounted by a 2 m tall glass skin. The side walls, 6.50 m tall at the rear and rising to a height of 7.60 m at the front, were each cast in two cycles.

Flawless tie hole and joint pattern

StarTec XT's integral combi tie holes allow speedy selection between three tying methods. The Ehrsam team opted for single-sided tying with XT taper ties. With no need to secure the initial formwork side with fixation screws, formwork assembly and stripping were fast and simple. Moreover, the fact that the large-format panels generally require far fewer connectors reduces the effort needed for storage, fitting and removal. This system's fresh concrete load capacity – 60 kN/m² over the full surface – also helped to speed up the pour cycles. The horizontal construction joints on the side walls were elegantly concealed by the subsequently inserted floor slab. The end product combined homogeneous finishes with a uniform tie hole and joint pattern, made possible by StarTec XT's symmetrical internal tie holes. The project once again underlined the wall formwork system's ability to meet stringent architectural requirements.

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Project data

- **Project**
 - Exhibition hall in Altensteig (D)
- **Contractor**
 - Erich Ehram Bauunternehmen, Nagold (D)
- **MEVA systems**
 - StarTec XT wall formwork
- **Engineering and support**
 - MEVA Schalungs-Systeme GmbH, Haiterbach



Neat workmanship down to the finest detail by Erich Ehram's site team using the StarTec XT system.



Test with rental Mammut XT

Before deciding to use the formwork with the combi tie hole, the contractor first wanted to try out the concept. "We rented Mammut XT for a contract with 12m high walls that we cast in 6 m cycles," reports Andreas Ehram. "Here too, we used XT taper ties so that we could dispense with the assembly works on the initial formwork side."

AluStar to remain in service

Contractor Erich Ehram was among MEVA's very first customers some 50 years ago and is now using its fifth generation of formwork. Until recently, it intended to phase out its StarTec and AluStar inventory, parts of which have been in service for over 15 years, in favour of the new formwork system. "The new StarTec XT considerably speeds up our formwork operations, in some cases by up to 30%," notes Andreas Ehram. "But the old panels are still in good shape and so we're keeping them, for example, for housing alterations." As StarTec, AluStar and the new StarTec XT are fully compatible, there is nothing to stop their continued regular use in future.





Norway's longest railway bridge

Challenging formwork design with BIM approach

In a recent project, MEVA's customer MAXBO Teknikk was in charge of engineering the challenging formwork design in BIM (Building Information Modeling) for Norway's longest railway bridge. During the project, Teknikk has been supported by BIM², MEVA's partner for digitization. The 3D formwork design was applied on the project in order to simplify the exchange of the model with Teknikk's contractor and to enable a streamlined connection to the BIM workflow.

Formwork design is a frequently underestimated discipline in the overall building life cycle. However, formwork is always on the critical path of the construction process and therefore must be considered in the process landscape. This includes a sophisticated site preparation of formwork and scaffolding that is going to be redetermined in a digital integrated BIM environment.

The project

The Minnevik railway bridge is located in Minnesund, a one-hour drive north of Oslo. The bridge is part of the state-owned company Bane NOR's ongoing upgrade of the railway system in Norway. When completed in the autumn of 2023, it will be the longest railway bridge in Norway. The contractor PNC Norge is carrying out the concrete works. The base of the 836 m long concrete bridge

consists of 20 pier shafts under water level, the largest with a depth of approximately 14 m. The foundation (pile cap) measures 22 x 18 m with a narrower pier shaft measuring 18.6 x 6.3 m up to the water level. Two bridge columns are built on each pier shaft.

