PERI BOOK

INTERNATIONAL – EN

PERIBOOK

Dear Readers,

We are pleased that you are taking the time to look at the PERIBOOK and cordially invite you to get to know our company, our products and many interesting projects.

As a family owned company that has been successful in its markets for over 50 years, we have a clear mission: we want to make work in our customers' industries more efficient, faster and safer. Providing the best service to our customers is what drives us every day.

In this new edition of the PERIBOOK, we show you which products, systems and services we use to fulfil this mission. We present some of the groundbreaking projects that we have successfully completed with our customers in recent years.

Our industries are changing rapidly and many exciting topics are being discussed. How can digitalisation contribute to greater efficiency and planning reliability in projects today? What opportunities do new, more sustainable materials offer? Where do we stand with regard to disruptive technologies such as the 3D construction printing of entire houses?

At PERI, we are already working on answers to these questions. As a technology and innovation leader, we would like to shape the future of our industries together with you. Reliable, long-term and trusting partnerships are important to us and form the basis for mutual success.

In this spirit, we wish you an interesting and inspiring read of the PERIBOOK and look forward to a successful cooperation together.

With our best regards,

Jürgen Voss

Leonhard Braig

Christian Schwörer

Carl Heathcote

Thomas Imbacher

THE COMPANY

SYSTEMS AND SERVICES

REFERENZPROJEKTE

VISION

What we aspire to:

We want to be the leading partner for all formwork and scaffolding applications – worldwide.

MISSION

What we stand for:

We make construction work more cost-effective, faster and safer. Providing our customers with the best possible service is what we strive for every day.

We are PERI

For us, construction has always been about shaping the future. For more than 50 years now, we have been making construction faster, safer and more economical the world over with cutting-edge technology, innovative strength and our proximity to customers. As a strong partner, we are always there to assist our customers and actively support them in making their construction projects a reality – not only with our products and systems, but also with our services.

Our entrepreneurial mindset, reliability and our passion for our customers have seen us become one of the world's leading manufacturers and suppliers of formwork and scaffolding systems. We are always looking to the future, and so in 2020 we were able to expand our portfolio to include 3D construction printing of houses as well as offering a wide range of services and digital solutions in the field of construction.

As a family business, long-term approaches are particularly important to us. That is another reason why we invest sustainably in a better future.

Video

Alexander Schwörer
Partner
PERI Group

"Accelerated by digitalisation, climate change and population growth, the world is changing and with it our markets. At PERI, we see ourselves as a catalyst for the future viability and sustainable success of our customers. Our innovations such as 3D construction printing and sensor technologies are just the beginning – the traditionally conservative construction industry has a lot more potential for innovation ahead of it. It is equally important that we approach the issue of sustainability consistently – in a systematic way, right down to the final link in the supply chain."

Christl Schwörer
Co-founder and member of the
PERI Group Advisory Board

"Our family business relies on the people who work for us every day and the passion, creativity and courage they bring to their projects. With their support and the ideals on which my husband and I founded PERI in 1969, we have grown into the global company we are today. Our vision at that time was to revolutionise the construction industry. At PERI, we continue to pursue this objective to this day, thereby shaping the future of construction."

The history of PERI

Thinking about tomorrow's world yesterday

Video

1969 Artur Schwörer and his wife Christl found the company PERI. The first T 70 V wooden girders are produced.

1970 With the world's largest double-vertical ship lift near Lüneburg, PERI receives its first major order, supplying the "Himmelstürmer", the extra-long T 70 V timber beam.

1971 PERI exhibits its products at the bauma trade fair in Munich and hands out the very first PERI handbook at the fair.

1974/75 The first European subsidiaries are founded in France, Switzerland and Spain.

1976 Production is expanded and the customer magazine "PERI Aktuell" is published.

1980 PERI develops the MODUL Slab Formwork made of aluminium.

1982 PERI USA, the first PERI subsidiary outside Europe, is founded.

1984 The T 70 V undergoes further development to become the Wooden Lattice Girder GT 24.

1986 TRIO Panel Formwork is launched on the European market.

1989 PERI introduces the ACS Self-Climbing System with hydraulic climbing mechanism.

1990 PERI opens the first production site outside Europe in Turkey.

1992 PERI unveils the SKYDECK Panel Slab Formwork with drophead system at the bauma trade fair.

1998 PERI enters the scaffolding market with PERI UP.

2007 For tunnel, bridge and building construction, PERI supplies the VARIOKIT Engineering Construction Kit consisting of standardised, rentable system components.

2009 On 15 April, Artur Schwörer dies at the age of 76. One year earlier, he received the Bavarian Order of Merit for his life's work, the most prestigious award in Bavaria.

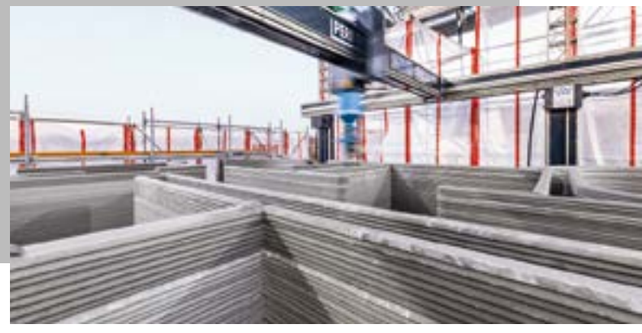
2013 PERI develops apps for the construction site and an online customer portal called myPERI. In addition, a new office building is built in Weissenhorn.

2016 The new, state-of-the-art primary plant for scaffolding systems is opened in Günzburg, Bavaria.

2019 The Schwörer family continues to play an active role in shaping the success story of the family business and celebrates the company's 50th anniversary. The new training centre opens at the headquarters in Weissenhorn.

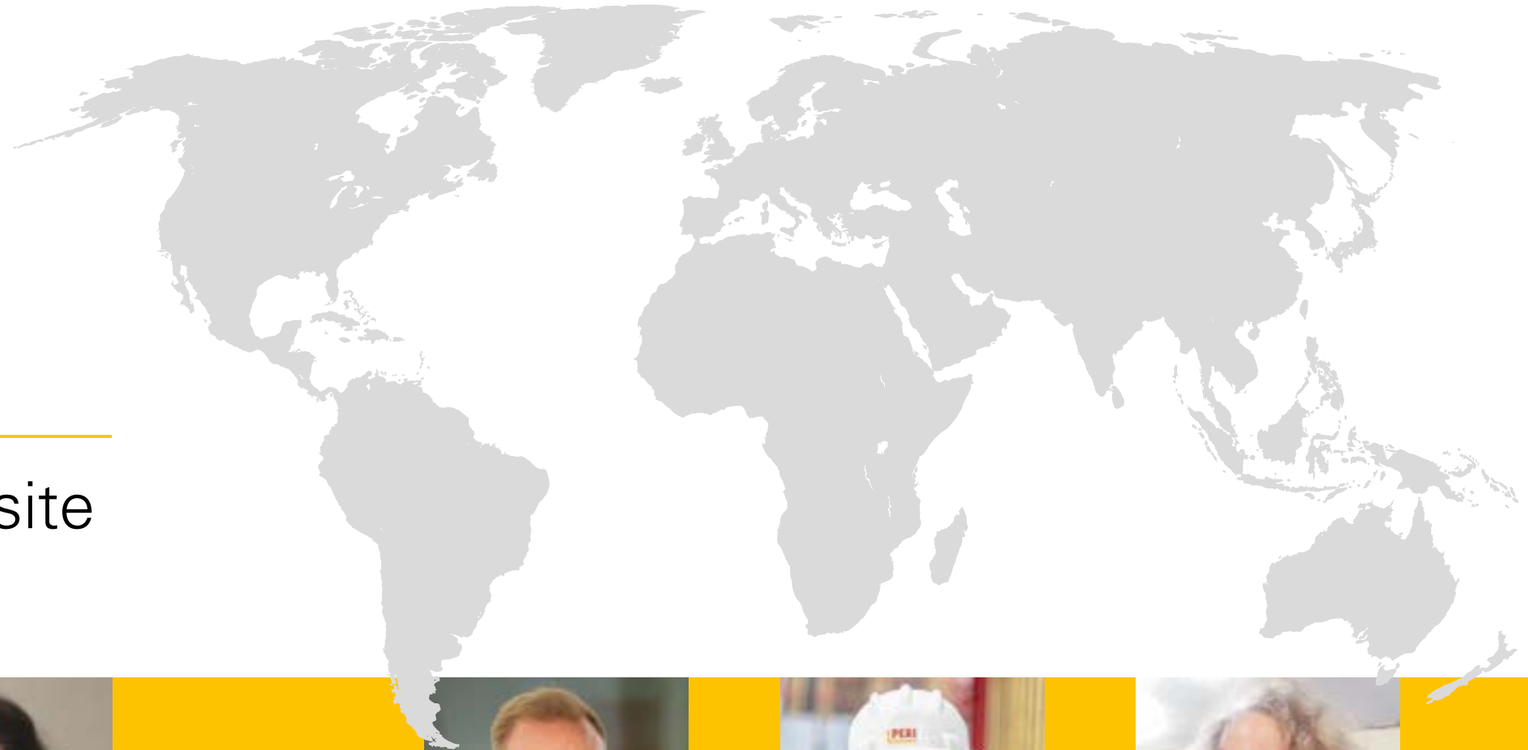
2020 The head plant in Günzburg is expanded. The fully automated scaffolding production facility featuring a galvanising plant is one of the most advanced in the world.

2021 With 3D construction printing, PERI brings disruptive technology to market maturity and completes Germany's first printed residential building and the largest printed apartment building in Europe with the COBOD BOD2.



Locations

The world is our construction site



Bernhard Überle
Managing Director
PERI Germany

"Providing a service to our customers is what motivates us every day. This maxim is also our key to success. For us, it's about cooperating to find a solution that makes the project a success. We do not think in terms of individual products, but rather about holistic solutions. This means that we have new, exciting tasks every day, and that we approach them with great enthusiasm."

Adriano Parola
Sales Manager
PERI Argentina

"Our goal is to provide the solution that best fits the needs of our customers. We see ourselves not only as a supplier, but also as a partner who works alongside the customer to make their projects a success. We believe that this is the way to create a strong, loyal and long-term partnership."

Filiz Aydoğdu
Senior Design Engineer
PERI Turkey

"For me, PERI is synonymous with trust, honesty and friendliness. I sense that these values, which PERI employees hold in high regard, are also embraced by our customers and are reflected in the way we work together."

Nick Cruickshank
Managing Director
PERI South Africa

"The thing I really like about being a PERI employee is the moment that a customer I am working with realises that they have made the right decision to place their trust in PERI. That the project is going to be a success because of the transparent cooperation with PERI. This is what makes working at PERI rewarding for me."

Manwar Shaikh
Chief Erector
PERI India

"PERI is my family. My colleagues are close to my heart as if they were my brothers. When I started at PERI, I made tea and coffee for everyone and served breakfast. Nowadays I'm a chief erector and instruct people on how to use our products. My goal for the future: continuous development at and with PERI."

Bettina Gerti Groß
Segment Manager for Infrastructure
PERI Nordics

"In my role at PERI, I build bridges in the Nordic region and supply the international infrastructure construction industry with innovative PERI products. For me, PERI stands for progress, internationality and, at the same time, a family-like cooperation."

Dr Carsten Weiss
Head of Product Technology
PERI Group

"Drawing on our market and product expertise, our internationally established team creates innovative solutions and thus sustainable added value for our customers."

Research and development

Customer-oriented innovations with added value

With our trend-setting products, system solutions and technologies, we are always setting new impulses for the future. We are always driven by the urge to develop something new and to question what already exists. With the benefit to the customer in mind at all times, we are continuously working on innovative solutions and systems – of a physical, methodical or even digital nature. After all, innovative strength is not simply a part of our identity, it is part of our DNA.

Our products are developed at our research facilities in Germany, Italy and India. Among other things, we focus on simplifying work flows, protecting users and combining our systems in an efficient manner. The product development process also takes into account the handling and transport requirements of the components. This results in efficient and durable systems with practical features that will stand the test of time.

Production

Keeping pace with the times in a sustainable manner

With its efficient systems engineering, state-of-the-art manufacturing processes, fully automated welding robots and, last but not least, an outstanding production team, PERI's approach to production is in keeping with the times. By opening the galvanising plant at our scaffolding factory in Günzburg in 2020 and developing a highly automated frame production line and an innovative surface coating system at the formwork factory in Weissenhorn, we have been making great strides towards an even more sustainable and environmentally friendly approach to production.

At PERI, we believe that future viability goes hand in hand with investment in our workforce. After all, we are committed to providing competitive jobs for many people, for example through our modern training centre, where we prepare the next generation for the rapidly advancing process of digitalisation in the production sector, while also providing further training for our core workforce.

Our common goal within the PERI production network is to establish global production and quality standards for PERI formwork and scaffolding systems across all plants. In this way, we can guarantee the first-class quality that PERI is known for and that customers have come to appreciate. Top quality and delivery reliability are our hallmarks, and they set our customers around the world on the road to success.

Tia Santer
Mechatronics Engineer
PERI Plant Weißenhorn

"I have been an integral part of the PERI team in Weissenhorn since I started the apprenticeship four years ago. Together with my team from maintenance, I support my colleagues from the production department – we make sure that the systems function perfectly from a technical point of view. We are very pleased that PERI continues to invest in Germany with state-of-the-art systems, thereby securing our future and giving us the opportunity to evolve off the back of new technologies."

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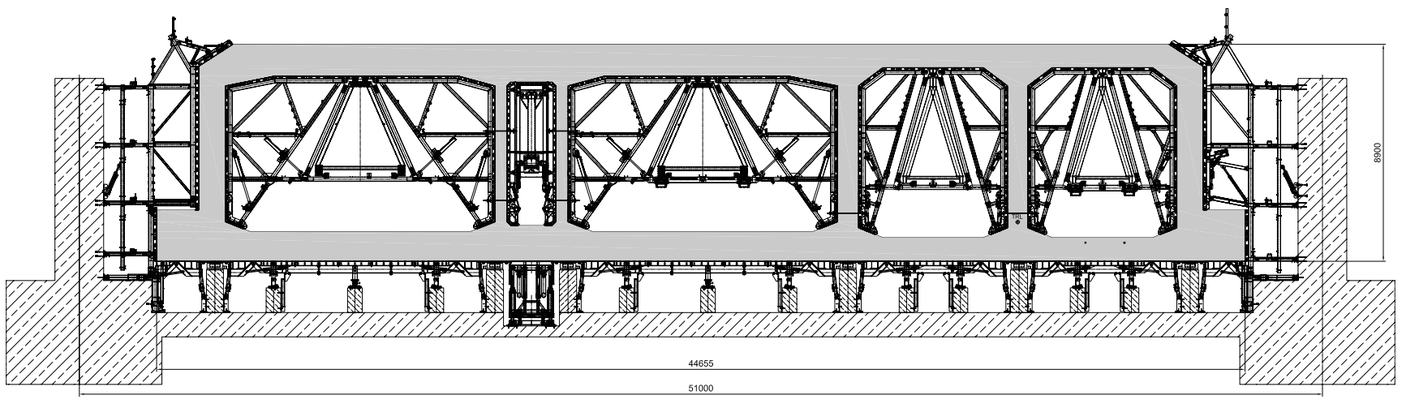
Engineering

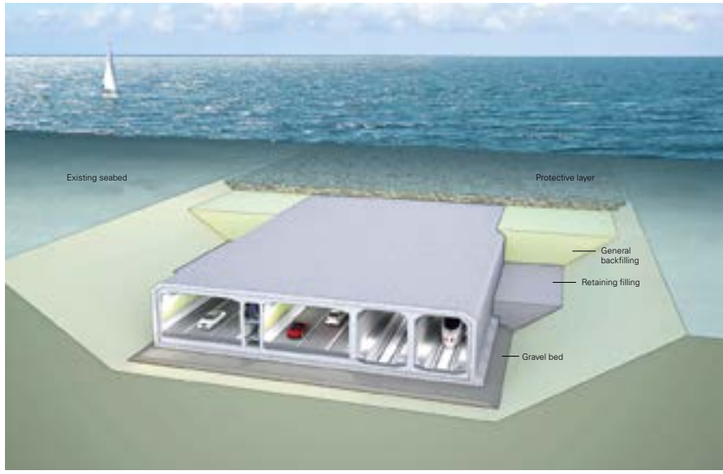
Working together to successfully complete challenging projects



Manfred Schnepf
Head of Technical Office Tunnel
PERI Group

"The work we are doing on the Fehmarnbelt Tunnel, for the contractor consortium Femern Link Contractors (FLC), is probably the biggest challenge in my career as a special formwork designer at PERI. We are developing a technically sophisticated "shuttering machine" that enables us to produce tunnel sections using monolithic construction. The demands on functionality and dimensional accuracy are incredibly high. Projects like these can only be realised with a team that is 100 per cent behind the cause."

Our workforce of more than 2,300 engineers and sales engineers plan, manage and provide support for challenging construction projects around the world. They are making construction history that sets new standards through their comprehensive expertise and extensive experience. Major international projects, such as the Fehmarnbelt Tunnel between Germany and Denmark, which is currently under construction, are overseen proficiently by our experts. This exceptional civil engineering project consists of an immersed tunnel with a four-lane motorway and a double-track electrified railway line – and runs almost 40 metres below the surface of the water at its lowest point.



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No way – that can't be possible: with individually planned and manufactured PERI free-form and special-purpose formwork, our customers are equipped for every project, no matter how unusual. From complex geometries to surfaces that meet the highest quality standards: To see the results of this, just look at the wealth of major projects we have successfully completed around the world.

At PERI, we thrive on close dialogue with our customers and stand out due to our extensive practical experience and the ongoing further training we provide. Drawing on our pronounced technical expertise and immense passion for what we do, we stand ready to assist our customers with even the most complex projects and offer the right solutions.

Purchase and Rental

Paving the way to success with global material availability

Josephine Ching Ching See
Deputy National Sales Director
PERI Malaysia

“We do not ask you to decide whether you should buy or rent. With us, you can combine both options. After all, your needs are at the heart of what we do. Together, we will find the best solution for your project: rent, buy or both.”

Every project is as unique as the challenges and needs of our customers. We offer customised packages that provide innovative system solutions, especially in the case of order peaks and unusual projects with large material requirements. Together with our sales engineers, we find the right solution for every situation – whether it’s a purchase, a rental agreement or a combination of both.

Our large international rental park with well over 160 logistics sites allows us to ensure optimum material availability – with the customary PERI quality standards, anywhere in the world. This approach is characterised by a high level of sustainability and minimises the capital and financing needs of our customers. You can benefit from the option of renting entire PERI solutions or, if necessary, individual components that will enable you to adapt to special situations with ease and without having to invest in additional material. Our maxim is as follows: the right amount of the best material in the right place at the right time.

PERI services

Support throughout each phase of the project

Marc Schmied
Product Application Specialist
PERI Group

“Each and every day we are driven by the desire to provide real added value and directly applicable knowledge to all the customers we train and advise. The key challenge in this respect is ensuring that the day-to-day work carried out on the construction site by our customers – most of whom are experts in their field – becomes faster, safer and more cost-effective. This is only possible through purposeful communication, constant contact with the customer and our own decades of experience on the construction site. We not only speak the language of our customers, but also have an open ear for their issues.”

Products and services go hand in hand at PERI. This is also reflected in our comprehensive service portfolio: in addition to engineering, pre-assembly, 3D design, project management or software solutions, we also offer comprehensive training and education.

In close cooperation, we develop technical solutions that are optimally tailored to our customers’ needs and optimise material consumption and the construction process. In addition, our pre-assembled products increase productivity and profitability. They also ensure greater cost reliability.

By providing professional support over the course of the entire project, we help to ensure that budgets and timetables are adhered to. We also assist with the development of new business areas. In addition, we offer target-oriented on-site training, either at the construction site itself or in our PERI exhibition halls around the world.

Digital solutions

Thinking ahead in construction

At PERI, we offer a comprehensive service and product portfolio of digital solutions that is suitable for a wide variety of project phases. In this way, we support, automate and simplify our customers' work processes along the entire value chain.

Our portfolio ranges from the initial visualisation of the construction project right through to the option of monitoring the final results with pinpoint accuracy: In addition to in-house planning software, a system configurator, the PERI component library for BIM software and our customer portal, we also offer sensor technologies for determining material conditions as well as numerous other innovative technologies. We want to actively shape the digital future of construction in collaboration with our customers. After all, if you go with PERI, you will be one step ahead in the world of digital construction.

Michel Seeger
Head of Digital Products and Services
PERI Group

"With our digital solutions, we are able to generate additional added value for our customers' core processes. The profound transformation of construction methods and processes driven and enabled by digital technology allows us to significantly increase efficiency, safety and automation. In this way, PERI also offers a holistic digital solution that enables decisions to be made on the basis of data, promotes our customers' autonomy through (partially) automated solutions and, by creating transparency, gives them the opportunity to control complex construction processes."

Shaping the future

Dr Fabian Meyer-Brötz
Head of 3D House Printing
PERI Group

"3D construction printing has great potential. We believe in this completely new construction technology and want to develop and support this emerging market from the word go. Good ideas are one thing. But it is equally important to have the entrepreneurial courage to think about things in a new way and to question what we are used to."

Video

© MENSE-KORTE ingenieure+architekten

COURAGE
ABOUT DISRUPTION

Our industries are changing faster than ever and are craving ingenuity and creativity. We are looking ahead and thinking about how people will shape their environment in 30 years time. What approach will we take to building then? What materials will we use? What technologies will we have at our disposal?

Challenging our existing business model and actively pursuing disruptive approaches at all times will put us in the best possible position to meet new challenges. For example, we were able to bring new impetus to the market with 3D construction printing and combine the agility of a start-up with the expertise of PERI. Because at PERI, we are already thinking about tomorrow today.

SYSTEMS AND **SERVICES**

Formwork Systems

Props and Shoring Systems

Scaffolding Solutions

Civil Engineering Solutions

3D Construction Printing

Components

Digital Solutions

Services

FORMWORK SYSTEMS

MAXIMO Panel Formwork

The single-sided operable wall formwork

MAXIMO Panel Formwork is characterised by the fact that it can be deployed extremely quickly by a lower number of site personnel. Thanks to the MX Tie Technology and additional system components, such as the formlining-side Brace Connector and the Wall Formwork Bracket, MAXIMO can be operated by just one person, from one side and without spacer tubes and cones. This speeds up the anchoring process. Due to the optimised arrangement of the tie points, fewer ties are also required for the formwork work. MAXIMO meets the high demands placed on the achievable quality of execution. The centrally arranged tie points and the neat joint and tie arrangement create a harmonised concrete finish.

- Systematic element portfolio with element heights of 2.70 m/3.00 m/3.30 m/3.60 m and element widths of up to 2.40 m
- Maximum permissible fresh concrete pressure: 80 kN/m²
- Use with MX Tie Technology for wall thicknesses from 15 cm to 60 cm, use with DW Ties for thicker walls
- Closing of unused tie positions is not required as it is normally the case that each tie point is used
- Flush, aligned and tight connections thanks to the BFD Alignment Coupler
- Compatible with TRIO Panel Formwork
- Simple cleaning operations and long service life due to the powder-coated frame
- Improved corrosion prevention thanks to cavity protection on the profile inner surfaces
- Closure technology also for increased requirements such as waterproof concrete, architectural concrete, F 90, with corresponding test certificates
- Simple MAXIMO ground plans and balanced cycles can be created with the PERI QuickSolve web application

Extended programme

MXK Bracket System
Modular system for MAXIMO and TRIO with widths of 0.90 m, 1.20 m and 2.40 m; safe pre-assembly of console brackets, scaffold deck and side mesh barriers on the horizontal panel

MXP Platform
Platform system ensuring maximum safety for MAXIMO and TRIO

MXH Heated Panel
Heated panel that can be combined with MAXIMO for concreting operations in colder climates; high level of cost-effectiveness thanks to enhanced utilisation options for the system formwork

MX Frame Holder
For securing MAXIMO panels to an existing wall and to the floor

MX Shaft Corner
Dual function as 90° inside corner and striking element

Hydraulic striking module for shaft corners
Compact, retrofittable hydraulic module for effortless striking of shaft corners

MXM 80 and outside corner angle
Flexible solution for designing a wide variety of corner scenarios

ROBU B 18 mm
Polypropylene hybrid formwork panel with particularly long service life and easy-to-repair surface

MAXIMO elements are available in six heights from 30 cm up to 3.30 m as well as five widths from 30 cm to 2.40 m in 30-cm-increments. Special-purpose sizes with heights of 3.00 m and 3.60 m are also available.

MAXIMO Panel Formwork stands out by virtue of its harmonised concrete finish, making it ideal for construction projects with high wall and surface requirements.

The well thought-out safety concept includes, among other things, the MXK Bracket System, which can be used to form safe and convenient working and concreting platforms.

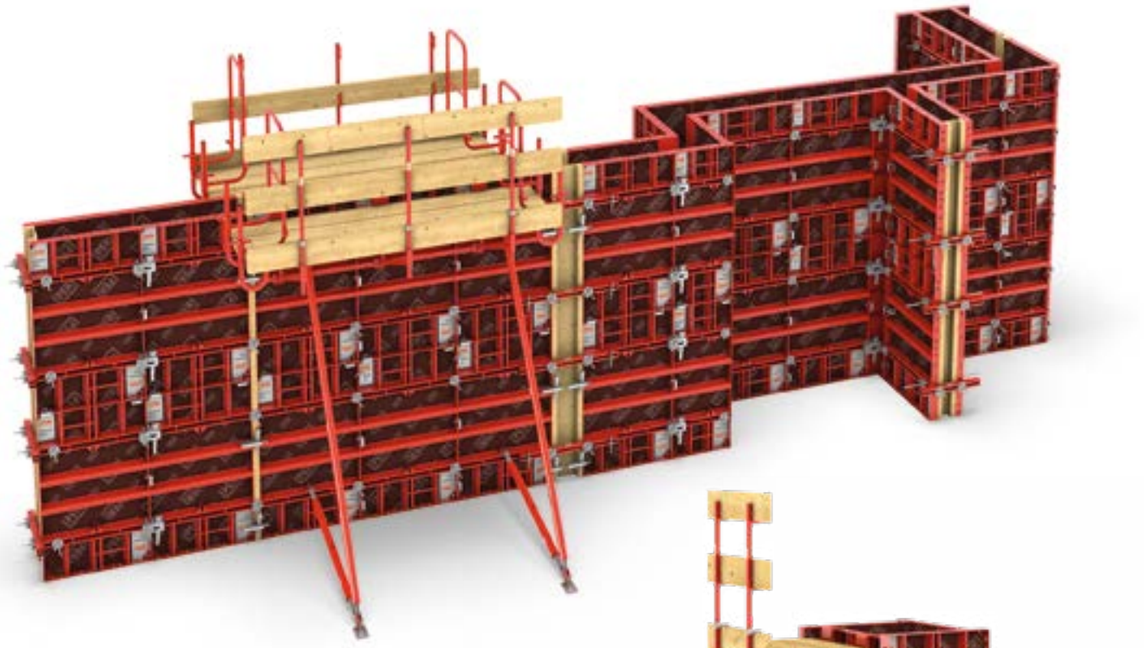
The MX VS Panel Connection Clamp facilitates the connection of panels in very confined spaces.

The MX RS Brace Connector formlining side serves as a connection point for the push-pull props on the safe internal side of the formwork.

The MX WK Wall Formwork Bracket can be used both as a wall formwork bracket and slab edge stop end.

HANDSET Alpha Panel Formwork

Robust and economical formwork system for crane-independent applications



HANDSET Alpha is a robust entry-level formwork system for walls, foundations and columns. The system consists of a low number of sophisticated components and multifunctional panels that make handling intuitive. This streamlined, integrated portfolio keeps the need for on-site training to a minimum and saves valuable time and costs. Only two people are needed to assemble the system. A crane is not required. The high quality steel and powder-coated panels make HANDSET Alpha particularly durable and reduce maintenance costs.

- Robust panels with a weight of 34.5 kg/m²
- A small portfolio consisting of only a few elements differing in terms of height (3.00 m/1.50 m/1.20 m) and width (0.90 m/0.60 m/0.30 m)
- All of the panels can be used as multi-panels
- Max. permissible fresh concrete pressure: 60 kN/m² (for walls)
- Max. permissible fresh concrete pressure: 60 kN/m² (for columns up to 900 mm x 900 mm)
- Max. permissible fresh concrete pressure: 75 kN/m² (for columns up to 600 mm x 600 mm)
- Columns ranging from 150 mm x 150 mm up to 900 mm x 900 mm without tie rods
- Easy cleaning due to inclined profiles in combination with high-quality powder-coated frames

The high permissible concrete pressure of 60 kN/m² for walls and up to 75 kN/m² for columns minimises errors and speeds up the concreting process.

Assembly is carried out quickly and intuitively by just two people – without the need for a crane. This makes HANDSET Alpha particularly efficient.

The multi-panels with integrated tie holes at 5 cm intervals provide a high degree of flexibility and reduce the volume of material held on site.

Video

The low number of reusable system components reduces the amount of material loss on the construction site as well as the amount of timber required.

TRIO Panel Formwork

The wall formwork with few parts and many application possibilities

The universal TRIO Wall Formwork System is ideal for all applications where reduced shuttering times need to be combined with conventional DW Tie Technology. The patented BFD Alignment Coupler, which stands out on account of its straightforward handling characteristics, is the only component needed for panel connections. A high working speed is achieved with only a few element components that can be used both horizontally and vertically. In addition, large-area shuttering is also possible using standard elements up to 3.30 m x 2.40 m in size.

TRIO can be used in a wide range of projects: From the construction of detached houses to large-scale projects all over the world. The refined MAXIMO Panel Formwork can be used in conjunction with TRIO. Many accessories such as the BFD Coupler or the MXK Bracket System are designed for both formwork systems.

The aluminium version of the TRIO frame elements is easy to recognise by its yellow powder coating. They can be moved by hand on account of their lighter weight.

- Panel heights up to 3.30 m, panel widths up to 2.40 m
- Maximum permissible fresh concrete pressure: 80 kN/m²
- Can be used with the DW 15 and DW 20 Tie Systems
- Flush, aligned and tight connections thanks to the BFD Alignment Coupler
- Simple cleaning operations due to the powder-coated frame

Extended programme

TRIO Aluminium
Lightweight formwork for crane-independent operations; easy to distinguish thanks to yellow powder coating

TRIO Structure
TRIO panels with a free choice of formlining for special concrete surface requirements – supplied already pre-assembled

© Eshhetty

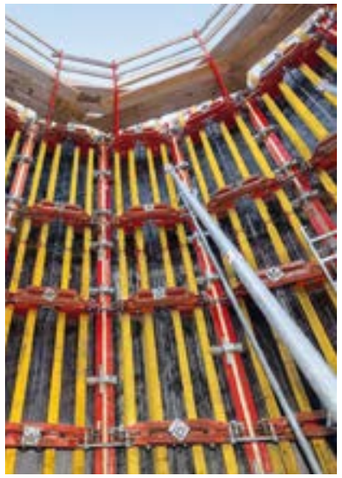
The low number of different formwork elements ensures easy handling for the construction crew. Additionally, a wide range of accessories is available for TRIO, ensuring that work operations can be carried out safely.

TRIO can be extended up to a height of 5.40 m in 30-cm-increments. For greater heights, a compensation waler is also used.

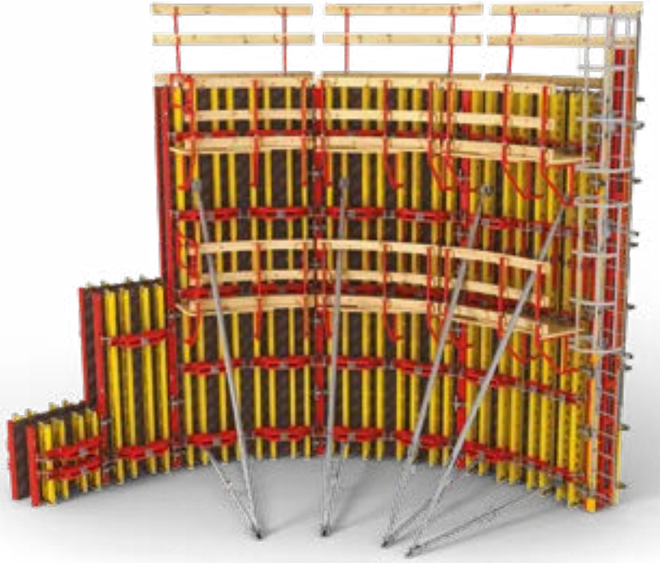
RUNDFLEX Circular Wall Formwork

Quickly and continuously adjustable for radii greater than 1 m

RUNDFLEX is a modular girder formwork that enables the desired radii to be adjusted easily and continuously. From a radius of 1 m upwards, a wide variety of round geometries can be realised with only three different element widths and six element heights. It is also easy to achieve varying radii with RUNDFLEX. Pre-assembled units and the BFD Alignment Coupler also ensure that installation work is kept to a minimum. Self-cleaning spindles and templates make it easy to adjust the RUNDFLEX system.



RUNDFLEX is quick and easy to install. For example, RUNDFLEX is often used in the construction of sewage treatment plants.



Panel heights up to 3.60 m, panel widths up to 2.50 m (external radius)

Maximum permissible fresh concrete pressure: 60 kN/m²

Flush, aligned and tight connections thanks to the BFD Alignment Coupler

The self-cleaning spindles can be quickly and easily adjusted to suit the desired curvature with a ratchet spanner.

VARIO GT 24 Girder Wall Formwork

A system for every ground plan

VARIO GT 24 can be easily adapted to accommodate a wide variety of geometries and conditions and can therefore meet almost any requirement. This concerns, for example, the choice of tie positions or the fresh concrete pressure that can be absorbed. The reason for the flexibility is the possible free arrangement of the system components. VARIO GT 24 is used in a wide range of applications from residential and industrial construction, bridge abutments or retaining walls to the construction of architectural concrete components. Architectural concrete requirements can be met in a particularly economical way on account of the joint pattern and the fact that the ties can be positioned as required. The slots in the ledger and coupling with flush, aligned and tight panel connections also allow for stepless compensation.

(©: Simon Turner Photography)

VARIO GT 24 combined with the RCS Rail Climbing System is a clever solution for high-rise construction applications.

The adaptability of the VARIO GT 24 Formwork is also evident in the construction of bridge piers in combination with climbing formwork solutions and access scaffolding.

Project-specific construction, adaptable for accommodating a very high maximum fresh concrete pressure

Flexible panel heights, determined by the length of the GT 24 Girder (standard lengths 0.90 m to 6.00 m in 30-cm-increments; special lengths up to 17.80 m)

Flexible panel width, determined by the length of the SRZ or SRU Steel Walers

Reduction in the number of GT 24 Formwork Girders due to their high bending rigidity and load-bearing capacity

SB Brace Frame

Reliable load transfer for single-sided forming operations up to 8.75 m high

The SB Brace Frame diverts the fresh concrete pressure that occurs in the case of single-sided components into the substructure or foundations. The brace frame system is compatible with all PERI wall formwork systems and therefore suitable for versatile applications. It consists of several frames that can be used individually or in various combinations for different heights. The height extension process is quick and requires no additional parts. In addition, the SB Brace Frame can also be used as a horizontal heavy-duty bracket.

- Maximum permissible fresh concrete pressure: 60 kN/m²
- Different tie systems can be used in accordance with the permissible tension force
- Can be used with all PERI wall formwork systems

RS Push-Pull Props

A complete programme with extension lengths up to 14.00 m

RS Push-Pull Props are used for the vertical alignment and transfer of wind loads from wall and column formwork or prefabricated concrete elements. This means that additional kickers are not necessary. RS Push-Pull Props are durable because they are made of galvanised tubes and threads. They are therefore permanently protected against corrosion and have a long service life. RS Push-Pull Props are quick and safe to use, as they can be adjusted in an approximate manner from the erection surface. They can then be fine-tuned in no time at all. Even in the case of precast elements, RS Push-Pull Props can be assembled quickly and safely using a push-pull prop adapter.

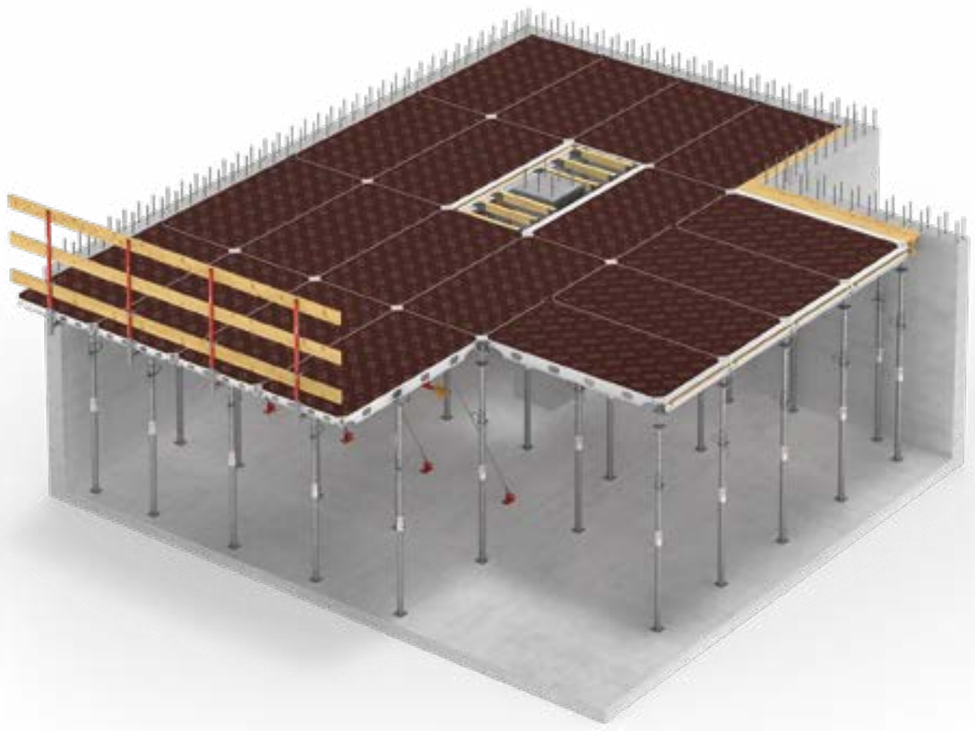
ALPHADECK Slab Formwork

Intuitive slab formwork with fast cycle times and low material requirements

ALPHADECK Panel Formwork is the preferred choice for customers looking to switch to system formwork. Compared to traditional formwork methods, less timber is required because of the reusable aluminium panels with PERI quality standards. The large-area panels are easy to handle thanks to their low weight and can be moved without the use of a crane. By combining only three basic components – panel, head and prop – ALPHADECK also impresses with its intuitive handling characteristics and can be used efficiently and safely even by inexperienced site personnel. The ingenious drophead system also allows the striking process to be carried out ahead of time and minimises the amount of material required, as the panels are quickly available for the next concreting section. ALPHADECK thus ensures considerable time and cost savings on the construction site.

- Standard panels in sizes 240 cm x 120 cm and 180 cm x 120 cm
- Low-weight aluminium panels with only 17 kg/m²
- For slab thicknesses up to 55 cm
- Tried and tested PERI Birch formlining with long service life
- Only one prop per 2.88 m² of slab area
- Straightforward closure of mating surfaces with the compensation beam and filler plates
- Increased panel life thanks to robust steel corners
- Simple cleaning procedure thanks to powder coating on frames
- Compatible with the entire PERI prop portfolio

Video



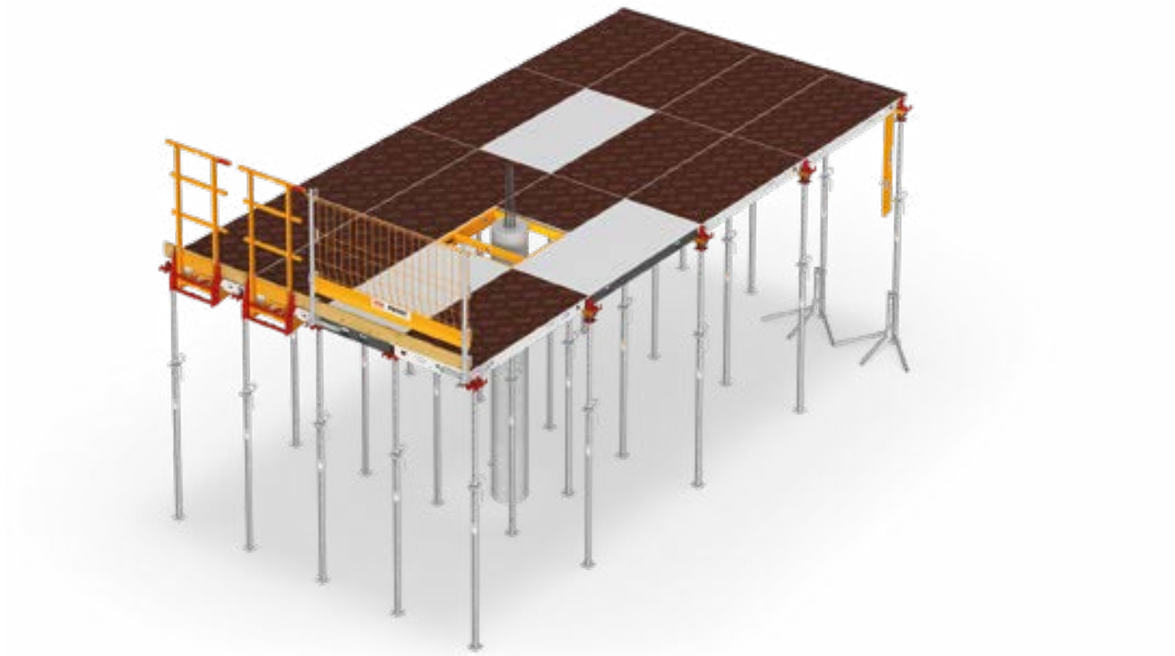
The assembly process is intuitive and can be carried out with minimal training effort. The ALPHADECK panels can be swivelled upwards from a safe position on the level below.

With only three basic components – panel, head and prop – the material requirement is particularly low. Thanks to the early striking option, only one formwork set is required, which improves the efficiency of the logistical process and minimises the need for storage space.

ALPHADECK offers considerable time and cost advantages due to the large panels and the possibility of early striking. What's more, only one prop is required for each 2.88 m² of slab surface.

SKYMAX Panel Slab Formwork

The lightweight slab formwork with large panels and future-proof assembly



When used in residential and commercial construction, SKYMAX Panel Slab Formwork ensures a particularly high standard of safety on the construction site thanks to the fact it is assembled from the lower level. The components and the lateral protection can be swivelled upwards from a safe position. The installed formwork can be walked on directly afterwards. In addition, the use of aluminium and polymer components makes the slab formwork a technically and economically very flexible system that is also self-explanatory in the assembly. The well-thought-out geometry of the heads and elements allows the direction of the panels to be changed – without the use of additional components. It can be formed with the prop head or, if partial early striking is preferred, with the lowering head as well. In addition, the lowering head enables partial early striking and thus reduces the material quantities available on site.

- SKYMAX panels made of aluminium and polymer including formlining
- Low panel weight: 32 kg (aluminium panel with 2.00 m x 1.00 m) and 30 kg (polymer panel with 2.00 m x 1.00 m)
- Can also be used efficiently for large slab thicknesses with just a few accessories
- Minimised effort for closing infill areas due to system components such as column frames and compensating beams
- Optimal handling due to the special shape and specific quality of the system components
- For subsequent openings, individual panels can be easily removed from the decking as required
- SKYMAX Starter Beams in lengths of 66.5 cm, 100 cm and 300 cm
- Up to 15 kN clamping force thanks to the tensioning unit
- Ceiling heights up to at least 3.80 m can be realised with the shuttering aid
- Prop head with a robust steel or cost-effective polymer design

The SKYMAX modular system
The SKYMAX modular system achieves a particularly high level of technical and economic flexibility: aluminium and polymer components can be efficiently combined with each other – for optimum performance.

