

# BAUER REVIEW

FOR EMPLOYEES AND FRIENDS OF THE

BAUER GROUP COMPANIES

2021

51






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*The port of Alexandria is being expanded. Bauer Egypt was commissioned with the foundation work for a semi-rectangular quay wall encompassing 225,897 m<sup>3</sup>, which comprises a front diaphragm wall, two rows of center piles and a rear row of barrette piles. Along with four trench cutters, two BAUER BG 28 drilling rigs are also being used.*

## Internal news

After roughly two years of COVID-19, one thing is clear: even after 2021, the virus will continue to loom large for us and the rest of the world. Nevertheless, we have managed to make it through this difficult time in good shape overall thanks to our enormous efforts and the incredible dedication of our employees around the world. Despite the adverse conditions, 2021 has also brought many project successes, positive developments and innovations for Bauer that we would like to inform

you about in this edition of the BAUER Review. Above all, the pandemic has shown us how important it is to stick together, especially in such difficult and challenging times. That's why we are dedicating this edition to everything that unites us – whether this means construction projects that bring people together and create living spaces for future generations, joint projects implemented by multiple Group divisions of Bauer working together, digitalization, or the Bauer company culture.

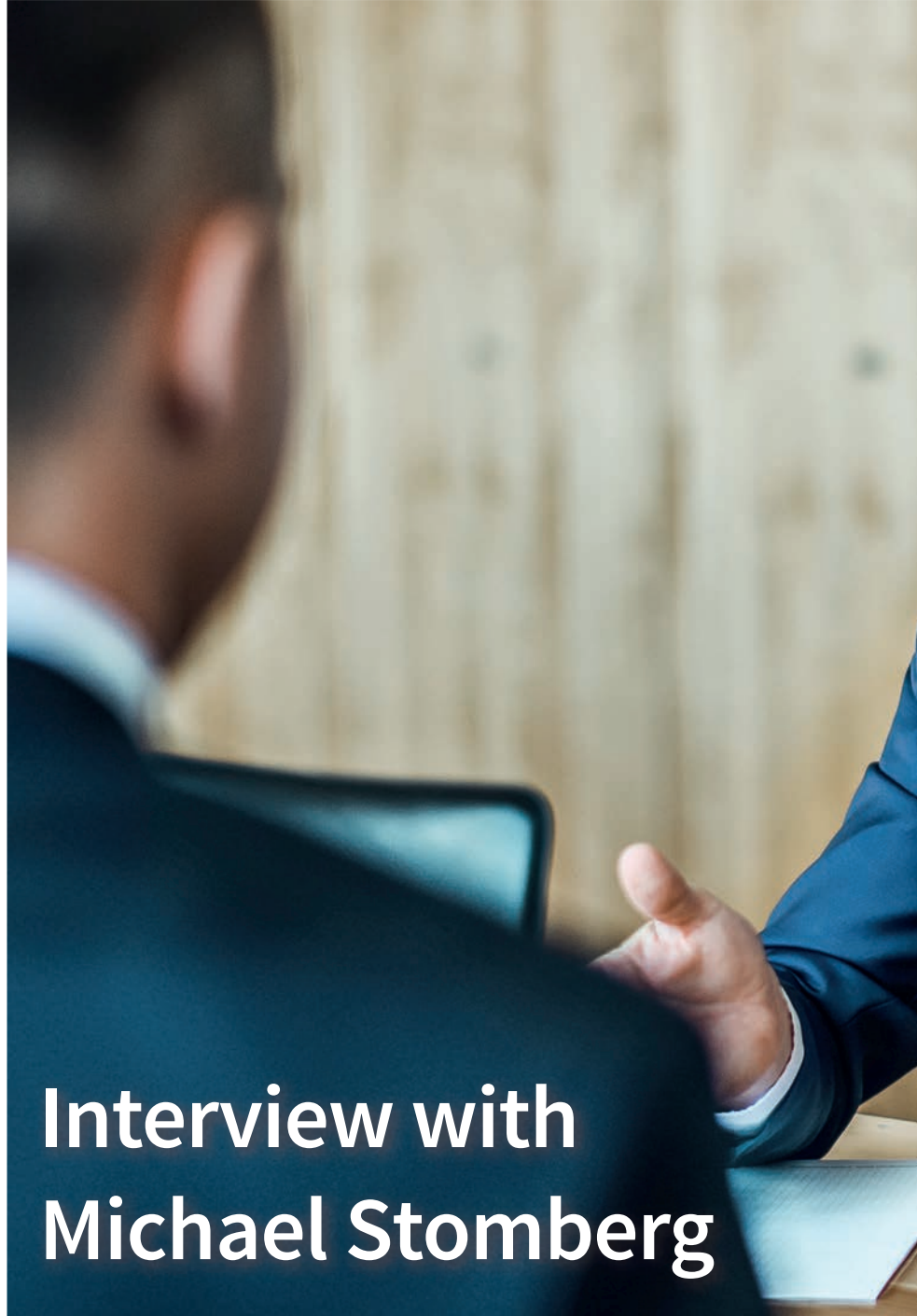


**Mr. Stomberg, even though the global economy is still clouded by the ongoing pandemic, the overall situation is nevertheless recovering. How would you assess the situation after roughly two years of COVID-19?**

The past two years have been truly unusual: in 2020, the world suddenly came to a standstill. The virus has caused the economy to drop sharply to an extent not seen in many decades. Of course, this also affected our globally networked business: for our Construction segment in some regions – particularly in the Far East – we had to deal with curfews and travel restrictions that were strict at times and had a significant negative impact on logistics arrangements for personnel, materials and construction equipment. Apart from a few exceptions, the Equipment segment was significantly affected by customers' reluctance to invest. Only our Resources segment remained relatively unaffected by the COVID-19 pandemic in 2020. In late 2020 and early 2021, many people began to hope that a sort of normality would soon return with the availability of vaccines. But unfortunately we are still far from reaching that goal if you consider the world as a whole.

**So the hope for normality has not been fulfilled?**

Today it is clear that even with intense efforts to provide vaccines, we are still far from where we want to be. In many countries around the world, most people have not even received their first dose of the vaccine, so we are still a long way from "normal". I believe that the pandemic and its effects will remain with us even after 2021 and we will still have to deal with this situation until vaccination rates are high enough and effective medication has been found against the symptoms and long-term consequences of COVID-19 infection so that the virus is no longer a cause for fear. That makes me even more impressed at the commitment many of our employees have shown, and continue to show, in this difficult time. In particular, employees working outside their home countries have had to endure major inconveniences due to the pandemic-related restrictions and, in some cases, were unable to see their families for many months at a time. This dedication can't be appreciated enough; it deserves the utmost respect.



# Interview with Michael Stomberg

**COVID-19 has not just changed everyday working routines on construction sites and in plants. Many Bauer employees have worked remotely for months, i.e. mostly at home. What have your experiences been in this regard?**

Over the last two years or so, we have learned a lot about working together virtually, about what is possible, what works, and what doesn't. For months, remote work was practically the only alternative to manage the situation at our offices. With increasing vaccination rates and adaption to the legal framework conditions concerning protection against infection, we want to return one step closer to normal routines and increase the number of employees working in person at the company.

**Why is that?**

Working from home has many advantages, but it also has considerable disadvantages. I am firmly convinced that it is good for all of us to meet more in person again instead of virtually. We are social creatures, we need contact with one another, dialogue about work and private matters, as well as personal interaction. And that's not possible if everyone is working in isolation all the time at different locations. Particularly when there are cultural barriers, language barriers, or different time zones involved, on-site visits are necessary to foster better communication. We won't be able to replace that with video conferences in the future, although they will naturally be a valuable addition. And





spontaneous brief chats in the hallway, in the breakroom, or cafeteria are not generally possible with virtual work – video conferences need to be more strictly planned and moderated. As a general rule, we need to find the right balance between in-person work at the company and remote work. In my opinion, we have established a reasonable and flexible framework for this.

**Apart from the pandemic, which topics are the focal points of corporate strategy?**

Above all, we are naturally addressing the major trends of infrastructure, urbanization, climate change, and environmental awareness, which we consider not only as

challenges but also as opportunities. They will drive our business in the long term: with our expertise, our services, and our equipment, we are building the foundations for the world of tomorrow.

Adaptation to climate change requires more intensive investment in flood protection. We can assist here with dike rehabilitation thanks to our specialist foundation engineering technology. In order to achieve climate targets, the use of renewable energy needs to be expanded. Water power and wind power are particularly interesting for our business and offer many opportunities that we would like to draw on. Of course, the topics of sustainability and climate change also have a major influence on the development of our drive technology for equipment.

**Digitalization – along with sustainability – is one of the core topics of the Group strategy. How does Bauer want to position itself here in the future?**

When it comes to digitalization, we want to be the industry leader, which for us specifically means demonstrating the advantages of digital solutions and equipment functionality on site. We use digitalization on our own sites to be more productive, among other reasons. We are working hard to make life easier for our employees on construction sites, for example with the digital construction diary. We offer our clients digitally documented quality

assurance and construction progress that can be monitored online. But of course, we also offer these advantages to our equipment customers – with hardware and equipment, as well as with software products. We also continually enhance our specialist foundation engineering equipment with digital assistance systems that not only support operators with their work but also considerably increase occupational safety. As a result, we are already on the right track with our innovative products and methods. We are also addressing the issue of sustainability and the question of how we can also take on responsibility for tomorrow with the entrepreneurial decisions we make today. In addition to our responsibility to our employees, customers, and partners of achieving commercial success in the long term, this also concerns, for example, the environmental footprint of our methods and products. We are constantly working on reducing this footprint to minimize any negative effects to people and the environment as much as possible. Sustainability also involves other aspects, such as occupational health and safety or the quality of our work, which customers rely on. We are striving being the biggest in our industry, but rather with taking on a leadership role overall, having the best ideas and solving the most difficult tasks with the most innovative methods.



*Expansion of an existing container terminal:  
in the Croatian port city of Rijeka, a BAUER BG 39  
with BV 2000 casing oscillator is being used.*





# Status report

COVID-19 continues to affect the world and our company. Since the start of the pandemic in early 2020, hardly a day has passed without news about the spread of the virus or efforts to contain it. We particularly felt the consequences of the pandemic in 2020. The collapse of the global economy and worldwide restrictions in public and social life also had major impacts on the BAUER Group. In 2020, total Group revenues decreased by 8.8% to EUR 1.45 billion. Nevertheless, we made it through this difficult year in good shape overall, thanks to our enormous efforts and the incredible dedication of our employees around the world. This was also evident from the earnings after taxes, which were only slightly negative in the end at EUR -8.2 million.