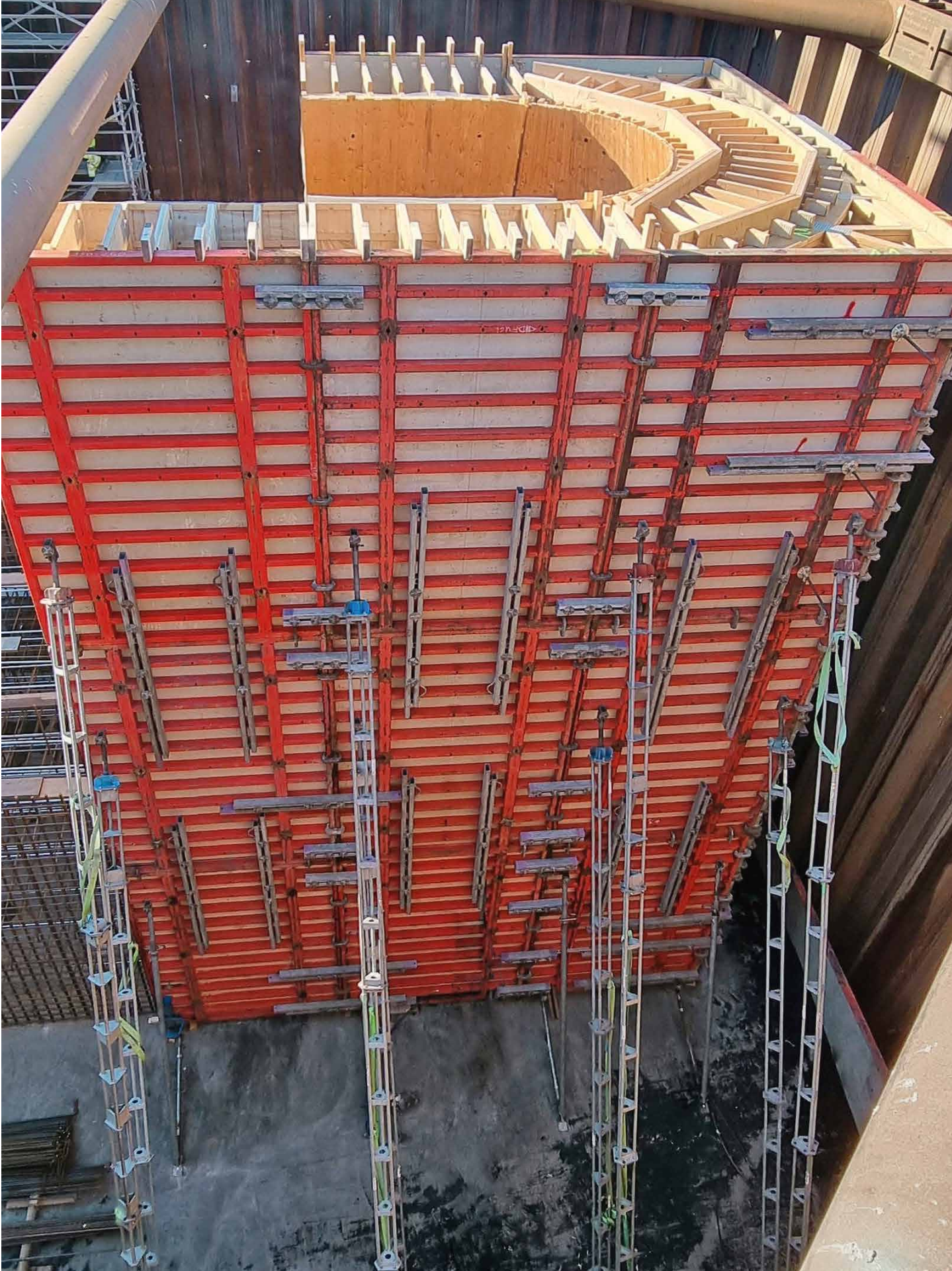
Together with crossbeams, the oval-shaped columns (3.2 x 2.2 m) carry the bridge, which is cast with a moveable scaffolding system. The project scope was to provide an efficient formwork design from the pile cap up to the top of the columns. Due to height differences of the pier shafts, adjustments to the formwork design needed to be taken into account from the very beginning. Furthermore, ease of erection, dismantling, and re-use on the next pier shafts were important obstacles to overcome in the early design phase.