In addition, the aluminium panels can be assembled directly on the construction site to form slab tables with dimensions of 2 m x 4 m and up to 4 m x 6 m, including lateral protection.

The SKYMAX panels are hooked into the head with the minimum level of effort required and swivelled upwards from the safe lower level.

The lightweight and large-scale panels ensure energy-conserving and ergonomic working. Thus, all panels weigh less than 32 kg.

Using a lowering head keeps the shuttering time to a minimum and paves the way for swift and partial early striking. The lowering head can be used in all directions and also for changing the direction of the panels.

Video

More information on the SKYMAX slab table solution can be found on page 48.

Thinking digitally with RFID for SKYMAX

RFID technology helps to make the flow of materials on the construction site more transparent while also optimising logistical processes.
The key: an RFID tag, a smartphone or UHF reader and the PERI MATERIAL SCAN app.

The SKYMAX panels made of aluminium are equipped with RFID tags as standard. In the case of the polymer panels, RFID is available as an option ex works or as a retrofit kit.

MULTIFLEX
Girder Slab Formwork

The flexible system for all ground plans and slab thicknesses up to 1.00 m

MULTIFLEX offers a high degree of flexibility for creating almost any slab thickness, ground plan and height. The flexible combination of VT 20 and GT 24 Formwork Girders as main and cross beams as well as the free choice of girder arrangement ensure an optimised use of material. If the high load-bearing GT 24 Formwork Girders are used, large spans for the main and cross beams can be realised.

In addition, MULTIFLEX is suitable for any ground plan due to the variable beam positioning characteristics – even polygonal, trapezoidal or overlapping arrangements are possible. The formlining can be freely selected according to the required quality and slab underside, meaning that practically any surface requirement can be met.

- Project-specific selection of formwork girders and their spacing
- Depending on the project, slab thicknesses of over 1.00 m can also be formed
- Free choice of falsework and formlining
- No infill areas due to project-specific planning
- Tilt-resistant support of the cross girders on the main beams through the use of Flexclips

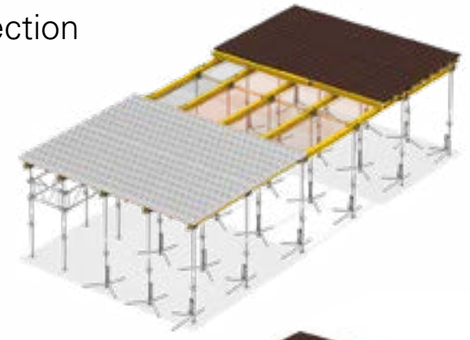
Video

With the MULTIFLEX configurator, the beam and column spacing can be optimised quickly and easily.

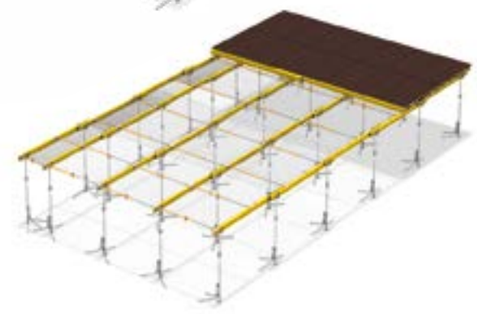
Safety systems for slab formwork

HAMMOCK Safety System
The safety net for collective anti-fall protection

The HAMMOCK Safety System is available in two versions and offers twice the protection when shuttering with MULTIFLEX Girder Slab Formwork and when using prefabricated slabs. It serves as collective anti-fall protection when shuttering from above at a formwork height of at least 2 m. At the same time, the net is capable of catching large falling parts. The safety system consists of a safety net and only a few other components. Assembly is carried out in a few work steps and from a safe position on the level below.



- HAMMOCK T-System for use with MULTIFLEX
- HAMMOCK S-System for use with falsework and prefabricated slabs
- Safe and efficient shuttering operations even if there are interference points in the slab area
- Nets available in eight sizes for a perfect fit every time



SKY-Anchor Universal
The attachment point for safe shuttering work

SKY-Anchor Universal allows shuttering work to be carried out safely from above and provides an attachment point for one person using personal protective equipment. It can be used with slab formwork in a versatile manner, for example, on a slab that has already been cast, or to close large infill areas. The innovative "tiger's paw", an arrangement of non-slip rubber pads, provides a stable grip on the slab surface.

- Mobile attachment device certified to EN 795-E
- Can be used in conjunction with the 21 mm and 27 mm SKY-Anchor
- Can be positioned freely on the slab or moved to the next place of use with a pallet lifting trolley or crane

VARIODECK
Steel Waler Slab Table
The standard slab table

A VARIODECK Steel Waler Slab Table can be used to form a slab area of around 15 m² with a thickness of up to 50 cm. The longitudinal steel waler facilitates the formation of large cantilevers and the accommodation of heavy-duty precast elements. VARIODECK Slab Tables can be moved to the next level in a single crane lifting operation. For this purpose, the props can simply be folded in the longitudinal direction of the table using the swivel head in order to move beneath beams, for example. VARIODECK can also be used for thicker slabs, if necessary, using a correspondingly greater degree of support. There is a free choice of props; these can simply be clamped in the table swivel head. When the tables are used at the slab edge, a work platform is pre-integrated into the system, meaning it is only the guardrail that needs to be fitted. Since VARIODECK Slab Tables are delivered in a pre-assembled state, they can also be readied for use particularly quickly. Due to the low overall construction height of only 36 cm, only a small amount of transportation and storage volume is required.

- Pre-assembled slab tables in 4 standard sizes
- Free choice of props (e.g. PEP Alpha 2, PEP Ergo or MULTIPROP), falsework can also be used
- Suitable for slab thicknesses up to 50 cm when combined with 4 MULTIPROP Slab Props
- Larger slab thicknesses or dimensions with additional supports or PERI UP Flex Falsework
- Width compensation of up to 50 cm by means of protruding cross girders which serve as a supporting surface for the formlining
- Can also be used as an edge table with guardrail holders and guardrail posts without any change in the prop position
- The low overall height saves on transportation and storage volumes

Project-specific slab tables
Individually adaptable for project-specific requirements

For higher geometric or static requirements, slabs at great heights as well as residual areas, project-specific slab tables can be planned and assembled. Depending on requirements, swivelling table heads or simple, rigid connections can be considered. In particular, the support for the slab tables can be designed in an extremely flexible manner – from simple slab props through to shoring towers with heights of more than 20 m. GT 24 Formwork Girders have a particularly high load-bearing capacity. Therefore, they can also be used for large slab thicknesses and high loads. The Table Head TK and the associated Clamping Set TK form a rigid connection between the slab props and the slab tables. This is a cost-effective alternative to the table swivel head.

Accessories for slab tables
For swift and safe horizontal and vertical repositioning

PERI offers the ideal accessories both for moving slab tables at floor level and for transporting them to the next floor. The Table Lift or Trolley is available for swift and simple striking processes or horizontal traversing. The PERI Lifting Fork can be used for swift, vertical repositioning of the slab tables.

When it comes to moving slab tables to floor level, the PERI Table Lift is a reliable and easy-to-steer work aid.

The Table Striking and Transportation Trolley enables swift and safe alignment and horizontal movement of the slab tables.

The PERI Lifting Fork is used for quick transportation by crane to the next level.

SKYMAX Slab Table

The slab table solution with standard panels

The SKYMAX Slab Table solution consists of components from the SKYMAX Panel Slab Formwork and can be supplemented with other components from the PERI product portfolio, such as MULTIPROP Slab Props. SKYMAX panels can also be used independently of the slab table configuration, minimising the number of components required by customers. Furthermore, the low number of components not only ensures that the system is easy to work with, but also saves valuable time as well as cutting training, logistical and storage costs.

SKYMAX Panels can be assembled right there on the construction site to form the slab tables. The SKYMAX Lateral Protection, the guardrail unit, is also installed in the same work step. This results in formwork that is safe and economical across the entire slab area. Due to the level of compatibility, it is possible to continue the shuttering process directly after the table solution with SKYMAX Panels, which makes the planning and handling processes particularly adaptable.

- Slab tables ranging from 2.00 m x 4.00 m up to 4.00 m x 6.00 m
- For slab thicknesses up to 55 cm
- Lateral protection can be mounted immediately
- Compatibility by shuttering with system components, namely the SKYMAX Panels

SKYTABLE Slab Table

For particularly large areas

SKYTABLE is the ideal solution for forming particularly large slab areas. The dimensions of the SKYTABLE are dictated by the building geometry. The maximum intrinsic weight of the table is the limit in this respect and is limited to 6 t. The SKYTABLE Tables are planned on a project-specific basis. When constructing buildings with open facades, the slab table, which is up to 24 m long, can be used to form an area of up to 150 m². The cost-effectiveness of this slab table is evident as early as the assembly process, which is carried out with bolts and spring clips rather than with screw connections. With PERI's remote-controlled transportation device, the process of moving to other floors is quick and easy. It is also carried out from a secure position on the already concreted slab without treading on the table. In addition, the combination involving the MULTIPROP Towers makes it possible to form high slabs as well.

- Project-related planned slab table with areas of up to 150 m²; up to 24.40 m long or up to 9.00 m wide
- For slab thicknesses up to 40 cm
- Load transfer using MULTIPROP Props which are mounted on the truss girders by means of quick-release devices; for greater heights, MULTIPROP Towers are used
- No infill areas due to project-specific planning

SKYDECK Panel Slab Formwork

The tried-and-tested aluminium panel slab formwork with particularly short shuttering times

SKYDECK's range of applications extends from residential construction through to industrial structure projects with thicker slabs. The light and easy-to-handle aluminium components ensure that the work can be carried out ergonomically and with minimal effort. The simple and systematic assembly sequence involving only a few slab props makes the shuttering process particularly efficient. The ingenious drophead system facilitates early striking and results in low on-site material requirements. In addition, the powder-coated elements, plastic components and undercut panel edges minimise the cleaning effort. SKYDECK is available with two different formwork panels, the tried-and-tested FinPly 9 mm and the modern, durable ROBU B.

SKYDECK Panel Slab Formwork
with FinPly 9 mm formwork panel

Panel slab formwork with lightweight aluminium system components including formlining
Slab thicknesses up to a maximum of 109 cm can be achieved
With lightweight individual components (panels and longitudinal beams weigh only 15 kg each)
Only 0.29 props per m² of slab formwork
The change in panel direction reduces filler areas to a minimum

Video

With SKYDECK Panel Slab Formwork, early striking is possible after only one day thanks to the ingenious drophead system.

SKYDECK Panel Slab Formwork with
ROBU B formwork panel

SKY-Anchor

The attachment point for personal protective equipment for SKYDECK

Thanks to the matching accessories, SKYDECK is suitable for markets that require personal protective equipment when shuttering from above. As a mobile attachment point for a person using personal protective equipment to prevent falls, the SKY-Anchor allows panels to be inserted safely from above. This ensures that work is carried out safely and properly – even at great heights. The SKY-Anchor is available in 21 mm and 27 mm versions.

GRIDFLEX

Grid Element Slab Formwork

A flexible system with safely accessible grid elements

GRIDFLEX is used in the construction of housing and multi-storey buildings. The systematic work procedure involving only one standard element and two filler elements makes the job easy. The shuttering process is particularly safe because the lightweight elements are swivelled upwards from the erection area. Filler areas can be closed quickly by simply changing the direction of the elements and using lateral and longitudinal infills.

Video

- For slab thicknesses up to 33 cm, or with additional centre support for the element up to 67 cm
- Only 2 system components required for each standard field (Prop Head and GRIDFLEX Standard Element)
- Only 0.5 props per square metre of slab surface
- The change in shuttering direction keeps filler areas to a minimum
- Filler areas closed with only 2 different filler elements
- At the open slab edge, the lateral protection element unit is safely swivelled upwards from the erection area

The different coating colours indicate the function of the slab elements. This simplifies both the shuttering and logistical work.

The guardrail is pre-assembled on the ground and then swivelled upwards together with the girder grid. After the assembly process has taken place, the closed girder grid can be accessed safely in order to install the formlining.

DUO Universal Formwork

Lightweight formwork for walls, foundations, columns and slabs

- Technopolymer with high resistance to all environmental influences
- Elements with heights of 135 cm and 60 cm and widths up to 90 cm
- Max. permissible fresh concrete pressure: 50 kN/m² (for walls)
- Max. permissible fresh concrete pressure: 80 kN/m² (for columns and shear walls)
- For square and rectangular cross-sections from 15 cm x 15 cm up to 55 cm x 55 cm in 5-cm-increments
- Optimised for slabs up to 30 cm thick

Extended programme

Efficient on-site maintenance
The DUO Repair Kit allows you to repair scores, scratches and holes up to a diameter of about 20 mm quickly and cost-effectively. It can be used on the construction site at any time without delay.

Space-saving storage and transportation
The DUO Stacking Device is a sophisticated solution for stacking DUO Panels. This allows the elements to be stacked, stored and transported in a compact and space-saving way.

Application for simple layout planning
With the help of the web-based PERI QuickSolve application, simple ground plans and balanced cycles can be created quickly and easily with DUO. Parts lists that are suitable for the construction site can be exported just as easily as 2D and 3D views of the formwork solutions.

DUO is a universally applicable system formwork for walls, foundations, columns and slabs. It is characterised by its low weight and straightforward handling characteristics. The low number of system components means that assembly can be carried out quickly and efficiently, requiring only a few tools. With its particularly lightweight individual components, DUO ensures that work can be carried out efficiently and ergonomically without the need for a crane. In the spirit of a sustainable circular economy, the panels are made of polymer-based composite materials. This means that DUO panels are 100 percent recyclable – with waste-free production and reduced emissions. What's more, the use of technopolymers for formwork applications is beneficial due to the particularly long service life of the material compared to timber solutions.

Video

The low number of different system components means that assembly can be carried out quickly and easily, always following the same assembly logic.

PERI QuickSolve is a quick and easy application for producing simple ground plans.

All accessories such as connectors and corner posts have been designed to be as versatile as possible. This reduces the material requirements on the construction site.

QUATTRO Column Formwork

Can be moved as a complete unit

QUATTRO Column Formwork is made of steel and designed for the swift formation of columns up to 4.50 m high. The entire column, including the push-pull props and the concreting platform, can be moved quickly and easily with a crane. Alternatively, it can even be moved by hand with the aid of transportation wheels. With QUATTRO Column Formwork, the formlining is screwed on from the rear. It is therefore particularly suited to situations where high demands are placed on concrete surfaces.

- For square or rectangular cross-sections from 20 cm x 20 cm up to 60 cm x 60 cm in 5-cm-increments
- Height adjustments up to a maximum of 4.50 m in 25-cm-increments with four different panel heights (0.50 m/1.25 m/2.75 m/3.50 m)
- Maximum permissible fresh concrete pressure of 80 kN/m²

TRIO Column Formwork

The ideal supplement to TRIO Wall Formwork

The standard elements of the TRIO Column Formwork are 90 cm wide and facilitate the construction of square and rectangular columns up to a cross-section of 75 cm x 75 cm. 120-cm-wide elements are also available for wider columns with a cross-section of up to 105 cm. Stacked elements can be connected easily using the BFD coupler. The elements' robust structure means that they can be used many times over. The reusable PERI chamfer strip, which is simply attached to the column panel, is a quick and high-quality solution for broken edges.

TRS90

- For square or rectangular cross-sections from 20 cm x 20 cm up to 75 cm x 75 cm in 5-cm-increments
- Three different element heights: 0.60 m/1.20 m/2.70 m
- Maximum permissible fresh concrete pressure of 100 kN/m²

TRS120

- For square or rectangular cross-sections from 20 cm x 20 cm up to 105 cm x 105 cm in 5-cm-increments
- Four different element heights 0.60 m/1.20 m/2.70 m/3.30 m
- Maximum permissible fresh concrete pressure of 90 kN/m²

LICO Column Formwork

Lightweight, economical column formwork without the need for a crane

The elements' low individual weight and simple frame construction make LICO the ideal solution for assembly and disassembly without a crane.
In addition, the column formwork is extremely easy to assemble because, on the one hand, only three panel heights are available and, on the other hand, the fasteners are firmly attached to the panel, meaning they cannot be lost. LICO is therefore an economical solution for moderate concrete surfaces. Eyebolts can be used on all panels as load-bearing points for relocation by crane and for connecting the panels when stacking.

- For square and rectangular cross-sections from 20 cm x 20 cm up to 60 cm x 60 cm in 5-cm-increments
- Larger cross-sections with additional ties
- Height adjustments up to a maximum of 4.50 m in 50-cm-increments with three different panel heights (0.50 m/1.00 m/3.00 m)
- Maximum permissible fresh concrete pressure of 80 kN/m²

VARIO GT 24 Column Formwork

For high architectural concrete requirements

VARIO GT 24 can be individually adapted to the requirements of the project. The column formwork consists of formwork girders, steel walers and any desired formlining and can therefore be continuously adapted to suit the required cross-sections. This also applies to the concreting height and the fresh concrete pressure. Due to the free choice of formlining and the project-specific design, it is particularly suitable when high demands are made on architectural concrete surfaces. Special geometries as well as conical column shapes can also be produced with the GRV Articulated Waler.

- For square or rectangular cross-sections continuously from 20 cm x 20 cm to a maximum of 120 cm x 80 cm
- Maximum permissible fresh concrete pressure of 100 kN/m² in the standard configuration; planned as required for higher pressure
- Project-specific adaptable solution

RAPID Column Formwork

For the highest requirements on the concrete surface and edge formation

RAPID is a column formwork that is suitable for forming columns with the highest demands on the concrete surface. It is designed to accommodate particularly high fresh concrete pressures. Because the formlining is simply clamped onto the frame, architectural concrete surfaces can be created without imprints. Sharp-edged column cross-sections can also be realised with the appropriately milled formlining. In combination with the clamping principle, the lightweight aluminium elements allow the basic assembly process to be completed quickly.

- For square and rectangular cross-sections continuously up to 60 cm x 60 cm (58 cm for sharp edges)
- Cross-sections from 85 cm x 85 cm up to 130 cm x 130 cm with waler for bracing and additional tie
- Height adjustments up to a maximum of 8.10 m in 30-cm-increments with three different panel heights (0.60 m/2.10 m/3.00 m)
- Maximum permissible fresh concrete pressure of 120 kN/m²

SRS Column Formwork

Steel formwork for circular columns with the ideal concrete surface finish

The Circular Column Formwork SRS is a type of steel formwork that can absorb a high fresh concrete pressure on account of its tight panel joint. The steel surface also provides the ideal concrete surfaces. As it consists of only a few single components, the assembly process is very simple. The two half shells with integrated tie yokes of the SRS system ensure quick assembly. Stacking aids are also integrated into the formwork to ensure that the logistical processes are safe: this means that the elements can be stacked easily and stored safely during transport.

- For circular columns with diameters between 25 cm and 70 cm in 5-cm-increments
- Special sizes available up to 120 cm in diameter
- Panel heights up to 8.40 m dependent on diameter, can be extended in 30-cm-increments
- Maximum permissible fresh concrete pressure of 150 kN/m²

Freeform Formwork

Tailor-made formwork for unique shapes

Customised freeform formwork is the preferred choice when there is a requirement for multi-curved reinforced concrete components. The basis for this formwork are 3D building models featuring so-called freeform surfaces. Using these as a starting point, the formwork bodies are manufactured individually by the PERI special-purpose formwork assembly service. This service is offered at many different PERI locations. The individual elements can be assembled quickly on site, almost in the same way as with PERI system formwork. Since many static load-bearing elements are based on VARIO GT 24 Girder Wall Formwork, they can also be used for other purposes after the project has been completed. This is both sustainable and cost-effective.

For virtually all building shapes that can only be realised with project-specific formwork

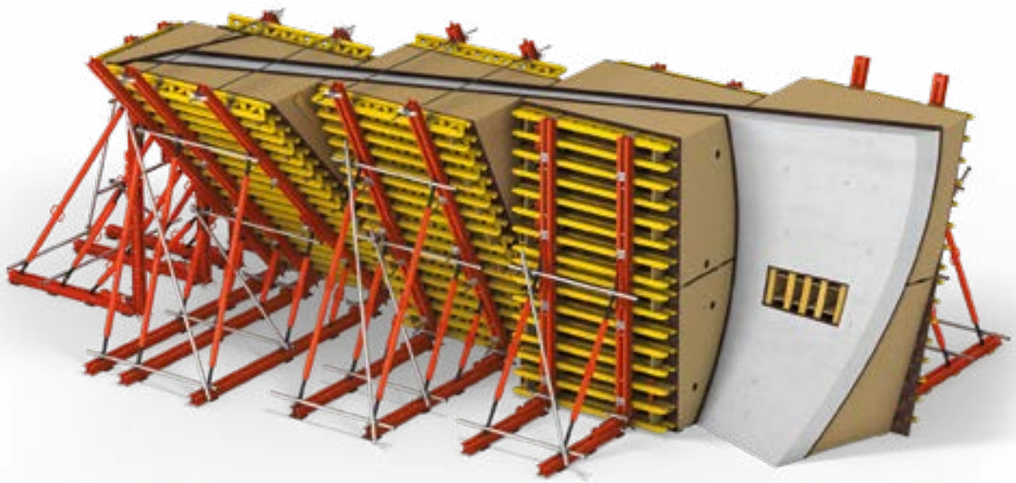
High production quality thanks to pre-assembly at the PERI formwork assembly facilities

Designed for a permissible fresh concrete pressure in accordance with project requirements

Formlining screwed on at the rear to meet architectural concrete requirements

Taking into consideration the respective site-specific boundary conditions for the final assembly

Better cost-effectiveness thanks to the highest possible share of rentable system components



UNO+ Customised Formwork

For monolithic construction

With UNO+ walls and columns as well as slabs and beams can be shuttered simultaneously and concreted using the monolithic construction method. It is a cost-effective solution for repetitive ground plans in residential construction. The aluminium elements, which are individually planned and prefabricated for each project, are lightweight and efficient to use. The tie technology is particularly cost-effective: as the system can be operated from one side and anchors are reusable, the number of tie points can be reduced by up to 70%. Striking can be carried out quickly thanks to the combination of the drophead system and the sophisticated transition between the wall and slab formwork.

For wall thicknesses from 10 cm to 30 cm and slab thicknesses up to 20 cm

Permissible fresh concrete pressure: 70 kN/m²

Crane-independent working operations using lightweight aluminium elements which are also easy to clean

Very tight panel connections and a simple striking procedure using the wedge clamp

Conical ties without spacer tubes, installed from one side only

Early striking of the slab with the drophead; as an option, panels can be directly supported

PROPS AND SHORING SYSTEMS

Slab Props and Shoring Towers

The PEP Ergo and PEP Alpha 2 Slab Props excel on account of their load-bearing capacity, which is significantly higher than the industry standard despite the props having a low intrinsic weight. They are also impressive from a safety point of view on account of their integrated hand safety clearance. The fact that all parts are hot-dip galvanised also ensures a long service life for a wide range of applications.

PEP Ergo Slab Prop
The robust prop with advanced functions

- Maximum prop load: 50 kN
- Prop load lengths: up to 1.50 m/2.50 m/3.00 m/3.50 m/4.00 m/5.00 m
- Total length embossed on inner tube in 10-cm-increments
- Prop type and length can be read off the outside of the end plate
- Tripods or frames available as assembly aids
- Quick adjustment thanks to directional adjusting nut with captive handle (12 cm adjustment range)
- Straightforward connection of prop heads to inner and outer tube

PEP Alpha 2 Slab Prop
For daily use on the construction site

- Maximum prop load: 36 kN
- Prop load lengths: up to 3.00 m/3.50 m
- Generous adjusting nut adjustment range of 12 cm
- Adjusting nut is positioned at an ergonomic height of 1.70 m or 2.00 m
- Tripods or frames available as assembly aids
- Anti-dropout safeguard on the inner tube

MULTIPROP Aluminium Slab Prop
Can be used as a single prop and as a shoring tower

The MULTIPROP Aluminium Slab Prop can be used both as a single prop and – in combination with the MULTIPROP Frame – as a shoring tower. Despite its low intrinsic weight, it is designed for very high payloads and impresses with sophisticated details such as the self-cleaning thread, the directional adjusting nut and continuous adjustability. Due to the length adjustment with integrated measuring tape on the inner tube and the wedge connection for the frame without screw connections, the prop is particularly quick and efficient to handle.

- Vertical loads up to 100 kN in accordance with the type test
- Max. type-tested assembly height (shoring tower with MRK Frames): 14.40 m or 14.90 m (with MP 50 Base Plate)
- Prop lengths from 1.20 m to 6.25 m
- Frame sizes from 62.50 cm to 150 cm (steel)/201.50 cm to 269 cm (aluminium)
- Continuous adjustment of the prop height without any pegging
- Securing device prevents the inner tube from slipping out unintentionally

Lightweight Shoring Tower

ST 100 Stacking Tower
Flexible height adjustment with only one frame size

The ST 100 has been designed for fast assembly and dismantling based on the stacking principle. The individual frames are simply inserted into each other and offset by 90°; neither tools, bolts nor screws are necessary. Diagonal braces ensure tension-proof connections for crane transport or when erecting during a horizontal assembly process. As only five system components are required in total, handling and logistical processes are particularly simple. With one frame size for each application height, different heights can be realised without a combination table. This means that the planning effort is extremely low.

- Shoring tower with 1.00 m x 1.00 m ground plan comprised of four stacking frames per meter of tower height respectively
- Vertical loads up to 53 kN
- Maximum type-tested assembly height of up to 22.29 m
- Fast height adjustment thanks to the 50-cm-grid dimensions of the frames
- Head spindles for accommodating up to 2x GT 24/VT 20 Formwork Girders, as well as steel walers or other steel profiles

PD 5 Shoring System
Versatile support with a low number of additional components

Thanks to its sophisticated frame construction, PD 5 offers quick and continuous height adjustment for the support for slabs and beams up to 20 m high. This is possible with only two frame heights, three diagonal braces and a few single components. The low weight of the components also ensures easy and safe handling. In addition, the system allows for simultaneous support of slabs and beams with only a few additional components. The components are adapted to suit the system grid of the PERI UP Scaffolding Kit, allowing components such as decks or ledgers from PERI UP to be integrated.

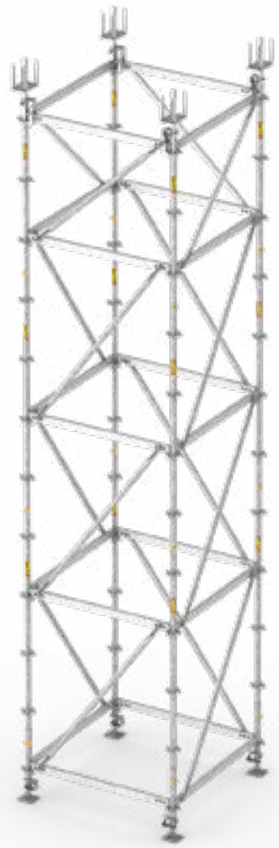
- Powder-coated frame system for supporting slabs and beams up to 55 kN per vertical and a height of up to 20 m
- Basic dimensions: 1.25 m x 1.50 m/1.25 m x 2.00 m/1.25 m x 2.50 m
- Continuous height adjustment from 1.50 m with only two frame sizes
- Can be set up vertically or in a lying position
- Easy horizontal moving procedure using the Trolley and Winch and the PERI Transportation Fork; vertical and horizontal moving procedure with a crane

Video

Lightweight Shoring Tower

PERI UP Flex Shoring Tower
Modular shoring with maximum versatility

The core components of the PERI UP Scaffolding Kit facilitate the assembly of modular shoring towers which can be used for a wide range of shoring tasks – from cost-effective shoring towers and shoring towers with additional frames, right through to spatial shoring that is also compatible with PERI Slab Formwork Systems. The assembly process is based on the consistent system grid of 25 cm or 50 cm and can also be easily adapted to accommodate different geometries and loads. For example, the ability to vary the positioning of the verticals and ledgers according to the respective load situation ensures a high degree of material utilisation. PERI UP Shoring Towers can also be used in large units without any difficulties due to the particularly rigid node connections between the verticals and horizontal ledgers.



PERI UP Shoring Towers are compatible with PERI Slab Formwork Systems and are also designed for use with standard steel and timber construction dimensions.

- Vertical loads up to 46 kN
- Maximum assembly height of up to 21.89 m (22.34 m with spindle section)
- As shoring towers with additional frames or shear frame for high vertical and/or horizontal loads
- Project-specific planning as spatial falsework for virtually all geometries and loads

PERI UP Flex MDS K Shoring Tower
The efficient shoring tower with system-integrated safety for vertical assembly and dismantling

The PERI UP Shoring Tower MDS K is suitable for transferring vertical and horizontal loads in shoring construction and consists of modular components in combination with specific frames. The crane-movable shoring tower with decks and circumferential guardrails facilitates safe and system-integrated assembly without additional components. The user is always in a secured position during the assembly process – no further protective measures are required. The low weight as well as the ability to carry out the work at torso level mean that the work processes are easy on the body. In addition, the low number of system components and the repetitive assembly sequence ensure that work can be carried out swiftly. The decks are attached to the horizontal ledgers without tools, while any unintentional lifting from below is not possible. Materials are supplied through the inside of the shoring tower.

The unique design of the MDS K allows it to be assembled and dismantled under the protection of a circumferential guardrail.

- Vertically erectable shoring tower consisting of core components of the PERI UP Scaffolding Kit and supplementary frames and decks
- Ground plans: 1.25 x 1.00 m/1.50 m/2.00 m/2.50 m/3.00 m
- Height adjustment in 50-cm-increments by combining the MDS K 100 Frame and MDS K 50 Intermediate Frame; fine adjustment using the head and base spindles
- Erection height and loads: as free-standing shoring tower up to 6.39 m erection height and loads up to 45 kN; up to 21.39 m when restrained at the head, and for loads up to 50 kN

Moderately heavy shoring

PERI UP Flex Heavy-Duty Prop HD

Hydraulically lowerable heavy-duty prop made of easy-to-handle scaffolding components

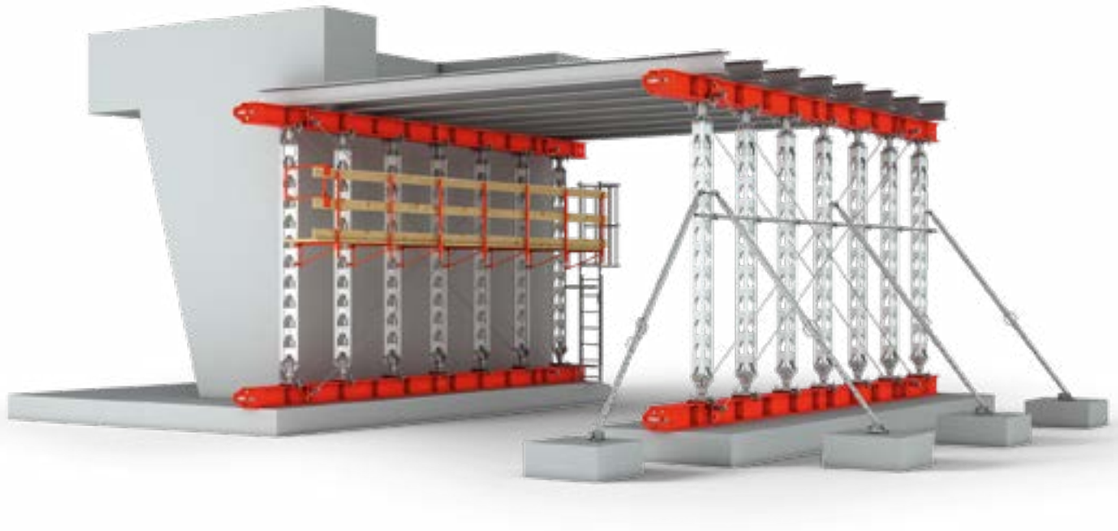
The PERI UP Flex HD Heavy-Duty Prop can be used whenever high loads need to be transferred and neither a crane nor a forklift are available. It is therefore ideal for existing building redevelopment. The heavy-duty prop consists of standard verticals and 25 cm ledgers from the PERI UP Scaffolding Kit and offers the possibility of lowering loads of up to 200 kN in a force- and displacement-controlled manner by means of easy-to-operate hydraulics. The simple assembly and disassembly processes result in time and cost savings, and the lightweight system components make for comfortable working conditions. The easy-to-handle parts make for easy handling even in confined spaces.

- 4-legged heavy-duty prop for transferring concentrated loads up to 200 kN
- Maximum assembly height up to 8.33 m
- Continuous height adjustment via the head spindle with head plate that can be tilted up to 3°
- Prestressing and release via the lowering spindle with the help of the hydraulic Lowering Jack HD
- System dimensions of 25 cm x 25 cm
- Ideal for existing construction sites thanks to the easy-to-handle standard parts from the PERI UP Scaffolding Kit

Heavy-Duty Prop HD 200

Lowerable prop made of easily connectible aluminium segments

The HD 200 Heavy-Duty Prop is a solution for heavier loads and can be used in a versatile manner from structural renovation right through to bridge construction. The low weight in particular – the largest aluminium segment weighs less than 30 kg – and the straightforward handling process by virtue of the integrated chord couplings for connecting the individual segments make for a swift, tool-free assembly process. Together with the lowering device, the HD 200 facilitates a controlled lowering process under full load up to a lowering range of 10 cm.



- Shoring support made of connectible aluminium and steel segments for moderately heavy shoring construction
- By connecting the props using main beams, it can also be used as a main beam frame; diagonal bracing with system components
- For loads up to 200 kN per individual prop
- Assembly in 30-cm-increments up to a total height of 12 m; up to 18 m as a main beam
- Lowering device with 10 cm lowering range for easy lowering under full load

SCAFFOLDING SOLUTIONS

The PERI UP Scaffolding Kit

High flexibility and application diversity due to the modular principle

Impressive variety of applications

The PERI UP Scaffolding Kit transcends the boundaries between frame and modular scaffolding and brings together the world of modern scaffolding in a single system. An important principle of the modular system is “plugging instead of screwing”, which means that many solutions can be assembled without couplings. This saves valuable time, and therefore costs, during the assembly process. PERI UP scaffolding technology is based on a metric grid, which makes it possible, for example, to change the direction of decks in a straightforward manner. This enables a high degree of adaptability, even in the case of complex geometries. For even greater application diversity, especially for more complex tasks, the components of the PERI UP Scaffolding Kit can be combined with the steel components of the VARIOKIT Engineering Construction Kit.

High degree of flexibility and compatibility

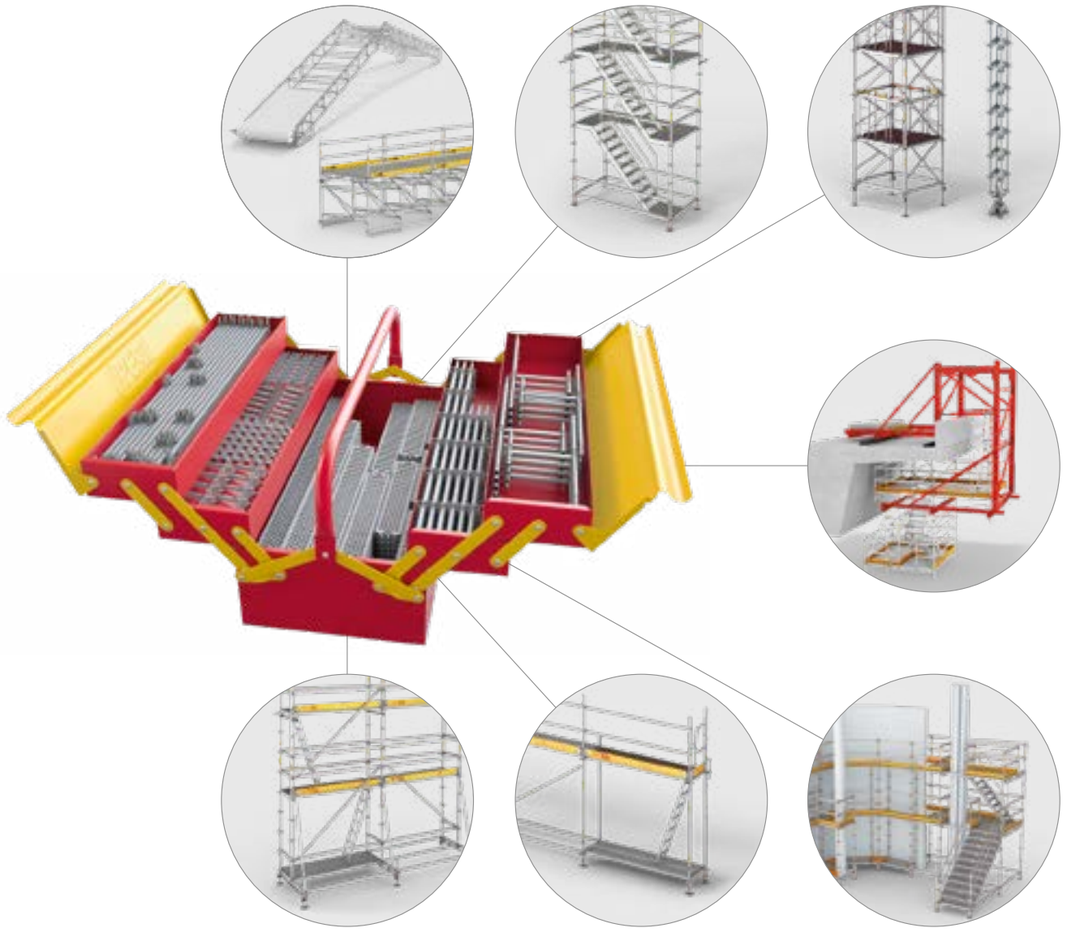
A wide range of applications can be realised with PERI UP components – from classic facade scaffolding to scaffolding for complex industrial plants. Frames and verticals can be combined using the PERI UP Scaffolding Kit. This ability to combine parts offers huge advantages for many applications. For example, staircases can be connected to a facade scaffold without the need for additional frame columns. The scaffolding node offers up to 16 different connection options for ledgers, diagonals and console brackets. For this reason, the PERI UP Scaffolding Kit continues to get by with only a few components while at the same time offering a wide range of possible applications, which is particularly useful for angled structures and ensures a high degree of system flexibility.

Robust, yet lightweight

The low weight of the components is what makes the PERI UP Scaffolding Kit so compelling. This not only facilitates logistical processes, but also the manual transport of the individual components on the construction site. PERI UP might be lightweight, but thanks to the ingenious design of each individual component, it is highly robust and has a high load-bearing capacity. The system’s load-bearing capacity and scope of application are documented in a wide range of Instructions for Assembly and Use, and the production processes and product quality are strictly monitored.

Safety in no time at all

The PERI UP Scaffolding Kit has innovative safety features that are also impressive in terms of assembly and dismantling speed. These include, but are not limited to, the system-integrated guardrail in advance and the automatic locking function on components such as decks and flights of stairs. In addition, the lightweight components and easy-to-understand assembly and dismantling principle of the scaffolding kit make for swift assembly and energy-saving work processes.



On the safe side: safety during assembly and dismantling processes thanks to system-integrated lateral protection, e.g. the guardrail in advance on facade scaffolds, and stairs that require no additional components, thereby reducing time and costs on the construction site.

Self-locking ledgers (Gravity Lock): The horizontal ledgers have a connection in the form of a wedge that is hooked into the node opening. The securing wedge thereby drops into the node opening on account of its own weight and locks automatically.

Integrated lift lock (Locking Deck): PERI UP decks are secured without requiring any additional components; a securing device integrated in the deck engages the ledger immediately after being installed and secures each deck against lifting.

Innovative scaffolding node: The PERI UP Scaffolding Node on the standards offers up to 16 connection possibilities in the node area and is therefore the central connecting element of the PERI UP Scaffolding Kit.

Metric grid: PERI UP features an easy-to-plan basic grid with 25-cm and 50-cm-increments.
Simple vertical and horizontal changes of direction result in versatile adaptability to different geometries – with virtually no couplings or trip hazards.

Video

PERI UP Facade Scaffolding

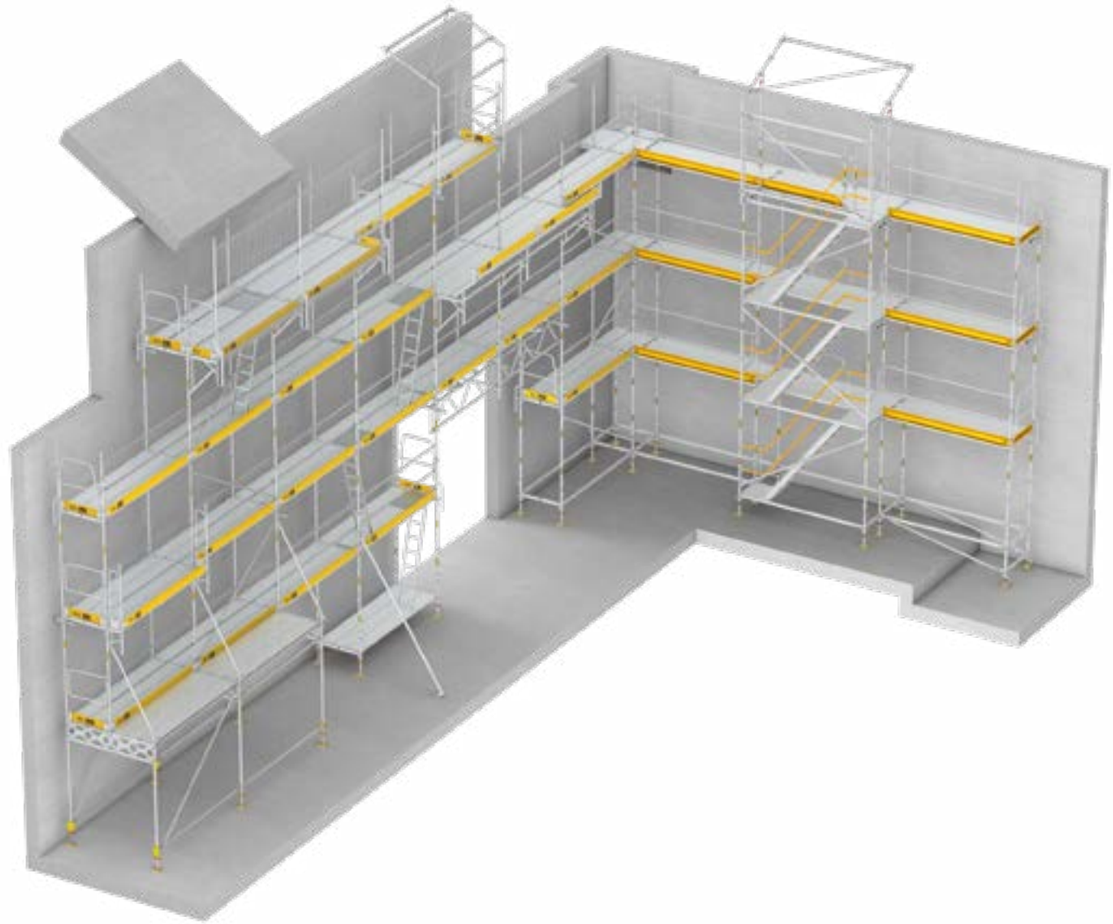
Scaffolding facades safely and economically

Video

PERI UP Facade Scaffolding enable fast and virtually coupling-free assembly thanks to intelligent connection technology and the minimal use of tools. Clever features such as the system-integrated, advanced side protection and the integrated lift lock in the decks with no additional components make the system both safe and economical. The easy-to-plan metric grid and the low weight of the individual components facilitate both planning and work. Another special feature: the scaffolding node on verticals and frames paves the way for an extraordinary variety of combinations using components of the PERI UP Scaffolding Kit. This means that a multitude of possible applications, even for more complex tasks, can be realised with just one system. This flexibility and modular logic therefore not only simplifies assembly and planning, but also warehouse utilisation.