The most significant effects on our business were felt in our Construction and Equipment segments. The curfew and travel restrictions, as well as mandated quarantines imposed in many markets – especially in the Far East – had a considerably negative impact on our sites in these countries. At EUR 669.0 million, total Group revenues in the Construction segment were actually 6.4% higher than in the previous year, since 2019 was shaped by significant special items. However, earnings after taxes remained negative at EUR -5.0 million.

In the Equipment segment, customers reacted to uncertainties concerning the future course of the pandemic and economic development with a strong reluctance to invest. Total Group revenues recorded a decrease of 14.4% to EUR 610.7 million as a result. Earnings after taxes also fell sharply to EUR 11.0 million.

The Resources segment was relatively unaffected by the COVID-19 pandemic, but was shaped by the conclusion of restructuring measures that began in the previous years. Total Group revenues thus decreased by 14.6% to EUR 268.8 million, and earnings after taxes were again negative at EUR -7.2 million.

We started 2021 with a great deal more optimism, since our Group recorded a very high order backlog of nearly EUR 1.2 billion at the turn of the year. The Construction segment in particular started in a very good situation and we were also able to acquire a few more major projects in the first quarter. Nevertheless, our hopes were not entirely fulfilled over the course of the year. Particularly in the Far East, the COVID-19 pandemic significantly worsened again due to the spread of the Delta variant and particularly affected countries that had pursued a "No COVID" strategy in 2020 by relying on isolation. For this reason, we anticipate ongoing significant obstructions in project implementation in this region.

The reticence of our equipment customers is also relaxing more slowly than expected. Although inquiries have picked up considerably over the course of the year, these have not yet materialized into final orders. Here as well, the Asian region is particularly affected. Nevertheless, we are confident that Asian countries will once again have a growing demand for construction activities in the future. That is why the Group is remaining in the region, and we are developing market opportunities despite the currently challenging environment.

Despite these adverse conditions, 2021 once again brought many positive new developments and innovations. Under

the event slogan "BAU ERLEBEN," we presented selected equipment to our customers on our company grounds. This included a world first: the BAUER Cube System. This is an innovative, electrically powered cutting system that is the size of a container and can be easily used in small tunnels.

In addition, we have numerous other initiatives and ideas for making construction more sustainable, such as our MIP method or elevated soft gel blankets that save a great deal of CO<sub>2</sub> and use considerably less resources than standard methods. The topic of digitalization continues to be a top priority on our development road map. We are already capable of mapping complete digital twins of our sites, thereby leveraging efficiency for us and our customers.

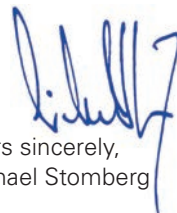
Our Resources segment is performing positively overall. After many difficult years, the success of the new strategic orientation is finally becoming evident. In Bahrain we also received a Letter of Intent for the construction and operation of another constructed wetland. Following our first plant in Oman, this is another major success for this special and forward-thinking technology.

We achieved another important milestone with successful execution of the capital increase in the middle of the year. Another major shareholder has now been added with Doblinger Beteiligung GmbH, alongside the Bauer family, who is still the largest shareholder. With this initiative, we have again established very solid capital resources for the Group in the future.

At the end of the year, my colleague from the Executive Board, Harmut Beutler is entering well-deserved retirement, after almost 40 years with the company. It has been a great pleasure to work with him over the last three years. I will miss him and wish him all the best for this new phase of life.

I would also like to particularly thank our employees. Over these two difficult years, they have made a major contribution in all areas and at all locations of the company. Sticking together is especially important in such difficult and challenging times.

And I would also like to warmly thank you, our partners, customers, and friends of the company, for your trust. I look forward to meeting you in person once again in the future!



Yours sincerely,  
Michael Stomberg





To remove the traces of a former gas combine plant on the grounds of the Schwarze Pumpe industrial park in Saxony, Bauer is carrying out comprehensive soil remediation work.





## Joint projects

# Strong individually, unbeatable as a team

When one gear engages with the next, when segments complement each other, when people inspire one another: this is called synergy. Mutually sharing our knowledge, talent and skill is what brings us together at Bauer, whether within the BAUER Group or within the individual segments. In every area there are specialists who are incredibly strong on their own, with lots of experience, expertise, innovative technology and a well-developed service mentality. Sometimes only a specific field or product is required, but sometimes the entire service chain is involved, from the use of heavy deep drilling equipment, to the construction of cut-off walls, through to brownfield remediation of former industrial sites. Intelligent networking of all skills and segments under one roof offers a decisive advantage in our daily operations: no matter how complex and challenging a project may be, Bauer is able to deliver a holistic solution for a wide range of tasks. The foundation for all this is our strong team, who works together with a great deal of enthusiasm and an extraordinary sense of solidarity. This mix makes us unbeatable in collaborative projects.

### **Impressive team performance on a large scale**

When thinking of outstanding collaborative projects led by the BAUER Group, the Schwarze Pumpe Industrial Park immediately comes to mind. For years, the soil and groundwater on the site were significantly contaminated by operation of the former gas combine plant. Since 2017, BAUER Resources GmbH and BAUER Spezialtiefbau GmbH have been carrying out extensive soil remediation work using heavy equipment from the BAUER

Maschinen Group, in order to remove these remnants from the 720 ha site.

This is not only a massive area but also an enormous task: large-scale soil replacement, with the aim of reducing the input of contaminants into the groundwater. To remove the soil, BAUER Spezialtiefbau GmbH sealed off six construction sections with approx. 1.3 km of primary sheet pile walls to a depth of 20 m. Subsequently, 147 additional single sheet pile boxes with a footprint of 10 x 11 m were constructed within the primary sheet pile walls. Various pieces of equipment from the BAUER Maschinen Group are used here: a BG 20 H drilling rig, an RG 22 and RG 16 from RTG Rammtechnik GmbH, as well as a KR 806 anchor drilling rig from KLEMM Bohrtechnik GmbH. Once this has been completed, the soil excavation is carried out by BAUER Resources GmbH up to a depth of 14 m. After cleaning, the soil is used with the uncontaminated soil from the initial excavation as backfill for the construction sections.

The most important consideration during all remedial actions is compliance with very strict safety requirements to protect people and the environment. The Bauer team works in protective suits, equipped with mouth protection, protective goggles and safety shoes, within the enormous encapsulation. In addition, two mobile air extraction units and several fog guns effectively prevent pollution of the ambient air during soil replacement. And that's not all: "The ambient air is actually continuously monitored by a precise measurement system, both from within and outside the construction site," explains Holm Uhlig, Project Manager with BAUER Resources GmbH.



To remove the soil on the grounds of the Schwarze Pumpe Industrial Park, six construction sections with approx. 1.3 km of primary sheet pile walls are sealed off to a depth of 20 m.



Over the last three years, the teams from Resources and Spezialtiefbau proceeded section by section, in shifts and almost without interruption. The halfway point was finally reached in March 2021, which means that soil replacement has been completed in three out of six construction sections. "In such a large project, it's important that everyone involved works hand in hand. Within the BAUER Group, we have an experienced team that is now working with great determination to complete the remedial actions for the remaining construction phases on schedule by the end of 2022," explains Holm Uhlig. More than 286,000 t of

*The rehabilitation work is expected to be completed by the end of 2022.*

contaminated soil will need to be treated and refilled by that time, and 430,000 t of excavated soil will need to be moved.

### Top-class Nordhausen trio

The combined forces of the Schachtbau Group were impressively demonstrated in Freiberg this year: Here, the joint venture comprising SCHACHTBAU NORDHAUSEN GmbH, SCHACHTBAU NORDHAUSEN Stahlbau GmbH and SCHACHTBAU NORDHAUSEN Bau GmbH was commissioned in November 2020, with the rehabilitation of a prominent symbol: the headframe of the Reiche Zeche research and training mine of the Freiberg University of Mining and Technology. Because the entire facility is a UNESCO world heritage site, as many components as possible needed to be rehabilitated and reinstalled to preserve the monument. All other parts were newly manufactured by the steel builders and replaced to maintain an identical construction.

The award-winning project began in April. Activity commenced with safeguarding work and dismantling the existing headframe. During the process, site managers Ralf Zwinscher and René Gutzschebauch needed to remove roofs and walls with their team in order to carefully extricate the diagonal struts. In mid-May, under the guidance of the steel builders led by Frank Malchau, the headframe and diagonal struts were detached from the foundation and lifted from the shaft house. This first required removing bolts at the intersection point of the diagonal struts and the headframe with welding torches. Here was the biggest challenge of all: the bolts had held the headframe

together since 1953 and were not easy to remove. For this reason, the Schachtbau team investigated the places requiring work using a camera drone. After this and under the strictest safety requirements, two employees went out onto the already loosened scaffold to weld off the bolts in a large area – and the operation was a success. In the next step, a 750 t special crane carefully lifted the 24 m long vertical section out above the roofs. "Nothing is straightforward when you're dealing with protected monuments," remarked Udine de Bortoli, who is responsible for construction supervision at MMG Mitteldeutsche MONTAN GmbH, drawing on experience from numerous projects of this kind. Schachtbau Project Manager Knut Grosse agrees with her:





“Historical structures require special knowledge, a sharp intuition, mutual trust and usually there will be surprises along the way.” Apart from bolts that were difficult to remove, severe wind conditions made work challenging – but this was no problem for the Schachtbau specialists.

The next step was demolition of the entire shaft head and the old shaft girder, which was replaced by a new structure manufactured by SCHACHTBAU NORDHAUSEN Bau GmbH. To conclude the project, the surface installation of the Reiche Zeche mine was reinstated using elaborate crane technology. Thanks to perfect interaction between different divisions within the SCHACHTBAU Group, the headframe was fully reworked and rehabilitated in the fall. It will now stand as a symbol for the region and the city of Freiberg for many years and decades to come.