The project delivery consisted of the MEVA wall formwork system Mammut 350 together with the KLK climbing system for the columns. To form the skew sides of the pier shafts timber frames were used as infill.

About MAXBO Teknikk

MAXBO Teknikk was established in 1962 with the head office located in Sandvika, just outside Oslo.

... continued on page 18



... continued from page 16

The company has a long track record of supplying the Norwegian construction market with formwork and falsework solutions. The company is very customer-focused and values solutions that challenge the customers' standard ways of thinking. MAXBO Teknikk strives to be at the forefront when it comes to engineering efficient and cost-effective formwork design with the latest technology.

Morten Hernes, Technical Manager, MAXBO Teknikk: "BIM²form made the complex formwork design easy to plan and with the BIM approach on this project we were able to exchange information and communicate with all parties involved in achieving the best possible formwork solutions."



About BIM²

BIM² is a start-up on the edge of the northern Black Forest, Germany. Founded in 2019, the young company is passionately focused on driving digitalization in the construction industry forward and specialized in efficient formwork design. The primary goal of the growing company is to achieve genuine added value on the construction site through intelligent tools in planning and work preparation.

About BIM²form

For the project, an advanced digital 3D delivery of the formwork design was executed. Therefore, Autodesk® Revit® and the related add-in BIM²form were used to carry out the formwork engineering. The tool was developed by technicians with many years of practical experience in the construction industry for technicians to provide them with the best support in their daily challenges.

The tool uses intelligent approaches which offer commands in multiple levels of automation – whether it be the single manual placement of two assembly locks or the automated arrangement of hundreds and thousands of different elements in a project. By using completely natively developed Revit® nested parametric families it shows an incomparably strong performance. Therefore, formwork design is generally much more efficient.

BIM²form follows the highest software engineering standards and is being steadily improved through an innovative concept that offers its users perspectives to be part of the product development and provides direct feedback to the development team. Overall, this ensures the best algorithms and enables the software to provide the perfect digital twin meeting any BIM project requirements.

In addition, the tool offers the possibility to easily integrate the formwork design into the BIM workflow. Through cloud-based links, all parties involved in the process can access and work on the project simultaneously. A web-based exchange allows non-CAD users to access the current scenario, command last changes, and review the planning progress. All of this contributes to excellent engineering and construction performance.

Besides using BIM²form, the design model was exchanged between the formwork supplier MEVA, their formwork partner MAXBO Teknikk, and BIM² as a consultant for the BIM approach of this project. That included a standard basis for the formwork design and versioning between all participants to process the complex engineering of the bridge.

Communication with contractor

Throughout the Minnevik railway bridge project, the model has been used in communication with PNC Norway to discuss and agree on the best formwork solutions. The BIM model includes the concrete structure, formwork elements and timber frames. This allowed the contractor to plan the erection of the material and placement of tie rods through the structure.

For each pile cap and pier shaft of the bridge, the BIM model has been used to draw the formwork. Ships pass the bridge between axis 12 and 13. Here, the piers had circular ends and an inclination that required special fabricated timber frames inside the formwork. By exchanging the BIM model with the supplier, it was easy to get the right geometry for the timber frames that were attached to the formwork elements.