Be it a detached building, apartment building, commercial building or a historical monument, every building geometry is different. This calls for great adaptability on the part of scaffolding companies. Using a PERI UP Facade Scaffolding provides considerable relief on a daily basis – whether it's in terms of planning, warehousing or on the construction site.

One example of innovation in terms of facade scaffold construction is the new standards, which not only open up a wider range of applications thanks to a selection of even higher load and width classes, but are also compatible with the tried and tested verticals. Despite their high load-bearing capacity, PERI UP Facade Scaffolds are true lightweights among the steel facade scaffolds on the market. For particularly complex designs and geometry requirements, look no further than the fully compatible core components.

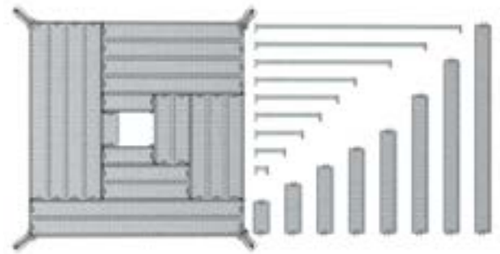


PERI UP Facade Scaffolding accessories

The right features for facade applications

PERI UP Decks

PERI UP Decks, which are available in various widths and with various non-slip surfaces, combine safety and durability with a low component weight. They can be laid in an almost gapless manner on account of their metric grid and, thanks to locking deck technology, can be installed from a secured position without the need for tools.



PERI UP Stairs

PERI offers staircase solutions for every requirement: made of either lightweight aluminium or robust steel, with high walking comfort and integrated safety features. They can be used as part of an existing facade scaffold and in the form of a stand-alone stair tower. In addition to ensuring optimal accessibility, their deep steps and sturdy treads improve comfort levels. What's more, PERI UP Stairs are characterised by the highest degree of versatility because they can be easily integrated into any type of PERI UP Facade Scaffold.

Read more about PERI UP Stairs on page 90 – 91.

STS 300 Scaffold Transport System

STS 300 is a new scaffold transport product that helps workers in assembling and disassembling PERI UP Scaffolds in a safe and efficient manner. By growing from one lift to another, STS 300 simplifies the scaffold assembly process so that more projects can be implemented in less time with less manpower. Given the fact that it can be mounted directly onto an existing scaffold, no conversion is necessary; in addition, the removable boxes enable horizontal transport on the ground as well as vertical transport on the scaffold.

- Fully compatible with components of the PERI UP Scaffolding Kit
- Pre-packed boxes can be transported by forklift or crane or even manually thanks to the mountable wheels
- Thanks to the swivelling boxes, the loading and unloading processes are always carried out in an upright and safe position behind the guardrail
- The stackable and removable transport boxes improve the level of organisation on the construction site
- Drive system: rack and pinion
- Max. load capacity: 300 kg
- Max. speed: 17 m/min.
- Max. conveying height: 50 m

The STS 300 can be mounted onto the existing scaffold directly, meaning no conversion work is required.

From one lift to another, the STS 300 facilitates assembly and disassembly of the scaffolding solution by assisting with material transport.

PERI UP Industrial Scaffolding

Safe working platforms for a wide range of requirements

The core components of the PERI UP Scaffolding Kit can be used to construct safe working platforms with a wide range of requirements. The consistent metric system grid, the ability to change the direction of the decks and the option of attaching additional components to verticals and ledgers make the scaffold structure highly adaptable to local conditions. Even complex technical systems or unusual building geometries can be scaffolded in a safe and adaptable way. The Gravity Lock, Locking Deck and the low weight of the components also facilitate quick assembly of the working platforms. Working areas can be covered in their entirety without any gaps and without any height offsets between the decks; interference points are simply redesigned, thus eliminating potential trip hazards from the outset. In addition to the integrated safety and assembly functions of the core components of the PERI UP Scaffolding Kit, digital solutions such as PERIpath, SET or the XR App ensure planning reliability. Thanks to the easy combinability with the VARIOKIT Engineering Construction Kit, there is also the possibility of having an economical and versatile Mega Scaffolding Kit that offers even more application options.

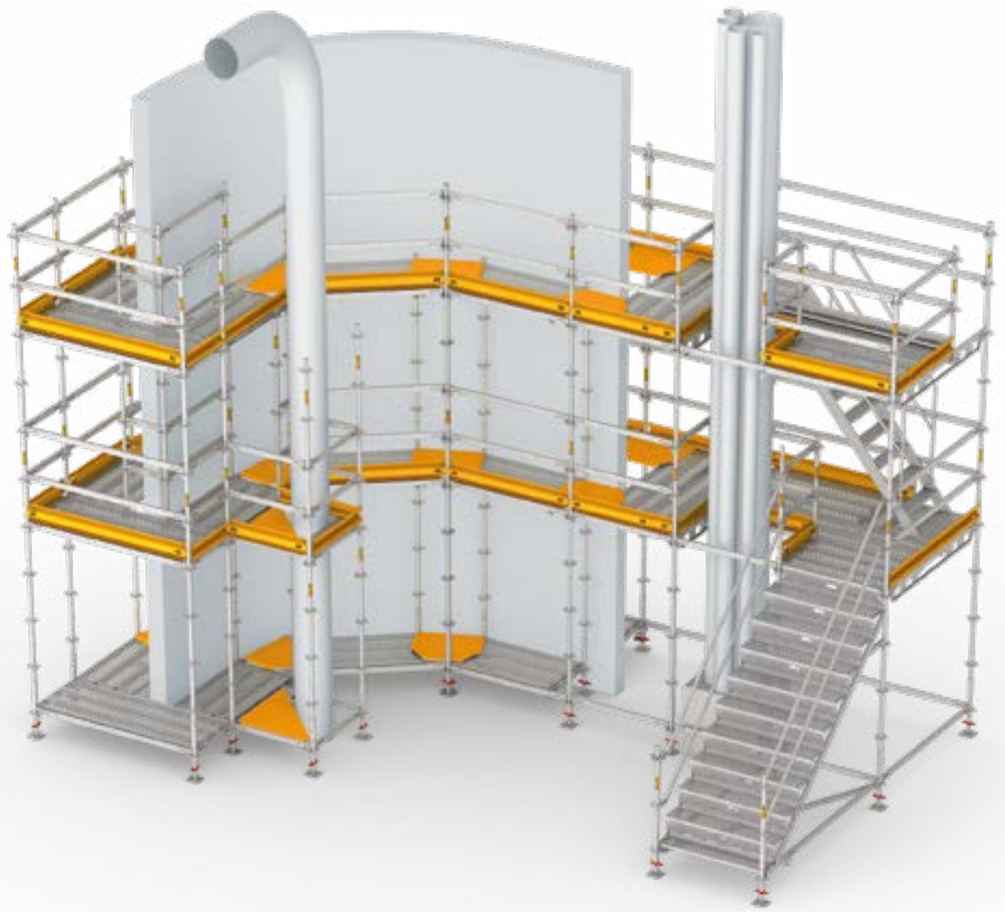
A wide range of supplementary system components, accessories for various applications and the ability to integrate other modular systems enable a high degree of application diversity.

During use, the non-slip perforated decks, circumferential guardrails and yellow toe boards ensure a high degree of occupational safety.

The self-locking ledger connection on the scaffolding node (Gravity Lock) and the integrated lift lock in the decks can speed up the assembly process.

For more information on compatibility with the VARIOKIT Engineering Construction Kit, see pages 88 – 89. You can also learn more about the digital tools PERIpath and SET on pages 136 – 137.

- Scaffolding for erecting complex working scaffolds
- Uniform, metric length and width grid arrangement for the 25 cm and 50 cm system components
- Connection possibilities on the standards at spacings of 50 cm
- Scaffold bay lengths of 50 cm up to 300 cm
- When placing the ledger head in the scaffolding node, the wedge drops into the opening due to its own weight and automatically locks (Gravity Lock)
- System-integrated lift lock (Locking Deck) without additional components; non-slip deck design



PERI UP Suspended Scaffolds

Suspended working platforms in a system grid

Temporary and safe working platforms can be realised with the PERI UP Suspended Scaffold. The working area, which is based on the core components of the PERI UP Scaffolding Kit, can be adapted to the local conditions using 25-cm-grid dimensions. The PERI UP Working Platform can be connected to existing steel profiles or to the steel components of the VARIOKIT Engineering Construction Kit using standard components. The UEB Suspension Device can be installed on various steel profiles with their specific flange widths; the installation position of the standard remains variable in this regard. When it comes to mobile solutions, the Trolley UFS 20 with its maximum load-bearing capacity of 20 kN is used, which can also be mounted on various steel profiles. The vertical support allows the scaffold to be connected to different steel profiles with their specific flange widths.

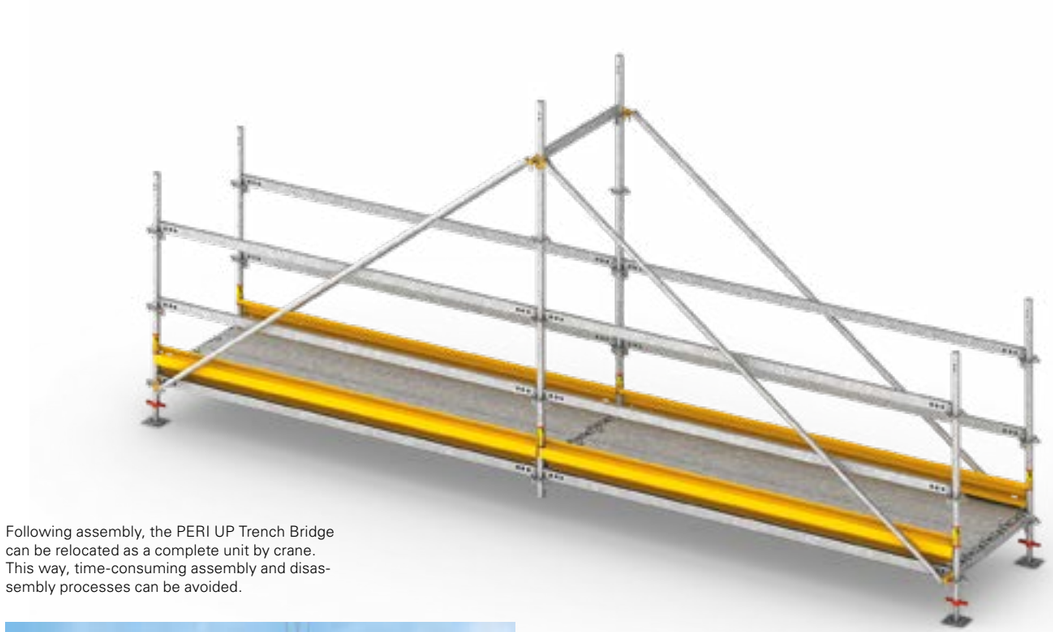
With the Trolley UFS 20, suspended scaffolds can be mounted on various steel profiles, thereby making them mobile.

- Tension-proof connection between standards with screws M10x70, 8.8; permissible loads up to 20 kN
- Scope of application of Trolley UFS 20: flange widths from 200 mm - 320 mm; flange thicknesses: up to 40 mm; permissible loads: up to 20 kN
- Quick assembly without pipes and couplings

PERI UP Bridging

Trench bridge for temporary crossings

The PERI UP Trench Bridge is a quick and easy solution for crossing over construction pits, trenches and channel trenches in a safe manner. The assembly process relies on standard components of the PERI UP Scaffolding Kit and can be carried out quickly thanks to system-integrated features such as self-locking decks and tool-free installation of the diagonal braces. In addition, the trench bridge has proven to be robust in the face of atmospheric influences. The decks with their integrated lift locks and non-slip, perforated surface as well as toe boards along the bridge provide safe access; the width of 1 m allows plenty of freedom of movement.



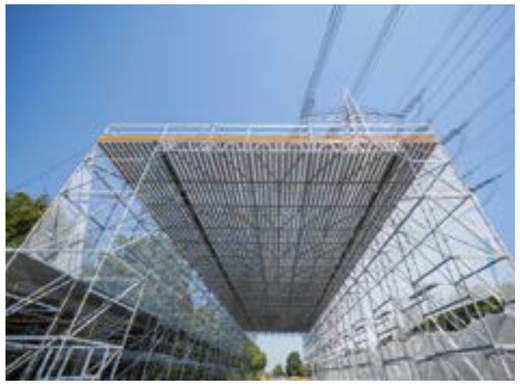
Following assembly, the PERI UP Trench Bridge can be relocated as a complete unit by crane. This way, time-consuming assembly and disassembly processes can be avoided.

- Span of 6 m and 9 m in the standard configuration
- Maximum permissible load of 2 kN/m² (load class 3)
- System width 1 m
- Other spans and loads are possible on request

PERI UP Working Platforms and Bridging

Easily adaptable working platforms up to 8.50 m long

With the help of the ULS Flex Lattice Girder from the PERI UP Scaffolding Kit, consisting of five individual components with a maximum length of 1.50 m and a maximum weight of 15.4 kg, it is possible to construct working platforms and bridging with a span of up to 8.50 m. Due to its compact dimensions and low weight, the ULS Flex Lattice Girder can also be used in confined spaces and is therefore particularly suitable for refurbishment projects. Assembly is carried out using bolts and cotter pins. The horizontal bracing is also implemented using system diagonals – without any pipe coupling connections. In addition, the girder length can be adjusted in 25-cm-increments and can be combined with decks, verticals and ledgers from the PERI UP Scaffolding Kit.



Bridging with spans of up to 8.50 m can be realised with the manageable system lattice girder. For example, this makes it possible to bridge uneven terrain or busy roads in a cost-effective manner.

- Loads up to 3.00 kN/m² for spans up to 8.50 m
- Spans ranging from 3 m to 8.50 m in 25-cm-increments
- Attachment to the scaffolding nodes of the verticals
- Compact dimensions with individual lengths from 50 cm to 150 cm and a beam height of 50 cm

Working platforms and bridging for large spans

Working platforms and temporary bridging in various heights and spans can be constructed using the truss system from the PERI UP Scaffolding Kit as a basis. LGS elements, ledgers and diagonals are used to assemble load-bearing truss elements quickly and easily. The high load-bearing capacity of the components even allows for large spans of up to 20 m.
The truss system is not only flexible in terms of truss spacing and span width, but can also be integrated into various applications in a versatile way thanks to its modular logic.

- Maximum span widths of up to 20 m
- Variable truss spacing from 25 cm to 300 cm
- Dimensions:
  LGS 75 Standard elements H = 75 cm,
  L = 300 cm or L = 150 cm/
  LGS 150 Standard elements H = 150 cm,
  L = 300 cm or L = 150 cm

Even at great heights, working platforms of up to 20 m in length can be erected on the basis of the truss system.

Thanks to the modular logic, the system can be integrated into other applications in many different ways.

PERI UP Weather Protection Roofs

Well protected no matter the weather conditions

PERI UP Weather Protection Roofs were developed to shield construction operations and construction sites from external atmospheric influence, among other things. Two versions are available: one for spans of up to 25 m and one for spans of up to 45 m. The weather protection roofs are easy to assemble and can be used wherever roofing and enclosures are required, for example on roof refurbishments, height extensions, bridge and motorway construction sites or on winter construction sites. The PERI UP Weather Protection Roof components can also be used for temporary footbridges and working platforms and are fully compatible with the core components of the PERI UP Scaffolding Kit.

Video

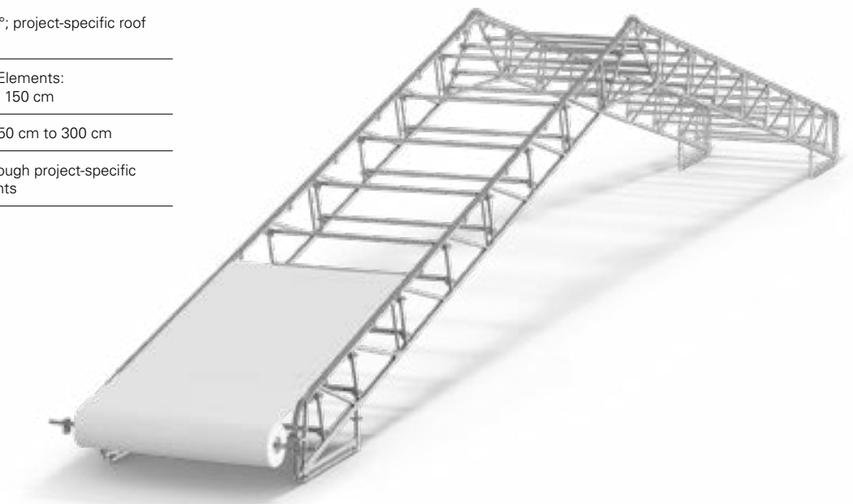
For more information on PERI UP Working Platforms and bridging, see pages 84 – 85.

Pre-assembly of the truss units is carried out from a safe position on the ground. Lifting is done by crane.

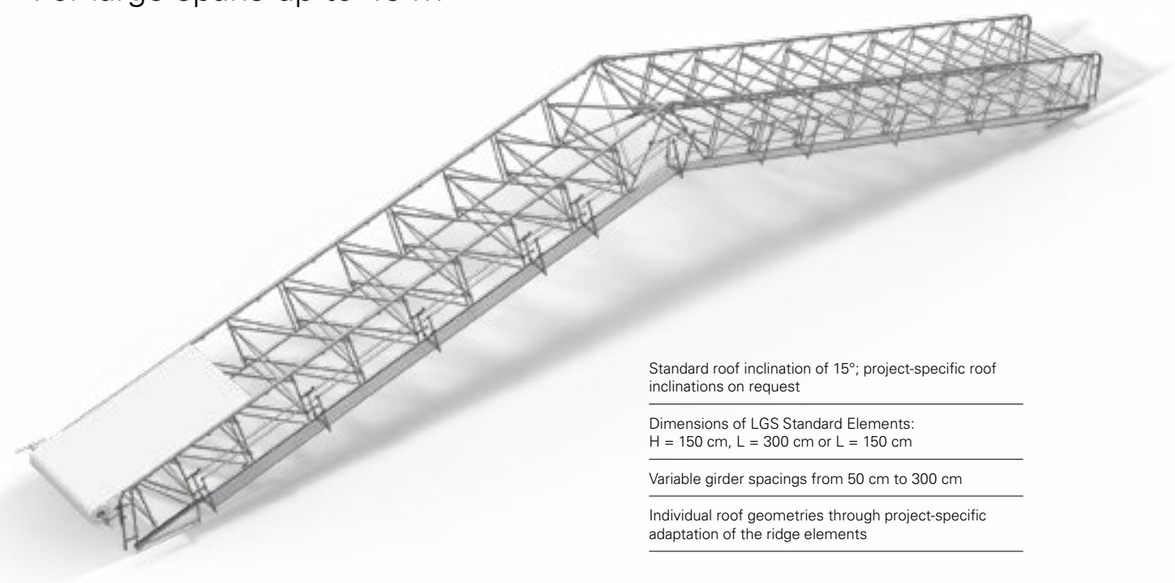
The PERI UP Weather Protection Roof can be erected independently of the substructure. Assembly is carried out without formwork girders and couplings.

PERI UP LGS 75 Weather Protection Roof
For small spans up to 25 m

- Standard roof inclination of 15°; project-specific roof inclinations on request
- Dimensions of LGS Standard Elements: H = 75 cm, L = 300 cm or L = 150 cm
- Variable girder spacings from 50 cm to 300 cm
- Individual roof geometries through project-specific adaptation of the ridge elements



PERI UP LGS 150 Weather Protection Roof
For large spans up to 45 m



- Standard roof inclination of 15°; project-specific roof inclinations on request
- Dimensions of LGS Standard Elements: H = 150 cm, L = 300 cm or L = 150 cm
- Variable girder spacings from 50 cm to 300 cm
- Individual roof geometries through project-specific adaptation of the ridge elements

PERI UP and VARIOKIT

Combination of scaffolding and engineering construction kit for an even greater range of applications

As the PERI UP Scaffolding Kit can be combined with system components taken from the VARIOKIT Engineering Construction Kit, even highly complex solutions for working platforms, shoring and access means can be realised in a cost-effective manner. This opens the door to a wide range of different applications requiring only a small investment, as well as the cost-effective manufacture of a wide variety of supporting structures. The basis for this is the grid dimensions of 12.5 cm for the VARIOKIT and 25.0 cm for the PERI UP Scaffolding Kit. Delivery through a single source prevents any interface losses during the planning phase itself as well as on the construction site; the ability to rent the components makes for an economical solution.

In combination with VARIOKIT, the PERI UP Scaffolding Kit allows safe access to various work areas.

In case of limited space or an unstable substrate, VARIOKIT can also be used as a load-bearing base for various PERI UP scaffolding solutions.

By combining VARIOKIT and the PERI UP Scaffolding Kit, working platforms can also be integrated into existing structures in a straightforward manner.

PERI UP Stairs

The ability to combine PERI UP Stair solutions with the core components of the PERI UP Scaffolding Kit results in numerous fields of application with high safety standards. The built-in features also provide a firm footing during the assembly process and protect the workers from potential accidents. B-class stairs with its deeper steps provide additional comfort. Thanks to the use of new production and welding equipment, all components are robust individual parts; the straightforward handling features also prevent errors during assembly. By using only a few components, the staircase solutions offer greater versatility as well as improved assembly and disassembly speed.

PERI UP Stairs with width of 100/125 cm

For high demands on load-bearing capacity and accessibility

Material: steel

Staircases comprised of stringers and individual stair treads with 100 cm and 125 cm widths

Can be used as staircase units in the same direction or alternating staircase units with assembly heights of 2.00 m to 50.00 m

Ground plan: 2.00 m x 4.50 m (Staircase 100); 2.50 m x 5.00 m (Staircase 125)

Permissible load: 3.0 kN/m² for stairs and decks

PERI UP Stairs with their wide and deep steps allow safe access to buildings and scaffolding solutions.

PERI UP Stairs with width of 75 cm

The versatile staircase for facades and stair towers

Material: aluminium

Can be used for alternating staircase units or staircase units in the same direction with assembly heights from 2 m to 66 m (project-specific planning up to approx. 100 m assembly height)

Ground plans: 0.75 m x 0.75 m/0.50 m; 0.75 m x 1.50 m/0.50 m; 0.75 m x 1.50 m/0.50 m; 0.75 m x 1.50 m/1.00 m; 0.75 m x 1.50 m/1.00 m; 0.75 m x 2.50 m/2.00 m; 0.75 m x 3.00 m/2.00 m

Permissible load: 2.5 kN/m² for a run of staircase and decks

Can be adapted for use in an existing facade scaffolding or as a stand-alone stair tower

PERI UP Stairs with width of 67 cm

The lightweight staircase for facade scaffolding

Material: aluminium

Manageable staircase made of aluminium

Ground plans: 0.67 m x 0.75 m/0.50 m; 0.67 m x 1.50 m/1.00 m; 0.67 m x 2.50 m/2.00 m; 0.67 m x 3.00 m/2.00 m

Permissible load: 2.5 kN/m² for a run of staircase and decks

Direct assembly on the facade scaffold using integrated scaffolding nodes – no additional row of verticals required for assembly

Combining the benefits of self-locking components and virtually tool-free assembly with advanced side protection.

PERI UP Reinforcement Scaffolds

Ensuring stability when working on formwork

The PERI UP Reinforcement Scaffold with its two base widths of 150 cm and 250 cm was designed for activities related to reinforcement, formwork and concreting. The standard configuration of the stable scaffold can be erected using up to 3 bays in the longitudinal direction and can be assembled quickly thanks to the self-securing ledger connection and the lift locks integrated in the decks. It does not need any ballasting or ties as long as it is supported in front of a wall or formwork. On account of its tension-proof connections, even large units of the PERI UP Reinforcement Scaffold can be moved in their entirety by crane. The PERI UP Reinforcement Scaffold also ensures a high level of safety by virtue of its continuous, uniform and gap-free deck surfaces. What's more, the planning process is simplified by the ability to quickly determine the material requirements with the help of pre-assembled units.

Thanks to pre-assembled units, the material requirement can be determined quickly, thereby facilitating the planning process.

On account of its tension-proof connections, even large units of the PERI UP Reinforcement Scaffold can be moved in their entirety by crane.

The PERI UP Reinforcement Scaffold can be used in front of formwork and walls without any ties or ballasting.

System width: 75 cm and 100 cm

Scaffold bay lengths: 150 cm, 200 cm, 300 cm

Maximum standing height 6.60 m (with base width 150 cm) or 10.80 m (base width 250 cm)

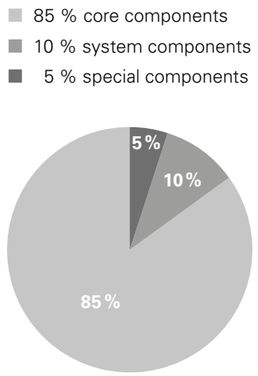
Working scaffold load class 1 - 3 in accordance with EN 12811-1, can be loaded with 0.75 kN/m² to 2.00 kN/m²

CIVIL ENGINEERING SYSTEMS

VARIOKIT
Engineering Construction Kit

System solutions for virtually every requirement

One construction kit – countless possibilities. Whether it's for bridge, tunnel or civil engineering solutions, VARIOKIT offers standardised components for a wide range of applications in civil engineering. The VARIOKIT Engineering Construction Kit consists of versatile core and supplementary system components with special functions, whereby the VARIOKIT standard components are ideally suited for technically demanding trusses and load-bearing systems. Another benefit of VARIOKIT is that it can be combined with PERI UP, which results in even more possible applications. As VARIOKIT is also compatible with PERI system formwork, tailor-made, cost-effective project solutions can be implemented. If the standard and core components are not sufficient for a project, special components are designed. The economic efficiency of the VARIOKIT solutions is increased further still by the minimised assembly time. Spindles are used to help adapt the solutions to the circumstances. Fitting pin connections also allow for carrying out the work quickly.



Typically, around 95 % of the core and system components in VARIOKIT solutions can be rented. Only a few special components are required to meet specific project requirements.

In addition to the required materials, PERI also provides numerous services such as comprehensive planning services for all the key aspects of the project solution from a single source. The focus is on construction and assembly processes as well as maximum functionality for construction work. Equally central are the economic efficiency considerations. The goal is always to utilise the rentable core and system components to the greatest possible extent.

On request, PERI can also deliver pre-assembled units to the construction site. In this way, assembly times on site can be minimised even further, making it possible to adhere to tight construction schedules. The rentability aspects in combination with the assembly benefits make VARIOKIT extremely economical, especially for short utilisation times.

The flexibility of the VARIOKIT Engineering Construction Kit guarantees that solutions can be implemented economically and at the same time optimally adapted to the project requirements.

The combination of core, system and special components paves the way for customised solutions, even in combination with other PERI services such as PERI Engineering.

VARIOKIT and PERI UP can be combined with one another perfectly. This paves the way for an extremely wide range of application possibilities.

VARIOKIT Pier System VPS

The powerful system with two applications for bridge pier construction

The VARIOKIT Pier System (VPS) combines two configurations: VARIOKIT Speed Stage (VSS) for constructing pier heads without shoring from below and VARIOKIT Speed Column (VSC) for efficient construction of bridge piers as well as large columns. The system is based on the VARIOKIT Engineering Construction Kit, which means that almost all project requirements can be met using rentable solutions.

The VARIOKIT Speed Stage is pre-assembled in its entirety on the ground and then lifted into place so that work can be carried out in a safe environment from the outset. The innovative split-soffit striking method ensures fast cycle times, meaning that a lower number of formwork sets need to be kept in stock.

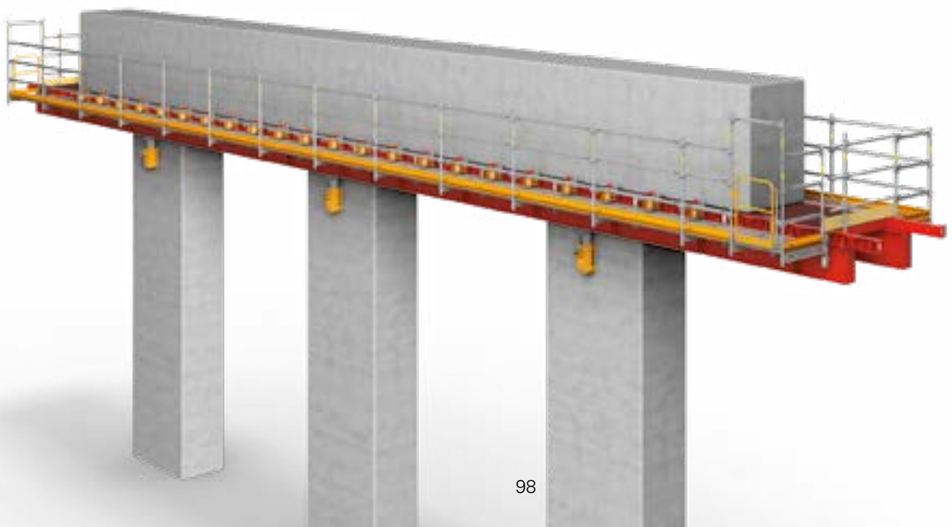
- Optimised for crossbeams and hammer heads of bridge piers
- Short cycle and assembly times
- Low stockpiling quantities needed
- Safe working conditions from the very first step

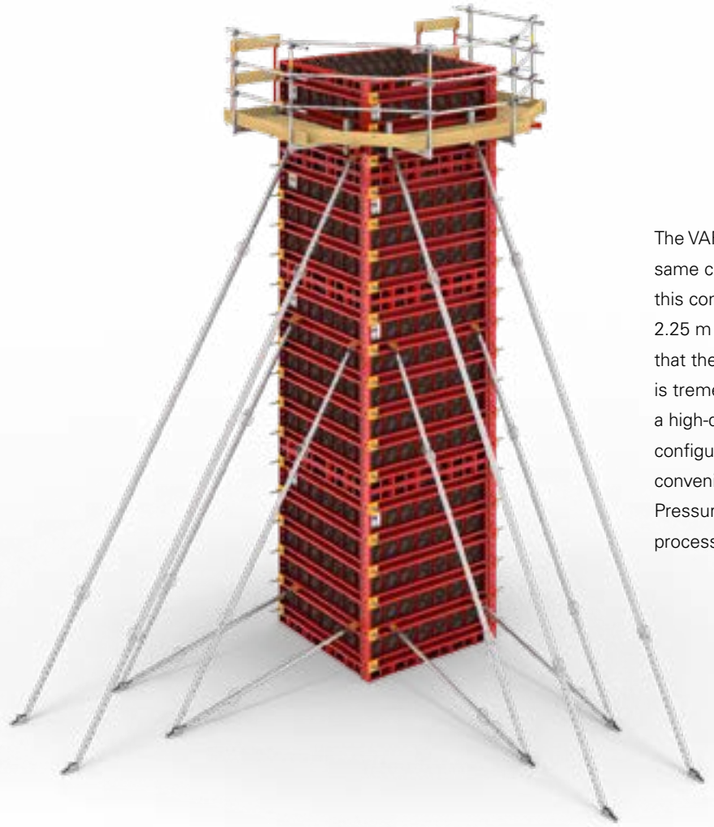
© Greg Folkin Photography

With VSS, the side formwork can be used independently. This means that the striking process can be carried out the following day and that the reinforcement work can be carried out conveniently.

© Greg Folkin Photography

The innovative split-soffit striking method speeds up the cycle time enormously, meaning that fewer formwork sets are required.





The VARIOKIT Speed Column (VSC) is based on the same components as the Speed Stage configuration. With this configuration, different column cross-sections up to 2.25 m x 2.25 m can be realised in 5-cm-steps. This means that the process of setting up and using the VSC configuration is tremendously flexible. Other benefits of the system: a high-quality concrete finish and fast handling. The VSC configuration is suitable for high pouring rates, which can be conveniently monitored with the use of InSite Construction Pressure Sensors. This results in an optimised concreting process.

- Square and rectangular column cross-sections of up to 2.25 m x 2.25 m
- Column cross-sections can be realised in 5-cm-steps
- Maximum permissible fresh concrete pressure: 95 kN/m² without ties
- Compatible with PERI InSite Construction Sensors

© Greg Folkin Photography

The innovative connection technology using X-Bolts and T-Bolts enables fast assembly and disassembly of the formwork.

© Greg Folkin Photography

The InSite Construction Pressure Sensor is another building block for achieving an expedited concreting process.

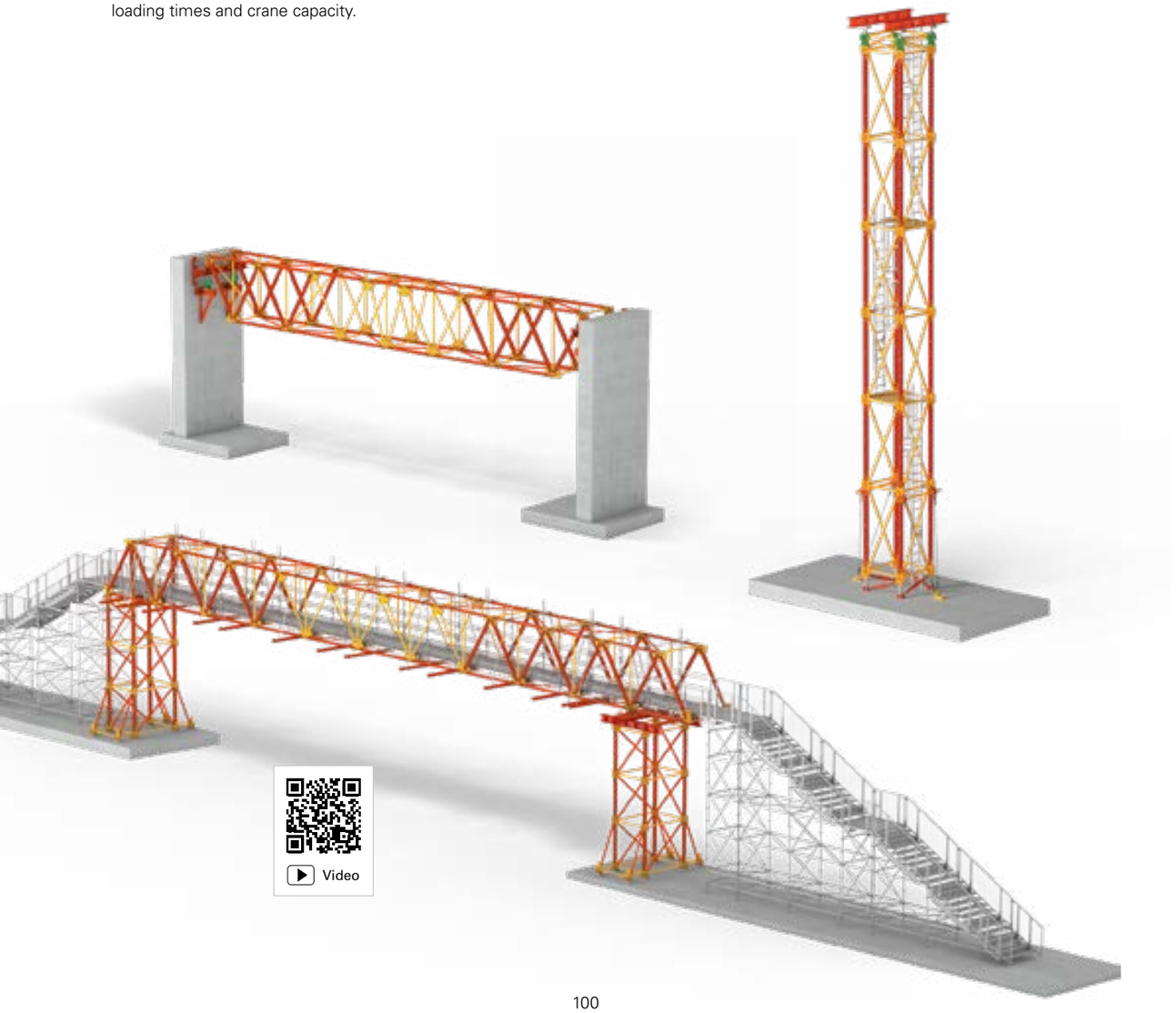
Video

ALPHAKIT Shoring Construction Kit

The easy-to-handle modular system for medium-heavy bridge construction

ALPHAKIT is the easy-to-handle shoring construction kit for heavy-duty truss girders, shoring towers and pedestrian bridges. Thanks to its sophisticated design, the 2.62 m long ALPHAKIT Steel Waler weighs only 44 kg. This low weight and the tried-and-tested fitting pin connection enable safe pre-assembly of complete towers and truss packages by hand, without lifting tools. This significantly reduces crane loading times and crane capacity.

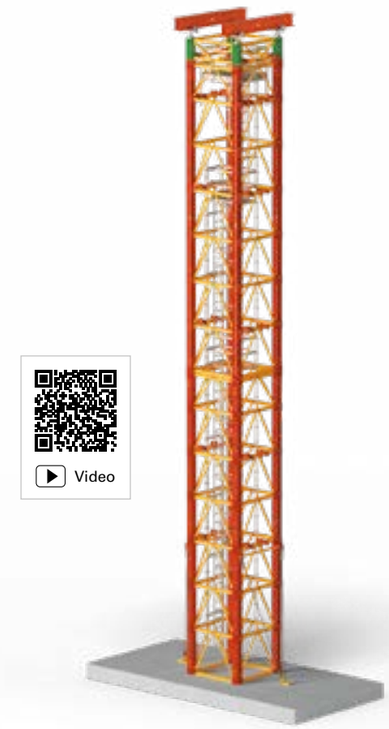
- Developed for spans up to 27.75 m and a permissible bending moment of 800 kNm
- For leg loads of up to 300 kN
- Used as standard up to a tower height of 30.00 m
- Pedestrian bridges with single span widths up to 28.75 m



VARIOKIT solutions for high loads

VST Heavy-Duty Shoring Tower

The VARIOKIT Heavy-Duty Shoring Tower VST is a rentable shoring tower solution that can be individually adapted to the load situation. The heavy-duty shoring tower allows for the transfer of heavy loads. The mobile hydraulics can even raise and lower the head spindle under full load. Corrective height adjustments can thereby be carried out without any issues. The mobile hydraulics – like all VARIOKIT standard components – can be rented.



- For 4-legged towers, towers with additional legs, shoring tower frames, main beam frames and birdcage scaffolds
- For leg loads of up to 700 kN
- Used as standard up to a height of 40 m
- Continuous realisation of all heights with staggered lengths of the RCS Rails, two spacers along with the head spindle

VRB Heavy-Duty Truss Girder

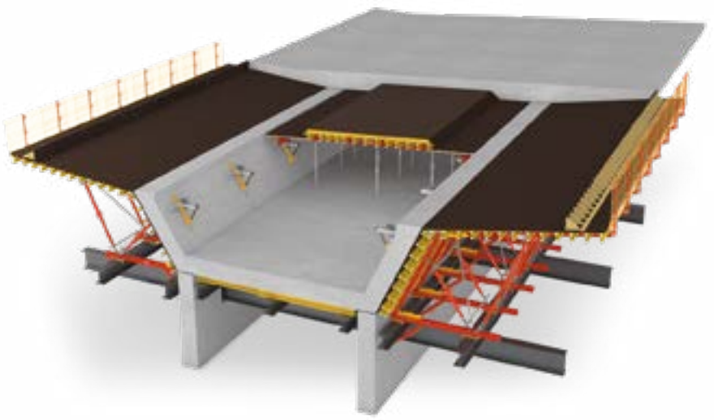
The VARIOKIT Heavy-Duty Truss Girder VRB is primarily used in bridge construction for spans of 25 m to 40 m. The low number of different frames allow for quick and easy length adjustments. Working platforms and access points can also be integrated with the compatible PERI UP Scaffolding Kit and ensure a high level of safety.

- Developed for spans up to 40 m and a permissible bending moment of 3,000 kNm
- Stepless adjustment of the truss lengths, as well as their longitudinal and transverse inclinations

VIL Incremental Launching Facility

With a clever striking mechanism for moving swiftly to the next cycle

The VARIOKIT VIL Incremental Launching Facility enables the cost-effective production of external, internal and slab formwork for bridges using the incremental launching method. The special shuttering and striking mechanism speeds up the working processes and thus allows the formwork to be released more quickly for the time-critical stages of the construction sequence. With external formwork, the gap between the cured concrete and the formwork is created immediately – in the case of steep web walls, the external formwork does not have to be moved in a horizontal direction as part of an additional work step. The mobile VIL Slab Formwork solution is also known for its convenient handling characteristics, as the slab props are simply folded up using the cross swivel head and do not have to be moved by hand. In addition, the formwork is brought back into the concreting position automatically with the aid of the roller drop heads during the moving process. The clamping points of the trough formwork can also be used for anchoring, which reduces the number of lost components.



Video

A large number of the VIL core components are part of the VARIOKIT Engineering Construction Kit and can be efficiently and cost-effectively rented from PERI.

The flexible VARIOKIT formwork units can be individually adapted to suit the substructure and bridge geometry.

A hammer blow is all that is required to trigger the quick-release mechanism of the roller drop head. In the new cycle, it is simply brought back into the concreting position.

VBC Balanced Cantilever Carriage

Fast and accurate through to bridge completion

The VARIOKIT VBC Balanced Cantilever Carriage is used for bridges with large spans. Load-bearing system components were developed specifically for balanced cantilever construction in order to carry the main loads. VARIOKIT standard components for formwork, working scaffolds and platforms round off this PERI solution. Adjustments to accommodate different geometries are also possible, as are concreting sections of up to 5.75 m. This allows for a reduction in the number of concreting sections. All of this shortens the construction time. Compatibility with the PERI UP Scaffolding Kit guarantees that safe and efficient access solutions are available at all times.

VCC Composite Formwork Carriage

Mobile solution for carriageway slabs on steel composite bridges

The VCC Composite Formwork Carriage is used for concreting carriageway slabs in cycles during the construction of long steel composite bridges. As the VCC Composite Formwork Carriage is based on the VARIOKIT Engineering Construction Kit, it can be easily adapted to complex project requirements and geometries. The carriage offers high rigidity in both the longitudinal and transverse directions. The composite formwork carriage can also be put into operation quickly thanks to its standard bolt connections and the option of having pre-assembled units supplied.

VCB Cantilever Bracket

Safe operation from above when shuttering and striking

The VARIOKIT Cantilever Bracket VCB is used in the construction of bridge superstructures based on steel composite or semi-precast concrete construction. It is simply hooked onto the bridge structure using tie plates. The cantilever bracket is operated entirely from above the bridge. It is not necessary to access it from below. Nevertheless, thanks to the clever bracing solution, there are no interference points protruding from the surface. In view of that, vibrating surface finishing screeds or power trowels can be used for concrete finishing. Traffic below the bridge is not affected either.

VGB Parapet Track

The concreting position corresponds to the moving position

The VARIOKIT VGB Cantilevered Parapet Track is used for the construction and refurbishment of external and middle parapets – economically from a superstructure length of approx. 150 m. With the system based on the VARIOKIT Engineering Construction Kit, units up to 25 m long can be moved via roller units. Since concrete loads can also be transferred via the roller unit, the travel position is also the concreting position. This means that no additional ties are required in order to carry out the concreting work. The rollers are attached to the underside of the cantilever arm, so there are no disruptions to the construction site processes on the bridge superstructure. A hydraulic winch is used for drawing the track. This means that the units can be moved quickly.