### Together for the future

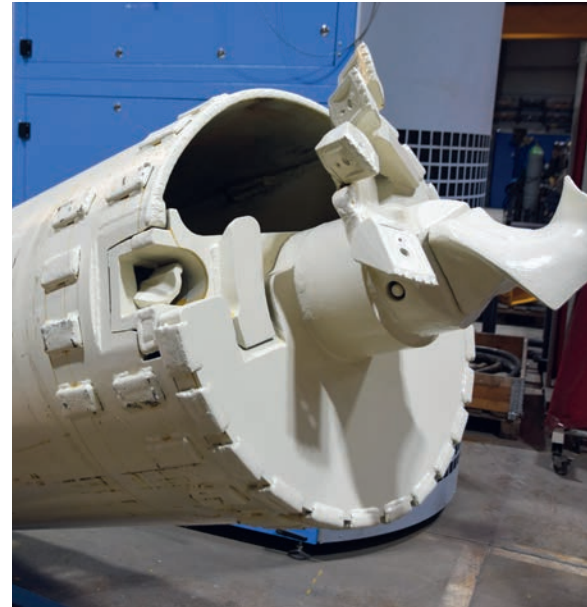
Since 2011, the Bauer Research Community has provided a successful basis for excellent cross-segment collaboration. Bauer purposefully decided against creating a central development department. Instead, the aim is to make use of employee ideas for innovation. This is why the Bauer Research Community also promotes basic research and cross-segment tasks along with major projects, thereby expanding the knowledge and expertise of the entire Group. Support is

granted to projects that are of strategic significance to the Group and that lead to marketable products or methods. With a view to the Group’s economic success, an innovation is considered valuable and its development pursued if it is capable of improving results, enhancing quality, or reducing costs. “Our three segments Construction, Equipment and Resources work together perfectly on tasks that go beyond their Group division. Ultimately, they will use the product or method that is developed in their everyday business,” remarks Dr. Patrik Wenzl from the Structural Engineering Department of BAUER Spezialtiefbau GmbH.

One example of successful collaboration between Bauer Spezialtiefbau and Bauer Maschinen involved the reduction of noise emissions on construction sites. After applying a series of improvements, such as drilling rigs with noise-diverting flaps, the two segments came together again for a joint project to reduce the effort for emptying a drilling bucket when drilling smaller diameters in adhesive soils (e.g. clay soils). Initially, various designs and materials were examined for the interior surface of the drilling tool, aided by means of model tests in laboratories. After the prototype for the “Silent Bucket” was developed, this was tested in marine clay for a construction project in Bad Wiessee, Bavaria, and compared with a standard drilling bucket. The result: emptying of the “Silent Bucket” was notably faster

due to significantly reduced shake-out procedures. In addition to this, noise emissions and physical load on the equipment were also scaled down.

Apart from innovative products, the Bauer Research Community also establishes new business areas through



*The “Silent Bucket” is the result of a cross-segment joint project.*

cross-segment collaboration. Because storage capacities in landfills and pits are growing increasingly scarce, the divisions of Bauer Resources, Bauer Maschinen and Bauer Spezialtiefbau combined their expertise to find a solution for the disposal of liquid backflows, such as slurry, on sites.

After the start in 2018, the first pilot plant for backflow disposal was constructed the next year. A second pilot plant followed in 2020. “By drawing on the expertise of our experienced employees, regardless of where they are assigned in the company, we were able to open up a new area of business for Bauer Resources that we will offer on the market in the future,” remarks Dr. Patrik Wenzl about the successful joint project.

*In an impressive initiative, Schachtbau Nordhausen separated the headframe of the Reiche Zeche research and training mine of the Freiberg University of Mining and Technology from its foundation and lifted it from the shaft house in one piece using a 750 t crane. This was carried out for the partial rehabilitation and replacement construction of the headframe.*







**Malaysia** After removing existing piles, Bauer carried out soil replacement work and pile drilling work for a new building in Kuala Lumpur's Ampang Park. Four BAUER BGs were used. **above**

**India** For the project "Teesta VI Hydro Electric," Bauer is constructing an anchored pile wall, consisting of around 10,000 running meters of piles with a diameter of 800 mm, as well as around 60,000 running meters of anchors. Along the upstream cofferdam, 4,700 m<sup>2</sup> of cut-off wall are being constructed using the jet grouting technique, as well as 4,600 m<sup>2</sup> of diaphragm wall on the upstream side of the barrage. **right**





# Specialist foundation engineering on all continents

**Thailand** For the Mulberry Grove Sukhumvit project in Bangkok, Thai Bauer constructed 131 bored piles up to a depth of 57 m as well as a 176 m long diaphragm wall up to a depth of 21 m. **below**

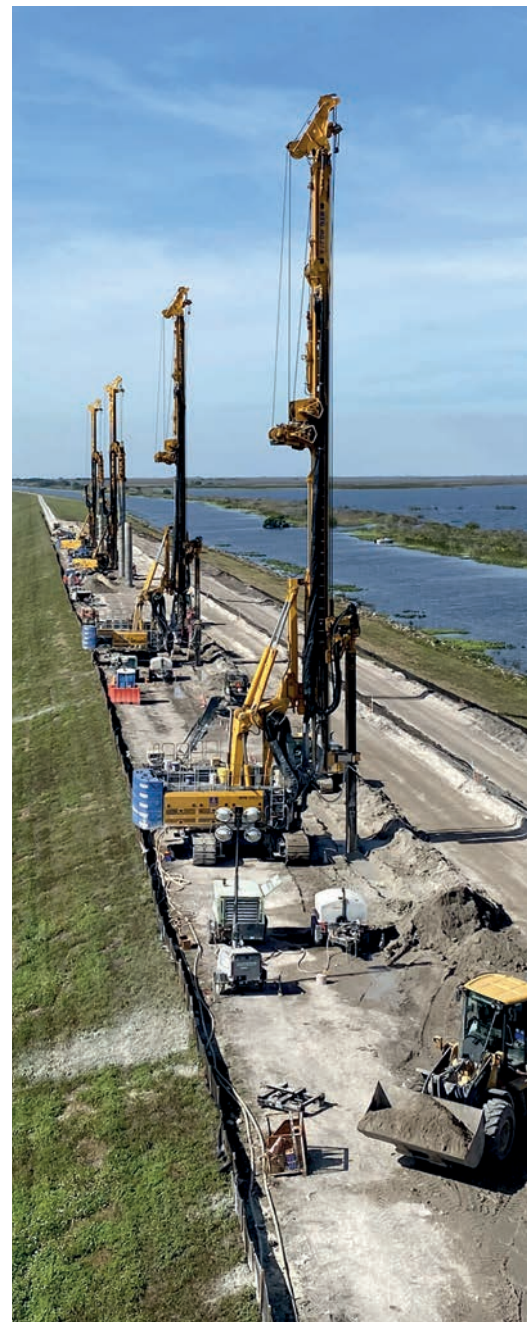


**Australia** The infrastructure project “Cooroy to Curra” includes the construction of 13 multi-lane bridges over a distance of 26 km. The Bauer team used a BG 30 to install cased piles up to a depth of 25 m with diameters of up to 1,800 mm including rock socketing. **left**



**Jordan** Since 2018, Bauer has been remediating earth basin dikes at the southern end of the Dead Sea. The order for the fourth section was issued in 2021. One special feature, apart from the special climatic, geological and logistical conditions, is the location approximately 400 m below mean sea level. **right**

**USA** Ground improvements in permafrost: the Red Dog mine is located roughly 170 km north of the Arctic Circle. Bauer carried out field tests using the jet grouting and cutter soil mixing methods here. Equipment used included a BG 30 outfitted specifically for the Arctic. **below**



**Canada** In Kingston, a 1.2 km long double-span bridge is being constructed over the Cataraqui River. For this project, Bauer used a BG 39 and a vibration hammer to construct a total of 46 shafts embedded into the bedrock up to a depth of 55 m. **above**





**Ghana** As part of the expansion of the Newmont Subika underground mine, Bauer used a BG 28 to construct multiple shafts with diameters of 4.1 to 5.1 m, consisting of secant pile walls. **below**



**USA** Rehabilitation of the Herbert Hoover dike around Lake Okeechobee in Florida is a project of superlatives. As part of the partial sections Task Orders 1, 2 and 5, Bauer executed 614 km of pre-drilling for 540,000 m<sup>2</sup> of cut-off wall at the start of the year. **left**





**Qatar** An eleven-story parking garage is being constructed in the center of Doha. Along with 466 secant piles with an average depth of 28.6 m, Bauer is also installing 141 anchors. **right**

**UAE** In Abu Dhabi, Bauer was commissioned with the retaining structure and pile drilling work for the new Mina Zayed Tunnel. 299 piles are being installed for the bridge and tunnel; work also includes the execution of diaphragm walls, cut-off walls and anchors. **below**



**Lebanon** For the new medical center of the American University of Beirut, Bauer carried out specialist foundation engineering works that included soil excavation up to a depth of 43 m. A BG 15, a BG 28 and a KLEMM rig were used for the execution of the pile and anchor works. **above**







**Qatar** As part of an urban development project in Doha, Bauer constructed 408 secant piles and 104 bored piles near the Corniche Road using multiple BGs. 774 anchors were also installed. **below**



**Saudi Arabia** For construction of a botanical garden in Riyadh, with an area of 160 ha, Bauer installed micropiles up to a depth of 10 m. The scope of service also included probing cavities. **left**





*For a section of the Hong Kong-Zhuhai-Macau bridge, with a total length of 55 km, BAUER Hong Kong Ltd. constructed 230 offshore bored piles.*





Creating the foundations  
for community

# Construction projects connect people

Bridges connect different shores and sides of the street, create secure routes and overcome obstacles. But above all, bridges bring people together. The same is true for roads, railways and flight paths. They also make connections possible – between cities, countries, and continents – thus bringing the people who use this crucial transport infrastructure together. But the hubs are not only train stations and airports – new and innovative living concepts can also create points of contact, for instance urban districts that combine individual residences and working spaces with a neighborly community. The foundations for all these connections and points of contact between people are innovative construction projects, without which the building blocks of community would not even be possible.

## **A bridge of superlatives**

In 2009, construction began on a gigantic infrastructure project that BAUER Hong Kong Ltd., a subsidiary of BAUER Spezialtiefbau GmbH, was involved in: the Hong Kong-Zhuhai-Macau bridge. After its completion, this once-in-a-century structure was formally opened on October 23, 2018. This 55 km long bridge shortened the travel time from Hong Kong to mainland China from four and a half hours to a mere 40 minutes. It connects the cities of Hong Kong, Macau and Zhuhai across the Pearl River Delta with a series of bridges, tunnels and artificial islands. The main section of the bridge is nearly 30 km long and has three lanes of traffic in both directions. A 15 km long section is now the longest steel bridge in the world, and the project's 6.7 km underwater tunnel is not only the longest of its kind, but also the deepest, at 48 m below the water surface. For

the "Hong Kong Link Road" section – a 10 km long section from the state border between China and Hong Kong to the Hong Kong international airport – the joint venture "Dragages-China Harbour-VSL" commissioned BAUER Hong Kong Ltd. with the necessary piling works. For this project, the local subsidiary of BAUER Spezialtiefbau GmbH constructed a total of 230 offshore bored piles, with lengths of up to 115 m, a maximum diameter of 2.5 m and up to 5 m of rock socketing. "One particular challenge of this project was that all drillings had to be executed from the water," explains Arnulf Christa, Chairman of the Management Board of BAUER Spezialtiefbau GmbH. "Five BAUER BG 40 drilling rigs were used for this task, four of them custom-built with an extended mast and larger main winch. They were brought to steel platforms by boat, along with pontoons for four bentonite plants, 300 t cranes and accessories." The major project was concluded by Bauer Hong Kong in December 2014 and has opened up new ways of connecting since officially opening for traffic.