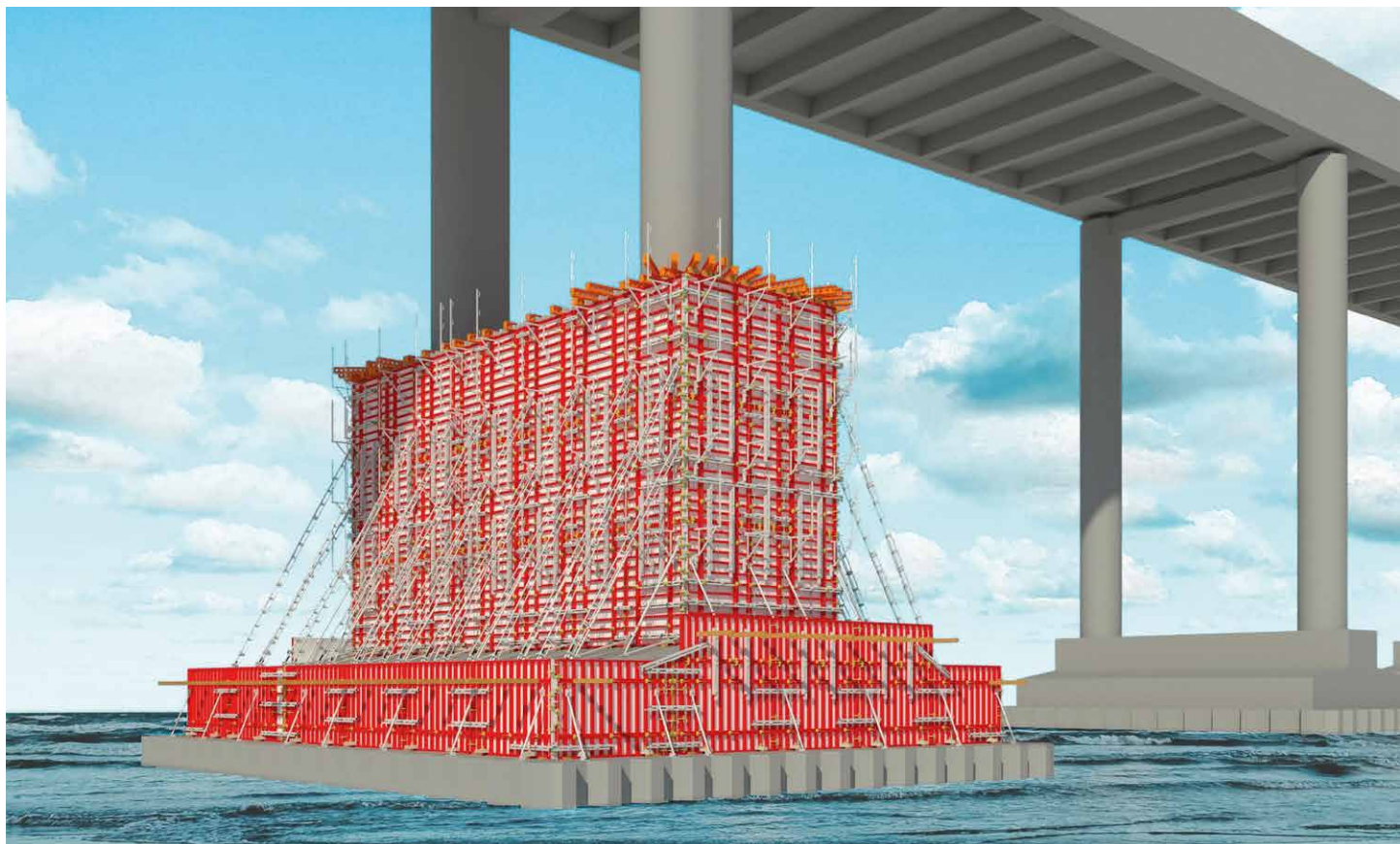
For more information about MEVA's partner BIM² and their Revit® add-in BIM²form contact your MEVA sales representative and visit their website www.bim2.eu.

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Project data

- **Project**
 - Minnevik railway bridge, Minnesund (N)
- **Contractor**
 - PNC Norge AS, Oslo (N)
- **BIM² support**
 - 3D formwork design
- **MEVA systems**
 - Wall formwork Mammut 350
 - Climbing system KLK
 - Triplex heavy-duty prop
- **Engineering and support**
 - BIM², Nagold (D)
 - MAXBO Teknikk, Sandvika (N)

The project scope is to provide efficient formwork design from the pile cap (at the lake bottom) up to the top of the columns.



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on the spot wherever you need us.

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