VGW Cantilevered Parapet Carriage

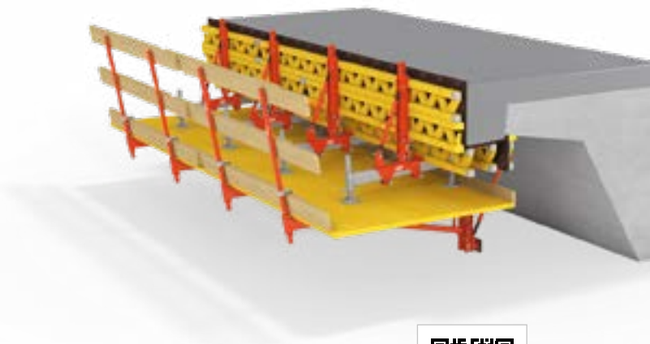
Manufacture of cantilevered parapets without anchoring in the bridge structure

The VARIOKIT Cantilevered Parapet Carriage is mainly used for refurbishment or the production of external and central parapets of more than 150 m superstructure length. In the standard configuration, the Cantilevered Parapet Carriage has a formwork length of 22 m and is moved over the superstructure in cycles. As no anchoring is required in the bridge structure, the VGW Cantilevered Parapet Carriage can be used flexibly at the edge of the bridge and can be easily adapted to the structure's geometry. Traffic below the bridge is not affected.

VGK Cantilevered Parapet Bracket

A flexible console solution for refurbishment and new constructions

For short bridge superstructures, the VGK Cantilevered Parapet Bracket is a safe, rational and efficient solution for refurbishment and new constructions. VGK is a type-tested system. Work platforms and formwork units are separated, which is why a closed platform decking is in place at all times. As a full enclosure can be achieved, refurbishment and concreting work can be carried out safely. At a maximum of 22 kg, the single components are comparatively lightweight, thus facilitating manual assembly and making VGK ideal for bridge refurbishment.
On account of the new components, VGK units can also be pre-assembled on the ground and then hooked in, making the work even safer. The VGK Design App also ensures that the Cantilevered Parapet Bracket is a solution that can be planned independently.



Video

VTC Tunnel Formwork Carriage

A flexible formwork carriage for cut-and-cover and mining methods

With the VARIOKIT Engineering Construction Kit, cost-effective tunnel formwork carriages can be realised that are precisely adapted to meet the needs of the respective construction site. Requirements such as drive-through openings for trucks or folding mechanisms for moving procedures can be easily fulfilled. Additional components for lifting, lowering and moving are also available in the rentable PERI portfolio, as are safe working platforms and access means. Essential technical accessories such as concrete pump connections complement the VARIOKIT solutions. This versatility combined with the expertise of PERI engineers paves the way for customised, individually configurable project solutions.

For example, it is possible to choose between fully manual operation or an entirely hydraulic, high-efficiency setup to suit the project in question. Thanks to several clever features, there is very little effort involved in operating the formwork carriage.

Video

- Reliable system components, tailored to the requirements of tunnel construction
- Straightforward modification procedure by making changes to the tunnel cross-section
- Optional hydraulic equipment for shuttering and striking as well as for moving the carriage

The versatility of the VARIOKIT components and the ability to use them in conjunction with PERI Engineering Services enable the development of complete solutions that are both cost-effective and safe.

With the VTC Tunnel Formwork Carriage, it is possible to create tailor-made solutions for tunnels constructed using either the cut-and-cover or mining method.

Fields of application

VTC Tunnel Formwork Carriage for the cut-and-cover method
Solutions for the separate, **semi-monolithic and monolithic casting methods**

VTC Tunnel Formwork Carriage when using mining techniques
Solutions for shorter tunnels or special challenges such as emergency stopping bays or cross-passages

PERI Steel Formwork

Solutions for particularly high utilisation rates in mining-method tunnel construction

For tunnels of medium to large lengths, PERI offers various steel formwork solutions. When adapted to the respective tunnel cross-section, the customised steel formwork with longitudinal distribution profiles sits on transverse support ribs. The formwork is equipped with viewing windows and concreting openings and is anchored to the floor slab via supporting spindles. Reusable tie devices are used to transfer the loads into the foundations. The formwork is structurally self-supporting, the carriage serves as a transport and positioning aid. Shuttering and striking as well as moving the steel carriage is quick and easy. Alternatively, an anchorless solution can be used, especially when building long tunnels.

Full-round steel formwork is another PERI solution used for tunnel construction. These solutions can be operated in an entirely hydraulic manner. Various designs are available for meeting the specific requirements of the project or the cross-section. They differ mainly in terms of how the formwork carriage for moving to the next concreting section is operated. The formwork can either be moved forward from cycle to cycle via the internal supporting structure or moved on rails from cycle to cycle.

Tunnels that range from approx. 500 m to over 2,000 m in length can be constructed with PERI Steel Formwork. It is also possible to use PERI's steel formlining, which can be flexibly adapted to the respective radius. Various solutions for concrete distribution round off the range. When combined with compressed air or electric compaction solutions, they enable concreting cycles of one day.

- Compliance with high safety standards for the entire work process
- Project-specific formwork solution, adaptable to suit different dimensions and construction methods
- Maximum permissible fresh concrete pressure: 100 kN/m²
- Safe handling thanks to hydraulic operation
- Cost-effective solution thanks to operation by means of hydraulic moving procedure and launching system

RCS MAX Rail Climbing System

Efficient and safe climbing formwork with synchronous climbing platforms

The RCS MAX Rail Climbing System is the further development of the proven RCS Rail Climbing System and stands out, among other things, on account of the fact that all of the platforms can climb simultaneously, thus improving the level of safety and productivity on the construction site. The two new modules, the RCS MAX Hydraulic Unit and the RCS MAX Drive Rails, are fully compatible with the RCS Rail Climbing System and ensure an accelerated construction process. The synchronous climbing of all platforms as well as the load transfer via the lower climbing section shortens the climbing cycles and, consequently, the construction time of projects. The intuitive plug-and-play configuration and lightweight components make the system easy to assemble and operate. The hoses and cylinders are placed in predefined positions once – no repositioning is necessary, meaning that sources of error are reduced. In addition, clever features such as the dead man's switch and an emergency stop switch on each platform ensure an innovative safety concept.

The synchronous climbing of all platforms increases safety on the construction site. Open building edges are thus a thing of the past. This eliminates tripping hazards and the risk of falling parts.

RCS MAX offers the user intuitive assembly with lightweight system components. In addition, the climbing shoes can be installed safely and conveniently without the need for a ladder.

Via light signals on the RCS MAX Hydraulic Unit and via the display, malfunctions are immediately indicated and can thus be quickly detected and easily remedied on site.

The new RCS MAX components at a glance

RCS MAX Hydraulic Unit
The RCS MAX Hydraulic Unit scores with its intuitive plug-and-play configuration and numerous intelligent features. Thanks to decentralised hydraulic units, the system stops automatically in the event of overload or collision. A dead man's switch with multiple remote controls as well as an emergency stop switch on each platform round off the innovative safety concept. Wireless control is also possible, providing operators with even more freedom of movement.

RCS MAX Display
The display, which is connected to the hydraulic unit by way of a cable, allows complete monitoring of the climbing process.

RCS C MAX and RCS CL MAX Drive Rails
The RCS MAX Drive Rails C and CL ensure that the platforms can be moved safely in 750-mm-increments. The cylinder is firmly connected to the system and climbs with it. Cumbersome conversions are now a thing of the past. A major plus point: the RCS CL MAX no longer requires an extension. The slope connector with integrated spindle makes it easier to reach the top climbing shoe and ensures flexible adaptation of the system to inclines.

Rail-guided, safe climbing of wall formwork, working platforms and enclosures – also in combination with components of the RCS Rail Climbing System

Synchronous climbing of all platforms

Short, fixed hoses ensure less pressure loss during the climbing process

No adjustments of hydraulics during the whole construction process due to the fully integrated cylinders in the drive rails

Climbing gear with 50 kN lifting force at a maximum operating pressure of 210 bar (21.0 MPa)

Automatic stop in the event of overload and collision due to the decentralised hydraulic units

Self-climbing in 750-mm-increments

Climbing even outside regular working hours thanks to particularly quiet climbing hydraulics

Video

RCS Rail Climbing System

The universal climbing construction kit for safe working conditions at great heights

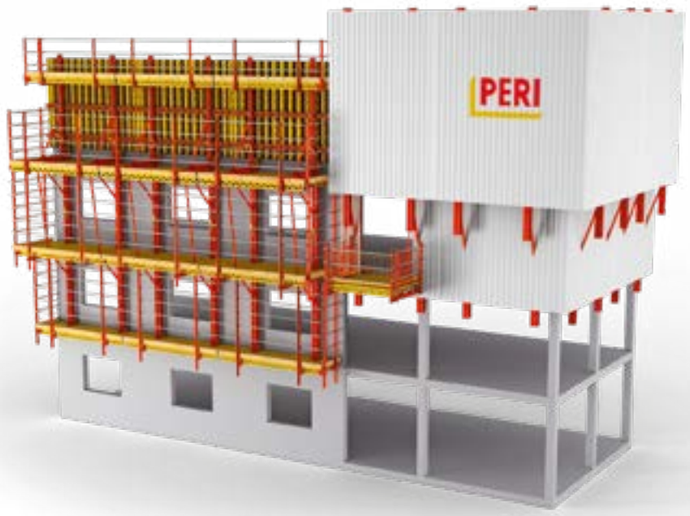
The RCS Rail Climbing System combines the advantages of different climbing applications in one single modular system. By virtue of this modularity, the components can be easily supplemented with additional PERI solutions, such as the PERI UP Scaffolding Kit or the VARIOKIT Engineering Construction Kit. Extending the RCS to include the new RCS MAX components also ensures optimised system performance. What makes the RCS stand out above all else is its variable options of assembly, which means that the platforms can be flexibly adapted to different floor heights. The climbing shoes can be attached to walls as well as slab edges, making RCS suitable for any building geometry. The climbing units are securely connected to the structure at all times using climbing shoes, which enables safe and fast climbing, even in windy conditions. The system is used both as climbing formwork and as a climbing protection panel.

System variants

RCS C Climbing Formwork
Used as standard for supporting wall formwork for storey heights from 2.70 m to 4.50 m; with carriage (90 cm retraction distance).

RCS CL Lightweight Climbing Formwork
For medium-height structures; with climbing rail extensions and intermediate climbing shoes, only one finishing platform is required.

RCS P Climbing Protection Panel and Guardrails
Enclosure and guardrails provide gap-free protection for work carried out on the building facade. Different materials can be used for the enclosure, e.g. LPS Screen Elements, trapezoidal sheeting, multi-layer wooden boards or netting.



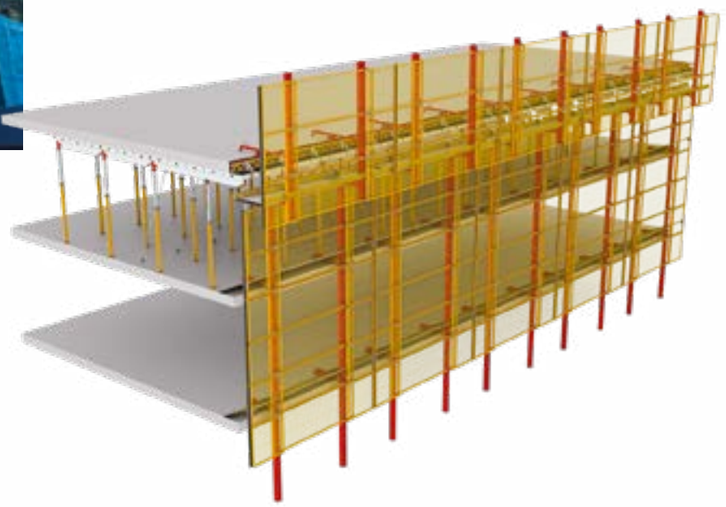
Video

- Rail-guided, safe climbing procedure for wall formwork, working platforms and enclosures
- Building authority approved standard anchoring for walls and slabs; if required, also with a horizontally-arranged climbing rail for large cantilevers
- Climbing device with 50 kN lifting force
- Optional self-climbing in 50-cm-increments with mobile self-climbing devices
- Compatible with the new RCS MAX components as well as the PERI UP Scaffolding Kit and VARIOKIT Engineering Construction Kit
- Units can be moved by crane or a mobile hydraulic system

LPS Climbing Enclosure

The protection system with lightweight screen elements

Together with the RCS P Climbing Protection Variant or the lightweight LPS Climbing Structure, the LPS Climbing Enclosure enables a variety of applications ensuring the optimal solution for any project requirement. The system protects the inner areas against the effects of wind, while still allowing light to shine into the building. The lightweight screen elements can be assembled quickly and without the need for a crane. Alternatively, the LPS system can be delivered pre-assembled, saving valuable time and space on the construction site. Having a permeable structure, the lightweight mesh panels exert reduced loads to the building and therefore can be used with thinner slabs. LPS is used as a vertically continuous climbing protection panel. Moreover, integrated working platforms provide access to the slab stopend formwork.



- Screen elements with telescopic function for easy adjustment and to accommodate complex building shapes
- Fast assembly with lightweight elements and simple clamping connection; alternatively delivered already pre-assembled
- LPS Screens and Platforms compatible with the RCS Rail Climbing System
- Safe, rail-guided climbing by crane, or optional self-climbing with mobile hydraulics
- Adjustable slab shoe for mounting to the slab, with variable cantilevers and extendable platforms

ACS Self-Climbing System

The rail-guided climbing formwork with hydraulic drive

The ACS Self-Climbing System is available in different variants for facades, building cores, shaft structures and inclined bridge pylons. These rail-guided climbing units consisting of wall formwork and platforms climb safely and without a crane using the integrated hydraulic system. Fast processes for shuttering and striking as well as hydraulic climbing ensure high productivity and short cycle times. In addition, the stable working platforms can carry high loads, such as those resulting from material storage or concrete placing booms. The completely enclosed platforms enable works to be carried out regardless of the weather and ensure a high level of work safety and, in the same way as the simultaneous climbing of several units.

- Climbing device with 100 kN lifting force
- Positively-controlled and smooth climbing
- Climbing can take place outside of normal working hours thanks to the virtually silent climbing hydraulics system
- Climbing shoes and tie types optimised for project-specific factors such as building structure, load, wall thickness and required concrete strength
- Large climbing units reduce the number of lost tie components
- An adjustable variant for inclined structures such as bridge pylons or piers, with platforms in a horizontal position at all times
- Can also be used as shaft formwork for staircases or small lift shafts with a single climbing device positioned in the middle

System variants

ACS R Self-Climbing System
Standard system with carriage and open formwork at the top; facilitates easy installation of the reinforcement

ACS P Platform System
For high-rise building cores constructed in advance and tower-like structures with generously sized storage and working areas

ACS G configuration with gallows
For concreting walls and slabs in a single pouring operation or for circular structures; both formwork sides are attached to the cantilevered gallows

ACS Core 400 Self-Climbing Formwork

Video

The efficient and powerful self-climbing formwork for high-rise building cores with innovative climbing hydraulics

ACS Core 400 is the solution for high-rise building cores with large cell dimensions and sophisticated self-climbing technology: the optimised climbing process ensures simple working operations and short cycle times. The safety of the construction site team is ensured as there are no leading edges. Given the fact that the working platforms have a high load-bearing capacity, large concrete placing booms can climb at the same time and be supported during operation.
As a result, storey slabs can be concreted at the same time as the walls. With the system up to two storeys can be built per week. ACS Core 400 also stands out due to its cost-effective tie technology with only two tie points per support point. The climbing cones can be reused.

- Optimised for massive high-rise building cores with large cell dimensions and wall heights from 2.70 m to 4.88 m
- For use with the VARIO GT 24, MAXIMO or TRIO wall formwork systems
- The entire core formwork can be climbed in a single stroke (long-stroke cylinders with 40 t lifting force each)
- Synchronous climbing of the entire internal and external formwork – even in the case of large load differences

System variants

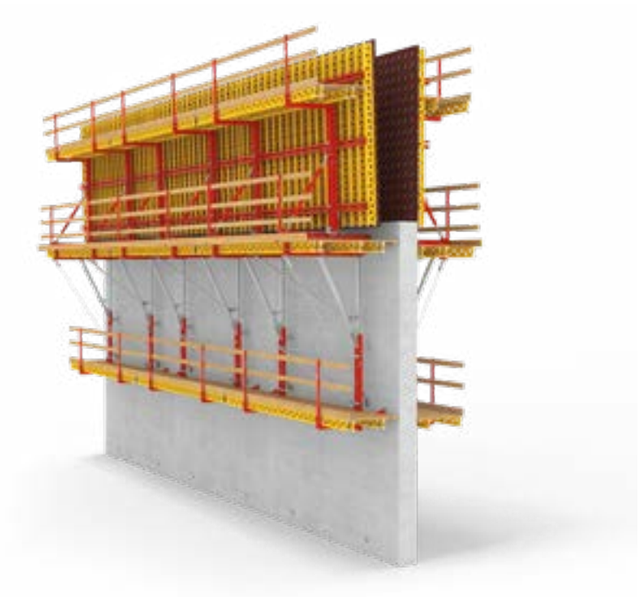
Concreting of leading cores
The external formwork and working platforms are suspended on cantilevered platform beams

Concreting the slab and wall in one pour
The external formwork is suspended on the cantilevered platform beams while the slab formwork serves as a working area for the work to be carried out on the outer sides of the core walls

SCS Climbing System

The flexibly adjustable bracket system for civil engineering structures

The SCS Climbing System is based on a modular construction kit and thus enables optimal adaptation to project-specific requirements and geometries while maintaining a high level of cost-effectiveness. This material-optimised solution stands out by virtue of the fact that it uses the same components for starter cycles as it does for subsequent standard cycles. Climbing anchors transfer the loads resulting from the fresh concrete pressure to the previous concreting section via the bracket. Horizontal working areas ensure that work can be carried out safely thanks to the horizontal alignment of the platforms, even when they are used at an incline. The large, multi-part brackets impress on account of their optimised crane operating times and can be delivered to the construction site already pre-assembled.



- Crane-movable climbing units consisting of a bracket unit and wall formwork system
- Optimised for a concreting height of up to 3.90 m for one-sided applications and up to 6.00 m for two-sided applications
- Addition of a finishing platform possible
- Concreting, working and finishing platforms can be tilted by up to ± 15° and ± 30°
- By using the angular adapter, the brackets can always be arranged in a parallel position, even in the case of circular structures; as a result, the formwork with carriage can be retracted and the climbing unit moved in a single crane lifting operation

System variants

SCS 190
Bracket width approx. 1.90 m with tilting device for striking operations; SCS 190 requires only a minimum of space and is the more cost-effective alternative

SCS 250
Bracket width approx. 2.50 m with carriage for retracting the wall formwork without requiring a crane

SCS Starter Brace Frame
Modular construction consisting of strongbacks, heavy-duty spindles and starter waler for transferring loads from the single-sided first concreting section into the bottom slab

SCS two-sided application
With only a minimum of additional components, the climbing brackets can also be used for anchored wall formwork up to a height of 6.00 m

Video

CB Climbing Formwork

The compact and crane-movable solution for large-area anchored wall formwork

CB Climbing Formwork can support large-area, anchored wall formwork. The permanently mounted climbing units, consisting of formwork, working platform and finishing platform, allow repositioning operations to be carried out by crane in a time-saving manner. The high load-bearing capacity of the CB Climbing System means that large spans and thus large scaffolding units can be accommodated with high load assumptions at the same time. As the platform decking is above the bracket, the CB 240 is free of tripping hazards, thus increasing the level of safety on the construction site.

- Supporting structure for supporting anchored wall formwork; alternatively, purely as a working scaffold
- Formwork height up to 5.40 m for standard applications
- Finishing platform with ladder provides access to the wall
- Optional equipment with wind bracing against tipping inwards

System variants

CB 240
Bracket width of 2.40 m with carriage (75 cm retraction distance), strongback and adjustable brace

CB 160
Bracket width of 1.60 m with adjusting unit, strongback and adjustable brace

BR Platform Beam

Customised support for shaft internal formwork

The BR Platform Beam is used for supporting the shaft internal formwork in stairwells and elevator shafts in a straightforward manner. PERI manufactures the BR Platform Beam to size for the respective shaft size. The decking is supported by GT 24 Formwork Girders or square timbers, which are fastened to the platform beams by means of hook straps. In addition, the system offers variable support options by means of folding brackets bolted to climbing anchors concreted in advance or, alternatively, by means of gravity pivot plates in reusable storage boxes concreted in advance.

FB 180 Folding Platform

A universal platform for working and safety scaffolds

The compact FB 180 Folding Platform is primarily used as a working and safety scaffold. It can also be used as a support for wall formwork up to 5.40 m high or as a roof edge protection scaffold. The folding platform is delivered to the construction site completely pre-assembled, making on-site assembly very easy. Labour and material costs are kept to a minimum by the large, consistent console bracket spacing, and the low number of ties, platform types and components required. What's more, it can be used easily for a wide range of ground plans.

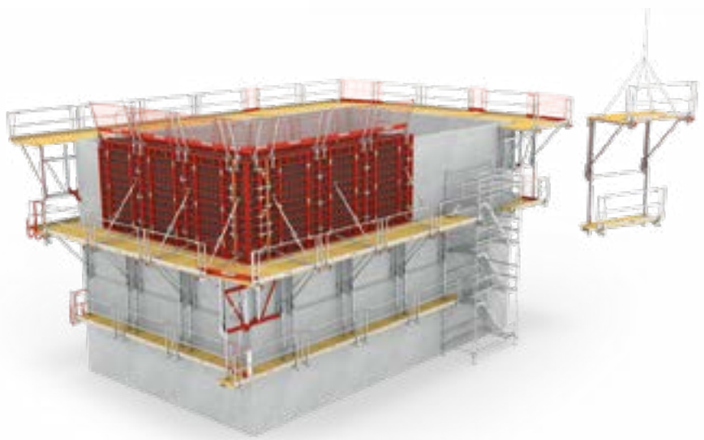
Platform length 300 cm; platform width 180 cm (standard platform)

Permissible load according to DIN EN 12811: load class 4 (300 kg/m²) when using main, intermediate and corner platforms (upper rendering); load class 5 (450 kg/m²) when using only main platforms (lower rendering)

Finishing platform as access to optional wind bracing

Support extensions with adjustable pressure point for bridging building openings

Less space required during transport and storage with an effective stacking height of only 27 cm

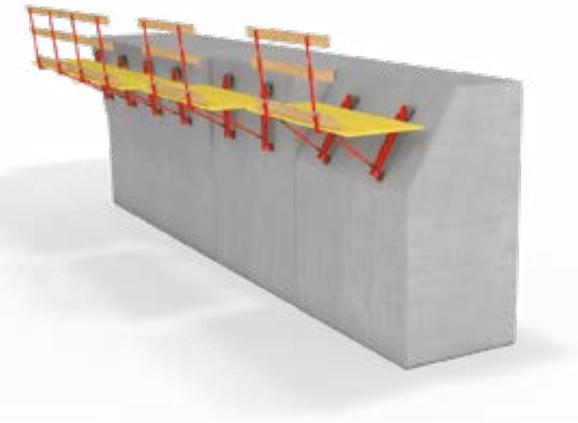


As the folding platform carries very high loads, high facade scaffolds can also be installed on the platforms. This is beneficial, for example, if the terrain is rough beneath the working area.

VGK – The console bracket solution for infrastructure and building construction

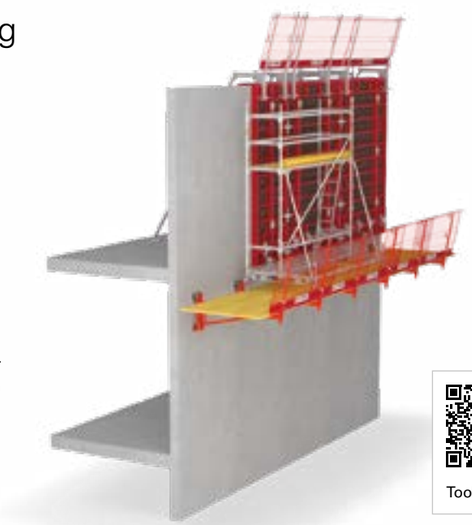
Also suitable for sloping walls as a versatile working platform

VGK components can – in addition to being used as cantilever brackets – also be used as lightweight, versatile working platforms. This opens up additional application possibilities for VGK components in building construction and transport engineering. Innovative further development work on the VGK components has enabled the system to be used as a lightweight working platform for walls with a forwards or backwards slope, which is particularly useful for pier heads or special geometries. Two platform widths are available for meeting different requirements. VARIOKIT standard components are used for the solution and can therefore also be rented.



As a working platform for building construction

The VGK can also be used as a working platform for building construction. To ensure that the work procedure is safe, the console brackets can be suspended in the structure as a pre-assembled platform unit. The result is an enclosed working platform on which reinforcement scaffolds can be placed. Formwork can be handled and other work carried out from a safe position, making the use of facade scaffolds superfluous. VGK Console Bracket solutions are type-tested. They can also be measured independently with the VGK Design Tool.



Tool

3D CONSTRUCTION PRINTING

3D Construction Printing

Printing buildings in a time and cost-effective manner with the COBOD BOD2

With 3D printers, concrete structures can be built quickly and cost-effectively without the need for formwork. It takes about five minutes to produce 1 m² of double-skin wall with a COBOD BOD2. Given the high level of automation, only two people are required to assemble and then operate the printer, which minimises personnel costs. In addition, 3D construction printing stands out due to its considerable freedom of design, meaning that custom structures can be realised without any issues.

Maximum dimensions of COBOD BOD2: 15 m wide, 10 m high, the length can be adjusted according to the individual project requirements

Printing speed: 1 m/s maximum speed; 25 cm/s standard speed, which corresponds to a printing time of around five minutes for 1 m^2 cavity wall

Layer heights and widths: Realisation of layer heights between 1 cm and 3 cm as well as layer widths between 3 cm and 10 cm

Printing materials: Any locally sourced 3D-printable mortar or concrete with a maximum grain size of 8 mm

Assembly and disassembly time: Depending on the configuration of the 3D construction printer, for a printing area that is 12 m wide, 17 m long and 8 m high, for example, 8 hours are required for one machine

Safety technology: CE-certified and safe, IP67-certified cabling and galvanised steel tracks, camera monitoring of the printing process and printing results

Integrating other trade activities into the printing process, such as insulation material or cable ducts, further increases efficiency.

The innovative 3D printing technology requires very little effort and impresses with its clean method of operation, which has a positive impact on the employer's reputation.

Germany's first 3D-printed residential building in Beckum with curved walls exemplifies the considerable design freedom offered by 3D construction printing.

Video

COMPONENTS

Safety Accessories

PERI products and systems are developed in order to provide a greater level of safety at the construction site. In addition, PERI continuously develops and improves economical safety solutions to set new standards in terms of construction site safety. Examples are platforms, console brackets, access points and enclosures. The range also includes other components and articles, such as the PROKIT Fall Protection System.

PROKIT and PROKIT Alpha
The highest standards of safety and cost-effectiveness

The 1.10 m high, quickly assembled PROKIT EP 110 serves as temporary anti-fall protection for open slab edges. The well established system also provides flexible solutions for complex building geometries without any planning effort, combined with a high level of robustness. Posts, attachments and powder-coated side mesh barriers can be installed easily, quickly and safely and adapted to the conditions on site.

PROKIT Alpha is a new designed barrier based on an optimised manufacturing process which makes the system even lighter. This leads to material savings, which are reflected in its increased cost efficiency – without compromising on the safety of the barrier. The optimised design and production process ensures the highest quality and compliance with all relevant standards. PROKIT Alpha can also be used as system-independent edge protection.

- Temporary lateral protection at the fall edges of slabs and walls in accordance with DIN EN 13374, classes A and B; can also be used on stairs in conjunction with guardrail boards
- Temporary lateral protection on PERI formwork and scaffolds in accordance with DIN EN 12811
- The 260 cm long side mesh barrier is ideal for open slab edges
- Also available in lengths of 240 cm, 120 cm and 90 cm; compatible with the elements of the MAXIMO and TRIO Panel Formwork

Catch Fan
For drop heights of up to 6 m

Catch Fan can be used as a safety net for people as well as for falling objects and small parts and, together with the PERI PROKIT Edge Protection System, offers an excellent safety solution for working at heights. The catch fan is an economical solution that protects all parties involved in the construction process.

- Available in the dimensions 3.00 m x 4.00 m/3.00 m x 6.00 m
- Product weight of 76 kg/89 kg in line with the dimensions
- Temporary safety net in accordance with DIN EN 1263
- Can also be used as a safety net for personnel if the relevant requirements are met

Stairways
For safe access at heights of up to 5 m

Stairways of various heights allow personnel to ascend safely to heights of up to 5 m. The step width of 1 m and the handrail on both sides ensure the utmost level of safety whenever the stairs are ascended or descended.

- Available with 3/6/9/12/15 or 18 steps, possibility of combining different heights for countless application scenarios
- Step tread width of 1.00 m
- Handrail on both sides for greater level of safety
- Made of galvanised steel, supplied pre-assembled or in single components
- Temporary access solution in accordance with EN 12811-1

GT 24 Formwork Girder

Durable formwork girder with high load-bearing capacity

This sustainable formwork girder made of timber from certified growth areas with its 24 cm overall height and lattice construction stands out due to its particularly high load-bearing capacity and bending stiffness. This makes it the preferred choice for high loads and large spans. The design is highly practical and simplifies the connection of on-site accessories. Using the GT 24 Formwork Girder reduces both the amount of material and the workload required when used with wall, column and slab formwork, stopend formwork on slab edges and special formwork.

- 18 standard lengths from 0.90 m to 6.00 m in 30-cm-increments, extra-long lengths up to 17.80 m on request
- Weight: 5.9 kg/m
- Permissible support force: 28.00 kN (at the nodes)
- Permissible bending moment: 7.00 kNm
- Bending strength: ELy=887 kNm²; Iy = 8,064 cm³
- PEFC-certified

Thanks to the stable design and the girder node with mini wedge galvanisation, the GT 24 Formwork Girder offers long-lasting durability. The struts penetrate the chords along the entire cross-section. This way, there are practically no cavities that could trap and hold moisture.

VT 20 K Formwork Girder

High-quality girder with steel caps for optimal protection at the girder ends

VT 20 K is a cost-effective formwork girder for slab and beam formwork as well as slab elements. The 20-cm-high solid web girder made of high-quality Nordic timber waler achieves high dimensional stability thanks to its chord cross-section of 4 cm x 8 cm and the 25-mm-thick, highly compressed web board. Thanks to the system holes in the web, the girder can also be used in a variety of ways, for example, a guardrail can be fixed there. Its low weight means that work can be carried out with minimal exertion by just one person at heights of up to 4.50 m.

- 11 lengths from 1.45 m to 5.90 m
- Weight: 5.4 kg/m
- Permissible support force: 22.00 kN
- Permissible bending moment: 5.00 kNm
- Bending strength: Ely=460 kNm²; Iy = 4,181 cm³
- PEFC-certified

Steel caps at the ends of the chords and the inwardly rounded web reliably protect the VT 20 K Girder from damage.

Variants

VT 20 Alpha Formwork Girder
with chords made of high-quality softwood without steel caps and highly compressed web board with high synthetic resin content

VT 20 Alpha 3S
with a dimensionally stable 3-ply board as a web

Other girders in the PERI portfolio

Aluminium Girder 16 and 20

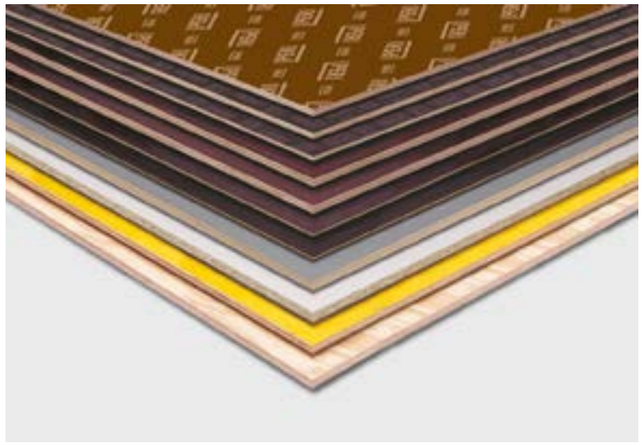
The ideal formwork girders for use with heavy loads and in tropical climates

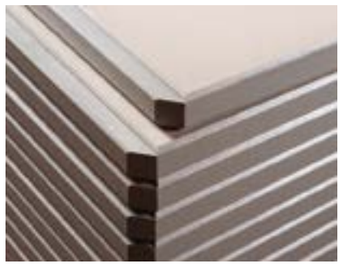
- Made of durable, weatherproof and insect-resistant aluminium
- Low weight of 4.91 kg/m (Aluminium Girder 16) or 6.35 kg/m (Aluminium Girder 20)
- Easy to recycle
- Can be nailed into place with plastic and plywood nailing strips, which are easy to replace

Plywood Formlining

PERI offers a diverse range of standard formlining sheets in various dimensions and quality levels for every requirement. On request, numerous other products and formats, but also wood-based materials and plywood precision-cut according to need, are available.

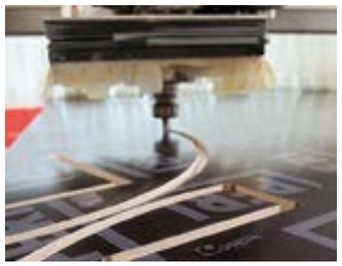
PERI has been operating successfully on the international formwork market for more than 50 years. The number of panels moved annually is roughly equivalent to the cargo of 10,000 containers. PERI experts have close working relationships with customers and producers all over the world, allowing them to respond quickly and reliably to short-term developments in the markets.





PERI Pave is the production pallet with a multiplex core used in the of concrete paving products. It is coated with a highly resistant plastic.

PERI Pave ensures uniform compaction of the paving stones.



CNC systems produce customised formwork panels that fit precisely.

Release Agents

Concrete release agents are liquid, chemical-physical release agents that are applied to the formlining of concrete parts before the concreting process in order to reduce adhesion between the concrete and formlining during the striking process. They also protect against rust, ensure that support threads are smooth-running and are suitable for all commercially available formwork and construction equipment. PERI offers a number of different release agents to cover a wide range of applications and requirements. PERI Clean and PERI Bio Clean can be used for both absorbent and non-absorbent formwork panels (e.g. boards, coated large-area formlining, steel). PERI Plasto Clean has been developed specifically for formwork panels with plastic surfaces. PERI pays attention to use environmentally friendly formwork oils. For example, PERI BIO Clean bears the EU Ecolabel and has Blue Angel certification. It is also biodegradable.

PERI Clean and PERI Plasto Clean are manufactured from mineral oil

PERI Bio Clean is a partially synthetic release agent and biologically degradable in accordance with OECD Guideline 301c (awarded the EU Ecolabel)

PERI release agents are solvent-free

Creeping oil properties regenerate resinous formwork surfaces

Waterproofing technology

The PERI portfolio offers a wide range of suitable accessories and components for all aspects of the in-situ concreting process and thus represents a holistic project solution from a single source. The field of waterproofing technology covers a wide range of different solutions for protecting buildings effectively and safely from water damage. The focus is on environmentally friendly as well as high-quality products certified according to current market standards.

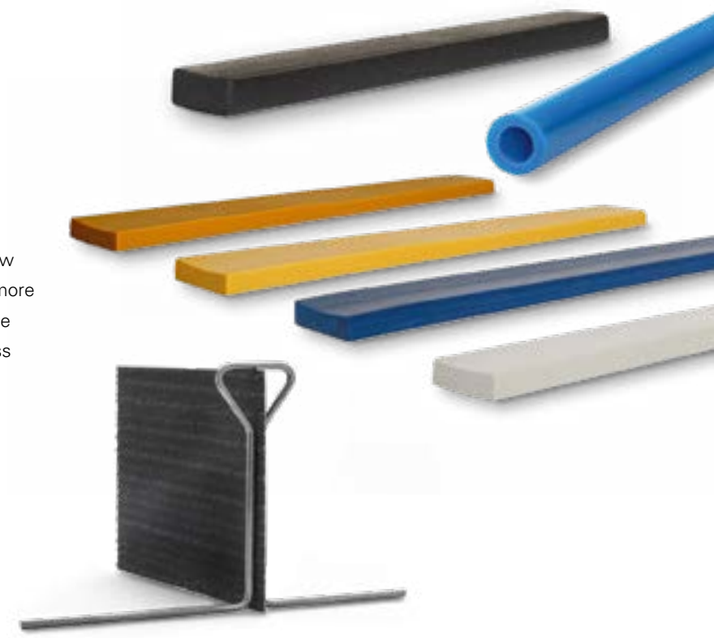
The PERI portfolio can be used in a system-free manner with any formwork and consists of solutions for sealing joints, tie holes and surfaces for a wide range of customer requirements, technology levels and applications – from simple sealing for residential buildings to high-tech structures such as drinking water or oil installations.

Sealing of tie holes

Tie rods leave holes in the concrete structure after the concreting process. The PERI waterproofing portfolio ensures that tie holes are efficiently and safely sealed against water penetration. Depending on the tie technology used, internal and external sealing may be required.

Sealing of joints

The joints of a structure are often weak points that allow water to penetrate the structure. This makes it all the more important to consistently seal all types of joints with the appropriate accessories during the construction process and to create watertight structures.



Sealing of surfaces

In addition, a secure surface seal is required to protect concrete structures from groundwater intrusion and contamination. The PERI portfolio includes various membranes that are applied to the wet or dry concrete and provide additional sealing and protection.

DIGITAL SOLUTIONS

myPERI Customer Portal

Digital and transparent management of construction projects

The myPERI Customer Portal provides access to all key information relating to PERI construction projects. Comprehensive project information about all materials required and used, costs, and product or article information is available quickly, easily and in real-time. Useful reports and visual representations facilitate work processes in all phases of construction site management. In addition, important project data is stored in a digitalised and centralised manner and can be used by all participants at the same time, which ensures transparent and simplified communication.

In 2022, the successful myPERI online portal will now take another step into the future. With its new, future-proof platform and the inclusion of features developed together with customers, it offers even greater transparency and interactivity:

- Even more intuitive operation of the portal thanks to new user interface
- Easier use of the familiar functions through increased usability
- Faster finding of the desired content with the new search function
- Location-independent use on all end devices – even on site with a smartphone or tablet thanks to responsive design

PERI is constantly refining the portal together with its customers. More functions are in the planning phase, e.g. for reporting. The new myPERI will be available in Germany from the end of 2022 – other countries will be added on a gradual basis.

Planning solutions

Digital tools for future-oriented construction

Whether it's in the office or on the construction site: PERI's digital planning solutions make the working world easier, simplify process planning for formwork and scaffolding projects and provide a realistic visualisation of planning. From valuable product-related apps for simple calculations with PERI systems and comprehensive software to tools that bring planning to life by means of augmented and virtual reality – the diverse range of services is designed for ease of use and high user benefit.

PERI QuickSolve

The PERI QuickSolve product family brings together a wide range of formwork and scaffolding editors for fast and intuitive planning of simple ground plans. In this way, the individual plans for a construction project can be organised in a structured way. With the aid of the cycle overview, balanced cycles can be created for the ground plans entered in order to arrive at an optimised formwork solution. When planning formwork and scaffolding solutions, it is possible to take the existing inventory into account. Alternatively, the application's optimum proposal can be used. Parts lists suitable for the construction site can be exported just as easily as 2D and 3D views of the solutions. QuickSolve is available for many PERI systems, such as MAXIMO, TRIO or DOMINO, and the portfolio is constantly being expanded. All the latest information is available in the app itself.

App

MultiCAD

The PERI MultiCAD portfolio offers professional formwork planning in Autodesk Revit and many other CAD systems. Together with our partner BIM², PERI enables professional and intelligent formwork planning in Autodesk Revit. In addition, the existing article catalogue on bimcatalogs.net has been and will continue to be expanded to include new planning objects that can be used free of charge and for over 150 CAD systems.

PERI CAD

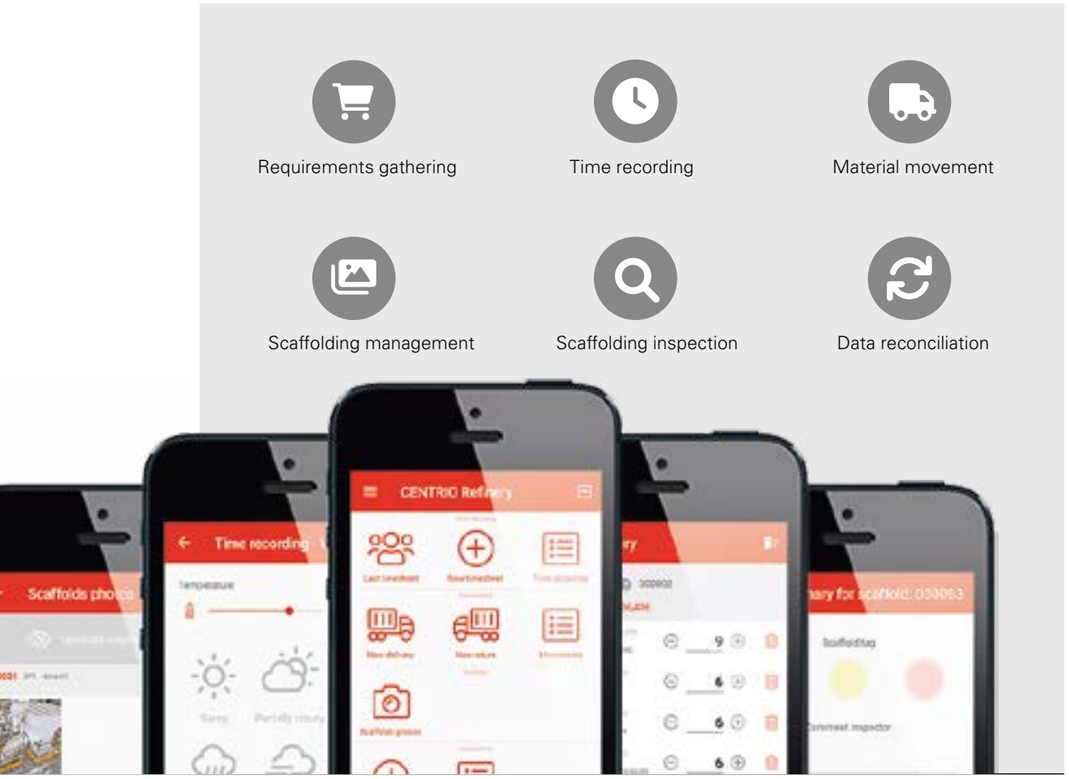
The PERI CAD software is used for a wide range of tasks in project planning – from planning simple ground plans with standard systems to developing complex solutions for engineering structures. 3D visualisations provide clearly arranged and detailed plans. In addition, with its exact quantity planning, PERI CAD contributes to optimised construction sequences and a reduction in costs.

Planning solutions

PERIpath

PERIpath was developed for use with PERI UP scaffolding material and makes it easier to manage complex construction projects, such as industrial scaffolding projects, efficiently and productively. With the help of process-controlled logic, this digital solution comes into play where other tools reach their limits: Regardless of whether it is the construction of a new plant, daily maintenance or a turnaround – the modular 5D software solution provides support for every planning phase of a large construction site. In this way, PERIpath users know at all times the status of the scaffolding requirements on the construction site, which inspections are imminent, whether material movements are taking place and how many people are working.

What's more, PERIpath provides a detailed cost overview and enables proactive pre-planning thanks to extensive reporting functions. In addition to the software itself, PERI offers additional support in the form of user training, process analyses, advice on work procedures and much more.



PERI Scaffold Estimation Tool (SET)

The planning tool for material estimation SET is available both on its own and as a standard package with PERIpath. Using the application, 3D models for scaffolding planning can be created intuitively – without the use of CAD software. The drag & drop function enables swift, straightforward and flexible assembly and simplifies the individual addition or modification of scaffold types and properties, access points and decks. In 3D, the scaffold can be configured as well as viewed from different perspectives, and individual components can be highlighted and hidden. SET also generates a material list including the item number, quantity and weight and automatically calculates volumes, surfaces and deck areas. All of the information can then be transferred to PERIpath with the click of a button.

PERI Extended Experience App

With the Extended Experience App, PERI takes the mobile 3D visualisation of formwork and scaffolding projects to a new level, optimising communication, safety and efficiency on the construction site. Using augmented and virtual reality, planning can be walked through virtually or projected into the physical environment. Due to the different visualisation options, the respective models are optimally integrated into the planning or construction process. The level of detail reflects the design planning precisely.