## **Traveling high speed from London to the West Midlands**

The planned high-speed railway HS2, between London and the West Midlands in Great Britain is another major international project that will bring people together more rapidly and conveniently in the future. Phase 1 of the project will initially run between London and Birmingham and is divided into a total of three sections: North, Central and South. The first phase of the construction project includes roughly 225 km of rails, 50 km of tunnel and 16 km viaducts. The ground engineering work will continue over a period of approximately four years and the project



For the section C23 of the high-speed railway HS2 (gray) in Great Britain, Bauer Technologies and Keller UK are carrying out the specialist foundation engineering works as joint venture partners.



is expected to be completed by 2033. As part of the project awarding for Sector C (Central), in April 2021 the 50:50 joint venture between BAUER Technologies Ltd., a subsidiary of BAUER Spezialtiefbau GmbH, and Keller UK, received the order to execute geotechnical work for Section C23 from EKFB – a merger of four international infrastructure companies Eiffage, Kier, Ferrovial Construction and BAM Nuttall. This section comprises a total of 80 km of high-speed rail, including 15 viaducts, more than 80 bridges, 7 km of tunnels and 30 million m<sup>3</sup> of excavated soil. The order for the Bauer-Keller joint venture encompasses the construction of foundation piles for the temporary structures, as well as the construction of secant pile walls and the installation of pressure relief drainage systems. The order is expected to be completed in 2024 and, at its peak, will require more than 200 highly qualified employees in the area of specialist foundation engineering, who will work at various locations. “After two and a half years working together with EKFB in the design phase of this project, we are thrilled to start work on the largest infrastructure project in Europe. Bauer and Keller have considerable synergies and a similar corporate culture, which makes us perfect partners,” says Michael Jones, Managing Director of Bauer Technologies.

### Bauer machinery for HS2

Alongside BAUER Technologies Ltd. as a subsidiary of BAUER Spezialtiefbau GmbH, BAUER Maschinen GmbH

is also directly involved in the major project HS2, with its local subsidiary BAUER Equipment UK Ltd. Not only were six new pieces of equipment delivered to Bauer Technologies, multiple customers are also relying on the performance quality of Bauer’s highly functional specialist foundation engineering equipment. “We are very pleased to contribute so many machines to work on this unique infrastructure project,” remarks Dr. Ruediger Kaub, Chairman of the Management Board of BAUER Maschinen GmbH. “This sets a milestone in the history of Bauer Equipment UK and will represent a gain for mobility in Great Britain.” The work on HS2 has already begun for the customers: in sections S1 and S2 (South), a BAUER BG 24 H, a BG 28 H, two BG 30 rigs and two BG 33 rigs are already in use, along with a BE 250-60 desanding plant from BAUER MAT Slurry Handling Systems. In parallel to the southern section, a BAUER MC 96 duty-cycle crane with BC 40 cutter system and a MC 76 duty-cycle crane with DHG-V diaphragm walling grab have been working on section C1 (Central) in Chalfont St Peter since August 2020. In total, they are constructing three shafts. With a depth of roughly 85 m, Shaft 1 has already been successfully completed. The work will continue until early 2022. The largest order for BAUER Equipment UK Ltd was issued by the contractors who are executing the geotechnical work for Sections N1 and N2 (North): For this partial section, a BAUER BG 33, a BG 36 and a total of four MC 76 duty-cycle cranes with HDSG and a DHG-V grab system have so far been delivered to the joint venture executing the work. In addition, its existing range of machines was expanded over the course of this year to include two additional

BG 33 units and two BG 36 units. The first test piles were installed in section N1 in 2020, while the main work started in the second half of 2021. In addition to the high-speed railway itself, a new train station is being constructed in London with the “Old Oak Common Station,” which will be used as the main terminal for HS2 trains in the future. Here as well, two MC 76 duty-cycle cranes with HDSG and a DHG-V grab system are being used, along with a BG 39 and a total of nine HP 50 hose pumps from Bauer MAT.

### A combination of bridge and railway

Following a different approach from the Hong Kong-Zhuhai-Macau bridge and the major project HS2, SCHACHTBAU NORDHAUSEN Stahlbau GmbH is creating a quick and easy two-level connection: with the replacement construction of a total of seven railway overpasses in Oberhausen, Unterensingen, Rüdeseim, Bremerhaven and Bremen in the coming years, Schachtbau is involved in the largest modernization initiative in the history of Deutsche Bahn. While the end of construction for the projects in Rüdeseim, Bremerhaven and Bremen is not expected until 2022 or 2023, respectively, the railway bridges in Oberhausen and Unterensingen have already been handed over. The bridge in Oberhausen was designed and executed as a single track, single span steel framework superstructure with an enclosed track and continuous gravel bed. Along with production of the bridge elements, Schachtbau Nordhausen also carried out pre-assembly on site, as well as guiding the elements into their final position in March 2021. In contrast, for the Unterensingen

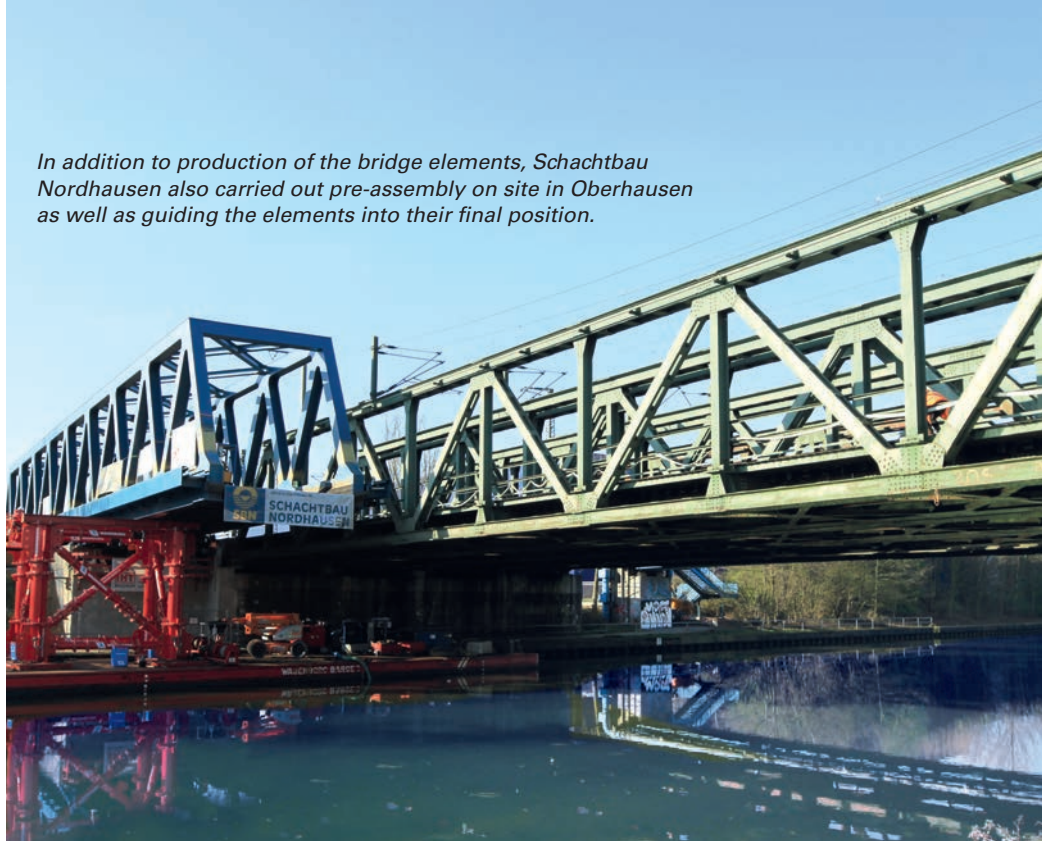
*Multiple customers of BAUER Maschinen Group who are working on the HS2 project in England are realizing their orders using Bauer equipment. One example is the joint venture Bachy Soletanche-Balfour Beatty, which is using an MC duty-cycle crane with grab in Bromford East, Birmingham to construct a starting shaft for a tunnel boring machine.*





project, both a railway overpass and a road overpass were necessary. The latter was constructed as a 210 t steel composite construction and accordingly pre-assembled before the elements were moved into their final position using mobile cranes. Additionally, the railway bridge was executed as a 800 t strut framework with external footpaths, then inserted and lowered into place using a combination of a self-propelled modular transporter (SPMT) and large crane. "In order to carry out construction for Deutsche Bahn AG, a special technical approval is required to ensure the highest quality standards. We are very proud of the work we have accomplished so far and look forward to the next two projects," says Thomas Staeter, Managing Director of SCHACHTBAU NORDHAUSEN Stahlbau GmbH.

*In addition to production of the bridge elements, Schachtbau Nordhausen also carried out pre-assembly on site in Oberhausen as well as guiding the elements into their final position.*



### **PANDION VERDE urban district**

Infrastructure initiatives are not the only way to bring people together: new residential construction concepts can create a sense of community, providing a central point of contact. This is also true of the new PANDION VERDE construction project: at the former Piederstorf site in Munich's Neuperlach District, which was until recently a gravel excavation site, three building complexes, comprising a total of six houses and 256 apartments, are being built on an area of around 20,000 m<sup>2</sup> to harmoniously integrate into the 12.8 ha Alexis neighborhood. The centerpiece of the residential district, and thus the main point of contact for residents, is the green inner courtyard. Ideally located in

the southeast of Munich, right next to the Trudering Forest and close to the city of Munich as well as major employers in the north and east of the regional capital, the future urban district will create the perfect connection between home, work and lifestyle. Bauer Umwelt, the environmental division of BAUER Resources GmbH, was tasked with the creation of an excavation pit for the project. A total of 25,000 m<sup>3</sup> of material – of which around 5,000 m<sup>3</sup> consisted of concrete demolition – was excavated to a depth of 4 m and disposed of. In addition, a 60 cm thick filter layer was installed to allow rain water to be discharged into the construction soil and the natural aquifer. "A comparatively simple pit

creation," says Jan Uhlig, operations manager of the Bauer Umwelt Division. "Nevertheless, it was a true highlight – also in terms of digitalization." The secret "star" was a drone – or rather the footage material and data generated by it. This drone was used for surveying the excavation pit and the masses that needed to be moved. A GPS-controlled excavator was also used to create the shaping of the excavation base by means of a generated 3D model. The work was largely completed on schedule in March 2021. Once the shell for the basement is finished, Bauer will install an infiltration chamber over the course of the year. Completion of the PANDION VERDE project is planned for summer 2023.

"In the future, new infrastructure initiatives and residential construction projects will continue to play a significant role in connecting people and keeping them connected," remarked Michael Stomberg, the CEO of BAUER AG, in conclusion. "Many of these projects will also pose new challenges for us as a specialist foundation engineering company. Thanks to our innovative methods, new equipment and technologies, we are ready for them and looking forward to helping connect people."



*Bauer Umwelt, the environmental division of BAUER Resources GmbH, created the excavation pit for the PANDION VERDE project in Munich.*



# Machinery in customer operations

**Netherlands** A new casino is being constructed in Lelystad. For execution of the CSM method, our customer BodemBouw B.V. used an RG 21 T including MAT SCA 15 K mixer. **left**



**Spain** A KLEMM anchor drilling rig of type KR 806-4GM, with manipulator and rotating magazine reel, was used in Bilbao for a project executed by our customer Tecimasa S.L.U. **above**



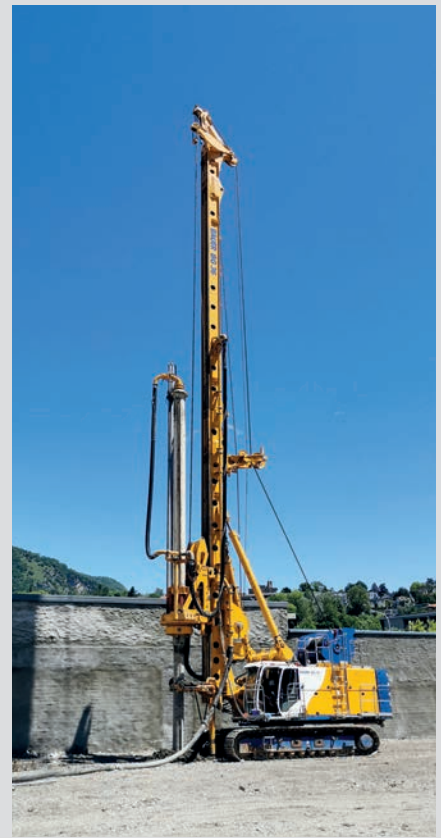
**Senegal** Using a PRAKLA RB 40 rig, BAUER Senegal SARL carried out drilling at a depth of 500 m for production wells. **above**





**USA** Using two BG 45 drilling rigs including SCM equipment and several pieces of Bauer MAT equipment, Severson Environmental Services, Inc. carried out ground improvement work in Harrison, New Jersey. **above**

**Switzerland** Our customer Axim SA carried out the foundation work for a residential building in Chiasso with a BG 36. The full displacement piles constructed with this rig up to a depth of 25 m had a diameter of 510 mm. **below**



**Italy** For a new bridge across the Magra River, our customer C.G.X. Costruzioni Generali Xodo S.R.L. constructed secant piles with a diameter of 880 mm using a BG 33. **above**

**Turkey** Using a BC 48 cutter on a MC 96 duty-cycle crane, the company Kasktas A.S. constructed a cut-off wall with a thickness of 1 m. **below**







**Belgium** In Beerse, our customer Van Rooy-FBT BVBA used an RG 27 S including BCM mixing unit to execute the cutter soil mixing method (CSM). **above**

**Greece** In Sepolia, a BAUER BG 40 including BC 32 cutter was used on an infrastructure project by our customer Intracom. **below**



**Italy** A new highway is being constructed between Gamberale and Civitaluparella. To construct a 1.2 m thick cut-off wall with a depth of up to 36 m, De Sanctis Costruzioni used equipment such as an MC 96 duty-cycle crane with BC 40 cutter and an MAT BE 500 plant. **above**





**Germany** Using a KLEMM KR 806-3GS, GUP GmbH carried out micropiling work for uplift prevention as part of the new construction of the Grosse Schleuse lock in Gleesen. **above**



**Austria** At the Lueg Pass, Keller Grundbau GmbH installed piles for the foundation of utility poles in rough terrain. A KLEMM KA 163 attachment system with a compact DH 10 double-head system was used. **above**

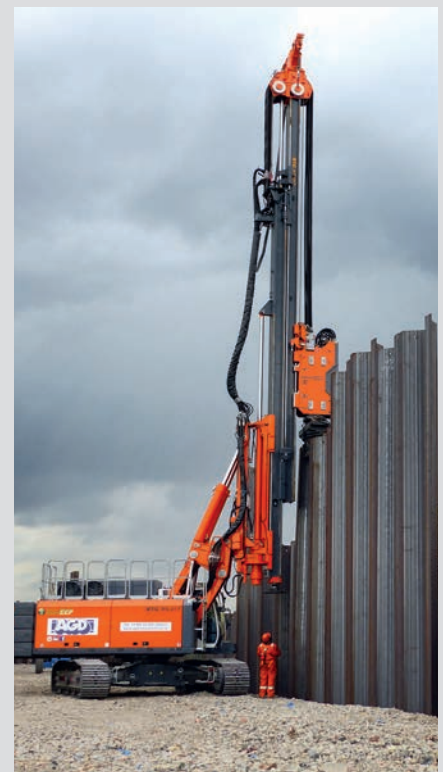
**Switzerland** For a temporary retaining structure in the Canton of Wadt, Weibel AG installed around 3,000 m<sup>2</sup> of sheet pile wall using an RG 16 T equipped with an MR 150 AVM hydraulic vibrator. **below**



**Ireland** In Dublin, our customer Brazil Piling and Foundations constructed a secant pile wall with a diameter of 880 mm using a BG 23 H. **below**



**England** An RG 21 T from RTG was used in the English town of Tilbury for the construction of a 21 m long sheet pile wall by our customer Graham Construction Ltd. **below**







**BAUER**



*To make the benefits of digitalization more attractive for small specialist foundation engineering projects, an innovative platform, the BAUERdigital Portal, was created to streamline processes and day-to-day operation at the site.*





## Smart programs, clever tools and intelligent equipment

# Approaching digitalization holistically

Digitalization offers enormous potential for the construction and construction equipment industry to design their process chains more effectively and competitively. In addition to the digitalization of processes in administration and internal service areas, Bauer is also focusing on digitalization of plant production as well as site processes. Within the BAUER Group, innovations in the area of digitalization were pooled under the term “BAUER digital” – a holistic approach that covers all areas of the company.

### The BAUERdigital Portal

Innovative approaches such as the b-project data management software have increasingly automated the collection, processing, and analysis of data at BAUER Spezialtiefbau GmbH in recent years, and progressively digitalized collaboration between all project members. The challenge: the expenditure could often not be aligned with the benefit of these new digitalization approaches when it came to small specialist foundation engineering projects. A relatively short completion period at the site was matched by comparatively high implementation costs for the digital tools. To make the benefits of digitalization more attractive for small specialist foundation engineering projects, an innovative platform, the BAUERdigital Portal, was created to streamline processes and day-to-day operation at the site.

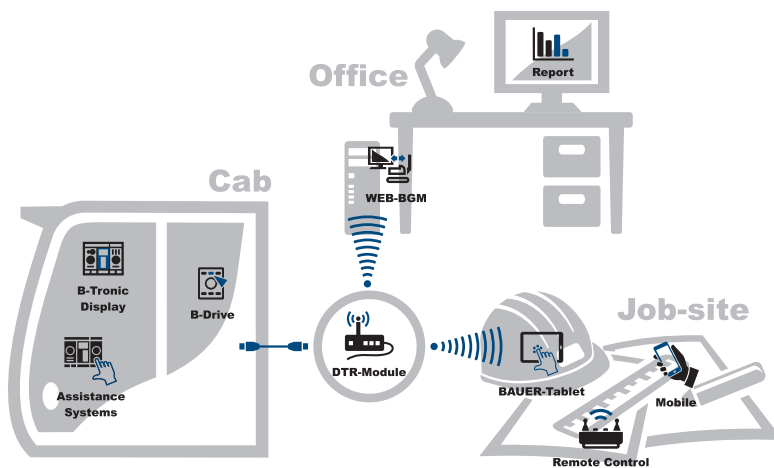
“The roll out of Microsoft Teams within the BAUER Group means that each new site will have its own separate digital area. This includes the BAUERdigital Portal, which the

site manager can manage centrally and independently,” explains Torsten Henssler, Project Manager for Digital Construction at Bauer Spezialtiefbau. The advantage of this system: rights can be managed directly without the need for involvement of the IT department. The centerpiece of the BAUERdigital Portal is made up of various application tiles that provide access to various digital tools. These applications make it possible to digitally record reports that previously needed to be painstakingly written by hand, to collect, process and analyze data, and to digitally display processes. There are currently six applications available as standard: the digital construction diary, the field data platform, the workflow for the site supply process, the digital delivery note Neptune, the equipment management system WEB-BGM, and the Bauer specialist foundation engineering product catalog.

### Data2Rig

When it comes to data and connections on site, there's a lot going on – there is not only equipment, people, drilling tools, etc., but also all sorts of computers, smartphones or other devices that generate and transmit data. “Receiving data from our equipment and providing this to authorized users has been the standard for some time now,” says Dr. Andreas Ziegler, Head of Development for Control Technology at BAUER Maschinen GmbH. Using B-Tronic, data is visualized and recorded on the display in the operator's cabin. The DTR transmission module installed on every machine then transmits this data to the equipment management portal WEB-BGM. With the B-Report program, reports can be generated and



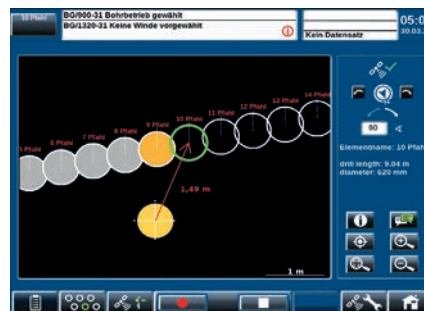


*The goal of the joint project Data2Rig is to communicate to the equipment and operator exactly who needs to construct which element when, where and how – in a way that the equipment is also able to process the data.*

subsequently analyzed. But how does the design of construction models even reach the equipment digitally, enabling the equipment to process the design data? Closing this circle is the goal of Data2Rig, a joint project of BAUER Spezialtiefbau GmbH, BAUER Maschinen GmbH and fielddata.io GmbH.