PERI InSite Construction

The solution for optimal concreting processes

PERI InSite Construction (ISC) enables customers to make informed decisions about the concreting process based on meaningful real-time data – anywhere, anytime. The portfolio includes various solutions for applications throughout the concreting process, such as temperature monitoring, concrete maturity determination and concrete pressure monitoring.

All of the applications have one thing in common: they optimise the concreting process on the construction site and help to save time and costs. The key: a measuring device, a cloud and the respective sensors. All of the sensors are easy to use, compatible with all formwork systems and allow real-time analysis of the collected concrete data using the ISC Web Application.

Video

ISC Filling Detection Set

The ISC Filling Detection Set measures the concrete level even in hard-to-reach areas of the formwork and minimises the risk of gaps between the concrete and adjacent components. This ensures a high concrete quality.

ISC Temperature Monitoring and Concrete Maturity Kit

The ISC Temperature Monitoring and Concrete Maturity Kit allows the monitoring of the temperature in the concrete and determination of the resulting strength. This can optimise the utilisation of the formwork and can shorten operating times. Compared to conventional methods, no costly and time-consuming reading and recording of the measuring points is required during the concreting process.

ISC Pressure Monitoring Set

The ISC Pressure Monitoring Set improves the level of safety during the concreting process by determining the concrete pressure acting on the formwork in real time. This ensures optimum utilisation of the formwork, reduces costs and minimises the risk of formwork breaks and deformations.

ISC SONO WZ Analyser

The ISC SONO WZ Analyser is used for efficient determination of the water-cement ratio in fresh concrete and provides reliable measurement results using innovative TRIME® radar technology. The measurement is carried out in only a few minutes thanks to the simple and structured procedure – without any complicated test set-up process. This leads to considerable time savings compared to measurements with the Darr method.

ISC Web Application

App

With the ISC Web Application, the real-time data collected by the sensors can be analysed. Thanks to the responsive design, access is possible from various end devices regardless of location. With its simple, digital reporting function, the web application minimises the amount of documentation work required.

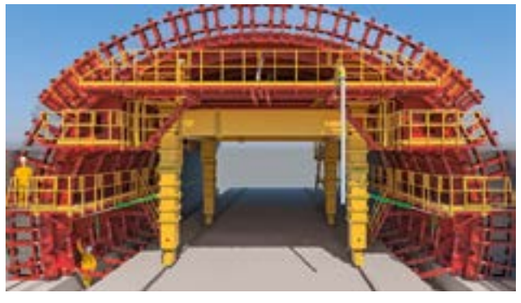
SERVICES

Building Information Modeling

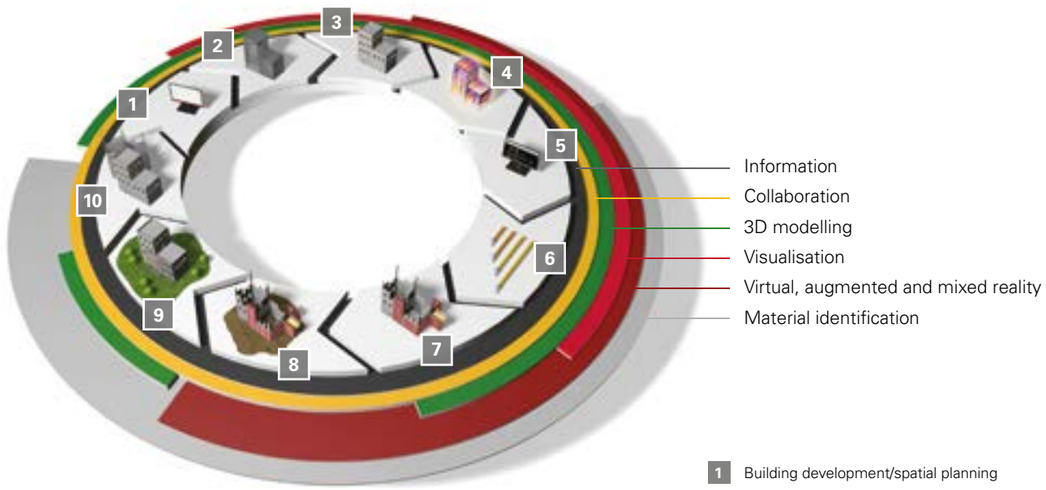
Planning and management of all construction processes – from the initial design to building operation

PERI provides suitable BIM solutions as a project partner on an equal footing.

For years now, PERI has been one of the leading companies in the industry when it comes to BIM and can already point to several international project references that were successfully completed using the BIM methodology. Step by step, the three-dimensional plans are transformed into a 4D or 5D model by integrating the factors of time and cost. Other decisive process data relating to formwork and scaffolding technology, such as necessary changes to plans and automated collision checks, are documented and tracked in a construction information management system.



With BIM, PERI is able to deliver specialist added value for all types of formwork and scaffolding technology throughout the entire project.



BIM lifecycle

With BIM, planning and execution variants can be simulated on the 3D building model at an early stage of the project. In this way, it will be visible to all parties involved where, when, why and at what cost interface problems can arise – at the structure planning stage and in the subsequent construction work. It is this future-oriented optimisation of the construction process that makes it possible for clients and all those involved in the construction process to carry out the project in a transparent manner and with a high degree of planning reliability.

1 Building development/spatial planning
2 Design planning
3 Implementation planning
4 Thermal and technical analyses
5 Plan creation/documentation
6 Prefabrication/element usage
7 Plant and assembly planning
8 Preparation/site planning
9 Operating margin with facility management
10 Revitalisation/conversion, deconstruction

Video

Improving the construction processes through three-dimensional visualisations and animated process simulations before starting the project

Efficient execution of construction work and cost transparency through optimised process planning and the integration of additional process data

Coordinated processes carried out in a consistent manner – from CAD design and all change processes right through to commissioning

Project information up to date and available at all times

Well-regulated communication through standardised working methods, even in the case of multiple trades

Engineering Services

Individual planning and advice for
customised formwork and scaffolding solutions

Implementation plans are coordinated. For this reason, subsequent changes to the plans can also be implemented easily and quickly.

More than 1,300 PERI engineers around the world plan and dimension formwork and scaffolding solutions. All of the plans put together by PERI Engineering are aimed at ensuring that PERI formwork and scaffolding systems are used in construction operations on schedule, at the right cost and with the right quality standards. The basis is formed by sets of execution plans, which are in turn based either on 2D views and sections or on realistically visualised 3D building models. In this way, technical solutions are developed in close cooperation with the customers. Not only do these solutions optimise the use of materials, such as the cycle planning for the formwork, but they also guarantee a smooth construction process. Safety aspects are also of central importance for planning.

The plans drawn up by PERI Engineering are supplemented by verifiable static calculations as proof of stability for the planned formwork and scaffolding solutions. Project-specific assembly and joinery plans for the professional assembly of special applications are also included in the scope of supply. With its customised formwork, PERI can also provide a solution for the production of double-curved concrete surfaces. To this end, PERI specialists plan and realise custom-fit three-dimensional formwork units.

- Well-thought-out and cost-effective solutions, optimally tailored to the construction process
- Project-specific formwork and scaffolding planning including site-compliant drawings and material-optimised parts lists
- Planning certainty through verifiable static calculations
- Transparent and clear presentation of the project processes through 3D visualisations and animations
- Cycle and operational planning based on currently applicable standards and regulations
- Cost-efficient realisation of 3D formwork units by using a high proportion of system components from the PERI product portfolio

Project Management

Professional project support and
advice for successful projects

PERI is also a reliable partner when it comes to executing plans. If required, PERI project managers can provide support with project management and execution in person on the construction site. Given the fact that PERI project managers have many years of practical experience, they are able to react quickly to new situations, disruptions in the construction sequence or changes in boundary conditions, and find the most cost-effective solution. The focus is always on the overall success of the project.

Our project managers are the central points of contact for all logistical, commercial and technical issues relating to the projects. They have a clear understanding of all of the formwork and scaffolding planning and how to implement them smoothly on the construction site.

The myPERI Customer Portal is also available for project management purposes. This web-based tool provides a quick overview of the most important data relating to the construction site – 24 hours a day.

- Planning, delivery and management of cost-effective material use
- No interface-related loss of engineering services due to continuous project support and technical advice from PERI specialists
- Continuous control option by means of target/actual comparisons regarding material, time and costs
- Compilation of key figure reports on a weekly and monthly basis
- Advice on safety issues on the construction site
- Organisation of smooth delivery processes for both incoming and outgoing deliveries

Courses and training

For the efficient and safe use of PERI products

The practice-oriented and wide-ranging PERI training programme is available to a great variety of customer groups and is optimally tailored to the challenges faced on the construction site. The trainings are conducted by PERI experts. This enables those involved in the project to work safely, efficiently and in a resource-oriented manner right from the start.

Practical training sessions at PERI exhibition and training centres provide the ideal opportunity for people to familiarise themselves with the operation of the systems and to directly apply and deepen their knowledge of the theory and expert tips. In addition, PERI offers training on theoretical topics, not to mention software training. If required, PERI supervisors can also support the construction site team directly on site so that the systems can be used safely and efficiently from the outset.

Logistics services

The ideal materials in the right place at the right time

With well over 160 warehouse locations worldwide, PERI ensures the reliable provision of innovative systems – in the right quantity, at the right time and in the right place. The organised exchange of materials between our rental warehouses around the world allows us to cover customers' peak demand economically and reliably, minimising their capital and financing requirements.

Particularly in the case of extraordinary projects with large quantities of materials, the sophisticated PERI freight management service comes into play, geared towards the specific requirements of construction site logistics. If required, PERI can define the project-specific boundary conditions together with the customer as early as the planning phase in order to optimise construction site processes and reduce costs.

Equipment services

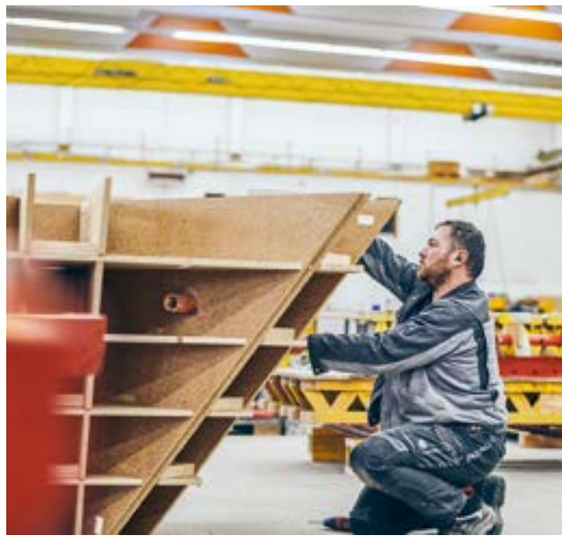
Professional maintenance

PERI provides professional maintenance and cleaning services for the customer's materials at all locations worldwide – thus ensuring the quality of the material, which is essential for achieving outstanding construction results. In addition, professional refurbishment services can extend the service life and ensure that the existing material retains its value. The required performance is agreed with the PERI experts individually according to the material condition.

Factory-realised formwork assembly

For the highest demands on architecture and geometry, PERI offers the production of project-specific and customised formwork units, ranging from simple CNC cut-to-size plywood panels and recess boxes to individual special elements as well as 3D formwork units and platforms in any geometric shape. The production of 2D or 3D additional infill spaces and complex formwork units is carried out according to individual requirements regarding the shape, formlining and planned number of uses.

Pre-assembly can be carried out by PERI experts in the factory, which, in addition to quality advantages, also results in an increase in productivity and cost reliability.



REFERENCE
PROJECTS

Housing and Multi-storey Buildings

Skyscrapers and Towers

Cultural Buildings

Transport Engineering

Water Retaining Structures

Industrial Structures

Building Redevelopment

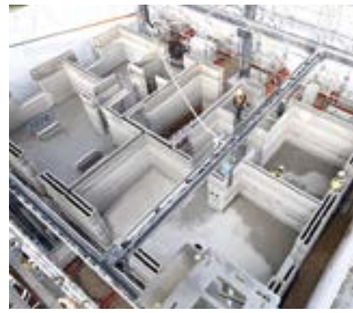
HOUSING AND MULTI-STOREY BUILDINGS

Apartment building built in **six weeks thanks to 3D construction printing**

Germany's first 3D-printed apartment building

Wallenhausen
Germany

At the end of 2020, a three-storey apartment building with approximately 380 m² of living space was built in Wallenhausen in just six weeks using 3D construction printing technology. Four of the five apartments have been rented out, while one is used as a show apartment.



Following the inaugural project in Beckum, where Germany's first printed residential building was constructed, this is the second project that has seen PERI use 3D construction printing technology. It highlights just how versatile the technology is in terms of its application possibilities, and how it is even suitable for the construction of large residential units.

The COBOD BOD2 gantry printer, whose print head moves along three axes on a securely installed metal frame, was used on this project. This means that the construction printer can control every angle in the construction with great precision and only needs to be calibrated once at the beginning of the project. As a result, complex geometries can be cleverly executed without unique formwork or special-purpose solutions. The print head and print results are permanently monitored by a camera.

The COBOD BOD2 also scores with its printing speed of 1 m/s. In addition, compared to conventional construction methods, only a small team of site personnel was required to operate the printer, which led to considerable savings in personnel costs.

The classical design of the apartment building blends in with the traditional townscape. The architectural concrete exterior facade has a radiant appearance and has been sealed in order to counteract the effects of the weather. The architectural highlights of the show apartment include a full unplastered wall in the dining area, revealing the typical structure of a 3D printed wall.

Video

Contractor
Rupp Gebäudedruck GmbH,
Pfaffenhofen an der Roth,
Germany

Field service
PERI 3D Construction,
Weissenhorn

Fabian and Sebastian Rupp · Managing Directors
"Thanks to automation and a high printing speed, we can build houses faster and cheaper with 3D construction printing. The machine is operated by the employees who previously built our houses in the conventional manner. We want to use this to make the construction profession more appealing again."

Private Residence

Viimsi
Estonia

The most stringent architectural concrete specifications **realised on schedule**

Contractor
Nordecon Betoon OÜ, Tallinn, Estonia

Field service
PERI Estonia, Saku vald Harjumaa

Mait Rõõmusaar · Owner
"Building beautiful structures is an absolute pleasure. A great deal of creativity went into the design of this house. Behind the facade of this extraordinary building lies robust concrete construction work, which called for effective cooperation between all parties involved. Thanks to PERI's reliability and flexibility, the engineers were able to focus on developing the ideal technical solution, resulting in an architecturally beautiful house and a satisfied family."

In the shade of tall pine trees, a private residence in Viimsi, Estonia, stands out on account of its contrasting architecture. The combination of timber and high-quality architectural concrete blends seamlessly with the landscape and reflects the owner's passion for distinctive concrete structures. Due to the high demands placed on the quality of the architectural concrete and the level of field service required, the customer opted to collaborate with PERI.

A concrete frame with an architectural concrete finish links the L-shaped building to a separate sauna. The customer wanted to use a uniform tie pattern and architectural concrete of the highest quality to give the walls of the frame a radiant appearance, so PERI offered several different technical options using a variety of panels and tie options. Ultimately, the customer decided to use TRIO Panel Formwork with a combination of panels in different sizes, which afforded the building a harmonious and engaging concrete finish with an orderly tie pattern. In addition, with its small number of different components and the single-hand operable BFD Alignment Coupler as the only connecting part, TRIO ensured that construction progressed quickly.

The inner courtyard of the building is characterised by elliptical openings in the slab that act as room dividers and provide sufficient light despite the massive concrete frame. The customer also wanted the complex round geometry to have an equally high level of architectural concrete quality, so PERI came up with a cost-effective solution using the easily adaptable VARIO GT 24 Girder Formwork and TRIO Panels for the closing edges.

In addition to the formwork from PERI, the key to success throughout the project planning and execution stages was also the high level of engineering competence and reliable quality of service, which ensured that the technical solutions functioned perfectly and materials were delivered to the construction site on time. This, coupled with the personal support provided by the PERI project manager, enabled the team to complete the project within the tight construction schedule of only twelve months.

Grotius I and II

The Hague
Netherlands

Reliable protection from wind, clever **system combination** and constant support

© Marcel Steinbach

© Marcel Steinbach

© Marcel Steinbach

The towers Grotius I and II were constructed in an excellent inner-city location only a few kilometres from the shore of the North Sea. At a height of 120 m and 100 m, they tower above the city's rooftops, making them a striking new feature of The Hague's skyline. Characteristic of both towers is the spectacular disintegrating crown, which offers residents a unique view of the city and the sea and sees the buildings literally merge with the sky.

PERI provided a comprehensive solution that included the materials, engineering and project coordination services. At the same time, the solution was designed to meet the particularly high requirements defined by the municipality of The Hague with regard to the safety of construction site personnel and passers-by. The RCS Rail Climbing System with integrated wind protection turned out to be the optimal climbing solution for the tower construction phase. That's because the system provided twice the protection: the rail guidance system allowed the climbing platforms to remain connected to the building at all times, which successfully shielded the construction site personnel working at great heights from the high wind speeds brought in by the North Sea. In addition, the RCS system nullified the risk of falling parts, thus providing a safe walkway for passers-by at ground level. With the hydraulic components that the RCS Rail Climbing System features, the platforms were able to climb 3 m to the height of the next storey autonomously, which ensured fast turnaround times and reduced the workload on the crane.

1,100 m² of MAXIMO panel formwork were used for the internal walls and 1,400 m² of project-specific VARIO Panel Formwork for the external walls of the high-quality external facade. Even the complex crowns of the towers could be constructed safely with the intelligent system combination and the expertise of the engineers from PERI.

Contractor
Bouwcombinatie Grotius V.O.F
Dordrecht, Niederlande

Field service
PERI BeNeLux, Schijndel

Julian van den Nieuwendijk · Site Manager for the Towers at J.P. van Eesteren/BESIX NL
"PERI followed our train of thoughts when it came to building the two residential towers and the crown and came up with a clever solution for the climbing platforms so that safety is guaranteed at all times. We know what we can expect from PERI in terms of competence, reliability, quality and costs. (...) PERI are the experts when it comes to formwork operations and climbing platforms and how they can be adapted to the specific needs of the project."

In Unterföhring, four state-of-the-art TV studios and office and conference rooms will be built on a 26,000 m² site by 2024. There will be space for 1,700 employees across five floors, including several garden and roof terraces for creative exchange. PERI supported the project with system solutions consisting of PERI UP and VARIOKIT.

Hitting the heights quickly and safely with PERI UP

The variability of the PERI UP Scaffolding Kit simplified the assembly work at the New Campus immensely. On account of the end-to-end system grid, PERI UP can be adapted very flexibly to various local circumstances. It is also possible to ensure a smooth transition between the shoring and facade scaffolds. Since the VARIOKIT Engineering Construction Kit is based on the same basic grid, both systems can be combined almost seamlessly into a comprehensive solution. In Unterföhring, too, the facade scaffold was supported with the aid of various VARIOKIT core components wherever the substrate did not offer sufficient stability or traffic areas had to be kept clear. The system grid simplified the process of adapting the scaffolding for subsequent trade work immensely – without compromising on safety.

In addition, PERI UP expedited the scaffold assembly through the internal coupling of the console brackets and at the same time simplified the work on the scaffolding during the complicated wall construction process involving double-shell masonry.

The guardrail in advance for the PERI UP Facade Scaffold also ensured a high level of safety on the construction site. The guardrail also proved its worth for the 67-cm-wide access solutions at the New Campus. It was possible to install the external stair towers in advance and connect them seamlessly to the facade scaffold. The lightweight system components meant that labour and time savings could be made in the process.

Scaffolding company
Schäfer Gerüstbau GmbH,
Munich, Germany

Contractor
Riedel Bau GmbH & Co. KG,
Schweinfurt, Germany

Field service
PERI Germany, Weissenhorn

Roy Deck · Chief Erecting Engineer, **Stefan Polster** · Site Manager
"With PERI UP, we can achieve a smooth transition from shoring to facade scaffolds. Outstanding comprehensive solutions can be achieved when this is combined with VARIOKIT. The 25-cm-grid gives us the advantage of being able to create decking surfaces without trip hazards, even in the case of awkward, circumferential corners. The guardrail in advance featuring the PERI UP Easy Standard affords us and our employees the highest level of safety during the facade assembly process without the need for any additional work."

Foreign Ministry Quarter

Jerusalem
Israel

Contractor
Aviv Group, Ramat Gan, Israel

Field service
PERI Israel, Rosh Ha'ayin

Idan Saidof · Civil Engineer

"In the "Foreign Ministry Quarter", a project consisting of a size and shape that varies from building to building, we are required for creative, changing and logistically adapted solutions. At Aviv group, we have always chosen to work and cooperate with suppliers and contractors who emphasise uncompromising compliance with the strictest standards and planning teams who give an effective planning solution with an emphasis on the needs of the area. These elements are the reason for our choice to work with PERI, a choice we are happy with."

With PERI UP **to new city block**

When completed, the Foreign Ministry Quarter will grace the western entrance to Jerusalem. The architecturally diverse buildings demanded adaptability – child's play for PERI UP.

A new residential complex consisting of five buildings, each with six to eight storeys, was built on the site of the former Ministry of Foreign Affairs of Israel. PERI supported the project in the heart of the New City of Jerusalem by providing around 25,000 m² of facade scaffold, which facilitated the process of mounting the stone cladding on the building facade.

PERI provided support with scaffolding planning from the very beginning of the project. The complex geometry of the buildings meant that the PERI UP system had to be extremely adaptable. This is because certain changes had to be made to the assembly even during the cladding stage. In addition, PERI guaranteed the availability of materials on the construction site, thus ensuring that work progressed smoothly.

PERI UP proved its worth in several ways: the intuitive design of the scaffolding solution simplified the assembly process considerably, as the PERI UP Facade Scaffold requires next to no couplings. Thanks to the low dead weight of the individual system components, the construction site workers were able to conserve energy and the speed of assembly increased, resulting in considerable time savings. Clever touches such as the guardrail in advance, which is installed from the scaffolding level below, also ensured a greater level of safety during the assembly process.

The facade scaffold for the Foreign Ministry Quarter was erected with a system width of 1.00 m to offer convenience to the workers, to provide space for temporary storage of materials and to guarantee safety at the stairways to the next level. The three 33-cm-wide, non-slip decks were installed in a seamless manner, thus eliminating any potential trip hazards. As the system components of the PERI UP Facade Scaffold are all compatible with each other and available in a wide range of sizes, the scaffolding solution could be easily adapted to suit the geometry of any of the buildings.

Waterfront

Waregem
Belgium

Modular scaffolding system **cuts construction time by several months**

In Waregem, a comprehensive project has been implemented that brings together living, working, hotel stays and recreation. After completion of the first phase – an office complex – the two residential towers Ascot and Windsor formed the second construction phase together with a 72-room hotel. The 45-m-high, 13-storey towers house a total of 120 flats.

Three solutions were required for construction of the flats: one scaffolding system for attaching the facade elements and windows, another for the balcony around the building and a third for the cantilevered part that gives the building its special shape. As the two residential towers were constructed at the same time, the timing and sequence of the delivery stages were crucial for a smooth process, in addition to the large amount of material required.

The PERI UP Scaffold System was the answer to all three requirements. On the one hand, it is ideal for the construction of robust facade scaffolding and falsework that have to withstand high loads; on the other hand, the metric grid makes it easy to assemble and connect other PERI system components. PERI UP was used as a combination of facade scaffolding and falsework, which enabled both the installation of the windows and the attachment of the facade elements as well as the construction of the balcony and the cantilevered part of the building. Thanks to its high flexibility and modularity, PERI UP was able to meet all specific requirements of cantilevers and balconies, and to provide a perfect combination of functional scaffolding and adequate support.

The engineers from PERI, who thought through and planned the project in advance, consequently ensured not only the continuous provision of the right material throughout the construction progress, but also punctual delivery – which was indispensable due to the limited storage capacities on site.

Scaffolding company
BELTEK BVBA, Sint-Niklaas, Belgium

Field service
PERI BeNeLux, Boom

Xavier Van Hoye · Owner of BELTEK BVBA
“Our construction site in Waregem posed several challenges. On the one hand, the irregular arrangement and varying dimensions of the terraces necessitated temporary support. On the other hand, the large overhang in both buildings also had to be supported. With PERI UP, the support for the terraces could be connected to the support for the cantilevered floor slabs. In addition, PERI UP was used for the installation of the natural stone facade cladding. This flexibility saved several months of construction time.”

HIGHRISE AND SKYSCRAPERS

Safety and speed through simultaneous climbing

In Incheon, South Korea, only a few kilometres from Seoul, two new luxury residential towers have been built near Central Park. At a height of 140 m, the two buildings together house 351 residential units across 40 floors. The project was shaped by the tight construction schedule, high safety requirements and the desire for low labour costs. The ideal setting for the innovative RCS MAX Rail Climbing System's first outing on Korean soil.

For the construction of the two residential towers, a total of 84 RCS MAX Console Brackets were supplied and divided between the two structures. Assembling the system itself was straightforward thanks to its intuitive plug-and-play configuration. The climbing brackets did not have to be installed by specialised personnel, which meant that labour costs could be kept low from the outset.

The main benefit of the system, however, became apparent during the climbing operation itself. The decentralised hydraulic units ensure a significantly higher level of safety at every stage of the climbing process. This is because the hydraulic units allow all of the console brackets to be climbed simultaneously. This means that personnel are not exposed to hazardous open building edges. The RCS MAX system also stops automatically in the event of a collision or overload and immediately alerts the user to any issues by way of a light signal or the attached display. The system's features gave the construction site team full control at all times and helped to reduce any downtime. What's more, since the RCS MAX system transfers the load via the climbing section below, the platforms can be readied for the next climbing section more quickly.

Consequently, the decision to use the RCS MAX system led to a considerably higher degree of work safety and, at the same time, shortened the construction time of the residential towers. In other words: not only greater safety, but also greater efficiency.

Video

Contractor
POSCO E&C Co. Ltd, Yeongnam, South Korea

Field service
PERI Korea, Seoul, South Korea

Jeong-Soo Kim · Construction Manager
"The PERI RCS MAX system proved to be an exceptionally safe, fast and cost-effective system on our construction site. Compared to split panel systems, it enabled us to achieve our highly standardised level of construction quality. What's more, RCS MAX is very fast and quiet, so we were even able to climb at night despite being in a residential area. I highly recommend the RCS MAX system to clients looking for safe, fast and cost-effective construction options."

Vienna
Austria

Minimised shuttering times through digital monitoring of concrete strength

With its usable floor space of around 70,000 m², the TrIIIple is writing a new chapter in Viennese residential history. An impressive ensemble of three high-rise buildings was built on the banks of the Danube Canal between the city centre and the Grüner Prater recreation area. In addition to privately financed flats, the three buildings also feature micro-apartments for students and young professionals.

The ingenious design of the TrIIIple Towers is characterised by the cantilevers on the 11th and 22nd floors. In terms of constructing the cantilevers, VST Heavy-Duty Towers, which were secured to the building by retaining structures, proved to be the perfect choice. The surface-mounted distribution platform served to accommodate the PERI UP scaffolding. The RCS P Climbing Protection Panel is the ideal solution for ensuring safe working conditions at slab edges and at great heights as well as for ensuring gap-free enclosure of the building shell floors. The rail-guided climbing system thus simplified the work processes carried out on the complex building geometry.

A particular highlight was the use of the PERI InSite Construction Temperature Monitoring and Concrete Maturity Kit. With the sensors used, the temperature was measured at different points in the concrete and the data was loaded directly into the ISC Web Application. This minimised costly waiting times up to the point where the concrete is fully hardened.

The cloud service BIM 360°Field was used to provide digital support on the construction site. Panoramic rendering facilitated immersive access to the PERI solution long before the solution was actually executed. In addition, this ensured that all project data was consistently available on the construction site.

Find out more about PERI InSite Construction on page 138
and about BIM on page 142.

Contractor
STRABAG AG, Vienna, Austria

Project developer
ARE Austrian Real Estate and SORAVIA

Field service
PERI Austria, Nußdorf ob der Traisen

Walter Aspan · Site supervisor
“The tried and tested PERI systems, the overall solution and the technical planning service were the most suitable and cost-effective solution for the TrIIIple project. This made it possible to shorten the construction time by quite a bit. The professional approach to the planning and execution of the site and the cooperation with the PERI team was excellent despite the numerous challenges, such as just-in-time delivery and the tight spatial conditions.”

Salesforce Tower Chicago

Chicago (IL)
USA

Versatile formwork solution for **demanding spatial conditions**

Contractor
Walsh Group, Chicago, IL, USA

Field service
PERI USA, Chicago, IL

Mike Remegi · Carpenter Foreman
"Once again, we have seen the benefits of working with PERI. The team from PERI worked closely alongside our team to deliver a safe and efficient self-climbing core system. The well-designed striking and anchor components made it easier to execute the cyclical schedule."

Salesforce Tower Chicago is the final building to be completed at Wolf Point Plaza, a three-phase project in the heart of the city centre. The 58-storey building towers over the city from its unique location on the banks of the Chicago River and offers ample space for offices and retail outlets. The project team had to deal with the challenges of limited access to and from the site on the main road, as well as cramped conditions.

The inherent lack of space influenced all decisions made before and during the project. A high degree of logistical coordination, meticulous advance planning and just-in-time delivery of all materials were absolutely essential for successful completion of the project.

The building consists of steel structures and a massive, four-cell vertical concrete core that supports the tower. The crane had to be positioned within the core of the building because of the combination of concrete and steel. This meant that the formwork solution had to be adaptable and able to climb without the need for a crane.

The VARIO GT 24 Girder Wall Formwork was chosen, supported by the ACS Core 400 Self-Climbing System, whose innovative hydraulic control unit enabled all four cells to climb simultaneously from cycle to cycle.

In addition, the spacious and stable work platforms of the ACS Core 400 provided safe and convenient access for site personnel. At the same time, the solutions impressed with the adequate space and load-bearing capacity they offered for additional materials and tools. Since the materials could only be delivered once a day, this proved to be hugely beneficial.

© YoChicago.com

© Nick Ulivieri Photography

© Nick Ulivieri Photography

Highest safety standards meet tight construction schedule

GIOIA 22 is setting new benchmarks in terms of sustainability: the 120-m-high tower at the heart of the Porta Nuova district covers 65 percent of its annual energy requirements using renewable energy sources. This makes it the first building of its size in Italy to meet the NZEB standard. Its folding design is not only of aesthetic but also of ecological value.

© Alberto Brevi

The structure consists of a main core with 26 storeys and a secondary core with 13 storeys and provides enough space for approximately 2,700 people, 350 parking spaces and 13 lifts. The special feature: from the second floor upwards, the tower starts to fold in on itself as the slabs get progressively wider as the height increases. A project-specific combination of different systems was required to create the unusual design of the building. For these reasons, the decision was made to combine the SKYDECK Panel Slab Formwork with an additional RCS P system solution to erect the slabs from the second floor upwards. Systematic erection sequences and lightweight system components made it possible to complete an entire floor in a week.

Around 1,000 m² of TRIO Panel Formwork were used to erect the walls of both cores. The TRIO system was combined with the BR Shaft Platform and the RCS C Climbing Formwork for erection of the staircases and lift shafts. A particular highlight was the use of the ACS P Platform System, which enabled the 32-m-long concrete pump to be moved from floor to floor.

Safety at the construction site was of paramount importance in spite of the tight schedule: the RCS P Climbing Protection Panels were used for gap-free enclosure of the floors in the building shell. In addition, over 4,000 running metres of PROKIT were used as fall protection at the edge of the building.

© Alberto Brevi

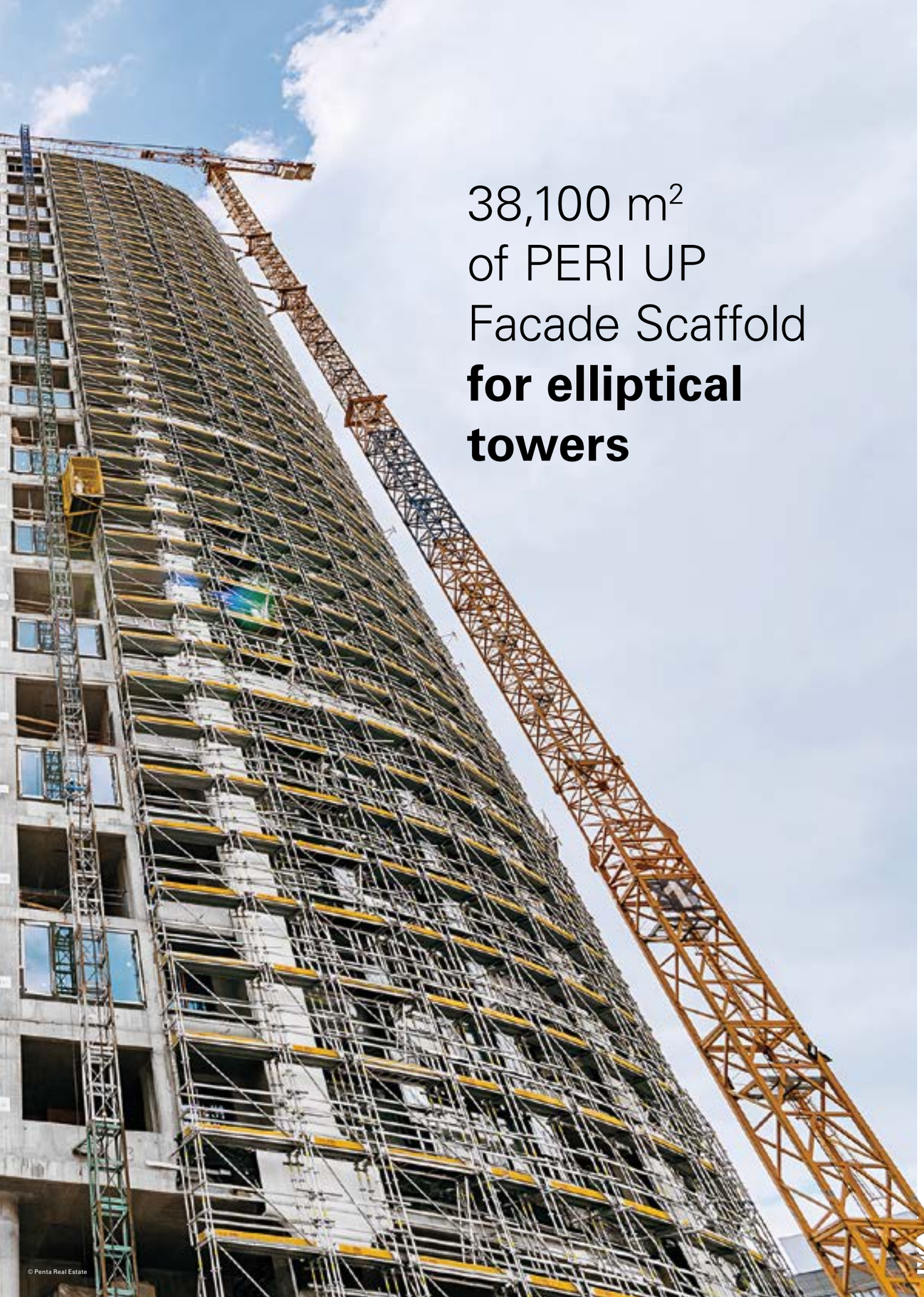
Contractor
Colombo Costruzioni S.p.A., Lecco, Italy

Field service
PERI Italy, Agrate Brianza

Gianluca Arconi · Site Manager

“This is an exceptional and structurally complex construction, that combines state-of-the-art technologies and project-specific systems in order to manage the progress of the concreting operations in an optimum manner. Thanks to the technical and operational cooperation between Colombo Costruzioni S.p.A. and PERI Italy, it was possible to stick to the tight schedule throughout this construction project while always making the safety of each individual worker the number one priority.”

38,100 m² of PERI UP Facade Scaffold **for elliptical towers**



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The new cultural hub in Bratislava's former industrial area bears the signature of Zaha Hadid: the three residential complexes stand out by virtue of their elliptical design, with each of them providing living and relaxation space across 31 storeys.

For the construction of the three residential towers, PERI delivered 38,100 m² of scaffolding material weighing 850 t to the site in Slovakia. On account of the high axial forces, the PERI Scaffolding System provided the optimal solution for erection of the facade. In the lower section, which reaches a height of 25 m, PERI UP Shoring was used as this guaranteed a high degree of load-bearing capacity and versatility. The PERI UP Facade Scaffold was chosen for the upper section.

In addition, a combination of the RCS Rail Climbing System and VARIO formwork proved to be the optimal choice for concreting operations carried out at height: in each case, a VARIO panel climbed upwards in 50-cm-increments together with an RCS Platform. The system could be adapted quickly and easily to the shape of the building because the individual VARIO panels could also be specially adapted. This also made it possible to form the slab edges. The foundation slab, exterior walls, ceiling slabs, stairs and lift shafts were formed with TRIO. The MAXIMO Formwork System, which can be operated from one side and features panel heights of 300 cm, was used for the interior walls.

The planning and execution phases of the residential building project were extremely complex due to the elliptical shape and the height of the building. Thus, two different teams were involved in the planning phase of the project: PERI engineers from Slovakia and the Czech Republic worked together to design a customised solution that met the requirements of the contractors involved in equal measure.

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Contractor
PSJ Concrete, a.s., Prague, Czech Republic
INGSTEEL s.r.o., Bratislava, Slovakia

Field service
PERI Slovakia, Senec
PERI Czech Republic, Jesenice u Prahy

Miroslav Petija · Chief Erecting Engineer
"For the SKY PARK residential towers, we decided to use the PERI Facade Scaffold again because we'd had good experiences in the past. The biggest challenge was the delivery and assembly of a large amount of scaffolding, which reached a height of almost 100 metres on all three towers at the same time. Considering the versatility and complexity of the services offered, PERI has proven once again that they are a reliable partner."

ONE by CA Immo

Frankfurt
Germany

Complex geometry made possible by **customised cantilever solution**

With 49 storeys and a height of 190 m, the skyscraper ONE by CA Immo enhances the skyline of Frankfurt's exhibition centre. The complex is particularly striking due to its triangular cantilever on the 33rd floor. It is visually reminiscent of a "1" – and gave the building its name.

A fundamental feature of the project was the large yet small-scale core with its constantly evolving cross-section. To cope with this level of complexity, the ACS P and ACS G Self-Climbing Systems with trailing wall formwork were used. The RCS Rail Climbing System was used to form the front side. Rail-guided climbing enabled flexible adaptation to all structural conditions – without any loss in terms of time and safety.

The engineering highlight was the formwork of the triangular cantilever at a height of around 125 m. Support units made of RCS Climbing Rails and special connectors were produced especially for this project.

The bracing within the support units was implemented using horizontal ledgers and diagonals of the VST System. A total of three different types of console bracket units were attached to the building in order to transfer loads into the building via a statically determined system. A shoring and working scaffold was then erected on two girder grids with components from the PERI UP Scaffolding Kit. The optimal compatibility of formwork and scaffolding from a single source allowed the slab formwork to be fixed to the head spindles of the PERI UP System Components.

The fact that the support units could be prefabricated at various PERI sites saved valuable space at what was already a cramped urban construction site. The interplay between PERI standard systems and individual system solutions also made it possible to complete the standard floors in weekly cycles.

Contractor
HOCHTIEF Infrastructure GmbH
Building, Frankfurt, Germany

Field service
PERI Group, Weissenhorn
PERI Germany, Frankfurt

Hans-Peter Roth · Senior Foreman
"All elements that could be pre-assembled were delivered to the construction site ready for use. Once the ACS and RCS Climbing Systems were installed, the formwork could be completed in a very short space of time. The technical support provided by PERI is absolutely outstanding."

Marina East Tower

Ayia Napa
Cyprus

Complex building geometry enhances Ayia Napa’s marina

The East Tower is part of the new complex at Ayia Napa's marina. At 115 m high, it provides 29 floors of space for apartments and shopping in the busy neighbourhood, offering a bustling environment for residents and guests alike. The building's T-shaped ground plan rotates 1.6 degrees per floor around the round core, making it a unique sight from land and sea.

The circular building core was realised with a coordinated system combination consisting of the RCS Rail Climbing System and the individually adaptable VARIO VT 20 Girder Wall Formwork. The interconnected system elements provided an excellent level of stability, thus preventing the platforms lifting off even under high wind loads. An important component of the twisting tower is its inclined columns, which extend from the ground up to the highest floors. SRS Round Steel Columns made it possible to achieve the desired inclination and at the same time ensured that the concrete has a high-quality appearance. The crane-free assembly process also resulted in valuable time savings.

The decision to opt for SKYDECK and VARIODECK ensured that the curved slab panels surrounding the circular core could be formed quickly and safely. They ensured that the assembly process was systematic and that the work procedures were ergonomic and less strenuous. In addition, the panel sizes of the standard system allowed for small infill areas despite the curved geometry of the ceiling slabs. Time and material-intensive construction site solutions made of timber were thus kept to a minimum, which also resulted in cost savings.

Contractor
TERNA OVERSEAS LIMITED, Nicosia, Cyprus

Field service
PERI Hellas, Koropi

Ilias Pavlidis · Site Manager
“On this demanding project, PERI proved to be a valuable and reliable partner that used its sophisticated equipment to meet the structural requirements of the twisting towers. The engineers from PERI Hellas also played their part in ensuring that the project ran smoothly by providing intelligent solutions and offering their support and expertise.”

Working safely on an iconic towers despite wind and height challenges

© Marcel Steinbach

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Contractor
Rizzani de Eccher, Pozzuolo del Friuli, Italy

Field service
PERI BeNeLux, Schijndel
PERI Group, Weissenhorn
PERI Competence Center Engineering, Algete, Spain

Ciro Menna · Site Manager
"For this large and complex project in the centre of Amsterdam, we decided to work with the leading supplier in the formwork industry: PERI. We knew PERI from projects in Italy and were familiar with the construction systems and working methods. In a project of this magnitude, it is important that the material is always available at short notice. Because PERI has a stockyard nearby with an enormous range of different construction systems, we were not short of anything. PERI is a reliable partner for us in such complex projects."

The construction of the Y-Towers has seen the arrival of a new residential and hotel complex in the modern residential district of Overhoeks, which is located on the banks of the river IJ in the centre of Amsterdam. As part of the iconic skyline, the two towers, 102 m and 110 m high, not only add aesthetic value but also offer numerous leisure opportunities for visitors.

PERI made its mark with system-integrated safety solutions for the complex construction of the Y-Towers in Amsterdam. The SKYDECK Panel Slab Formwork met the exacting safety requirements as soon as the base erection began. Due to the lightweight and handy system components, shuttering times were short and the site personnel were able to work quickly while conserving energy. This solution was combined with robust MULTIPROP Aluminium Slab Props as well as the PROKIT Guardrail, which provided site personnel with reliable protection at the outer edges.

The building core of both towers was constructed with the help of an economical system combination consisting of the RCS Rail Climbing System, the VARIO GT 24 Girder-Wall Formwork and MAXIMO Panel Formwork. Enormous wind loads were considered a particular challenge here, which is why both towers were equipped with an RCS P Climbing Protection Panel. This allowed for safe working processes at great heights and minimised the risk of falling parts. The ACS Self-Climbing System also simplified the process of moving the concrete spreaders upwards and eliminated the need for a crane.

For the construction of the staggered balconies of the residential tower, PERI overcame the technical challenges with a special-purpose solution for the project. The engineers developed a special platform system consisting of SKYDECK and VARIOKIT, creating a self-supporting construction. In addition to facilitating erection of the balconies, this solution also created a secure working position for the facade builders.

© Marcel Steinbach

Swift and simple climbing in Poland’s capital

The Generation Park office complex consists of three office buildings: X, Y and Z. The tallest tower in the complex, Tower Y, projects a full 38 storeys upwards. One of the major highlights of the building is the leafy terrace on the 35th floor, which offers a spectacular view over the city centre of Warsaw from a height of around 127 m, and, at the same time, creates a visual fissure between the idyllic natural surroundings and the bustling metropolis.