Data2Rig has already been used on a construction project at Elisabethplatz in Munich. Under constricted urban conditions, Bauer constructed a secant pile wall with a BG 28 H. The typical procedure for this type of project in the past: each pile is marked by hand in color after execution on a large-scale construction plan, made of paper, where the elements to be constructed – e.g. the individual piles – are depicted. The element names are entered manually for recording purposes. "This system significantly complicates not only progress monitoring, but also communication in case of changes to the plan," explains Dr. Andreas Ziegler. The goal is to communicate to the equipment and its operator exactly who needs to construct which element when, where and how – and the equipment must be able to process the data as well. For this purpose, the design data including position, geometry and production parameters of the elements are first imported from building construction and assigned to the machines. In this way, the individual task list for each machine is prepared. For the subsequent technical data transfer, the equipment receives this list via WEB-BGM. The DTR module synchronizes the elements with the server and provides the data for the B-Tronic located in the equipment. Then the operator is shown an overview of

the elements to be constructed on the B-Tronic screen, including main parameters (name, depth, diameter etc.) and status (open, currently in processing, pause/interruption, completed).



*B-Tronic screen with an overview of the elements to be constructed.*

During construction of the elements, the production data is recorded in a direct connection with the selected element. Upon completion, the production data is transmitted and a report is drawn up. "All of this takes place without any handwritten documentation. All the information about the elements is available simultaneously and an actual-target comparison is possible at any time," says Dr. Andreas Ziegler. "Or to put it another way: this system finally puts an end to cumbersome paperwork."

### VR and AR technology

BAUER Maschinen GmbH has been testing an entirely different technology in the Service area for some time now, together with the branches in the Americas, Asia-Pacific and India. Using data glasses, technicians on site are able to provide support in real time for troubleshooting, equipment design, quality acceptance, and many other service tasks. These Smart Glasses

could also be very useful in the future for "remote" customer training as well as production and quality audits. This modern tool could also potentially be used for internal storage and inventory work in daily routines. Particularly during the pandemic-related travel and contact restrictions, this system is an intelligent complementary solution. In addition, during the "BAU ERLEBEN" days held by the BAUER Maschinen Group, virtual reality and augmented reality technology were used in presentation of the new BAUER Cube System: "This type of interactive product presentation offers entirely new opportunities for allowing customers to experience our equipment," explains Wilfried Rosenberger, Head of Digital Solutions at BAUER Maschinen GmbH. There are various other potential applications of this technology, including in simulation-based engineering for everything from planning and construction phase all the way to customer training.

### Digitalization facilitates soil remediation

BAUER Resources GmbH also relies on digital helpers, for example during a project in the town of Arnstadt, Thuringia, which the Bauer Umwelt division executed in collaboration with BAUER Spezialtiefbau GmbH. The order encompassed soil remediation, including excavation pits and groundwater treatment, on the grounds of a former gas works. In January 2021, the work of digital surveying the 12,000 m<sup>2</sup> site using a drone and a rover rod began. During its surveying flight, the drone took hundreds of high-resolution images in which objects can be distinguished down to mere millimeters. The rover rod also enabled precise centimeter-accurate surveying to rapidly determine the cubic volume of debris, the excavation pit volumes and changes to the site. Using the images collected, 3D data were generated and then transferred to a digital site model. The result is true-to-scale, photorealistic representations of the entire site including all details. "The more precise and detailed data we have about a site's condition, the more precisely the quantities can be calculated, and therefore also the expenditure required for a construction project. These little digital helpers make it possible and also save us a lot of time," emphasizes Holger Kaiser, Manager for Building Information



*Using data glasses, technicians on site are able to provide support in real time for troubleshooting, equipment design, quality acceptance, and many other service tasks.*



*Digital helper: for a soil remediation project executed by the Bauer Umwelt division in Arnstadt, Germany, a drone and a rover rod were used for surveying the site.*

Modeling (BIM) and Digitalization at BAUER Resources GmbH. The surveying work was followed by gradual excavation of the three excavation pits up to a depth of 3.5 m. The affected foundations were recorded in 3D on a tablet using surveying software, then forwarded to the BIM department at Bauer Resources to calculate volumes. Along with drones, rover rods and tablets, the Bauer team also relied on digital tools for site documentation. The team led by Friedrich Leifheit, Site Manager for the Bauer Umwelt division, recorded all relevant data (including tasks completed, personnel and equipment employed, site images and quality-related information) using a digital construction diary. The decisive advantage: with this approach, all construction diaries for a site are automatically collected and compiled. The laborious and time-consuming task of preparing a report at the office is eliminated. "In this way, we can identify construction progress at a glance, review the work that has been performed and adopt countermeasures or adjust the schedule in case of

deviations," explains Friedrich Leifheit, adding: "Furthermore, the information is available for all parties involved, around the clock and from any location. This greatly facilitates and improves communication on the site."

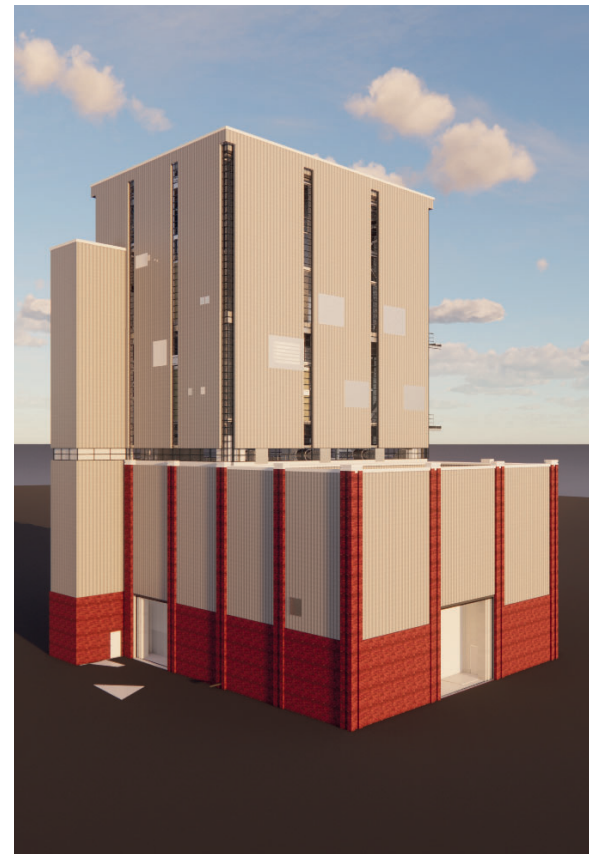
#### **Digital data exchange on Schachtbau projects**

Digitalization has also arrived at Schachtbau Nordhausen, for example on the project Shaft Tower Konrad 2. The project comprises the engineering and execution of a shaft tower over an area of 20 x 23 m and with an exterior height of 42 m. This forms the centerpiece of the future permanent disposal site "Schacht Konrad," where low and medium-level radioactive materials are to be stored underground following the scheduled completion in 2027. During the design phase, communication and data exchange are almost exclusively digital. "File storage is accomplished using Teams or OneDrive. Each external project partner has an access via which all drawings and data for the project can be downloaded or uploaded, which makes it unnecessary to use additional data exchange platforms or download services," reports Schachtbau Project Manager Steven Philipp.

As a platform for data exchange, Microsoft Teams is used along with a second system: Winplan 2.0. This plan management software is used to approve draft, execution, and workshop plans between Schachtbau, project partners, and the client. Just like Teams, Winplan 2.0 is browser-based, so the client does not need to acquire any costly software licenses. Any user can use it on any computer with internet access. Special access rights make it possible to call up specifically drawings as well as 3D BIM

models. Administration is carried out by Schachtbau itself, which means that external assistance is mostly avoided. Individual workflows can be created and coordination regarding how and when each task will be accomplished, or when which plan needs to be viewed by the parties involved in the project can be managed internally.

All these examples demonstrate that digital work processes assist in the quick and effective management of all types of projects to save time and reduce cost. Supplementing the product range with digital services and products, and improving results by means of digital methods and technologies are also a focus. "All digitalization efforts and innovations should serve to simplify the daily work of all employees and foster a cooperative partnership with the customer," summarizes Florian Bauer, who is responsible for the topics of digitalization and development coordination, among other areas, on the Executive Board of BAUER AG.



*During the design phase for the Schachtbau project Shaft Tower Konrad 2, communication and data exchange are almost exclusively digital.*



Multiple world firsts made in Schrobenhausen

# BAU ERLEBEN

EQUIPMENT TALK FRIENDS  
S U M M E R 2 0 2 1



*The new eBG 33 is the first electrified drilling rig from Bauer.*

After the in-house exhibition had to be cancelled in 2020, the team at BAUER Maschinen GmbH was very excited to finally welcome guests back to Schrobenhausen this summer. Under the event slogan BAU ERLEBEN, numerous customers were welcomed with a varied program from mid-June through the fall, in small groups to comply with pandemic-related restrictions. To ensure that everything ran smoothly, a sophisticated hygiene concept was developed in cooperation with the Health, Safety & Environment (HSE) department. "We had a large number of inquiries in advance, particularly from Great Britain and the USA, but also from the DACH region," reports Tanja Kopold, Head of Marketing at Bauer Maschinen. Together with Sigrid Distl, Ramona Forster, Annabel Janker, Franz-Werner Gerressen and Peter Knopp, they organized the event, an unprecedented format at Bauer – and presented two entirely new developments in the area of specialist foundation engineering technology with the new BAUER Cube System and the electrically-powered eBG 33.



## BAUER Cube System

The innovative cutting system will open up entirely new opportunities for the construction of diaphragm walls in the future. It was developed in collaboration with a strategic partner, the Belgian tunnel construction expert Denys. "It is designed as an electrically powered cutting system which builds on a great deal of proven expertise from Bauer but



features an entirely new construction," explains Dr. Rüdiger Kaub, Chairman of the Management Board of BAUER Maschinen GmbH. What makes it unique: the entire system was developed precisely in container dimensions. This means it can be used without any problem in microtunnels with small diameters of just 3.8 m, for example.