The project in the heart of the Polish capital presented numerous challenges in terms of economic feasibility and cost efficiency. PERI found a suitable solution with the SKYDECK Panel Slab Formwork, as the low intrinsic weight of the panels meant that they could be mounted and moved without a crane. At the same time, it allowed the site workers to conserve energy. The clever drophead also allowed the formwork striking process to be carried out ahead of time, thus facilitating the swift handling of materials. For the high ceilings of the Sky Office, the system was supplemented with MULTIPROP Aluminium Slab Props, which have a high load-bearing capacity despite their low weight.

The decision to use the two climbing systems RCS and ACS significantly increased the level of safety on the construction site. Both systems are characterised by their consistent assembly, which minimises potential trip hazards.

Contractor
General contractor Skanska Inc., Warsaw, Poland

Field service
PERI Poland, Płochocin

Wojciech Sokalski · Site Manager
“Generation Park is a construction site where we put our trust in the technologically advanced PERI ACS and RCS Self-Climbing Systems. The ACS System is straightforward to use. You could even call it intuitive. The formwork can be stripped in an ideal manner thanks to the abundance of space in the shaft chambers. What’s more, the fact that the RCS system climbs so quickly means that fewer technical interventions need to be made.”

The RCS P Climbing Protection Panel also protected the construction site team from gusts of wind at great heights and eliminated the risk of objects falling onto city traffic from the outset. Overall, great emphasis was placed on safety throughout the project, as demonstrated by the safety competition for children organised by the project developer. The winning picture was even emblazoned on a huge banner. The ACS Self-Climbing System climbed hydraulically during the process of forming the four shafts in the building core, and impressed workers with its simple and intuitive operation.

© Yochicago.com

Hitting the heights safely: Vitreous elegance for Chicago's skyline

These two tapered glass towers are a real head-turner in the heart of Chicago. The 296 m high Tower A is the sixth tallest building in the city and houses 276 rental units and 77 freehold flats across 74 floors. A central podium connects it to the 175 m high Tower C, which, like its big brother, has a viewing platform. Altogether, the towers cover a surface area of over 200,000 m².

The ACS Core 400 Self-Climbing System ensured that the tower cores could be erected quickly and safely. The climbing system minimises fall and trip hazards by enabling the platforms to climb simultaneously on the inside and outside, thus increasing the level of safety for the construction site team. In addition, the powerful cylinder facilitates a swift climbing speed of just 20 minutes per floor, resulting in cost and time savings.

The RCS Rail Climbing System was used for the exterior walls. This climbed the facade with the help of crane lifts and simultaneous hydraulic support. To curb the enormous wind loads at these heights yet still allow daylight to enter, the rail climbing system was cleverly combined with LPS – a climbing protection panel with a mesh enclosure. The system combination therefore improved the degree of work safety at the higher levels, while passers-by and personnel on the ground were also well protected.

In addition to the products, PERI also provided drawings and technical support from its own engineers and also assisted with the coordination of all formwork and scaffolding processes on the construction site.

© Yochicago.com

Contractor
James McHugh Construction Co., Chicago, IL, USA

Field service
PERI USA, Chicago, IL

Tom Kruszewski · Superintendent
"The project had an aggressive schedule requiring all four phases of the project to be constructed simultaneously [...]. The construction sequence required a complicated core formwork solution that started in a forty-foot-deep earth retention system, various crane lifted walls and a complete perimeter of windscreens on both towers. McHugh Construction selected PERI to supply and engineer the formwork that was instrumental in completing the project efficiently and ahead of schedule."

Landmark TLV

Tel Aviv
Israel

Contractor
Electra Construction LTD, Ramat Gan, Israel
Danya Cebus LTD, Or Yehuda, Israel

Field service
PERI Israel, Rosh Ha'ayin

Gal Dagan · Project Manager
"With a complicated project like the Landmark TLV, it is necessary to have an experienced design team on hand to find creative solutions. PERI gave us optimal support with their services."

Speed and safety
during skyscraper construction

PERI supported the construction of a modern building complex in Tel Aviv's new trendy district of Sarona. The approximately 200-m-high Landmark TLV skyscraper consists of two towers for flats and offices, which are connected via a shared atrium and a bridge. With efficient system solutions, PERI helped to meet the tight construction deadline of just two years.

For the erection of the ascending building core, PERI engineers designed a combination of CB 240 Climbing Formwork and VARIO GT 24 Girder Wall Formwork. The economical system solution reduced the required crane times during construction. After striking, it was also possible to climb the platform and formwork simultaneously with just a single crane lift. This saved time and money right from the start – and without having to make any compromises in terms of occupational safety or concrete quality.

The safety of all those involved in the construction had the highest priority during the project. For example, RCS P Climbing Protection Panels were fitted to the outer edges to protect the construction staff on the upper floors from wind loads. At the same time, the panels ensured greater productivity, as the workers were able to carry out their tasks unhindered in spite of the great height.

For the lower floors, PERI engineers came up with another impressive solution. PERI UP was used as a shoring solution for the construction of the bridges. The metric system grid offered flexibility during the assembly process and thus facilitated design operations. The lightweight system components also sped up the assembly of the entire shoring, and at the same time ensured the safety of the workers.

Sustainable guardrails **for safe work operations at the slab edge**

The 81 m high Hotel A Tower is located in the heart of the Slovenian capital Ljubljana and consists of five underground and 22 above-ground floors. Upon completion, the main section of the building will form a glass square across three floors, resting on an elliptical roller, giving the impression that it is floating above the ground floor. PERI supplied optimally coordinated formwork and scaffolding solutions to bring the unusual building design to life.

A Tower

Ljubljana
Slovenia

TRIO Wall Formwork was used to form the walls and the rectangular columns of the underground floors. It was possible to connect the panels securely and quickly using the BFD Coupler, which can be operated with one hand, thus achieving a high level of efficiency. SRS Steel Circular Formwork was used for the circular columns with varying diameters. This way, it was possible to achieve the architectural concrete quality desired by the customer.

In addition, the PERI solution included various slab formwork systems which impressed with their high level of safety and flexibility. For example, MULTIFLEX Girder Slab Formwork, which could be easily adapted to suit the geometry, was used for the garage driveways. The building slabs were constructed with SKYDECK Panel Slab Formwork, whose drophead facilitated early striking and thus saved costs. The planning work carried out by PERI engineers made it possible to use the formwork material from the lower floors for the other floors, which reduced costs even further. To compensate for the difference in height of the various floors, PERI supplied PEP Props in different lengths which could be quickly and safely adjusted to the respective height.

Finally, VARIODECK Slab Tables were used for installing the slab panels at the edge of the building on the upper floors. This enabled large slab areas to be formed in a very short space of time. When combined with the PROKIT Safety System, a high level of working safety was ensured at great heights. This was also done sustainably, as there was no need to use timber as lateral protection.

PERI's comprehensive solution was rounded off with PERI UP Stair Towers, which provided safe and straightforward access to all floors of the construction project.

Contractor
Homplan d.o.o., Kranj, Slovenija

Field service
PERI Croatia, Zagreb
PERI Slovenia, Maribor

Muzafer Rujović · Project Manager
"The safety of our site personnel was our priority and the PERI PROKIT Lateral Protection enabled us to work comfortably and safely without any concerns. The support we received from PERI from the planning phase right through to the final realisation of the project is the reason why we are always keen to work with this supplier. This time PERI demonstrated their reliability with just-in-time deliveries, which meant that this city centre construction site ran flawlessly."

Rapid construction progress thanks to PERI climbing solutions

The new 150 m tall residential tower CoolTower has been built in the middle of Rotterdam's lively city centre, between the Witte de Withstraat, the Schiedamsedijk and the Vasteland. With its striking crown as an eye-catcher, it blends into the Rotterdam skyline – and offers space for an impressive entrance area and 283 high-quality flats on 50 floors. The attractive residential project was carried out with an optimally coordinated combination of PERI formwork and scaffolding materials.

Each of the flats has its own balcony, made possible by the building's fully load-bearing core. This was concreted using the ACS R and ACS P Modular Self-Climbing Systems in combination with VARIO GT 24 Girder Wall Formwork. The self-climbing solution scored particularly highly with its speedy processes for shuttering and striking, as well as the integrated hydraulic system, which enabled a rapid concreting cycle for the core walls of just six days. The BR Platform Beam was used to support the inner shaft formwork.

Safety was the top priority during the work. To protect the construction site team from wind and weather, the RCS P Climbing Protection Panel was therefore used during the shell construction phase. In addition, the team decided to use the RCS MAX Rail Climbing System for the first time in the Netherlands, a system which features synchronous climbing of all platforms. Falling edges could thus be avoided and safety increased. In addition, components of the PERI UP Scaffolding Kit ensured safe working at various points of the project in the form of scaffolding and stair towers.

Contractor
Ballast Nedam N.V.,
Nieuwegein, The Netherlands

Field service
PERI BeNeLux, Schijndel

Volkan Beskardesler · Site Manager
"When building the CoolTower, the unique design presented us with challenges that required sophisticated solutions. For this reason, we decided on the know-how and experience of PERI. [...] The flexibility and variety of the systems played just as much a role as PERI's engineering expertise and solution-oriented thinking, especially with the tight schedule and unique facade."

Complex core geometry **on a 6-day cycle**

The South Quay Plaza 4 project represents the second phase of construction of the South Quay Plaza residential development in London's Canary Wharf financial district. At 56-storeys high, the new skyscraper will offer space for around 400 residential units when completed. Due to the excellent cooperation during the construction of the first tower in 2018, PERI systems were also used for the construction of the second tower. For a high degree of cost-effectiveness, PERI engineers – wherever possible – incorporated the existing materials from the first construction phase into the second solution.

For the complex geometry of the core, the ACS Self-Climbing System was the preferred choice. The building core was divided into two climbing zones in order to achieve the concreting sequence required by the customer in an efficient 6-day cycle. This allowed the installation of reinforcement bars and fixings on one half of the core, while the concreting process was already in full swing on the other half.

The hydraulic climbing capabilities of ACS reduced crane operation, meaning that the latter was primarily used to transport the reinforcement cages to the working levels. The fully enclosed PERI climbing solution for constructing the core external walls consisted of 3.30-m-high elements of the single-side-operable MAXIMO Panel Formwork in combination with the ACS G Climbing System with cantilevered gallows, which facilitated concreting of the wall and slab in a single pour, thereby helping the team stick to the demanding 6-day cycle. In addition, a total of four ACS P Platform Systems were used for the interior walls - two of which had built-in hatches to facilitate the concreting process and to install the stairs. Two other, smaller ACS P solutions were used for climbing the shafts. Attached PERI UP 75 Stair Towers provided emergency access to the levels below.

Due to the very confined space and limited storage area, just-in-time deliveries were crucial for the success of the project. To limit the amount of material required and simplify the assembly process, over 80 formwork elements were delivered to the construction site prefabricated and were then completed on site. PERI's digital services were a great help in providing project support. For example, 3D models of the structure were created to visualise the climbing sequence, enable clash detection and identify spatial limitations in advance.

Contractor
Expanded Structures Ltd, Kent, UK

Field service
PERI UK, Rugby
PERI UK, Brentwood

Brad Allen · Project Engineer
"For the planning and briefings, we used the digital 3D model from PERI. The result was great, as it allowed us to capture the detail and lifecycle of the ACS Climbing Formwork from erection to operation to the dismantling stage. The team at PERI were proactive in meeting our needs with engineered safety at the forefront of their solutions."

Swift construction progress despite high wind loads and limited space

One of the tallest office buildings in the city is being built directly on the Marseille coast. The 85 m high building has 21 floors of state-of-the-art, energy-efficient office space with views of the sea and the neighbouring city. PERI supported the three-year project by supplying a wide range of systems.

The immediate proximity to the Mediterranean Sea not only meant that space was limited during the construction phase, but also led to special requirements in terms of safety. The high wind forces, for example, proved challenging. By using the LPS Climbing Protection Panel for enclosure purposes, however, the workers were effectively protected from the high wind loads even at great heights and the possibility of falling objects was ruled out.

The RCS C Rail Climbing System used for the construction of the facade also ensured a high level of work safety, with the climbing unit being securely connected to the structure at all times via the rails.

The climbing system was combined with the MAXIMO Panel Formwork, which resulted in a very high level of concrete quality. Furthermore, the self-climbing system with its retractable formwork not only minimised the number of crane lifts required, it also sped up the climbing process at the same time, as only a handful of climbing shoes were needed.

With SKYMAX, another PERI system was used, this time for forming the slabs – 1,000 m² of slab formwork was used for this. The low dead weight of the SKYMAX Panels of just 32 kg sped up the shuttering process considerably and made the work processes less strenuous. The lowering head also facilitated prompt striking of the formwork, resulting in lower on-site material requirements. This, in turn, was beneficial in view of the cramped conditions on the construction site.

Contractor
Léon Grosse Provence, Aix-en-Provence, France

Field service
PERI France, Rognac

Nicolas Alcaraz · Site Manager
“The technically complex Tour Mirabeau was constructed in an environment that was difficult to access. The proximity, responsiveness and expertise of the PERI engineering team enabled us to carry out the work without any issues – and using the systems that were best suited to the task. By using the PERI LPS, RCS and SKYMAX systems, all safety aspects could be complied with and swift construction progress achieved.”

CULTURAL BUILDINGS

Red architectural concrete for the Polish Army Museum

Some aspects of the history of the Polish army were previously housed in the National Museum of Poland. In order to be able to combine a greater number of exhibits with multimedia experiences and thus present the history of the military in an even more exciting way, a museum of its own has now been built on the historic grounds of the Warsaw Citadel. PERI met the high requirements for the red, patterned architectural concrete with a custom-made yet cost-efficient formwork solution.

The walls of the new 11 m high building were to consist partly of smooth concrete and partly of chevron-patterned concrete. This required the use of high-quality formwork panels and customised plastic matrices. These were bonded in the PERI pre-assembly plant and then delivered to the construction site.

In order to withstand the extremely high concrete pressure of 90 kN/m² in the ideal manner, the formwork solution was based on VARIO GT 24 Girder Wall Formwork. The individually prepared FinPly Maxi formwork panels with a height of 8.10 m and a width of 2.40 m produced the ideal architectural concrete result – irrespective of whether the surface was patterned or smooth. Timely material supply and the option of using only one type of formwork for erecting structural and pressure walls meant that the concreting work could be carried out in weekly cycles, thus saving time.

The formwork solution was rounded off by the PERI UP Scaffolding Kit. The 8 m high mobile reinforcement scaffolds made it easier for the site personnel to carry out formwork work at great heights and at the same time ensured a high level of working safety. In addition, concreted wall sections were supported with PERI UP in the form of a shoring solution to prevent the structures from sinking.

Contractor
Consortium: IDS-Bud Inc. & Mar-Bud Budownictwo LLC, Warsaw, Poland

Field service
PERI Poland, Płochocin

Sławomir Bogucki · Deputy Head of Technical Issues

"The Polish Army Museum construction project was one of the most difficult projects I have had the privilege of undertaking due to the very high architectural concrete wall requirements. PERI's significant experience, the sophisticated technological concept, the quality of the initial assembly and the efficient logistical service all played their part in enabling us to carry out the work entrusted to us in an efficient way."

The REACH
Kennedy Center
for the Performing Arts

Washington, D.C.
USA

Highest architectural concrete quality with standard and special-purpose formwork

The building extension at the imposing Kennedy Center for the Performing Arts comprises three interconnected pavilions that stand out due to their exceptional architectural design and architectural concrete of the highest quality, which includes white in-situ concrete and various chequerboard patterns. The project won the American Concrete Institute's Overall Excellence Award in October 2020.

With its 12.90 m high ceilings and wave-shaped wall, the Skylight Pavilion is one of the highlights of the project. The wall has a continuous curvature that runs both vertically and horizontally. As such, every free-form box supplied by PERI needed to be custom-designed. To this end, a 3D model that created a virtual depiction of the wall was developed, thus paving the way for the development of project-specific PERI special formwork. The high fresh concrete pressure of around 100 kN/m² resulted in a stripping force of over 120 kN and a horizontal force of over 420 kN in the uppermost concreting section. Since the two forces were working in opposite directions, the stop-end ended up being twisted.
These significant demands called for a far stronger stop-end system assembly than what is typically required in a standard case. Heavy-duty standard products from PERI, such as the RCS Rails, were used. In this way, a torsionally stiff yet cost-optimised system was used, which was held in position by anchors in the ground.

Because of this high horizontal force, PERI engineers developed a specific solution to ensure that the high forces acting on the moulding boxes could be transferred. For this purpose, a tension-compression system (TCS) was designed and deployed. This saw the panels connected horizontally so that the load could be gradually transferred to a supporting structure system instead of to the adjacent panels.
This prevented the panels from being overloaded.

For the slab formation process, the flexibly applicable MULTIFLEX Girder Slab Formwork was the preferred choice throughout the entire project as it allowed the architectural concrete surfaces to be formed to the quality standards expected of PERI. In addition, SKYDECK Panel Slab Formwork was used for the slabs of the underground car park. SKYDECK's lightweight system components allowed the construction site team to conserve energy during the construction process. The majority of the bracing was assembled with components from the VARIOKIT Engineering Construction Kit.

©: Cowles Graphic Design

Client
Lane Construction Corporation, Cheshire, CT, USA

Architect
Steven Holl Architects, New York, NY, USA

Field service
PERI USA, Elkridge, MD

Josue Leon · Project Manager
"On the Kennedy Center expansion, the concrete is the project. It required a lot of coordination because there was so much curvature, and not something that could be easily built. We needed architectural buy-in that what we were building and what we were providing was correct. And that all had to be all done prior to PERI manufacturing a single form."

©: Cowles Graphic Design

New stadium for NK Osijek

Osijek
Croatia

Flexible system combination ensures **rapid construction progress**

The stadium for local football club NK Osijek in the largest city in eastern Croatia is the first fully covered stadium in Croatia. PERI made a significant contribution to the successful implementation of the project by providing a flexible system combination of VARIO GT 24 Girder Wall Formwork, the PERI UP Scaffolding System and DOMINO Panel Formwork.

With its dimensions of 188 m x 150 m, a height of 22.50 m and a total area of 15.50 ha, the stadium will offer seating for almost 13,000 spectators upon completion. A total of around 53,000 m² of formwork was used for the monolithic construction of the stadium, which consists of a total of 4,000 m³ of concrete and 2,150,000 kg of reinforcing steel.

The lightweight DOMINO Panel Formwork proved to be the optimal choice for the foundation. The small-format, lightweight elements with recessed tie points are easy to handle, meaning that swift construction progress could be made. The foundation beams themselves rest on a total of 578 piers at a depth of 10 m, which were built using the jet-grouting method.

In order to achieve a high degree of efficiency for the inclined beams of the grandstand with the architectural concrete quality required, the decision was made to use a solution based on the PERI UP Scaffolding Kit in combination with VARIO GT 24 Girder Wall Formwork, whose pre-assembled formwork elements were optimally adapted to the complex geometry and the required height. VARIO GT 24 ensured an excellent surface result and, in combination with PERI UP, was also the preferred choice when it came to constructing the monolithic, 11 m high external wall of the stadium.

Together with the site managers, PERI engineers also worked out a solution for the west stand, which houses the changing rooms, press lounges, VIP lobbies and other accompanying facilities: In order to achieve swift construction progress with as little manpower as possible, the slabs were constructed with SKYDECK Panel Slab Formwork. The easy-to-handle system components made for a systematic and simple assembly process, and the sophisticated drophead system minimised the shuttering times. TRIO Panel Formwork was used for the stair core and the lifts. Thanks to the SRS Column Formwork, it was also possible to safely construct all round columns with a diameter of 80 cm and high-quality concrete surfaces.

Contractor
Eurokamen d.o.o., Osijek, Croatia

Field service
PERI Croatia, Zagreb

Hrvoje Sučić · Chief Surveillance Engineer
Marko Ilić · Construction Site Engineer
"To carry out this complex project involving a large amount of raw material, we needed the support of a reliable and high-quality formwork and scaffolding supplier. The exceptional flexibility of the PERI systems offset all of the construction-related challenges. We were particularly impressed by the SKYDECK formwork, which enabled us to achieve a significantly better outcome than would be possible with traditional slab formwork."

Customised special-purpose formwork **reduces construction costs**

The new Indoor Tennis Centre at Kuwait University provides athletes and students with 7,100 m² of space for their daily training regimes. With its dome-shaped roof in the style of Islamic tradition, the sports facility is particularly impressive from the outside. PERI planned and delivered a project-specific solution that would enable the construction site team to construct the architecturally demanding dome-shaped building in an efficient manner.

Contractor
Societe d'Entreprise & de Gestion Qatar (SEG Qatar), Doha, Qatar

Field service
PERI Kuwait, Kuwait City
PERI Group, Weissenhorn

Robert Bou Chedid · Engineering Manager
"The combination of different PERI formwork and shoring systems and the support provided during the 3D model planning process were of paramount importance for the realisation of the complex dome shape."

Indoor Tennis Center
Kuwait University

Al-Shadadiya
Kuwait

The facade of the 25 m high tennis centre was constructed using a total of eight concreting heights. To apply the limestone Trencadis mosaics to the thin reinforced concrete ceiling as part of the finishing work, triangular recesses were included in the construction. The recesses, which are found at different heights of up to 11 m, feature up to 120 round openings, each with a diameter of 20 cm. These form a fine mesh and ensure that the sports venue, which is over 80 m wide, is flooded with sunlight in a unique way.

Engineers from the Technical Office of the PERI Group designed the 3D structural models and 3D plans used in the construction process based on the building plans. Customised 3D special-purpose formwork elements were used to construct the curved reinforced concrete walls with different-sized recess boxes and varying wall thicknesses of between 20 cm and 30 cm. The static load-bearing elements were based on the VARIO GT 24 Girder Wall Formwork. Once the construction site personnel had been trained by a PERI supervisor, the 3D formwork units were assembled directly on site.

The significant spatial restrictions, limited crane availability and overlapping schedules for other work, such as the installation of grandstands, presented logistical challenges. Given the fact that the design of the curved walls is repeated horizontally within a single concreting height, it was possible to use exactly the same special-purpose formwork elements up to four times in each concreting process. This lowered manufacturing costs and also saved valuable assembly time.

A combination of PERI formwork and shoring solutions was used in order to achieve the desired shape of the building and meet its demanding architectural requirements. Thanks to the 25 cm or 50 cm end-to-end system grid and the possibility of combining it with SRU Steel Walers from the VARIOKIT Engineering Construction Kit, it was possible to optimally adapt the PERI UP Scaffolding System to the various geometries and loads of the freeform formwork by way of a load-bearing construction. In addition, the shoring system was deployed as a safe and stable working platform for the construction site team.

Albert Einstein Education and Research Center

São Paulo
Brazil

PERI engineering expertise **ensures the most stringent requirements are met**

For the construction of the new research centre of the Albert Einstein Hospital covering around 23,300 m², the PERI team put in a top performance: The special building geometry and the highest requirements for the architectural concrete in combination with tight time and cost specifications called for skilful engineering and a specially coordinated range of PERI products, which included pre-assembled freeform formwork.

Contractor
Racional Engenharia Ltda,
São Paulo, Brazil

Field service
PERI Brazil,
Vargem Grande Paulista

Nivaldo Santos · Project Manager
"PERI's performance was excellent, both in the development of technical solutions and in day-to-day work on site, especially when it came to upholding the signed contract, management of materials and maintenance. The best example of this excellent performance was the strategic approach to the garden in the atrium area. As early as during the planning phase, it was already clear to us that PERI, together with Racional Engenharia, was the right company for this great challenge."

The new research centre will extend the hospital's success as a leading institution in Central and South America. Gardens inside and outside the building, a facade with the highest requirements for the architectural concrete surfaces with a low number of tie points, double-curved walls in the atrium and large areas with flat slabs are what characterise the complex, which brings new splendour to the cityscape of the Brazilian metropolis of São Paulo.

The preliminary planning for the formwork solutions was carried out in close cooperation with the contractor Racional, and in the end, the wishes of the architectural office were even exceeded: For the curved walls of the atrium with an area of 1,000 m², custom-made PERI Freeform Formwork was used, which was covered with special formwork panels so that the required architectural concrete surface could be achieved efficiently.

PERI delivered the formwork units pre-assembled to the construction site, which saved both time and assembly work.

In addition, an outstanding architectural concrete solution with few tie points was also required for the large-scale facade walls. PERI engineers decided to use a total of around 8,100 m² of VARIO GT 24 Wall Formwork. Thanks to the flexible arrangement of the beams and ledgers, the formwork was optimally adapted to the shape of the building and created walls in an attractive architectural concrete quality. Given the fact that the formlining could be freely selected and the ties positioned as required, it was possible to bring the planning specifications of the architectural office to life. Thanks to the PERI solution encompassing planning, pre-assembly and suitable formwork, it was also possible to fulfil all time, cost and safety requirements.

Faculty of Governance, Economic and Social Sciences, Mohammed VI Polytechnic University

Rabat
Morocco

Adherence to nine-month construction period thanks to comprehensive PERI solution

During the construction of the new campus of the Mohammed VI Polytechnic University (UM6P) in Rabat, PERI defied the demanding construction schedule of only nine months with its impressive show of reliability and customer focus and helped to carry out the project in accordance with strict safety standards. A comprehensive overall solution from a single source was used, including the new ALPHADECK and HANDSET Alpha Panel Formwork as well as PERI UP scaffolding solutions.

Adherence to the tight shell construction time of only nine months and the fulfilment of all existing safety requirements were the top priorities in this construction project. The customer was convinced that PERI could provide a comprehensive solution that took both safety and time aspects into account. On the one hand, PERI developed a detailed safety concept which was compelling by virtue of the system-integrated safety features of the PERI products and was therefore able to pass even the most stringent inspections. On the other hand, PERI was able to stick to the tight construction schedule thanks to coordinated logistics processes and on-time delivery of materials.

A total of 2,000 m² of ALPHADECK Slab Formwork was used for the slab area. The particularly lightweight system components made it possible to work without the use of a crane, while at the same time maintaining a high level of efficiency. It was possible to increase the level of safety on the construction site by systematically shuttering and striking the formwork from the level below. The drophead system allowed for early striking and rapid cycle sequences meaning that the panels were soon ready for the next section.

In addition, tried-and-tested girder formwork consisting of a total of 16,000 m² of PERI formwork panels as well as 30,000 linear metres of VT 20 Girders were used on the site. PERI also made its mark here with high quality materials that were immediately available. LIWA and HANDSET Alpha Panel Formwork were chosen for the process of erecting the foundation.

The advantage: the formwork systems could also be used manually, without the need for a crane. This resulted in considerable time savings.

Around 600 t of scaffolding material completed the overall solution: The PERI UP Scaffolding Kit was used as falsework, working scaffolds and access scaffolds. Thanks to the guard-rail in advance and non-slip, anti-lift decks, PERI UP ensured the highest level of employee protection. In addition, PERI engineers were on hand to assist the customer on site every day, making a further contribution to the seamless progress made at the construction site.

Contractor
SOGEA MAROC Ltd, Oued Ykem Témara, Morocco

Field service
PERI Morocco, Skhirat

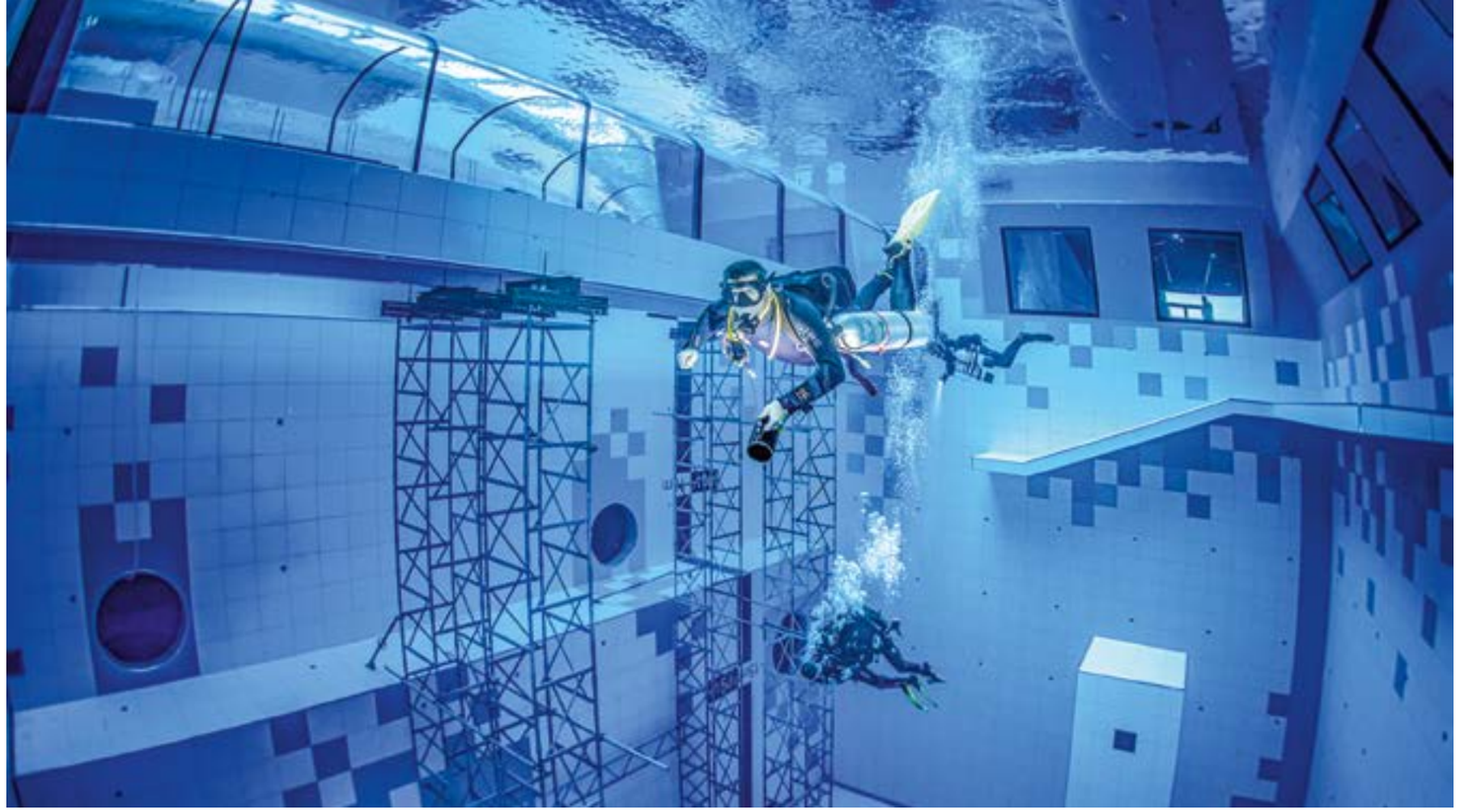
Said Benzekri · Head of Development
"We opted for PERI products for three reasons. The materials offered meet our stringent safety requirements. The ALPHADECK Slab Formwork and PERI UP shoring solutions are highly efficient and quick to assemble and dismantle, which meant we were able to meet our deadlines. The immediate availability, on-time delivery and on-site technical support also enabled us to make the construction progress that was required."

Deepspot

Mszczonów
Poland

One of the deepest diving pools in the world was built with the aid of numerous PERI systems near the Polish capital of Warsaw. The Deepspot diving facility, which reaches depths of up to 45.50 metres is divided into two sections: the main section reaches a depth of 15.50 metres, while the diving tube is 25.45 metres deep. The tube depth is roughly equivalent to the height of a 15-storey building and holds a total of 8,000 m³ of water. Deepspot opened at the end of 2020 after a construction period of only around two years.

Safe working conditions at great depths



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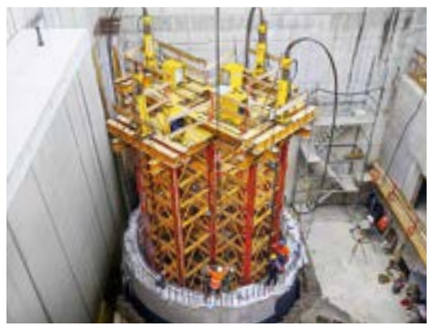

The diving tube, with its internal diameter of 7 m and a foundation of 40.50 m below ground level, posed the greatest design challenge. The concreting process for the pipe rings was carried out using monolithic construction in steps of 4 m each. A set of hydraulic cylinders supported on VST Heavy-Duty Towers assisted this operation. A special-purpose solution was required for the vertical alignment of the diving tube in the first of a total of four segments. Special-purpose guides were required for this process. The individual elements weighed 300 t each. In addition, the non-axial and irregular lowering processes as well as the possibility of collision with the jet pipe elements posed a major challenge from a structural analysis point of view. To overcome these challenges, a hydraulic unit was used to ensure precision when the first segment was lowered. The inherent weight of the other segments caused them to sink downwards naturally. The process was repeated until the deep well reached its final depth of 25 m.

As early as the planning phase, the responsible PERI engineers paid attention not only to the static feasibility but also to the safety of the site personnel. The used and pre-assembled PERI systems, as well as the selected concreting procedure, ensured that work was carried out safely at all times – even in the great depths of the diving tube.

In addition to the diving tube, the underwater viewing bridge is one of the highlights of the Deepspot diving facility. The bridge only became self-supporting when the pool was filled with water and the necessary buoyancy force was fully present. For this reason, it was necessary to support it with shoring until shortly before the pool was commissioned. It was decided that ST 100 Stacking Towers with a height of 14.40 m, would be used to ensure the safe transfer of loads. The dismantling of the stacking towers could only take place after the pool was filled with water. Professional divers were hired for this task, and in a total of ten hours they dismantled the scaffolding material, which weighed 3,400 kg, under water and brought it safely to the surface.

Contractor
Aerotunel LLC Limited Partnership, Warsaw

Field service
PERI Poland, Płochocin

Michał Braszczyński · Managing Director
“For an extraordinary project like this, we needed a reliable partner. That is why we put our trust in PERI. A large number of geometrically and technologically complex reinforced concrete elements were required to construct the diving pool. At the same time, it was essential to maintain a high level of safety for the personnel. A significant aspect of this was special-purpose formwork that was pre-assembled in PERI’s warehouse. The formwork deliveries had to be made just-in-time. PERI made it possible to meet all these requirements.”

Kailas House

Heinola
Finland

State of the art weather protection technology for new school complex

In March 2021, construction started on a new school complex consisting of a primary school and a nursery school in the city centre of Heinola, Finland. The construction project was named after Uuno Kailas, the most important poet during the early years of Finnish independence. To ensure that the timber work on the roof and the brickwork on the facade were not exposed to the harsh Finnish climate, PERI facilitated the construction process with the LGS 150 Weather Protection Roof, among other things.

Essential to the construction of the school complex was a reliable weather protection solution for all works that required moisture protection. With this in mind, a plan was devised to divide the construction into three separate weather protection phases, each covered by an LGS 150 Weather Protection Roof.

However, under no circumstances was the weather protection solution to interfere with the construction of the building's roof by using shoring towers. So, at the transition between the first and second sections, the LGS 150 was supported on one side by a VARIOKIT VRB Heavy-Duty Truss Girder that was around 27.50 m long and extended over the entire flat roof – an important factor in ensuring that the project could be completed successfully.

Together with parts of the PERI UP Scaffolding Kit, the weather protection solution formed an integrated system that also provided a shoring and access solution at the same time – ensuring dry and safe working conditions in all weather conditions.

Contractor
Insinöörityö Hentinen Oy, Joutsa, Finland

Field service
PERI Finland, Hyvinkää

Petri Orava · Site Manager
"The frame assembly process went smoothly, as both a reliable weather protection system and safe scaffolding were in place. It was also a relief that the scaffolding and weather protection plans had been finalised and approved by the structural engineer."

TRANSPORT ENGINEERING

© Florian von der Fecht

Contractor
Niro-Riva UTE, Ciudad Autonoma Buenos Aires

Field service
PERI Argentina, Escobar - Bs.As.

Agustina Fernandez · Site Manager
"The final result speaks for itself: The PERI employees were always willing to rise to the complex challenges. We were able to bring this project to a successful conclusion and adhere to the demanding quality standards as a result of our collaboration with both the PERI Engineering Office and the production department."

Swift concreting of **complex geometry** thanks to special formwork

A new air traffic control tower was built in close cooperation with PERI about 20 km from Buenos Aires, at the Aeropuerto de Ezeiza. At a height of around 60 metres, the air traffic controllers have a 360° field of vision, providing the basis for optimised visual monitoring and control of air traffic. Including the steel roof and antennas, the 27-storey tower reaches a total height of 108.40 m. The stringent architectural concrete requirements and the pipe-in-pipe structure were main challenges of the project.

The internal core of the tower, which extends vertically upwards, houses stairs, lifts and installation ducts. This core was constructed using a combination of CB Climbing Formwork and VARIO GT 24 Girder Wall Formwork. Use of the latter allowed flexible adjustments to be made to accommodate the project-specific requirements. While the VARIO formwork climbed upwards on the CB 160 Climbing Formwork on the outer section of the wall, the BR Shaft Platform provided reliable support for the internal formwork of the shaft formwork.

The outer, elliptical pipe is connected to the interior via transverse partition walls and therefore required a higher degree of preparatory work. The geometry of the outer core changes from floor to floor from the fifth level upwards. A 3D model made specifically for the planning process assisted with this challenge. For example, it formed the basis for eight VARIO 3D boxes. Thanks to the metal and timber beams that provided the curvature and a contact surface for the formwork, it was possible to readjust the panels in each set. This paved the way for a swift two-week concreting cycle. In order to maximise the level of safety provided to site personnel, PERI subjected the special-purpose formwork to extensive testing prior to use.

© Florian von der Fecht

Finally, the control centre, which consists of five geometrically different cantilever slabs, was built at a height of 62 metres. A variety of PERI systems were used for this, including PERI UP Working Platforms. The benefits of the PERI UP system ensured a high degree of safety even at great heights. This allowed the system to be adapted flexibly to the different geometries. Non-slip steel decks were used, and these were secured during the assembly process to prevent unintentional lifting.

© Florian von der Fecht

The Komorjak Tunnel

Omiš
Croatia

Efficient realisation of various tunnel diameters with a single formwork solution

The more than 600 m long Komorjak tunnel on the Croatian coast is part of the bypass road of the city of Omiš and an important element in easing traffic congestion in the city centre. The complex geometry of the tunnel and several modifications during the course of the project called for a great deal of flexibility. The VARIOKIT and PERI UP systems deployed not only met all the requirements, but also ensured that work processes were efficient on account of their modularity.

The first 90 m of the tunnel consist of a three-lane cross-section, after which the route begins to split into two separate double-lane tunnels with a carriageway width of 7.10 m and a height of 6.85 m. Due to these complex characteristics and the location of the south portal above the Cetina River, special-purpose formwork and a specific project execution strategy were required for the construction of the tunnel.

PERI engineers therefore designed an ingenious VARIOKIT VTC Tunnel Formwork solution which was also used for the nine-cycle, three-lane section once the two-lane tunnel section with its 42 concreting sections had been completed. The diameter was expanded efficiently by installing additional formwork elements. This meant that only one solution was needed for the construction of the complex geometry, which saved time and money. The formwork was moved with the help of VTC hydraulics, which saved a lot of effort. The fact that PERI delivered the formwork elements to the construction site already pre-assembled also meant that very little assembly work was required on site. The single-sided tunnel walls at the tunnel bifurcation were constructed using 7 m long, specially designed VARIOKIT formwork in 6 m long casts. To ensure the safe transfer of loads, PERI UP Shoring was used throughout the project. This could be optimally adapted to the changing tunnel geometry due to its high flexibility and the different lengths of the components.

For the south portal of the tunnel, the engineers from PERI decided on the VARIOKIT VCB Cantilever Bracket in combination with HEB Girders. VST Heavy-Duty Shoring Towers formed the support for the cantilever bracket and carried the high load of up to 600 kN each with a total of eight verticals. For the external formwork of the south and north tunnel portals with their complex geometries, the VARIO GT 24 Girder Wall Formwork ultimately offered the required flexibility.

Contractor
STRABAG d.d., Zagreb, Croatia

Field service
PERI Croatia, Zagreb

Đani Radić · Construction Site Engineer
"The versatile and highly practical VARIOKIT and PERI UP modular systems met all the requirements we had for the construction of the extremely complex tunnel segments. The technical support from PERI was outstanding, from the detailed design before the start of the project to the extensive commitment shown during the construction itself. We decided to work with PERI because we were looking for a reliable supplier for this demanding project who would not only provide us with the materials we required, but who also had extensive expertise in preparing all formwork and scaffolding solutions."

Optimised processes thanks to new PERI system

Contractor
ARGE (PORR/Strabag), Zirl, Austria

Field service
PERI Austria, Reichersdorf

Bernhard Ramsauer · Site Manager
"The fact that we had to take the River Inn's high-water periods into account meant that the schedule was very demanding. We were able to reduce the number of construction phases on each supporting structure by two due to the fact that we were able to concrete 5.70 m section lengths with the PERI VARIOKIT VBC system. Furthermore, when we were awarding the contract, particular emphasis was placed on a straightforward procedure for retracting the scaffolding and on the technical details regarding the ability to adapt to the spatial limitations posed by the old existing bridge when erecting the first supporting structure and by the new bridge when erecting the second supporting structure."

The reconstruction project of the Innbridge at Terfens in an earthquake zone on the A12 motorway was one of the largest bridge construction projects to be carried out in western Austria. With PERI by their side, the construction site team was able to complete the project on time despite the demanding construction schedule, and with the necessary structural calculations for earthquake loads.

By using the VBC Balanced Cantilever Carriage including formwork, PERI provided the client with a comprehensive solution, not to mention planning services and on-site support. The decision to use the VBC Balanced Cantilever Carriage meant that 5.70 m long concreting sections could be realised. This meant that the number of construction phases could be reduced to only four per bridge support structure. The fact that the system is highly flexible and easy to align meant that the respective segments could be concreted in weekly cycles, the projection of the cross girders in the grate could be adapted, and the supporting structure had a spacing of only 50 cm. The latter was necessary due to the longitudinal cantilevered slab retaining wall in the abutment area, which extended from the upper edge of the foundation to the lower edge of the cantilevered slab. What's more, the fully integrated hydraulics simplified the process of adjusting and calibrating the formwork from one section to the next. Given the fact it is convenient to operate, the system could be moved to the next cycle quickly and easily.

The formwork carriage also proved to be advantageous during the concreting process as its carriageway slab formwork reduced the degree of penetration in the supporting structure due to the fact it is positioned on the M24 anchor sleeves. The balanced cantilever carriage was also straightforward to dismantle – the time-consuming process of lowering the rails to retract the carriages was not required.

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Contractor
J. Kumar Infraprojects Limited, Mumbai, India

Field service
PERI India, Mumbai

Somesh Pandey · Project Management
"The Bandra Kurla Complex (BKC) is the largest metro station in Asia. We were looking for a comprehensive solution for the formwork materials. We also had to ensure that the tight project schedule with a casting cycle time of 25 to 30 days could be adhered to. With the formwork solution from PERI, we managed to stick to the planned cycle time. What's more, compared to conventional formwork systems, fewer workers were required on the construction site to realise a project of this scale. In addition to the high quality of the material, the cooperation with PERI's designers and construction engineers was excellent throughout the project."

Bandra Kurla Complex (BKC) Station

Mumbai
India

Millions of people use Mumbai's rapid transit system every day. The newly launched Line 3 will extend the network by 33.5 km and connect Mumbai's far south with the north of the city. The Bandra Kurla Complex (BKC) was commissioned to guarantee as seamless a transfer to Line 2 as possible. With its 475 m length and 30 m width on two underground levels, it was the largest underground station in Asia at the time of construction.

The shuttering process for the retaining walls at a depth of 16 m posed a major challenge on the construction site. As the formwork had to be placed against the ground earth on one side, the ideal solution was to combine the SCS Climbing System with LIWA Panel Formwork. The 24 m long and 4.50 m high construction phases could thus be formed in a single pouring operation. This meant that the tight construction cycle of 25 to 30 days was adhered to.

LIWA proved its worth in Mumbai due to the variability in its application. Due to the integrated locking bar, the panel formwork could not only be used for retaining walls, but also for the approximately 8.50 m tall columns. The low weight of the elements also saved valuable working time and personnel costs.

Another challenging task was the forming process for the 24 m x 32 m roof slab, which had to be produced in a single pouring operation. As a solution, PERI supplied the height-variable PERI UP Shoring Tower Plus, which acted as a table support. Formwork was carried out with the VT Slab Table in combination with VT 20 K Formwork Girders. The slab tables were pre-assembled directly on construction site and could be moved by crane lift. This was a clever solution that could be implemented quickly, thus playing a fundamental role in the project team's ability to stick to the time-critical construction schedule.

Rapid construction progress when shuttering at a depth of 16 m

S3 expressway
Legnica

Lubawka
Poland

Fast weekly cycle thanks to VIL Incremental Launching Facility

Contractor
Konsorcjum Mosty Łódź Inc. & ONDE Inc.,
Łódź, Poland

Field service
PERI Poland, Płochocin

Wojciech Putowski · Bridge Construction Manager
"The VARIOKIT VIL Incremental Launching Facility is particularly quick and easy to operate, leaving the workers more time for other jobs on the construction site. The shuttering itself is also particularly fast – we were able to move the 25-m-long formwork into position within 30 minutes. We are very satisfied with the system and we have also been able to rely on PERI's support at any time."

PERI assisted with the construction of the 480-km-long S3 expressway in western Poland. For the erection of the three bridges in the section between Legnica and Lubawka, a comprehensive PERI solution involving the VARIOKIT Incremental Launching Facility was the key to success. This proved successful due to its reduced material quantities and time-saving handling characteristics.

A special feature of the VARIOKIT Formwork Units for the external formwork was the striking mechanism: When the casting bed was lowered, the mechanism pushed the external formwork outwards in a horizontal direction. This provided the necessary distance between the cured structure and the struck formwork when moving the superstructure, which is necessary for narrower bridge radii. While the casting bed was being raised, the mechanism then automatically pulled the external formwork back into the concreting position. This meant that no additional alignment of the external formwork was necessary and the site personnel could get started on the next work steps straight away.

The VIL Wall Support with Roller Drophead was used for the slab formwork in the trough to implement the movable slab formwork solution with additional quick striking mechanism. The shuttering method of the VIL System allowed the slab formwork to be moved independently into the concreting position by pulling. The 25-m-long slab formwork was thus pulled into the new cycle and aligned within half an hour. This simplified the workflow and contributed significantly to the project team's ability to stick to the weekly cycle.

In addition, numerous solutions from the PERI UP Scaffolding Kit were used on the construction site. Among other things, the components provided a high degree of working safety as stair towers, reinforcement scaffolds and working platforms, leading to a successful result through reliable perimeter protection and safe access for site personnel.

Throughout the entire project, PERI engineers were available on site as contact persons to train the construction site team on how to use the VARIOKIT Incremental Launching Facility.

Theunisbrug

Merksem
Belgium

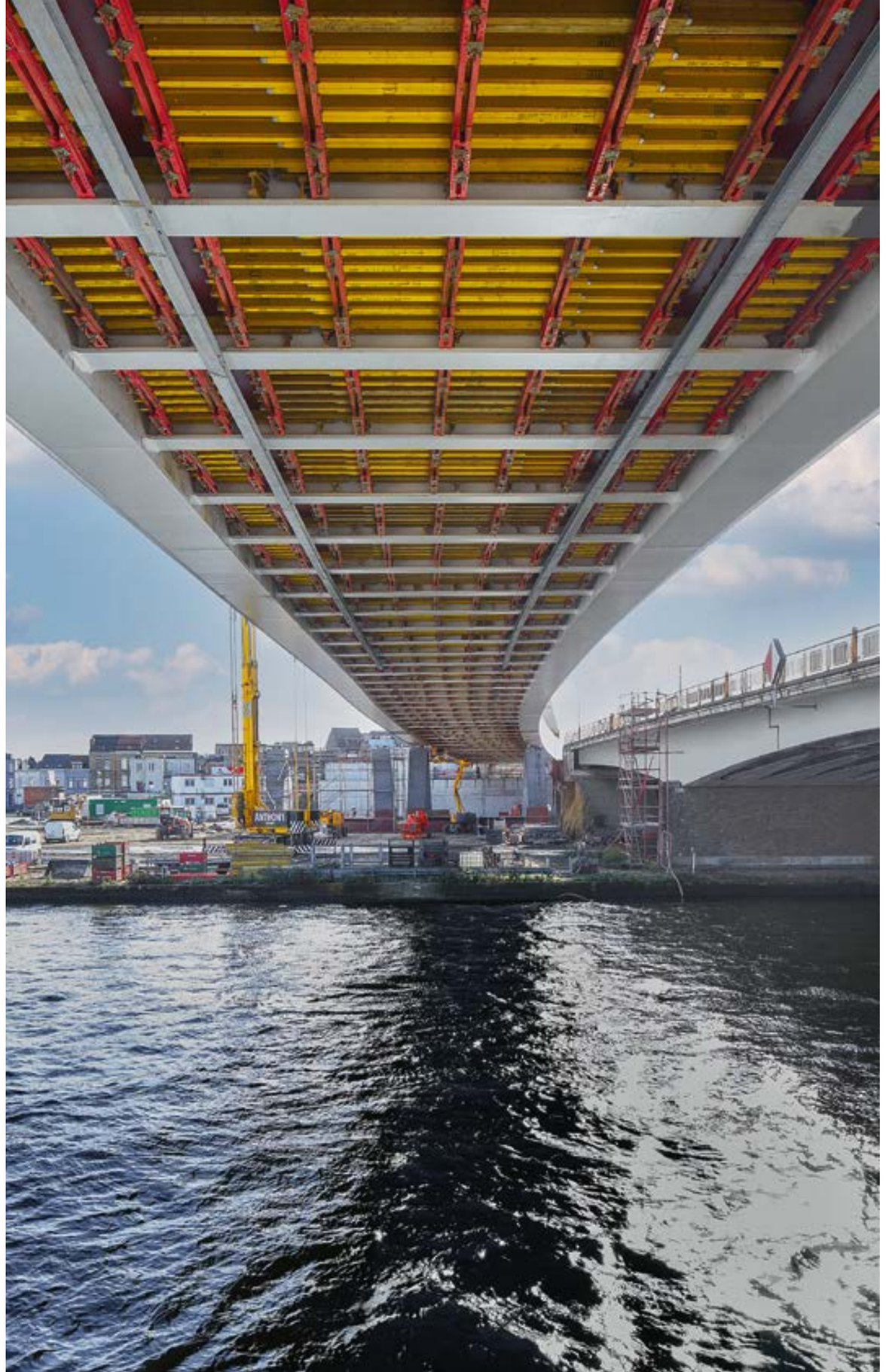
Contractor
BELTEK BV, Sint-Niklaas, Belgium

Field service
PERI BeNeLux, Boom

Maarten Goossens · Project Manager Artes Roegiers
“Complex concrete elements had to be created for this project. The 10 m high piers and the bridge deck are good examples of this. We relied on PERI’s expertise for these formwork projects. The good cooperation with PERI contributes to a great result on the construction site.”

Parallel bridge construction made possible by reliable availability of materials

To improve the traffic situation in Antwerp, Belgium, and to modernise the existing infrastructure, the Gabriel Theunis Bridge was raised and the Albert Canal was widened in some places. PERI supported the large-scale project with a system combination.



One of the most important success factors in large-scale projects of this scale is time. The efficiency of the formwork solution was therefore just as important as the fact that the delivered material enabled simultaneous construction of two bridges. Both were achieved with the PERI solution.

The construction process for the three bridges was similar and essentially only differed in the height at which the system combination of the VARIOKIT Bridge System and VARIO GT 24 Girder Wall Formwork was used. The formwork solution was placed on the bank before the bridge deck was floated in on the canal. Since the VARIOKIT system parts are available in different standard lengths, individual parts did not have to be specially cut to size.

This saved time and material costs on the construction site. In addition, the formwork performed impressively with its simple and intuitive handling characteristics during the shuttering and striking processes. Concreting was carried out only once on the water; the PERI systems were transported back to the bank with the help of a pontoon after striking.

Due to the fact that both bridges were formed simultaneously, the material requirements were enormous. Close cooperation between several PERI subsidiaries in Europe ensured that all parts arrived on site on schedule, and thus saved an enormous amount of time.

Čortanovci viaduct

Novi Sad
Serbia

Easily adaptable: PERI systems ensure **swift construction progress**

The Budapest-Belgrade high-speed line is part of the Budapest-Belgrade-Skopje-Athens international rail link. One of the bigger challenges on this route was the Čortanovci viaduct, which is located between Stara Pazova and Novi Sad. PERI assisted with the construction of sections B and C, each 642 m long.

The concreting work for both sections B and C was carried out simultaneously to the left and right, starting from the delta pier in the middle. The 18.50 m high delta pier was therefore initially realised per carriageway in both sections. The construction workers found support in a combination of the PERI UP system and components from the VARIOKIT Engineering Construction Kit. As both systems are based on the modular principle as well as on a metric basic grid, any adjustments required to geometries and loads could be made in 25-cm-increments. The optimum connection options ensured that the formwork and scaffolding solution was perfectly coordinated and available from a single source. For the rest of the columns required for both stages, CB Climbing Units were used as safe working platforms to support the TRIO Panel Formwork as well as the VARIO GT 24 Girder Wall Formwork.

To transfer the loads in section B, the decision was made to use the ALPHAKIT Shoring Construction Kit, which is suitable for particularly large support heights. The assembly of the 24.75 m high towers was particularly efficient due to the small number of lightweight single components. The pre-assembly process was carried out quickly and safely from the ground. The ability to position and move the units by crane thereafter meant that time was saved and construction progressed quickly. Moreover, additional working platforms from the PERI UP Scaffolding Kit were installed to provide a greater level of safety for the construction site personnel at great heights.

Throughout the entire project, PERI engineers were on hand to assist the construction site personnel. On account of the intensive amount of material planning work carried out in advance, as well as the supportive and advisory supervision provided while the systems were being installed, adhering to the tight construction schedule was no issue at all.

Video

Main contractor
RZD International, Belgrade, Serbia
Subcontractor: Karin Komerc MD, Veternik, Serbia

Field service
PERI Serbia, Šimanovci

Boris Miloradov · Chief Engineer
“Thanks to the close cooperation between the companies Karin Komerc and PERI, this magnificent railway bridge, which is unparalleled in our region, was completed within the deadlines set. We are particularly grateful for the assistance provided by the engineering team consisting of PERI planners and site managers, without whom we would not have been able to carry out the work on the viaduct so quickly and successfully.”

Contractor
Mota-Engil Engenharia e Construção S.A.,
Lisbon, Portugal

Field service
PERI Portugal, Castanheira do Ribatejo

Manuel Lopes · Site Manager
"By using this innovative, modular falsework, it was possible to adhere to the concreting cycles specified in the construction site plan. It led to a reduction in the movement of materials, and allowed us to systemise the work processes. We achieved a higher level of labour productivity as a result, which enabled us to complete the works on time and to a high standard."

On-schedule completion thanks to straightforward assembly process

Not far from Alandroal, the Lucefece Bridge spans a distance of 664 m at a height of 25 m. As part of the project to modernise the Évora railway line between Freixo and Alandroal, the section will facilitate logistical operations between Portuguese ports and the rest of Europe, but also allow for passenger transport. The project was to be completed in only 10 months. A very challenging deadline, which was met in cooperation with PERI.

The ALPHAKIT Shoring Construction Kit, which was used extensively during the construction process, impressed on account of its characteristics. For instance, it could be adapted perfectly to the varying features of the viaduct, which ranges in height from 12 m to 25 m. The system's straightforward assembly process also resulted in fast installation and processing times, thereby significantly reducing the workload. And let's not forget the other advantage of the lightweight steel components: These could be pre-assembled without a crane, thereby minimising the use of cranes on the construction site.

The VARIOKIT Engineering Construction Kit was also decisive for the economic efficiency of the infrastructure project. The economical use of materials made possible by the structurally optimised components minimised material and labour costs. Furthermore, the combination with the access solutions in the PERI UP Construction Kit facilitated access to the structure, while also ensuring a greater level of safety.

To keep to the tight schedule, a full cycle involving two concreting phases needed to be completed within three weeks. This goal was achieved thanks to the straightforward assembly process of the systems, and the viaduct was completed on schedule – without compromising on work safety.

Bridge Road 16

Jerusalem
Israel

Space-saving formwork
for new connection to Jerusalem

When completed at the end of 2023, Road 16 will cover a distance of around 4.70 km and connect Road 1 in the west of Jerusalem with Road 50 in the east of the megacity. The bulk of the road is to run through tunnels beneath Jerusalem. PERI assisted with the construction of the bridge piers by providing planning services and formwork solutions.

The infrastructure project posed two major challenges. On the one hand, the uneven, cramped terrain made it impossible to work with shoring towers or formwork carriages; on the other hand, tight budget and time constraints challenged the engineers from PERI to find particularly time and cost-efficient solutions. To meet the requirements, PERI provided support throughout the project by deploying on-site personnel as well as providing integrated planning services.

For the piers, a system solution consisting of a BR Shaft Platform and CB Climbing Platforms was used, on which VARIO GT 24 Girder Wall Formwork was fixed. In this way, the piers could be formed in a cost-efficient and space-saving manner. The pier heads, in turn, were constructed using a combination of the VARIOKIT and PERI UP systems. The PERI UP Shoring was fixed to SB Platforms, which were attached to the piers horizontally. This meant that there was no requirement for high shoring towers, which reduced costs.

The superstructure was concreted with VBC. The system is equipped with a comprehensive hydraulic kit to regulate the movement of the formwork from cycle to cycle and to adapt the formwork to the varying cross-sections of the bridge. Concreting was carried out in cycles of 5.30 m on both sides of the piers – both uniformly and simultaneously.

Contractor
Shapir Civil and Marine Engineering LTD, Petach Tikwa, Israel
Impresa Pizzarotti & C. S.p.A, Parma, Italy

Field service
PERI Israel, Rosh Ha'ayin
PERI Poland, Plochocin
PERI Group, Weissenhorn

Alexey Skydin · Foreman
"In my view, it was important to work with a reliable formwork company that was able to provide equipment and solutions for the entire bridge: namely the piers and the hammerheads. PERI was the right choice for this reason."

Al Bustan Street South

Doha
Qatar

Adherence to deadlines, efficiency and completion without interrupting the flow of traffic: PERI made use of the PD 8 Shoring System and the PERI UP portfolio in addition to a tailor-made VARIOKIT solution with VST Heavy-Duty Towers.

The Sabah Al Ahmad Corridor infrastructure project is a transport corridor in Doha with a total of four roads and a multitude of multi-lane motorway bridges. The Al Bustan Street South construction project is one of four project phases and features bridges with a total length of more than 10 km. Together with the customer, PERI engineers developed a time-saving engineering solution that was implemented while traffic continued to flow. Around 150,000 m^3 of shoring, 13,000 m^3 of working scaffold, 13,000 m^2 of formwork were used in addition to VST Heavy-Duty Towers. The result is a bridge that consists of an in-situ concrete bridge with 37 piers and a prefabricated concrete bridge with 81 piers.

Bridge constructed in record time thanks to engineering solution

Combining the modular VARIOKIT and PD 8 systems proved to be the ideal approach for this in-situ concrete bridge. Modifying the systems to accommodate the varying thicknesses of the bridge structure, which ranges from 3.20 m to 4.00 m, was a straightforward process. The prefabricated components of the external web and cantilevered formwork were assembled on the ground, raised by a single crane to save time and then adjusted to marry up with the angle of inclination of the bridge using articulated couplings and a heavy-duty spindle. The PD 8 Shoring System ensured that loads could be transferred in an optimum manner.

VARIOKIT VST Heavy-Duty Towers were used to erect the main bridge and the bridge access roads. The towers were adjusted steplessly using mobile hydraulics to account for the special geometry of the bridge. This made the formwork process particularly efficient and played a major role in ensuring that the project was completed in April 2021. A PERI UP scaffolding solution ensured a high degree of work safety by providing comprehensive, all-round protection on the internal and external sides as well as anti-slip decks. The considerable application potential of PERI UP was utilised in full, namely in the form of reinforcement scaffolds, working platforms, stair towers, access points for finishing works and suspended scaffolds.

Contractor
Hyundai E&C, Seoul, South Korea

Field service
PERI Qatar, Ar-Rayyan

Kim Hyungwoo · Procurement Manager
“The huge concrete viaduct in the Al Bustan Street South project, covering a distance of more than 10 km, was completed in a very short space of time. Thanks to their extensive supply network and excellent technical support, PERI ensured that we did not run into any delays or technical issues during the entire construction period. Everyone involved in the project made a point of saying that PERI’s solution was the most efficient and reliable they had ever used.”

Short cycle times
despite curved geometry

Contractor
NJ Doyne, Berkshire, England

Field service
PERI UK, Brentwood
PERI UK, Rugby

Richard Fahey · Contract Manager
"The interesting thing about the tunnel is that its curved shape was achieved by reusing straight formwork units. The mobile solution for the pier table system worked brilliantly and reduced turnaround times – especially within confined spaces."

Luton DART

Luton
United Kingdom

From 2022, the new Luton DART service (Direct Air-Rail Transit) will ferry passengers between the airport terminal and Luton Airport Parkway station at high speed, on a 24/7 basis, and without the need for a driver. PERI assisted with the £200 million construction project by erecting piers for the viaduct as well as building a 320 m long double tunnel with a curved geometry.

The viaduct consists of a total of seven piers, two of which were designed as double piers with complex inner arches. For this, engineers from PERI designed a customised formwork solution using VARIOKIT as a basis. Because of the unique soil conditions, conventional systems proved to be impractical. The engineers proposed an alternative solution whereby SB Brace Frames were rotated through 90 degrees and acted as props for platforms, which were also used to carry loads. While they are usually used in single-side forming operations, in this case the frames were placed horizontally around the pier shaft to support the formwork and structure during the curing process. A PERI UP access solution enabled the workers to safely ascend and descend the construction, which reached heights of up to 13 metres.

GT 24 Girders were used in combination with plywood boards in order to construct the tunnel roof. This construction was fixed on MULTIPROP Shoring Towers that were equipped with rollers. This meant that they could be moved on to the next section after the shuttering process without having to be disassembled. As a result, with a cycle time of only one week, a considerable amount of time was saved. Single-sided VARIO formwork elements were connected to intermediate fillers to create a faceted structure that ultimately formed the curve for the tunnel.

Contractor
Cebu Link Joint Venture, Cebu City, Philippines

Field service
PERI Philippines, Muntinlupa

Benjamin Dublin · Project Manager
"Thanks to the extreme flexibility of the PERI UP Scaffolding Kit and its high stability, we were able to use it at various points on the bridge, for instance for access to the pile caps, for access to the elevated head sections and for supporting our launched traveller. PERI provided excellent technical support by offering alternative and practical solutions. This helped us achieve high efficiency at the construction site. The close cooperation with PERI also ensured smooth and straightforward implementation on site."

Versatility of PERI UP ensures **efficient bridge construction**

The Cebu-Cordova Link Expressway is a toll road with a total length of 8.50 km and a width of 27 m. Once completed, around 50,000 vehicles will cross the four-lane bridge between the municipality of Cordova and the mainland of Cebu City on a daily basis. The project required a high degree of cost efficiency while maintaining a high level of occupational safety.

Components from the PERI UP Scaffolding Kit offered consistent safety throughout the entire works. They were used as access or shoring solutions, for example as stairways at great heights or across bridge edges for access to important goods lifts. The standardised system decks in a 25-cm-grid also allowed for flexible adaptation to a wide variety of geometries during the project. Another benefit of the PERI solution: A high level of occupational safety due to non-slip decks and comfortable step widths.

PERI also provided support for the project with the planning and supply of formwork solutions, among others for the access viaduct on the Cordova side. From adaptable VARIO Column and Wall Formwork in various sizes to a head trestle solution with horizontal SB Brace Frames, CB Platforms and a customised heavy-duty console bracket solution, the PERI systems proved their versatility on the construction site and were also safe and efficient in use.

During the entire construction project, PERI engineers were at the customer's side to find optimal approaches to new requirements or to provide support during the implementation of these approaches.

San Giorgio Bridge

Genoa
Italy

Pre-assembled VARIO GT 24 and RCS systems for **swift cycle sequences**

To construct a bridge to replace the Morandi Bridge in Genoa, which collapsed in 2018, a time-saving solution was required to restore Italy's vital transport link. For the new San Giorgio Bridge, PERI provided an efficient formwork and scaffolding solution that facilitated rapid cycle sequences of two to three days.

A total of 21 piers in impressive architectural concrete quality support the new bridge at a height of 42 m and a length of 1,067 m over the Polcevera River. For the erection of the piers, PERI's solution included a combination of VARIO GT 24 Girder Wall Formwork with the rail-guided RCS Climbing System which ensured rapid construction progress. The total of five VARIO GT 24 formwork units were tailored precisely to the piers, manufactured with the utmost accuracy in Cremona, Italy and then delivered pre-assembled to the construction site. As the RCS Rails were firmly anchored to the already shuttered building at all times, the solution provided the site crew with reliable protection from the effects of the weather.

TRIO Panel Formwork and PROKIT Guardrails were used for the erection of the foundations. The system combination ensured rapid construction progress thanks to its swift assembly characteristics and also improved safety levels thanks to the all-round protection at the building edges.

In addition, the PERI UP Scaffolding System provided safe access to the formwork at great heights. The assembly process was carried out safely and without any exposed building edges using the guardrail in advance. The metric grid of the components meant that all scaffolding surfaces were closed without any gaps and trip hazards were avoided, which also improved safety.

Contractor
Webuild S.p.A., Italy, Milan

Field service
PERI Italy, Agrate Brianza

Renzo Rossi · Site Manager
"The decision to choose PERI as a partner for a project like this did not come about by chance. The outcome is impressive – as in other major projects undertaken by the Webuild Group, PERI again showed a high level of reliability and professionalism."

Second River Niger Bridge

Asaba/Onitsha
Nigeria

Once completed, the 1.60 km Second River Niger Bridge will connect the Nigerian cities of Asaba and Onitsha, helping to decongest traffic on the existing bridge over the Niger. PERI assisted with the construction of this key national project with a sophisticated engineering solution based on the VARIOKIT Engineering Construction Kit, the PERI UP Scaffolding Kit and the VARIO GT 24 Girder Wall Formwork.

Reduced personnel costs thanks to VBC Balanced Cantilever Carriage

The bridge consists of three sections with a total length of 1,590 m. PERI assisted with the construction of the 630 m long main bridge, which consists of three 150 m long spans and two 90-m-long spans and crosses the navigation channel upon completion. The piers were erected with the help of a customised system combination. For this purpose, VARIO GT 24 Panels and SB Brace Frames were used, with whose help the platforms were anchored to the previous construction phase in order to safely carry the high loads. It was possible to use the VARIO GT 24 Formwork Elements again for the respective mirror-image pier, which resulted in time and cost savings. In addition, the PERI UP Scaffolding System with integrated ladders ensured safe and easy access for site personnel and performed impressively with its high stability and load-bearing capacity.

The VARIOKIT VBC Balanced Cantilever Carriage ultimately proved to be the right choice for the formwork of 630 m of bridge deck with three lanes in each direction, and spans of 150 m each. PERI supplied a total of four VBC Balanced Cantilever Carriages which were reused for the individual sections. This made the shuttering process particularly efficient and considerably reduced the number of personnel required. The cycle time per segment was a maximum of seven days. It was possible to combine PERI UP efficiently with the VBC solution. Thus, uninterrupted access to the formwork solution was constructed for the site personnel, keeping them safe when working above the water.

Contractor
Julius Berger Nigeria PLC, Abuja

Field service
PERI ISSU, Spain, Algete
PERI Nigeria, Lagos

Stefan Uelzmann · Project Manager
“We have a strong and reliable working relationship with PERI. In this project, too, we worked together to solve challenges competently and save costs.”

Access Tunnel:
A26 Danube Bridge

Linz
Austria

Contractor
ICM construction GmbH, Vienna, Austria

Field service
PERI Austria, Nußdorf ob der Traisen
PERI Infrastructure Sales Support Unit, Algete, Spain

Francesco Jusufi · Site Manager
"Due to the complex geometric conditions as well as other challenging constraints, during the tendering process we were looking for a concept that would result in as much optimisation as possible. PERI was intensively involved as early as the planning stage, providing solution-oriented input. When it came to the operational implementation stage, there was constant communication between the parties, which meant that the formwork systems could be used in the optimum manner on the construction site."

First fully hydraulic formwork carriage **with caterpillar drive**

The A26 project is one of the most important infrastructure projects in the Austrian city of Linz and the surrounding area with the goal to ease congestion on its transport network. The key to success for PERI during the project implementation stage was an engineering solution that was innovative, safe and efficient in equal measure, coupled with comprehensive project support. The highlight: The first fully hydraulic special-purpose tunnel formwork carriage with a caterpillar drive in Austria.

Five different tunnel cross-sections, profile transitions, tight radii of between 50 m and 750 m in the bends, and varying gradients: these were just some of the challenges that had to be overcome when constructing the 1,600 m long access tunnels for the new suspension bridge over the Danube.

The construction company's top priority during the project execution phase was solution-oriented and collaborative working methods. In view of this, PERI engineers developed Austria's first customised and fully hydraulic special-purpose steel formwork carriage with caterpillar drive and a weight of 250 t. This alone was enough to produce the different cross-sections in a total of 170 concreting sections.

The special feature: Given the fact that the very tight curve radii made it difficult to transport the formwork carriage, an innovative caterpillar system was used to move it. In addition, the formwork carriage impressed with its considerable dimensions of 8.07 m in height and 14.50 m in length as well as 10.70 m in width when ready to move and 11.20 m in width when ready to pour concrete.

PERI also made their mark when it came to project support. The formwork carriage was assembled in front of the tunnel entrance under the guidance of a PERI supervisor.
Only a short time later, the first concreting section was successfully completed, meaning that the formwork could be stripped efficiently the very next day and the formwork carriage moved forward to the next concreting section.

The engineering solution also included a 6 m long assembly carriage for the sealing work as well as a 12 m long reinforcement carriage, both consisting of a VARIOKIT Base Frame and PERI UP scaffold that were adapted to the cross-sections in the form of a work platform. These enabled efficient conversion and relocation of the carriages.

Martin Place Tunnel
Ventilation Shaft

Sydney
Australia

Early project completion
thanks to time-saving VTC solution

Contractor
BKH Group, Kings Park, Australia

Field service
PERI Australia, Glendenning

Iris Isidro · Project Management
"PERI provided us with support from start to finish – from the planning phase involving the engineers to the provision of a supervisor during the construction phase. The PERI solution worked great and allowed us to meet all deadlines and achieve all safety objectives during the project."

PERI was contracted to build two ventilation tunnels for one of Australia's largest infrastructure projects. These tunnels were approximately 110 m in length and 30 m below ground level. VARIOKIT VTC Solution and engineering support allowed PERI to complete this section of work on the project ahead of schedule.

The VARIOKIT VTC Solution consisted of two tunnel carriages having a length of 12.00 m and a height of 8.70 m. Combined with single-sided wall formwork, it was possible to carry out the striking process quickly, meaning that the carriages were ready for the next section after only three days. This significantly reduced the concreting times.

A particular challenge was the shaft openings on one side of the two tunnels, this led to uneven load transfer during the concreting process. This problem was solved by strategically placing ties above and below the fabricated truss elements.

During the project, the PERI UP scaffolding system was also used as safe access to the formwork, for assembly of the reinforcement and as a carriage for the slab formwork. The versatility of PERI UP allowed flexible adaptation to the construction site and simple assembly, which led to time savings and ensured that the safety specifications were met.

The preceding planning phase was also extensive: PERI engineers prepared numerous construction and assembly drawings for the complex project, which led to a successful first application of the VTC Tunnel Carriage in Australia. Thanks to an additional 3D model that could be used via a PERI app, comprehensive project supervision was possible even under difficult pandemic conditions and with limited site access.

Tekkale Viaduct

Artvin
Turkey

Contractor
Nurol – Gülsan Adi Ortaklığı,
Yusufeli, Turkey

Field service
PERI Turkey, Istanbul

Kayserşah Erdem · Project Manager
"With the Tekkale Viaduct, we not only had to deal with the elevated structures of the viaduct, but also with strong winds that are typical for the region. All this made it necessary to work with a formwork and scaffolding manufacturer that has a wide range of products – PERI was our first choice here. Immediately after the start of construction, it became clear how astute our decision was: in addition to the systems used and the constant attention to the aspect of work safety, it was also the professional site supervision on the part of PERI that ensured that the project was carried out in the shortest time possible and at the highest level."

Combination of VARIOKIT and PERI UP **saves time and increases safety**

The Tekkale Viaduct is part of the Yusufeli Dam Project, which is one of the highest dams in the world with its 69 kilometres of roads, 17 tunnels, 4 bridges and a height of 270 metres. Each of the bridges has four lanes, which provide sufficient space for traffic. The total length of the bridges is 2,200 m. The Tekkale Viaduct, which was constructed using PERI systems, has a length of 644 m.

In order to realise the shape of the piers with variable cross-sections, the decision was made to use the PERI RCS C Rail Climbing System. Its mobile climbing hydraulics not only helped to save time but also provided the workers with safe working conditions at all times despite strong winds and a height of 150 m. This is because the climbing unit is firmly connected to the structure at all times through the rail-guided system.

The VARIOKIT Engineering Construction Kit was also used to implement the demanding bridge geometry. With the VARIOKIT VBC Balanced Cantilever Carriage, each slab segment could be produced in an average of 7 days – and all this in compliance with occupational health and safety regulations thanks to the safety equipment integrated in the system. The VBC Balanced Cantilever Carriage made it possible to press ahead with the production of segments with a length of 5.50 m and a weight of 350 tonnes. For the fabrication of the heavy-duty girders, the load-optimised systems VARIOKIT, the single-sided SB Brace Frame and the VARIO GT 24 Column Formwork were combined.

Last but not least, an integral part of the PERI project solution was to combine VARIOKIT solutions with the PERI UP Modular Scaffolding System. By means of this connection, the site managers erected modular work platforms that always allowed safe access to all work areas.

Frankfurt Airport
Construction of Terminal 3

Frankfurt
Germany

Customised formwork carriage **cuts construction time by several months**

At the south end of Frankfurt Airport, Terminal 3, with its futuristic design, is currently one of Europe's largest infrastructure projects. Upon completion of costruction in 2024, up to 19 million travellers will be able to arrive and depart from the three new gates each year. Together with Max Bögl, PERI assisted with the construction of the drive-by platform, which will in future provide passengers with direct access to the departure level.

Contractor
Max Bögl Group,
Frankfurt, Germany

Field service
PERI Germany, Nuremberg

Christopher Diefenhardt · Site Manager
"The construction site personnel were pleasantly surprised by the solution for this complex task. Thanks to the systems supplied by PERI, we were able to finish each concreting section about 2 weeks faster than originally planned."

The 550 m long and 27 m wide drive-by platform is supported by 70 V-shaped columns covering an area of almost 15,300 m² and connects the two access and departure ramps to the terminal. PERI engineers designed a customised formwork carriage for this complex construction project using the VARIOKIT Engineering Construction Kit and the PERI UP Scaffolding Kit as a basis. It was 40 m long, 25 m wide and 12 m high – with a total weight of just under 500 tonnes. The construction was carried out entirely in 3D.

With an integrated hydraulics system, the entire formwork carriage could be lowered by 2.20 m for striking and repositioning. Between the V-supports, the solution was made up of six individual carriages that could be separated for relocation and striking. Outside the V-supports there were two further carriage units that were 40 m in length and could be moved in one piece. For the relocation process in the longitudinal and transverse direction, PERI developed a special hydraulic walking gear that could be transported back and forth between the individual carriage units quickly, easily and manually.

The formwork of the oblique-angled and V-shaped beams of the drive-by platform posed a particular challenge. In this case, it was necessary to shutter and strike the beams separately from the formwork carriage – and in a very confined area. This was realised by means of a folding mechanism and the MAXIMO Structure because of the lower construction height compared to the girder formwork. MAXIMO Structure also made it possible to achieve the desired SB2 architectural concrete class. The beam formwork was operated from a PERI UP Platform located in the belly of the formwork carriage. In order to meet all the occupational safety requirements, all access points and working platforms in the formwork carriage were constructed using the PERI UP Scaffolding Kit.

It took more than 16 hours to concrete the first 36 m long concreting section. The formwork carriage, weighing almost 500 t, was ready to be moved to the next concreting section within just one week. A further 13 concreting operations were carried out in order to complete the entire drive-by platform.

WATER RETAINING STRUCTURES

Vistula Spit Shipping Canal

Skowronki
Poland

In future, the shipping canal in the north of Poland will provide a second link between the Vistula Spit and the Bay of Gdańsk. The canal consists of a 270 m long lock, two swing bridges as well as two piers and a captain's house. High demands were placed on the quality of all visible concrete surfaces as well as on workplace safety.

VARIO System and PERI Services enable **on-time completion**

Contractor
Consortium: N.V. BESIX Inc.;
NDI SOPOT Inc.; NDI LLC, Poland

Reinforced concrete work enterprise
Przembud Gdańsk Inc, Gdańsk, Poland

Field service
PERI Poland, Płochocin

Łukasz Łuczyński · Contract Manager
"The lock was a complex engineering project that PERI handled in a professional manner and completed on schedule. The designers from PERI showed great commitment and provided a lot of support throughout the implementation process. At the same time, the PERI project manager ensured, among other things, the correct number of brace frames as well as the professional and punctual execution of the complete formwork assembly."

The first challenge was to form the canal walls, which are almost 6 m high. With the help of VARIO GT 24 Girder Wall Formwork, single-sided concreting was carried out against the steel piling that had been installed previously. By combining the SB-A and SB-B Brace Frames, it was possible to transfer the fresh concrete pressure into the substructure via the brace frames with suitable anchoring, in spite of the single-sided formwork. This made it possible to achieve a high quality concrete finish while being cost effective.

The shipping canal has two lock pockets with a height of 6 m and a slab that is about 1 m thick. The slabs were supported using the MULTIPROP system throughout the shuttering process. The aluminium supports boast a high load-bearing capacity of up to 100 kN despite their low intrinsic weight.

Safety was also of central importance in this project. To this end, the PERI UP scaffolding system was used to provide access to higher levels. The MAXIMO MXP Platform System and the PROKIT Fall Protection System enabled the construction site personnel to work safely at great heights.

The interplay between the PERI formwork and scaffolding components in combination with a range of PERI services meant that the project could be completed efficiently and safely.

Flexibly adaptable formwork for changing shape of tank structure

PERI provided support for the construction of two water towers in the West African city of Lomé. The systems used not only had to meet the most stringent safety requirements, but also be capable of adapting flexibly to the changing shape of the structure. The two towers, which are shaped like a wine glass and more than 20 m high, taper upwards at an angle of 55°, with the diameter of the hexagonal upper edge being just under 17 m.

Given the fact that swift construction progress was essential without the challenging building structure posing a risk to the workers, PERI's SCS Climbing System literally played a supporting role. It was possible to absorb all lateral loads from the dead weight of the concrete in a safe and reliable manner. To accommodate the complex 3D double curvature, relocatable SCS Platform Units were mounted in just a few crane movements. Thanks to the SCS Angular Adapter, the platform units could be used for two concreting operations. It was not therefore necessary to attach formwork panels for each individual concreting operation, which meant that the rate of progress could be increased significantly.

To allow for the changing shape of the tank structure, PERI South Africa decided to combine the climbing unit with the VARIO GT 24 Girder Wall Formwork. This meant that there was no need for plywood cassettes, which resulted not least in considerable material savings. In addition, the PERI UP Scaffolding Kit was used for the interior – on the one hand as a working scaffold and as support for the roof slab in the upper area, and, on the other hand, as shoring for the platform beams. The decision to work with PERI resulted in the following significant benefit: materials that were not held in stock were delivered by sea freight from Spain and Hong Kong to Togo's capital. This meant that nothing could hamper the team's progress on site.

Further services included comprehensive on-site training for the construction site teams on how to use PERI products correctly, constant project support from PERI engineers as well as intensive, video-based consultation to ensure that continuous assistance could be provided in the event of questions or difficulties despite the pandemic-related conditions.

Scaffolding company
Sogea-Satom, Lomé, Togo

Field service
PERI South Africa, Johannesburg

Serigne-Mbacke Gueye · Site Manager

"In order to construct the two water towers with their unusual hexagonal shape in compliance with all construction standards and regulations, we made use of PERI systems from start to finish. These included the SCS Climbing System, PERI UP and the MULTIFLEX Girder Slab Formwork. Because the SCS Climbing System is quick to assemble, robust and user-friendly, and the convenient working area always gives users a sense of security, it drew the attention not only of my entire team and the customer, but also of local residents. Thanks to PERI, we saved ourselves the time-consuming and complex task of erecting shoring towers, while still ensuring that the geometry of the water tower is unparalleled in Lomé."

New Water Tower

Helsingborg
Sweden

High-quality architectural concrete for state-of-the-art water tower

The new water tower in Helsingborg ensures a reliable supply of water to the north-west of the Swedish coastal region of Skåne. The 40-m-high tower consists of a 90-m-wide concrete ring resting on a total of 24 concrete pillars. A comprehensive PERI project solution developed in close cooperation with the customer enabled the use of high-quality architectural concrete, affording the structure a radiant appearance.

For the contractor involved, a high level of technical competence on the part of the supplier was decisive in the awarding of the contract, so that the architecturally outstanding structure could be realised with a jointly developed and technically flawless solution. PERI won over the customer with a system solution that provided the basis for meeting the high concrete surface requirements and the need for an efficient construction process.

For the formwork of the 24 piers with a height of 28 m, a combination of the RCS Rail Climbing System and the VARIO GT 24 Wall Formwork was used. This combination made it possible to achieve the desired high surface quality with only a few joints and a uniform tie pattern. The pre-assembled platforms ensured a high level of safety for the site personnel and, because they could be used several times, saved a great deal of time and ensured that the construction work progressed quickly. The versatility of the VARIO GT 24 solution became apparent when erecting the final pier, which is used as a service shaft.

The arrangement of the girders made it easy to adapt the structure of the climbing platforms to the round geometry and also ensured that outstanding walls could be produced in architectural concrete quality.

The crown of the water tower consists of a total of 24 monoliths, each weighing 340 t, which form the actual water reservoir. The monoliths were concreted on the ground and lifted onto the piers using two cranes. Here, again, a VARIO GT 24 solution was the preferred choice for the walls in architectural concrete quality. The slab was constructed with the help of MULTIFLEX Girder Formwork and the PERI UP Scaffolding System which could be flexibly adapted to the geometry.
The combination was particularly compelling in terms of safety. A suspended VARIOKIT construction was used for connecting and sealing the respective concrete parts.

Contractor
NCC Infrastructure, Solna, Sweden

Field service
PERI Sweden, Halmstad

Per-Erik Petersson · Site Manager
“Commitment and cooperation are the key to success. As a contractor, you’re very grateful when you find a supplier who is committed to achieving the gold standard and who you can partner with from the system right through to the design documents to successfully develop an engineered solution.”

Zahid Business Park

Jeddah
Saudi Arabia

Floral design for water retention structure made possible by PERI

The port city of Jeddah is located in western Saudi Arabia in the heart of the province of Mecca. A 45 m high water retention structure was built at the Zahid Business Park thanks to a comprehensive PERI solution and extensive engineering support.

Contractor
O.C.C. WEAVERS, Jeddah, Saudi Arabia

Field service
PERI Saudi Arabia, Jeddah

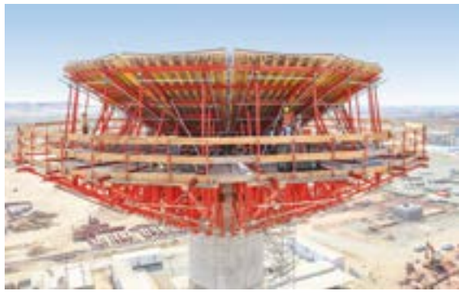
Dahen Hassan · Project Manager
"For PERI, it was a welcome challenge to size, plan and deliver the platform as well as the enormous scaffold in the time frame available, while constantly liaising with other parties involved. Overall, the project was a huge success for PERI, the contractor and the client."

The shape of the elevated water retention structure is reminiscent of a Saudi desert flower and consists of a circular wall with a diameter of 4.30 m and a ring beam supporting the cantilevered and slightly inclined slab measuring 1.00 m in depth.

To build the structure, PERI proposed a comprehensive solution with formwork and scaffolding from a single source. Optimally coordinated PERI products consisting of only a few components played a major role in ensuring that the project was carried out efficiently. For example, the circular wall of the structure was constructed using VARIO VT 20 Wall Formwork. This could be optimally adapted to the design and was used for both the interior and exterior walls. For the formwork of the outer wall, the VARIO VT 20 Wall Formwork was supplemented with CB 240 Platforms, which made the climbing process safe.

The BR Shaft Platform provided reliable support for the formwork elements inside the shaft. Here, SB Brace Frames mounted horizontally as a modular frame system ensured that loads were transferred safely. The structure was supported by PERI UP modular scaffolding, while PERI UP Stair Towers were used to assemble the facade efficiently.

PERI experts were on hand to support and advise the construction site team from start to finish. The close collaboration with the customer and the coordinated PERI solutions made it possible to minimise the costs of the project and keep to the tight construction schedule.



Okhla Sewage Treatment Plant

New Delhi
India

Sustainable and robust system formwork for **large concreting sections**

The Okhla Sewage Treatment Plant is located in New Delhi, India, and is currently the most capacious plant in Asia. In view of the large concreting sections of up to 7 m in height and 30 m in length, the customer decided against using traditional formwork methods involving timber, opting instead for the efficient HANDSET Alpha Panel Formwork.

The construction site covered an area of 104 ha and consisted of several structures that were built according to a very demanding construction schedule and with a concrete volume of 150,000 m². Given the exceptional scale of the project, it was not economical or practical to use cranes. Therefore, a modular formwork system was needed that could be assembled and repositioned by hand and used efficiently for different sections over the course of the project. The lightweight HANDSET Alpha Panel Formwork allowed large concreting sections to be cast efficiently in a single pour. In addition, HANDSET Alpha which, in the case of walls, is designed for a fresh concrete pressure of 60 kN/m², ensured that the work could be carried out efficiently and with minimum effort. The particularly lightweight multifunctional panels, weighing 34.5 kg/m², could be installed by hand with minimal manpower requirements.

The modular HANDSET Alpha Formwork also stood out for its sustainable use of materials, consisting of only three system components. The robust and powder-coated HANDSET Alpha panels are reusable, meaning that both the timber used and the timber offcuts were kept to a minimum. The customer was also impressed by the formwork's attractive surface finish.

PERI not only supplied the formwork material but also ensured that the formwork was assembled correctly by providing competent construction site support. The construction site personnel, who had only worked with traditional formwork methods up to that point, learned about the benefits of system formwork in no time at all. The HANDSET Alpha's straightforward work sequence involving only a few, easy-to-use components kept the potential for error to a minimum and ensured that the project ran smoothly.

Contractor
SUEZ India Pvt. Ltd, Mumbai, India

Field service
PERI India, Mumbai

Dushyant Sharma · Project Director
"The Okhla Sewage Treatment Plant consists of a total of 150,000 m³ of concrete. Given the enormous amount of concrete, it was not possible to use a conventional formwork method. For this reason, we decided to use the HANDSET Alpha Panel Formwork, which enabled us to pour large concreting sections ranging from 4.50 m to 7.00 m in height, as well as 30 m long walls. We are very happy with the result."