"Imagine you are planning a new subway line in a densely populated city. Ideally, you want to plan the new line to allow passengers to get on and off exactly where they want to go. This means that the new subway stations need to be located exactly where large building complexes or the city center already exist. But in such locations, it would be very difficult or even impossible to build these subway stations with the currently available technology. It is now possible thanks to our BAUER Cube System, which can be used exactly where the new subway stations need to be constructed: underground, below the existing buildings! This opens up entirely new opportunities for designers and architects," says Rüdiger Kaub. Underground expansion of cities, setting up drinking water storage, or transferring cloud servers below ground, along with the necessary cooling technology, are all potential applications. "All these examples demonstrate the enormous potential of our Cube System," continues Rüdiger Kaub.

The advantages of the system are evident: the impact of construction sites on traffic, businesses, and residents (in particular) are minimized. This is because the minimally invasive Cube System only requires a comparatively small access point to an existing microtunnel or auxiliary tunnel. The actual work is carried out underground, essentially invisibly. The electric drive system also considerably reduces the ecological disturbance of a cutting site. When it comes to logistics as well, the system's compact dimensions are a major advantage: Instead of expensive heavy haulage, the individual elements of the BAUER Cube System are easily transported to their place of deployment as conventional containers. As a result, the BAUER Cube System also sets new standards when it comes to sustainability.

#### **eBG 33 with electric drive**

The new eBG 33 – the first electrified drilling rig from Bauer – relies on electrical power, so it does not require



*The innovative BAUER Cube System opens up entirely new opportunities for the construction of diaphragm walls.*

any fossil fuels. As a result, it operates extremely quietly, making it perfect for use in cities. "We have been working with electrification for some time now," explains Christian Heinecker, Head of the Drilling Equipment division at Bauer Maschinen. Previously, electrification of Bauer equipment has only been applied in specific cases such as the Dive Drill, a drilling rig operated from ships for underwater drilling in which electrically driven hydraulic power packs were installed, or in the area of deep drilling technology with the electrically driven Top Drive. The first duty-cycle crane with an electric motor was presented at Bauma 2019 in Munich: the BAUER MC 96, a trench cutter that is suitable for urban construction as well as for the construction of subway shafts.

The new eBG 33 falls in the mid-range segment of the drilling rig series with a drive power of more than 400 kW, which puts it on the same scale as a BG 28 to BG 36 and thus within the range of 280 to 390 kNm torque. As a result, it covers a very wide range of applications on site. Apart from classical Kelly drilling, the eBG 33 can be used for high-performance methods, for example soil mixing techniques such as cutter soil mixing (CSM) or twin rotary system drilling. It is even possible to attach a Bauer trench cutter. This makes the eBG 33 a novelty on the market: one of the main pieces of equipment for specialist foundation engineering can now be operated completely CO<sub>2</sub>-free on site.

To deliver the same capacity as a BAUER BG with a diesel engine, the eBG 33 was developed using a direct power supply solution. The reason: currently available battery systems would not be able to manage the capacity required in this size class. Accordingly, the preparatory

work on site must be planned over a number of months to ensure that the power supply is also provided. Using the eBG is thus primarily advantageous on large-scale and long-term sites, since the overall benefits, such as significantly reduced operating costs, can be fully exploited over longer periods of time. Cable guidance for a secure power supply poses a particular challenge. Once again, the idea comes from deep drilling technology: The solution is a power loop, a thick hose with a firm protective sheath inside of which a total of seven cables are laid.



*Dr. Rüdiger Kaub, Chairman of the Managing Board of BAUER Maschinen GmbH*





**Austria** During construction of the new S7 highway in Fürstenfeld, a total of 4,370 m of foundation piles and 3,800 m of gravel piles were constructed for dewatering using a BG 45, a BG 30 and a BG 20. **right**







# Bauer Spezialtiefbau all over Europe

**Slovakia** For a tower in the Skypark complex in Bratislava, Bauer executed the foundation and the excavation pits. More than 4,600 m<sup>2</sup> of MIP wall were constructed using an RG 27 S, and a BG 30 was used to construct more than 2,600 running meters of CFA piles. **left**



**Netherlands** For the urban Mercado in Groningen, a public market hall with luxury apartments on the upper floors, Bauer constructed roughly 2,000 m<sup>2</sup> of MIP wall with a thickness of 0.55 m. An RG 25 S and an RG 14 T were used for this work. **right**



**Denmark** In the harbor of Copenhagen, Bauer carried out extensive diaphragm wall and anchor work for the "Operaparken" project. The two-layered anchored diaphragm wall will act as the permanent exterior wall of the underground garage. **left**



**Georgia** For the “Alliance Centropolis” project in Batumi, bored piles are being constructed to a depth of 60 m with a max. diameter of 1,200 mm. Two BG 30 drilling rigs are being used. **right**



**Switzerland** The 360 m long Donnerbaum bridge in Muttenz is being constructed on partially cased Bauer piles with diameters between 1,500 and 2,000 mm. The spatial constraints and embankments with steep slopes have proved challenging. **above**

**Hungary** For the new office complex “H2Offices” in the heart of Budapest, Bauer constructed a 12 m deep diaphragm wall with two grab units. A KLEMM rig was also used in addition to an MC 76 duty-cycle crane. **right**







**United Kingdom** As part of the development of a new polyhalite mine in North Yorkshire, Bauer constructed a tunnel access shaft comprising 29 secant piles up to a depth of 30 m using a BG 39 drilling rig. **below**



**Bulgaria** Section 1 of the Hemus highway requires roughly 3,500 running meters of foundation piles up to a depth of 25 m, including rock socketing. Bauer is drilling the partially cased piles with a BG 28 and a BG 30. **above**





BAUER

BAUER



*Strong team spirit and social cohesion are at the heart of the Bauer company culture.*





# What unites us We make culture, culture makes us

When most people hear the word "culture," they probably think of art, painting, music, or the like. Of course, these are also aspects of culture, but ultimately they only represent a small segment of a complex cultural reality. In the broadest sense, culture – as opposed to nature – refers to everything that is made, processed, changed, or created by people. But culture is even more than that: it brings people together, offers a common foundation, and provides joy and connection. This applies equally for the culture of an entire nation or for a company culture. "Culture defines everything that we do," remarks Florian Bauer, Member of the Executive Board of BAUER AG, who is responsible for the functions of digitalization and company culture, among others.

The company culture at Bauer is first and foremost family-oriented. This is evident in many areas, for instance the focus on long-term and sustainable business development instead of short-term profit maximization. The company's regional roots are also a distinguishing feature – Bauer can look back proudly on more than 230 years of history on site since its founding in Schrobenhausen, Germany in 1790. In spite of this – or perhaps precisely because of its strong regional roots – Bauer successfully made the leap into international business and thereby laid the foundation for considerable growth over the past 50 years or so.

A family-oriented culture can also be seen in the way people in the company interact, support one another, deal with challenges, and communicate, as well as the traditions they maintain or how they celebrate together. "As a company, it is very important for us to retain our culture," continues Florian Bauer.

## Values provide orientation

The American anthropologist Edward T. Hall compared culture with an iceberg: only a small part of the entire whole can be seen at first glance. Initially, the superficial aspects of a company's culture that we perceive can seem highly varied: behavior, traditions, language etc. But what we don't see are the employees' attitudes, thoughts, feelings, motives, needs – and above all, their values. This last factor in particular can provide crucial orientation during everyday work. At Bauer, five core values form the foundation of our company culture:

### Responsibility

We rely on mutual trust and encourage each other to make decisions independently. We overcome challenges by working as a team. The principles of integrity, reliability and correct behaviour govern our daily actions.

### Openness

As an internationally operating company, we are open to new ideas and have the courage to make changes. The diversity of cultures and variety of people at our company make us who we are.

### Appreciation

We put people first. We interact on equal basis and treat each other with respect and honesty. Maintaining a positive attitude, we work together in trusting collaboration with our employees, customers and partners.

### Innovation

We enthusiastically develop ideas and sustainable solutions for the challenges of the future. Our international experience and many years of expertise provide the foundations for our innovative capacity.





Along with innovation, responsibility, openness and appreciation, a down-to-earth attitude is another one of the core values that forms the foundation of Bauer's company culture.

### A down-to-earth

As a family business, we are committed to acting sensibly and appropriately. We make pragmatic decisions, with an eye on the big picture.

### Understanding the needs of our employees

"Culture doesn't just fall into our laps like ripe fruit. A tree needs to be tended carefully in order to bear fruit," the Nobel Peace Prize laureate Albert Schweitzer once said. Culture cannot be imposed: it needs to develop and has to be encouraged. In the same way, a company culture cannot be prescribed or enforced, but it can be reinforced and lived by example. "This is a constant balancing act for company management," asserts Florian Bauer. "On the one hand, the management has to ensure the company's economic viability. On the other hand, it needs to make reasonable decisions on behalf of the people involved and understand: What are my employees' concerns, what problems and needs do they have?"

In order to find this out, Bauer has taken multiple approaches simultaneously in recent years: for example, under the motto "Jetzt red' I" (I'm talking now) familiar from Bavarian TV, employees from entirely different company divisions and levels – from trainees to supervisors – are given the opportunity to meet with the Executive Board and management on equal footing in a relatively informal setting. Due to the COVID-19 pandemic, virtual employee information events were conducted via live stream in 2020

and 2021. Here, employees not only received information about the current situation from the Executive Board and management, but were also able to actively participate using a digital survey tool – an opportunity that employees adopted enthusiastically. Furthermore, the current 15-person committee "People in the Company" meets at regular intervals to introduce initiatives and measures that promote culture. Along with poster campaigns, for example, a Bauer traditional dress day with photo competition has been introduced, as well as a virtual live lecture series where Bauer employees from around the world provide information to their colleagues about a specific topic that they are personally engaged with or excited about. "All this means that we view ourselves – even under COVID-19 conditions – as one big community. We don't lose contact with one another and at the same time are open to new culture horizons," explains Florian Bauer.

There are numerous factors that define the Bauer company culture.



### Between modernization and preservation

Developments such as digitalization in particular lead to changes in the company that are felt in the culture. It must be said: Topics such as Big Data and Industry 4.0 are relevant for the future of all companies nowadays. Decisions are increasingly made on the basis of data, most of which is collected and analyzed digitally. "Digitalization



Many of the roughly 110 Bauer subsidiaries celebrate a Family Day.

is not a topic that has suddenly emerged over the past few years, but it has definitely accelerated. It is changing the ways we work together to an extreme degree," remarks Florian Bauer. Of course, this also involves risks: "The digital transformation can only be successful if we manage to include all our employees in this topic.



At the same time, we have to make sure that we do not lose our culture of personal interaction."