Château d'eau

Benouville
France

Successful project completion through innovative load transfer on schedule

In Benouville in the Département of Calvados, a new water tower was built to guarantee the supply of water to two French municipalities. The diameters of the 39 m high water reservoir range from 6.70 m at the narrowest point to 19 m at the widest point. But it wasn't just the changing radii that posed a challenge – the five-month time frame for completion also resulted in a demanding schedule.

Contractor
Vauban GC, Ifs, France

Field service
PERI France Ouest, Le Rheu

Steve Fontaine · Site Manager
"The success we've had on this construction site is a really positive advertisement for the company VAUBAN GC. We are already planning the construction of further water towers using the same method and PERI solutions."

The reservoir construction work was divided into several sections so that the resulting loads could be transferred in the best possible way. A combination of SB Brace Frames, parts of the VARIOKIT Engineering Construction Kit and MULTIPROP Shoring Towers played a decisive role in this. The modular design of the heavy-duty brackets was particularly advantageous, as the connecting parts could be fitted to the brace frames, meaning no additional parts were required. The way the SB Brace Frames were anchored in the thin walls was critical in this respect. A double suspension with suspension shoe was used to distribute the forces.

The PERI engineers calculated the exact forces that would act on the various lifting devices in order to determine the required number of girders and the best possible arrangement of the horizontal profiles for optimal load transfer.

PERI's engineering expertise and the system combination comprising the VARIOKIT Engineering Construction Kit, MULTIPROP Shoring Towers and SB Brace Frames played a major role in ensuring that the project was completed on time and also ensured a high-quality concrete result.

INDUSTRIAL STRUCTURES

Vitamin A plant
BASF

Ludwigshafen
Germany

Completion on schedule
thanks to modern planning and Mega Scaffolding Kit

The new plant is expected to increase BASF's annual production capacity for vitamin A by 1,500 t. Around 600 machines and devices as well as 5,000 test points were integrated into the process control system. In addition, 250 linear metres of pipe bridges had to be constructed.

BIM methodology with cross-trade 3D planning, coordination and execution provided the basis for the associated scaffolding construction process. The majority of the scaffolding was planned in CAD using Autodesk's BIM 360 Field construction field management software and then made available as a 3D model. This enabled subsequent users to check the scaffolding plans for efficiency, variability and adaptability before they were erected. Not only did this allow the processes to be planned and documented in terms of time and space, but all of the information such as requirements/planning data, drawings or parts lists could also be called up at any time in a kind of digital scaffolding book.

At peak times, around 1,300 t of PERI system material were in use at the same time. It was possible to use the PERI solutions in an extremely versatile manner, for example for standing scaffolds, safety scaffolds, suspended scaffolds, shoring, stairs, material platforms and mobile working scaffolds. Most notably, by combining the PERI UP Scaffolding Kit with the VARIOKIT Engineering Construction Kit, it was possible to ensure both geometric and static flexibility thanks to the metric basic grid of both systems – and thus the highest degree of working safety.

The restrictive spatial conditions and the 30 m high heavy-duty platforms designed for 20 kN/m² on the northern side of the building, which were used for bringing equipment into the building, called for technical scaffolding masterpieces from the planning and assembly teams. In particular, the bridging construction with its tensioning system and its span of 12.75 m proved to be a challenging task. Based on RCS climbing rails from the VARIOKIT Engineering Construction Kit, it was possible to pre-assemble the bridge as a single unit on the ground and lift it into place with the mobile crane.

In addition to the almost gap-free design of the PERI UP deck levels, trip-free corner designs and transitions also ensured that the scaffold could be used safely. The inward-opening safety swing gates, protective caps in a signal colour and other supplementary components in the PERI UP Scaffolding Kit improved safety levels further still.

Scaffolding construction project management
promaintain GmbH & Co. KG,
Ingolstadt, Germany

Field service
PERI Germany, Weissenhorn
PERI Germany, Stuttgart

Tino Freund · Project Manager
"The spatial conditions dictated by the plant structure posed a significant challenge in this project. Thanks to the 3D pre-planning phase and the PERI UP grid dimensions of 25 cm, it was possible to erect the scaffolding safely and on schedule despite the spatial confinements of the plant. To a certain extent, new solutions and components were conceived and deployed to overcome this significant challenge, which expanded the horizons of industrial scaffolding construction. In the external areas, enormous cost and time savings were achieved for the customer through the use of PERI UP in combination with the VARIOKIT modular system. This has also opened up new scaffolding construction possibilities."

Contractor
MPNM – MANGIAVACCHI PEDERCINI and NESSI & MAIOCCHI

Field service
PERI Denmark, Greve
PERI Italy, Rome

Stefano Borroni · Site Manager
"PERI systems provide numerous benefits on the construction site and meet all safety requirements. The decision to use these systems sped up the construction process and led to high-quality results."

The building, which looks like a triangle when viewed from the air, was erected in a central location right next to the sea at the Øresund crossing between Copenhagen and Malmö. The use of PERI systems accelerated the progress of the project and meant that SB 4 concrete quality could be guaranteed – architectural concrete of the highest order.

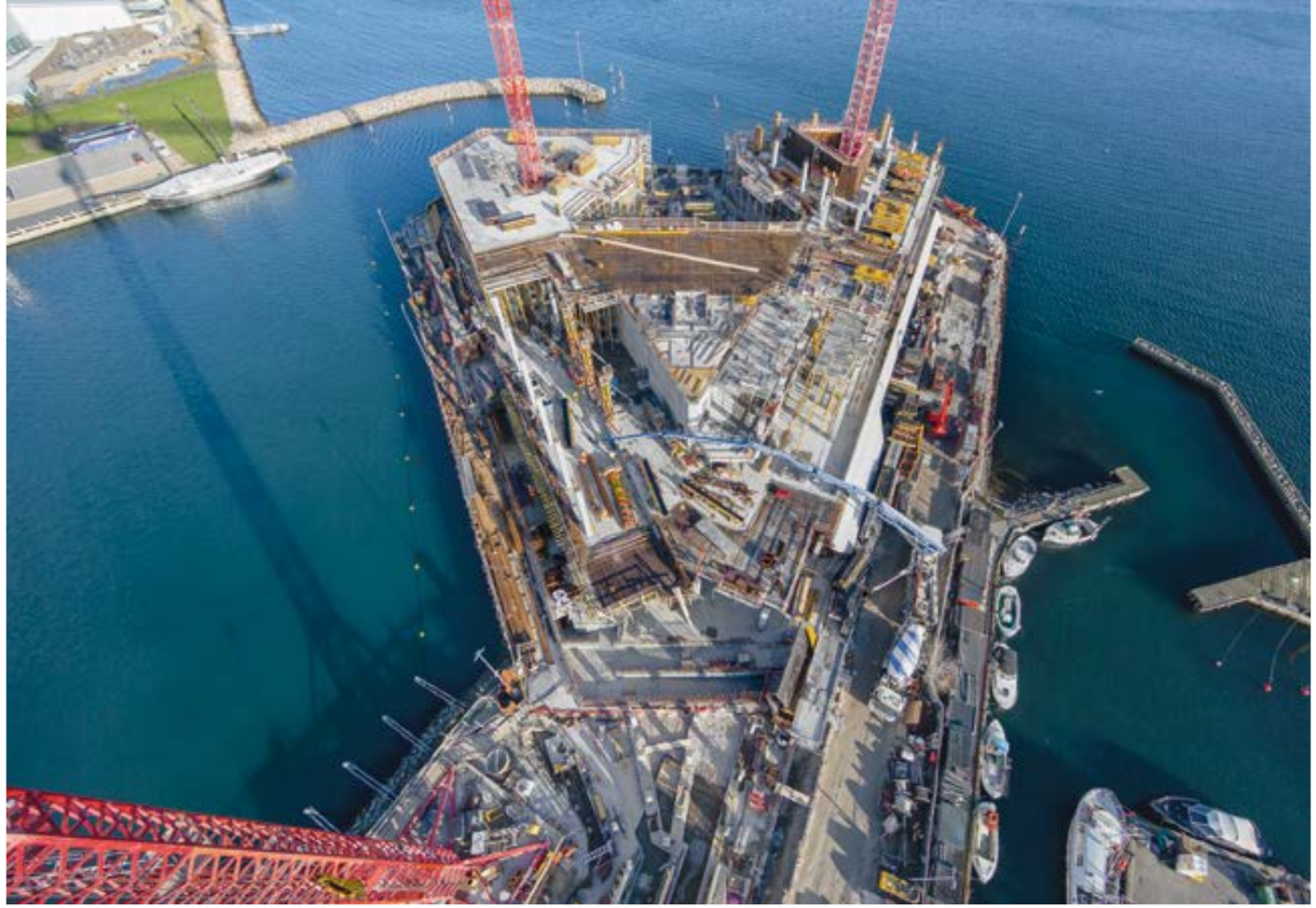
The centrepiece of the Research and Development Centre at Ferring Pharmaceuticals AS is a spacious atrium with panoramic views, consisting of an entrance hall, café and break room, as well as conference facilities and space for events. Most of the walls of the eight-storey building consist of extremely high-quality SB 4 architectural concrete, causing them to gleam impressively. The dimensions and shapes of the slabs were specified with the highest level of detail and vary from one floor to the next. For the facade, major emphasis was placed on horizontal lines, which is consistent with the flat surrounding structure.

PERI engineers developed a tailor-made solution for the construction consisting of 2,600 m² of pre-assembled VARIO Formwork, 2,000 m² of SKYDECK Slab Formwork, 2,000 m² of MULTIPROP Slab Props and 1,200 m² of VARIODECK Slab Tables.

The VARIO GT 24 Girder Wall Formwork proved to be the optimal solution for realising the special geometry and the defined joint and tie arrangement of the walls, as well as achieving the high level of architectural concrete quality. Thanks to the high degree of adaptability and the high load-bearing capacity, it was possible to adapt the wall formwork to the complex shape of the inclined walls in a straightforward manner.

The use of SKYDECK Slab Formwork with its drophead design meant that the striking process could take place at an early stage and that shuttering times were particularly quick. This, together with well-thought-out concreting cycles, meant that the material quantities available on site remained manageable. Throughout the entire construction phase, the construction site teams were able to work safely on the SKYDECK Panels. Regardless of whether there were straight or oblique residual areas to be closed within the slab area or if columns had to be shuttered – SKYDECK offered a practical and fast solution for every situation requiring only a low number of supplementary system components.

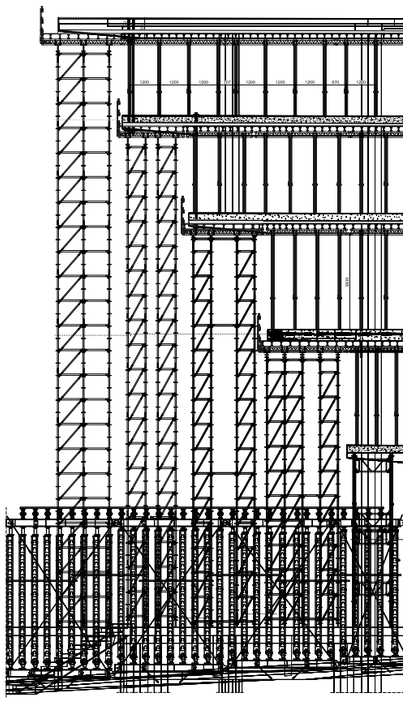
The modular PERI UP scaffolding system was also used. It was possible to use this in a versatile manner thanks to its 25 cm or 50 cm end-to-end system grid and the possibility of combining it with SRU Steel Walers from the VARIOKIT Engineering Construction Kit: As such, the scaffold provided a safe and stable working platform for the construction site team and provided optimal access to the widely varying concreting heights throughout the building.



Research and Development Centre for Ferring Pharmaceuticals AS

Copenhagen
Denmark

Architectural aesthetics made possible by customised PERI solution



Maintenance process 30 percent
quicker thanks to PERI UP

Contractor
HCV Mühendislik Mekanik, Adana, Turkey

Field service
PERI Turkey, Istanbul

Kubilay Varlı · Owner
"We have been working with PERI for many years now as an E&D partner over the course of several projects. We are very satisfied with PERI's performance when it comes to things like site supervision, adherence to deadlines, engineering and design support. Given the fact we are under time pressure during the shutdown period, this support becomes increasingly important. I had no doubt that this project would also be a great success with PERI by our side."

With its capacity of 1,320 MW, İSKEN is one of the largest coal-fired power plants in the country, generating energy for a significant part of Turkey. Recurring maintenance work is one of the tasks carried out regularly at the large plant. This downtime calls for reliable and safe work processes. PERI provided support for these time-critical tasks with approx. 500 t of PERI UP scaffolding material, engineering services, planning support, and logistical and consulting services.

The work on the boiler was a particularly challenging part of the project. The maintenance work on the valves, class-wire and the mill was carried out at the same time as the insulation work on the inside. To carry out the work, a 22 m high industrial scaffold with a diameter of 13 m was erected using the PERI UP Scaffolding Kit. The versatility of PERI UP with its system grid of 25 cm or 50 cm proved to be particularly effective in this regard. For example, it was possible to accommodate the different spatial conditions while maintaining the required level of occupational safety.

Another challenging task was the overhaul of the chimney system. A new coating was to be applied to a 100 m section of the chimney, while new insulation was installed on the outer section. For this, scaffolding was erected on the inside and outside in a short space of time. For the 36-hour maintenance period of the absorber section, very swift, pre-planned and reliable scaffolding work was required to ensure that work procedures remained safe. This task was also completed successfully and on schedule.

The versatility of the PERI UP Scaffolding Kit allowed the customer to react spontaneously and yet efficiently to unforeseen requirements over the course of the project. This system capability combined with the low weight of the individual system components brought about enormous time savings with a reduction in maintenance time of an impressive 30 percent. PERI UP also significantly improved the degree of occupational safety – both during the assembly phase and during maintenance work. In this way, safety and cost efficiency were combined.

FAIR Particle Accelerator Facility

Darmstadt
Germany

Major project safely implemented

with project support and suitable product mix

In situations where ions and antiprotons are to be accelerated to the speed of light, you can expect the requirements in terms of quality and safety to be particularly demanding. Around 2 million m³ of earth and over 600,000 m³ of reinforced concrete will need to be moulded into shape in order to complete the "Facility for Antiproton and Research" particle accelerator, or "FAIR" for short, by 2025. PERI supported one of the largest research projects in the world by providing formwork and scaffolding.

Contractor
ARGE FAIR,
Shell Construction Plant Section North,
(PORR GmbH & Co. KGaA;
PORR Bau GmbH)
Darmstadt, Germany

Field service
PERI Germany, Nuremberg

Huw Ashhurst-Smith · Planning Engineer
"Our positive working relationship with the project manager from PERI makes the job easier. In major projects like this, that is extremely helpful. The foremen are also very fond of PERI's systems."

The centrepiece of the huge facility is the triple-cell, 1,100 m long ring tunnel at a depth of around 20 m. In addition to the extension work taking place at the same time as the shell construction work, the 44 tunnel sections posed a major challenge, as they each required separate planning as a result of the wide range of different interference points.

VARIODECK Steel Waler Slab Tables made it possible to form the slab sections of the tunnel. The smart decision to combine these with MULTIPROP Props meant that access openings within the tunnel cross-sections could be eliminated. The lowered slab tables were then moved through these to the next construction phase. Whenever there were special load transfer requirements for wall or slab formwork, PERI engineers provided support in the form of a project-specific HD 200 Heavy-Duty Prop. Many wall and slab formwork elements were supplied with a high degree of prefabrication, meaning that the number of tie points within the tunnel could be reduced, for example.

The PERI UP Staircase 100/125 was specially designed to meet the increased requirements for load-bearing capacity and accessibility, and was used to bridge the height distances of the 20 m deep ring tunnel. This meant that the work areas of the excavation could be accessed safely and conveniently, even with tools or in the case of oncoming traffic.

PERI UP was also used as reinforcement scaffold in connection with column and slab formwork elements.

In addition to the corresponding formwork and scaffolding systems, the support PERI provided also extended to services: A project manager from PERI assisted the site supervisors during all construction phases and was on hand to provide advice if any questions or issues arose. What's more, all execution plans and delivery notes, and thus a daily updated overview of materials and costs, were available at all times through the myPERI online portal.

The oil and gas field Ku-Maloob-Zaap (KMZ), which covers a total area of around 121 km², is situated in the bay of Campeche, 105 km north-east of the city of Ciudad del Carmen. In 2019, a new gas compressor platform named CA-KU-A1 was added to the oil and gas production complex that is located there. To carry out the time-critical construction project, PERI provided flexible scaffolding solutions and comprehensive on-site support.

Safe assembly of new platform for oil and gas production field in Mexico

With the aid of the modular PERI UP Scaffolding System, it was possible to erect safe working platforms even at great heights. Being able to change the direction of the decks within the scaffolding bays at will made it possible to build around obstructions such as pipelines or load-bearing constructions. This meant that working areas were almost completely free of gaps with no height offset or trip hazards. The self-securing ledger connection on the scaffolding node, the integrated lift lock on the non-slip decks and the end-to-end lateral protection provided a particularly high degree of safety.

What's more, the continuous metric system grid consisting of 25-cm-increments paved the way for a construction consisting largely of suspended working platforms made up of UDG Steel Decks. Scaffold tubes and couplings were used to fix these to the steel girders of the platform.

Stair towers with alternating staircase units were installed at two corners of the platform in order to provide access to the first level of the main station. The PERI UP Staircase 100 not only provided site personnel with short walking distances between levels, but also significant head clearance. Non-slip decks and trumpet-shaped openings that are curved upwards meant that the steps could be used safely. With a live load of 40 kN, it was perfectly equipped to support up to 50 people at one time.

On the one hand, the ALPHAKIT Tower served as a shoring tower for the tripods, on the other hand, it provided an access point for the construction workers. Pre-assembly of the shoring towers was carried out on the ground and by hand. This was a quick and efficient process due to the low number of lightweight components involved. A crane was not required until the erection stage.

Contractor
Dragados Offshore S.A.,
Altamira, Tamaulipas/Mexico

Field service
PERI Mexico, Huehuetoca

Juan José Martín Niño · Head of Design
"For Dragados the most important thing to consider is safety. Safety is above everything for us and PERI Scaffolding flexibility guarantees safety. The possibility of using it as a suspended solution is a great advantage against the competition as not every product in the market offers this solution. We have used PERI scaffolding and ALPHAKIT in this project, saving tons of steel, lots of cm³ of weld making the project more profitable to us. PERI scaffolding adjusts more to our projects because of the continuous changes in the construction site and the adaptability of PERI scaffolding works really fine with that."

BUILDING REDEVELOPMENT

St. Stephen's Church

Bamberg
Germany

Church scaffolding **in record time**

For the renovation of St. Stephen's Church, which was built in the Greek cross shape, the use of system components and the compatibility of the PERI UP and VARIOKIT modular systems ensured significant time savings.

The central yet exposed location of the church, which was consecrated by Pope Benedict VIII in 1020, placed high demands on the construction site equipment, logistical process and scaffold assembly. Only vehicles under 3.5 t could be used for material delivery; in fact, a number of construction site areas could not even be accessed with these vehicles. As a result, the planned renovation work on the church tower, west gable and roof could only be carried out partially, whereby the main access road leading past the church had to remain free for vehicle and pedestrian traffic throughout and had to be safely accessible.

In order to precisely determine the load class 4 scaffolding material required and to optimise the subsequent assembly work, the church geometry, characterised by numerous projections and recesses, was represented first in a 3D model. The scope of planning also included the bridging construction using the VARIOKIT Engineering Construction Kit and the PERI UP Scaffolding Kit including verifiable statics. The VARIOKIT Rafter Truss could therefore be optimally adapted to the local conditions with a high load-bearing capacity.

Despite the complicated geometry of the structure, PERI UP's metric system grid made pipe coupling and timber work virtually superfluous and thus resulted in a time saving of almost one week. The option of changing the direction of the system decks meant that the work platforms could be designed as a flat, closed surface – without gaps and disruptive overlapping planks. The integrated lift lock in the PERI UP Decks, which engages immediately after each placement without the need for additional components, constituted a further important time and safety advantage: Thus, the 58 m high church tower could be completely scaffolded in 19 days by only two workers.

In addition to the work platforms, the access technology used also formed the basis for convenience and safety during the renovation work. The PERI UP Staircase, for example, with its 1 m wide flights of stairs, provided sufficient space for the construction site personnel to pass each other. What's more, it is easy to assemble: The fact that the steps could be inserted from bottom to top without tools and that they interlocked automatically when swivelled in saved both time and money.

Scaffolding company
Karl GmbH, Viereth-Trunstadt, Germany

Field service
PERI Germany, Nuremberg

Kevin Fleischmann · Site Manager
"In my view, PERI UP combines numerous benefits: The metric grid makes it extremely versatile and always ensures that the decking surfaces are closed without the need for additional timber overlays. What's more, the deck's integrated lift lock is beneficial both in terms of time and safety. When it came to bridging the access road, we were able to achieve high load-bearing capacities with a streamlined design thanks to the almost seamless combination possibilities that VARIOKIT offers."

Contractor
E.M. Pekkinen Oy,
Espoo, Finland

Field service
PERI Finland, Hyvinkää

Kari Suomala · Concrete Foreman
"The heavy-duty props from PERI turned out to be surprisingly easy to install. It is essential that we have good partners for demanding projects like this one!"

Creative solution simplifies complex renovation work

The aim of the project, which cost around €20 million, was to reinforce the old foundations of the Hakaniemen Market Hall. To this end, timber piles were to be replaced with steel tubular piles and new beams, columns, waterproof floor slabs and vaults were to be cast. Replacing the concrete piers, the concrete structures above them and the long-standing building services also constituted part of the renovation work. The upper area of the hall, however, was to be preserved.

In order to ensure the structural stability of the prefabricated building during the gradual demolition process, the superstructures were supported by 70 prestressed PERI UP HD Heavy-Duty Props until the new columns were cast. This hydraulically adjustable support system offered the creative solution that was needed to carry out all the work in a timely and, above all, safe manner despite the heavy loads. However, all of the components of the heavy-duty prop can be moved by hand, meaning relocation can be carried out without a crane. In addition, only one hydraulic unit is required to pretension the heavy-duty props. Once the full load-bearing capacity of all of the reinforced concrete columns has been reached, the props can be lowered again under load in a controlled manner.

PERI was also able to provide support with the formwork requirements: DUO Universal Formwork was used in order to meet the logistical requirements of the construction site. Thanks to its low weight of less than 25 kg per system component, the formwork can be moved around without a crane. The groundwater level posed another challenge. Here, too, the DUO system was used to create a watertight reinforced concrete wall around the excavation pit. This prevented the groundwater level from sinking outside the work area.

Pesnica Viaduct

Maribor
Slovenia

Contractor
Pomgrad d.d., Murska Sobota, Slovenia

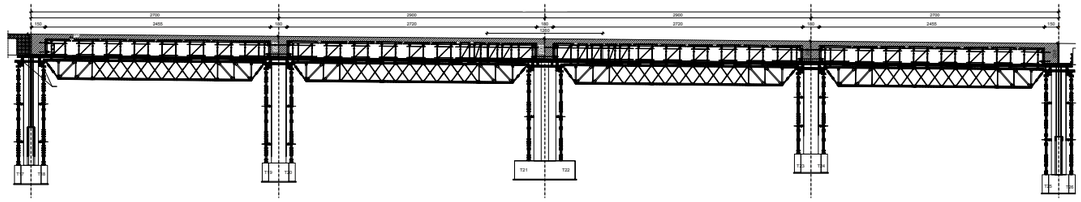
Field service
PERI Croatia/Slovenia, Zagreb

Srečko Prša · Project Manager
"The technical support from PERI was highly proficient and professional, and tailored to all of our construction site requirements from the outset. [...] With VARIOKIT, we were able to save a lot of time during the installation stage thanks to the system parts and connections. We opted for the PERI UP scaffold because it could be used universally and could be moved easily by crane. [...] By collaborating with PERI, we have been able to achieve our main goal: a fast, economical and high quality construction process. PERI proved to be a reliable partner – as early as the tendering stage, but also throughout the entire project execution stage."

Economical reconstruction
of railroad viaduct

The viaduct of the railroad connection between Vienna and Trieste, completed in 1846, was filled up in its entirety to form a dam by 1908 due to the sinking groundwater level. On account of the modernisation work as well as the massive stability problems on the old line, further measures were required: With support from PERI, the new, approximately 900-m-long double-track railway viaduct over the Pesnica Plain was built alongside the old line.

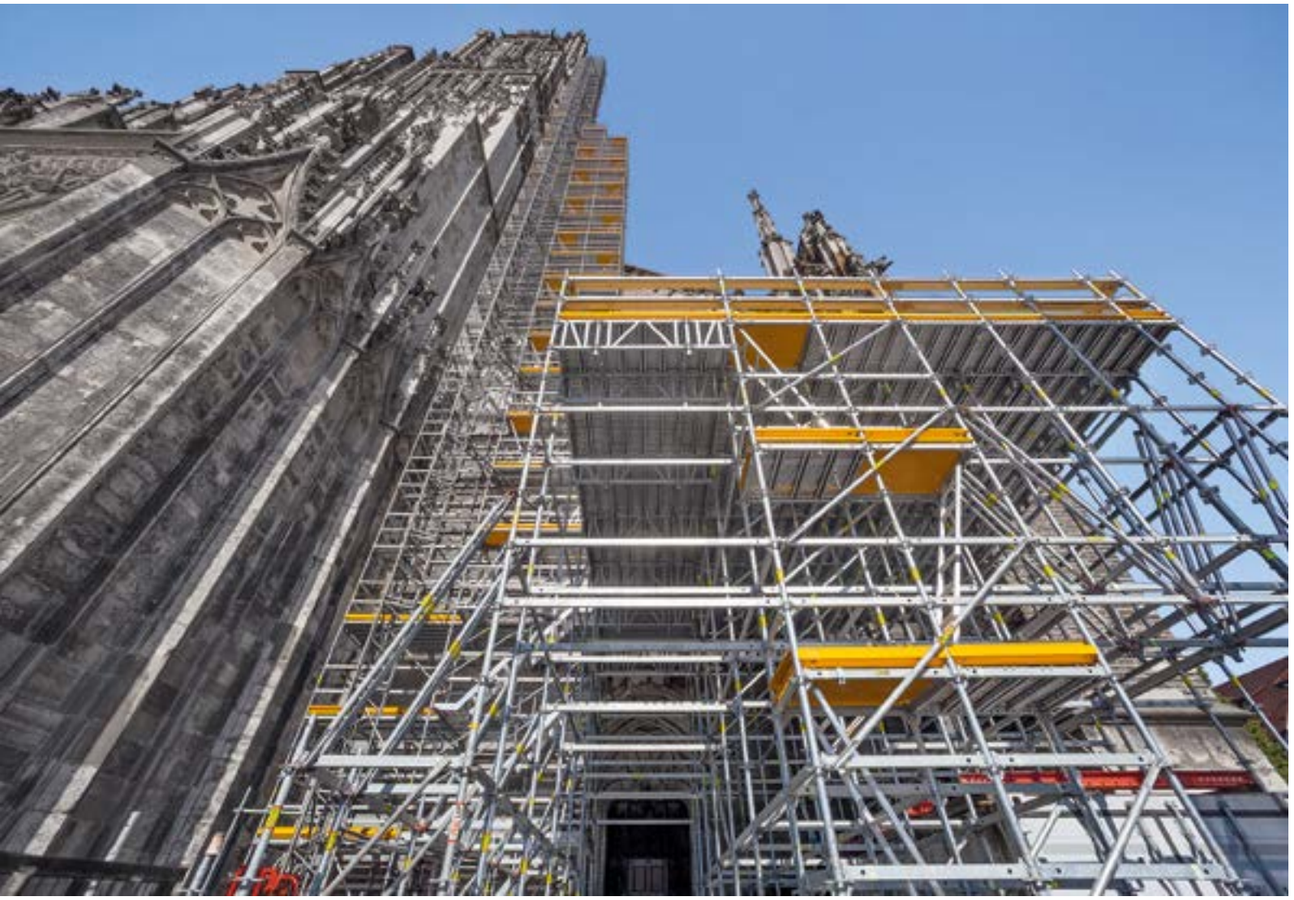
The integral, reinforced concrete structure consists of seven 112 m long segments and two 56 m long edge segments. The viaduct is supported by columns up to 14.50 m high with a diameter of 1.60 m, which were formed using SRS Circular Column Formwork. This is designed for a particularly high fresh concrete pressure of 150 kN/m², thereby facilitating swift progress with concreting operations. The benefit: the SRS Formwork could be combined with the TRIO Panel Formwork whenever required, using the alignment coupler and a connector strip.



PERI offered a customised VARIOKIT comprehensive solution for the large spans of the individual segments. VST Heavy-Duty Shoring Towers were positioned on the foundations of the bridge piers. These were connected with VRB Heavy-Duty Truss Girders in spans of 27 m and 29 m without intermediate support in the viaduct spans. The viaduct was realised using VARIOKIT Formwork, which is particularly cost-effective, adaptable and versatile. The low number of connections and extremely fast assembly and disassembly processes, not to mention swift relocation to the next segment, resulted in significant time and cost savings. In addition, PERI engineers provided advice and support to the construction site personnel during pre-assembly and also during the on-site assembly process.

Ulm Minster

Ulm
Germany



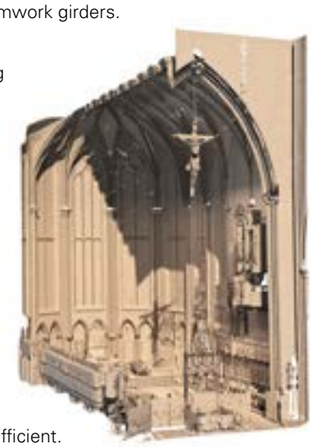
Efficient refurbishment using PERI UP and laser scanning

The 161.53 m high main tower of Ulm Minster is known as the highest church spire in the world. Equally impressive is the 29 m long, 15 m wide and 26 m high sanctuary. The PERI UP Scaffolding System and laser scanning were the key elements in the success of the main tower renovation project.

Having been designed for a total live load of 15 kN/m², the secure work and safety scaffold was the preferred choice given the fact that a total of 2,500 stones had to be replaced and 1,800 preserved in the course of the refurbishment work. A 7 m high heavy-duty platform was also erected on the facade to allow for suitable, temporary storage of heavy stones weighing up to 1.5 t.

The ability to flexibly adapt the PERI UP system to suit the loads and geometries using a 25-cm-grid played a central role: The grid allowed for an uninterrupted transition from the PERI UP Staircase to the scaffolding bay, thereby creating trip-free working levels. With PERI UP, it was possible to create tiered working levels and access options that allowed work to be carried out safely on both the choir vault and the choir stalls at the same time. The PERI UP Toe Boards also prevented objects from falling to the ground. The scaffolding was installed safely on Ulm Minister using the easily manageable, modular formwork girder. This allowed for 3 m to 9 m bridgings at a height of up to 30 m without any complex pipe coupling connections. The five easily manageable single components of the girder could be transported easily using only small-goods vehicles – an enormous advantage compared to bulky single-piece formwork girders.

The sanctuary posed another challenge, as no scaffolding planning work could be carried out using the historical 2D plans. Here, the BIM method paid off: By carrying out 3D laser scanning and then transferring the results to a 3D structural model, PERI engineers were able to develop a scaffold design using a free-standing, metric PERI UP system grid in 25-cm or 50-cm-increments and with a total size of 13,000 m³ for the complex geometries of the sanctuary. The three-dimensional visualisation of the scaffold also served as a common communication model. Thanks to the BIM method used, both the scaffolding planning process and the subsequent assembly process proved to be particularly efficient. The location of the rental park for system units at PERI's head office in Weissenhorn offered short transport routes – and on-schedule material supply without any downtimes.



Client
Münsterbauhütte [Minster Site Office], Ulm, Germany

Scaffolding company
Mack Gerüstbau GmbH, Nersingen, Germany

Field service
PERI Germany, Weissenhorn

Michael Hilbert
Former Master Builder of the Minster, † 2020
"The time frame of only four weeks for the preparation process was extremely demanding. That's why it was important to me that we were able to combine the laser scanning and scaffolding planning processes, and therefore plan the scaffolding for the structure in the shortest possible time. It only took three weeks to erect the scaffolding too. An incredible achievement."

Gurrehus

Kvistgård
Denmark

Rapid renovation
regardless of the weather

Thanks to PERI's weather protection solution, it was possible to renovate the "Gurrehus" in northern Denmark within a single calendar year without any weather-related interruptions. Other components in the PERI UP Scaffolding Kit were also used.

Gurrehus, which was built in the 16th century, is located in the north of Denmark. In the past, the building was used as stables for Gurre Castle, which has since fallen into disrepair. To save the Gurrehus from a similar fate, extensive renovation work was carried out using various PERI UP scaffolding solutions. Thanks to the LGS 75 Weather Protection Roof, the team was able to carry this out quickly, without being affected by the often changeable Danish weather. To this end, a roof was erected over the entire building, which has a unique design.

The entire facade of the house was scaffolded for the repair work using PERI UP, whose versatility proved to be very useful in this project. For instance, in addition to console brackets, a 1.5 m wide main deck and material platforms were built using PERI UP. The latter made it possible to store the slate tiles for the roof close to the action, thus saving the carpenters a lot of effort and providing a greater level of safety at the same time.

The real highlight of the project was the LGS 75 Weather Protection Roof. This medium-span canopy covered a total of 28 m. The system is fully compatible with PERI UP scaffolding materials and can be constructed using only five additional components. Pre-assembly of the truss units was carried out conveniently at ground level and saved valuable work time thanks to the user-oriented handling processes. The keder tarpaulins were drawn in with great precision using smooth-running rollers; the assembled parts were then lifted onto the roof using a crane. The movable platforms also afforded the workers great flexibility during the work processes. For example, by opening and closing the movable girder segments, it was possible to bring new materials under the canopy without wasting valuable work time.

Contractor
KyedStillads A/S, Tikøb, Denmark

Field service
PERI Denmark, Greve

Frederik Kyed · Owner of KyedStillads A/S
"We are grateful for PERI's willingness to help us with the first steps of the project. The canopy works in the manner intended and the dialogue with PERI and support provided have been good from start to finish."

Steglitzer Kreisel

Berlin
Germany

Protected work operations
with an exceptional view

30 floors of the roughly 50 year old building, which were previously used for administrative purposes and had been empty for over ten years, have now been given a new purpose: in the course of an elaborate refurbishment project, the building was completely gutted and transformed into an exclusive urban residential tower with over 300 freehold flats going by the name of "ÜBerlin". To make the view from the 120 m high tower block even more stunning, projecting and recessed balconies were integrated into the new, modern facade, which is made of glass, steel and aluminium.

Not only is it important to protect the workers themselves during inner-city construction projects, it is also important to protect all passers-by. PERI guaranteed this by means of a wide-span bridging construction across the street "Schloßstraße" based on the VARIOKIT Engineering Construction Kit, which served as a protection roof for the two lanes as well as the passers-by on the footpath and cycle path while the facade was being dismantled. In addition, the structure supported by VARIOKIT VST Heavy-Duty Towers was used as a central delivery and storage area throughout the entire construction phase.

Around 20,000 m² of facade surface were scaffolded at the Steglitzer Kreisel building complex at the same time, meaning that at peak times up to 1,250 t of scaffolding materials were in use. The geometric basis for the scaffolding planning carried out by the engineers from PERI was provided by the offset cantilevered balconies. The positioning of the construction hoists also had an impact on how the scaffold bays were divided up. The benefit of the PERI UP solution: the metric 25-cm-system grid meant that the verticals could be arranged in almost any direction.

The structural element posed another challenge. The load case with an open facade in particular was different to any standard application in scaffolding construction. Owing to the scaffolding of the skeleton building, which actually only consisted of steel supports and extremely slim intermediate slabs, higher wind loads had to be taken into account. The long service life of the scaffolding also had an influence on the load assumptions. As an important part of their scaffolding planning process, the specialists from PERI determined how to execute the introduction of loads into the existing building with correspondingly high vertical loads and anchoring loads in close cooperation with the responsible structural engineer.

A double-row scaffold design was chosen for carrying out all the necessary construction work throughout the entire construction phase. The 1.00 m wide longitudinally oriented scaffold bay installed at the outset served as a safe workplace for facade disassembly, shell strengthening and slab edge renovation. At the sections where cantilevered balconies and bay windows were to be installed at a later date, a 1.00 m wide section was also part of the PERI solution.

General contractor
Consus Construction GmbH, Berlin, Germany

Scaffolding company
Ro² GmbH & Co.KG, Berlin, Germany

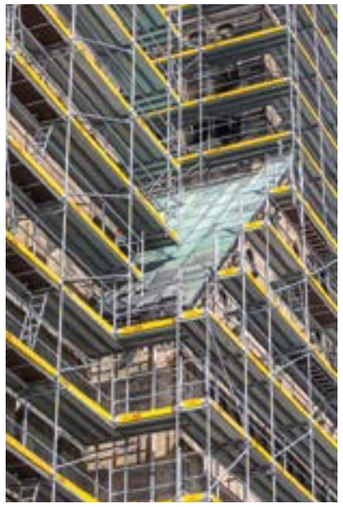
Field service
PERI Germany, Berlin

Björn Arendt
Scaffolding Crew Leader
"Even with 22 years of scaffolding experience behind me, I still have a lot of fun at work. When it comes to being able to make scaffold adjustments using a system, especially in corner areas, PERI UP really is the only choice for me. Conventional tube-coupling designs would be far too time-consuming. The fact that the PERI UP system is variable at all times is fantastic."

The versatility of PERI UP facilitates **careful restoration**

Built at the beginning of the 20th Century from brick and sandstone, the Church of St. Jacek with its two 57 m high towers graces part of the former mining town of Bytom, not far from Katowice. Inside, murals and a suspended wooden ceiling adorn the monument. Where the nave and transepts intersect, a small ridge turret with a pointed roof juts out.

It was precisely these circumstances that presented the greatest challenges of this project. PERI had to supply a scaffolding construction that required as little anchoring as possible in the interior and could still be adapted to the complex geometry of the structure. In the course of building information modelling, PERI engineers determined the correct number of scaffolding elements with high accuracy using a custom-made 3D model. In this way, costs could be saved right from the start.



PERI UP proved its worth as early as the assembly stage on account of the safe assembly technology based on integrated guardrails. Even the entrances to the domes of the main towers could be conveniently placed and made easily accessible with stair towers. The facade was scaffolded with standard elements, which were fixed above the roof with beams and VARIOKIT Console Brackets to avoid damaging the gable. Thanks to the flexibility of the PERI UP Scaffolding Kit, the complex shapes in the facade could be scaffolded without building edges and trip hazards.

The historic ceiling inside the church was secured with tight falsework consisting of various PERI UP system elements. The combination was also used to form a working scaffold around the ridge turret to be renovated.

Contractor
Parish of St. Jacek, Bytom, Poland

Field service
PERI Poland, Płochocin

Sebastian Pilski · Scaffold Assembly Coordinator
“We have been using PERI UP Scaffolding successfully for many years. The PERI scaffolding system enables fast and safe assembly. Thanks to the numerous combination options, we were able to adapt to the complex geometry of the structure flexibly and use console brackets in different lengths, such as 25, 33 and 50 cm. The rigidity of PERI UP Scaffolding is something that distinguishes this system on the market. Anyone who has stood on the scaffolding of a tall church knows how important it is and how it adds to the safety and convenience of the work.”

Scaffolding company
Gloser Gerüstbau GmbH,
Walzbachtal, Germany

Field service
PERI Germany, Stuttgart

Oliver Bernhardt · Site Manager
"This is certainly an unusual project with some special installation features. One major benefit in this respect is the way in which the scaffolding and formwork are combined: the VARIOKIT walers serves as the supporting structure for the standing, shoring and suspended scaffolds – and the flexible connection points, together with PERI UP, allow for force-fit connections."

Challenging refurbishment work while trains continued to run

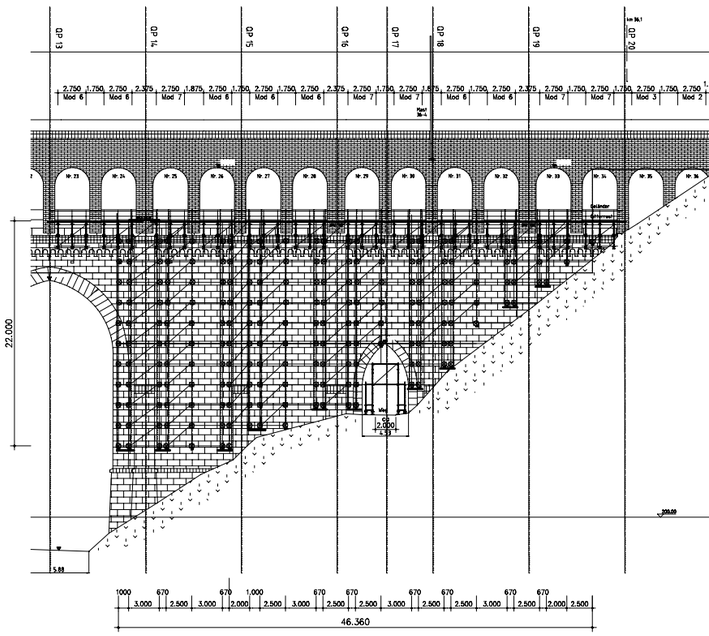
Uninterrupted travel thanks to intelligent connections: At the Heiligenborn railway viaduct, the PERI UP and VARIOKIT systems ensured that train services continued to run despite extensive refurbishment work.

Complex structural geometry, significant spatial restrictions and poorly accessible sloped areas – the 167 year old, 180 m long and 40 m high viaduct on the railway line between Riesa and Chemnitz posed unique challenges to the parties involved. The company Gloser GmbH opted for PERI scaffolding solutions in order to carry out the extensive repair work on the masonry of the arches and the bridge piers made of natural stone and bricks, and, at the same time, to restore the track supporting structure and the drainage facilities.

The shoring structure and the standing and suspended scaffolds were constructed on the basis of the PERI UP Scaffolding Kit as well as the rentable components of the VAROKIT Engineering Construction Kit. Both systems can be combined seamlessly on account of the standardised, metric basic grid. It was possible to adapt the systems to project-specific geometries and loads in 25-cm-increments without any issues. The scaffolding was erected in alternation: While the shoring and working scaffolds for the superstructure were held available on the west side, the standing and suspended scaffolds were used to carry out the facade work on the east side. The switch was then made later on.

This simplified the installation process considerably and allowed the refurbishment work to proceed swiftly and safely both in the sloped areas and within the 32 bridge arches. The use of standardised, coordinated connecting components also simplified the planning process.

Another considerable benefit of the integrally aligned PERI scaffolding technology: railway traffic did not need to come to a standstill over the course of the one-year construction period, but could continue to run on a single track.



Our commitment to environmental protection

All relevant CO_2 emissions generated during the production of the PERI Book are determined according to the “natureOffice procedure” and subsequently offset through the purchase and binding suspension of recognised climate protection certificates.

In addition, the wood used for the paper production of the PERI Book comes from FSC®-certified forests. The FSC® label confirms that the entire processing and supply chain – from the forest and wholesalers through to the printing stage – is fully certified.

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Important notes

All current regulations and guidelines applicable in countries where our products are used must be observed.

The images shown in this brochure feature construction sites in progress. For this reason, safety and tie details in particular cannot always be considered conclusive or final. These are subject to the risk assessment carried out by the contractor.

In addition, the computer graphics used are to be regarded as system representations. To facilitate understanding, these and the detailed illustrations shown have been partially reduced to certain aspects. The safety installations that are not shown in these detailed descriptions must nevertheless be available. The systems or items shown might not be available in every country.

Safety instructions and load specifications are to be strictly observed at all times. Separate structural calculations are required for any deviations from the standard design data.

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