Like a magnifying glass, the COVID-19 pandemic has made this delicate balance even clearer: whether video conferences, webinars, or live streams – many digital solutions have helped and are helping the company remain in contact with colleagues, employees, customers, and business partners worldwide, maintaining a dialogue and successfully implementing projects together. "However, these formats cannot replace meeting in person," says Florian Bauer. "The 'analog' maintenance of our networks can never be completely replaced by digital networking. For this reason, one of the central questions for the company culture will be: as a company, how can we balance a meaningful preservation of tradition and the necessity of modernization?"

#### It's all in the mix

Up to this point, a *single* company culture was always discussed. However, if you consider that Bauer is represented by roughly 110 subsidiaries in 70 countries around the world, it begs the question: does a *single* company culture even exist? "Every Bauer

company – whether in Germany or around the world – is naturally shaped by its region, the people who live there, and their own cultural traditions," says Florian Bauer. It is the mix of these local cultures and the awareness of belonging to a family business with very specific fundamental values that ultimately provides an overarching structure. "This diversity unites us, and in the end is one of our biggest strengths."

Standing together all over the world.  
We believe in our skills,  
we got the power of will.  
Trusting each other to get the job done,  
so many people – standing as one.

From the Bauer song – accessible at [www.youtube.com/BAUERGruppe](https://www.youtube.com/BAUERGruppe).



Whether in plants, on site or in the office: we are stronger together.



The diversity and variety of people at our company make Bauer what it is.



## Webinar with live stream

# Sustainability in specialist foundation engineering

Unusual times call for unusual means of communication: Due to the pandemic-related restrictions, BAUER Spezialtiefbau GmbH held an interactive webinar with live stream for the first time in November 2020. "Sustainable concepts are needed in construction – Setting new benchmarks for specialist foundation engineering," was broadcast from the Bavarian

enormous potential for the development of sustainable technologies in specialist foundation engineering. This was followed by a statement from Prof. Dr. Lamia Messari-Becker, in which she addressed the central relevance of the construction industry to the German government's environmental and climate protection goals and emphasized the crucial role that resource-efficient,

fueling the shift towards sustainable development for some years now, and the public is also starting to think about sustainability in the long term. I think it would be a major step for companies to take on the leadership role in this area." Dr. Christine Lemaitre then discussed the importance of more equally integrating the environment, people and the economy into the concept of sustainability: "It is not necessary to pretend that this process is a science. Instead, what matters is to define and adhere to substantiated benchmarks." Certification systems could be an important and appropriate tool to establish equal basis for all parties involved in construction. "Ultimately, what's most important is to do the right thing. We are already capable of building sustainably and ensuring quality – no one is preventing us from doing more than what is required," remarked Lemaitre. The final round of questions focused on generating alternative energies through geothermal heat in specialist foundation engineering as well as the possibility of establishing incentives for sustainable construction, even among private investors. After the final polls were evaluated and discussed, Hans-Joachim Bliss summed it up: "When it comes to sustainability in construction, quality is not negotiable. There is no lack of innovative ideas, but politics and business need to work together."



*Dr. Karsten Beckhaus, Prof. Thomas Bauer and Dr. Christine Lemaitre were able to attend the panel discussion in person as guest speakers, with Hans-Joachim Bliss moderating the event (from left to right).*

representatives in Berlin with an average of around 700 viewers. Hans-Joachim Bliss, then Managing Director of BAUER Spezialtiefbau GmbH, acted as moderator for the event. Renowned guests contributed to the panel discussion: Dr. Christine Lemaitre, CEO of the German Sustainable Building Council, Prof. Dr. Lamia Messari-Becker, Professor of Building Technology and Construction Physics at the University of Siegen and member of the Club of Rome, who connected virtually, as well as Prof. Thomas Bauer, President of the European Construction Industry Federation (FIEC).

The event kicked off with a keynote speech by Dr. Karsten Beckhaus, Head of the Structural Engineering Department at Bauer Spezialtiefbau. He touched on topics such as the sustainability goals of AGENDA 2030 released by the United Nations, the requirements for sustainable specialist foundation engineering methods, and the

regenerative construction will play in the future. "We need more cooperation, more dialog, and more communication about sustainability in the construction industry," remarked the internationally experienced civil engineer. The first thematic section was concluded with various surveys, in which all webinar participants were given an opportunity to contribute to the discussion using an app. Specific audience questions were discussed, for example contract awarding practices and the possibility of giving more weight to environmental aspects in that context.

Prof. Thomas Bauer's statement focused on how to realistically and enthusiastically master the challenge of sustainability in specialist foundation engineering: "We need to approach the challenge of sustainable construction at the right speed and with the right technologies, and we must not let a failure to act prevent us from taking responsibility. The political world has been



*A resounding success: roughly 700 viewers participated in the webinar with live stream.*



# "Schrobenhausener Tage" 2021

## Urbanization, digitalization and climate change

In the middle of April, the national and international "Schrobenhausener Tage" symposium took place in a webinar format with several hundred participants. With the slogan "Specialist foundation engineering: DIGITAL – INNOVATIVE – SUSTAINABLE,"

the national webinar was moderated by Hans-Joachim Bliss. In addition to Arnulf Christa and Frank Haehnig, Members of the Management Board of BAUER Spezialtiefbau GmbH, Michael Stomberg, CEO of BAUER AG, was also available to answer questions from participants.

### More sustainability with digitalization

In his introductory presentation "Sustainability and Innovation in the BAUER Group," Michael Stomberg addressed the three major future topics in specialist foundation engineering: urbanization, digitalization and climate change. "Bauer has been continuously developing over recent years and is one of the most experienced specialist foundation engineering providers when it comes to sustainability," says Michael Stomberg. In addition to the goal of minimizing the carbon footprint as much as possible, the Group is also focused on noise reduction. Michael Stomberg illustrated how important digitalization has become for specialist foundation engineering using the example of the Herbert Hoover Dike rehabilitation in Florida – a project that was 100% digitally supervised.

As the first guest speaker at the German "Schrobenhausener Tage" symposium, Wolfgang Roeck, Managing Director and shareholder of WÖHR + BAUER GmbH,



reported about the two innovative real estate developments "TOM & HILDE" in the heart of Munich. The topic of Dr. Klaus Engels, Hydropower Director at Uniper Kraftwerke GmbH and Managing Director of Rhein-Main-Donau GmbH, was rehabilitation of the Rosshaupten Dam as a sustainable contribution to the energy revolution. "For us, the most important topics are always flood protection and sustainable power generation," he emphasized. The topic of sustainability in the construction of urban quarters was covered by Thomas Bergander, Managing Director and shareholder of Taurecon Real Estate Consulting GmbH, which is the project developer for "Quartier Heidestrasse" in Berlin.

### Expanding the boundaries

In keeping with the motto of the international "Schrobenhausener Tage" event – "Bauer Expanding The Boundaries" – was the presentation by Dr. Karsten Beckhaus, Head of the Structural Engineering Department at Bauer Spezialtiefbau, about the metro in Cairo. In 2008, construction works started on line 3 in the Egyptian capital, which were divided into various phases. Work on Phase 3 began in September 2017 and included the construction of six underground stations. The new line also crosses the Nile. Bauer Egypt constructed around

250,000 m<sup>2</sup> of diaphragm wall up to a depth of 83 m and around 180,000 m<sup>3</sup> of underground sealing.

Knut Pielsticker, Head of Business Development at Bauer Spezialtiefbau, reported on the world's deepest diaphragm wall in Jordan.

At the Dead Sea, Bauer is rehabilitating the dikes around multiple earth basins that are used to extract potash using evaporation. Gebhard Dausch, Managing Director of BAUER Spezialtiefbau GmbH, then highlighted the contrast of working in remote locations shaped by ice and fire: two of the largest mines in the world – one in Alaska, the other on a geothermally active island in the Pacific – serve as examples to illustrate the sometimes challenging environment in which specialist foundation engineering projects are implemented.

The series of presentations was rounded off with the presentation "Innovation at Bauer – pushing the boundaries" by Florian Bauer, member of the Executive Board of BAUER AG and Managing Director of BAUER Spezialtiefbau GmbH. He highlighted major challenges facing specialist foundation engineering, including climate change, urbanization, and the energy revolution.



Expert panel at the German "Schrobenhausener Tage" forum (from left): Wolfgang Roeck, Dr. Klaus Engels, Arnulf Christa, Hans-Joachim Bliss, Michael Stomberg, Thomas Bergander, Florian Bauer and organizer Rainer Burg (above).



Dr. Karsten Beckhaus, Frank Haehnig, Knut Pielsticker, Arnulf Christa, Hans-Joachim Bliss, Rainer Burg, Gebhard Dausch and Florian Bauer (from left) at the international "Schrobenhausener Tage" symposium(left).



# Specialist foundation engineering all over Germany

The new “Quartier Heidestrasse” is being realized in **Berlin**. For the “QH Track” subproject, the longest excavation pit in Berlin, the tasks of Bauer include construction of roughly 23,000 m<sup>2</sup> of MIP wall. The 16,000 m<sup>2</sup> large excavation was sealed using BAUER LWS silicate gel base. **right**



For a new culvert beneath a floodway in **Weiden**, Bauer was tasked with the construction of three sheet pile wall boxes, including structural design and tie back. An RG 19 and a BG 15 were used. **above**

In the Hessian town of **Viernheim**, one of the most modern wind tunnel sites in the world is being constructed. For this project, Bauer secured the excavation pit with two-layer anchored MIP walls. An RTG RG 25, an RG 19T and a KLEMM KR 806 were used. **right**







For a new waste water structure in **Aschaffenburg**, a retaining structure was executed with a secant pile wall using the CFA method up to a depth of approx. 24 m. Bauer also installed a low lying HDI base. **left**





For the 2nd core line project in **Munich**, 2,500 m of steel supports weighing 1,800 t were installed by the "Primary Supports Team" of the Tunnel Hauptbahnhof joint venture. The particular challenges during this step were the difficult logistical side conditions at the construction site and strict requirements for vertical positioning of the primary supports. **above**

In **Mainz**, Bauer was commissioned with construction of the excavation pit and the foundation measures for a new residential building. Using a BG 24 H and two KLEMM rigs, 3,000 running meters of bored piles were constructed, and 50 ground anchors and roughly 120 m<sup>3</sup> of HDI injections were installed. **left**





Excavation pits in the tightest of spaces: in **Munich's** Glockenbachviertel neighborhood, Bauer Spezialtiefbau realized an excavation pit in a rear courtyard. The required materials and a BG 20 H needed to be lifted in over the adjacent buildings. **above**

On Elisabethplatz in the Schwabing neighborhood of **Munich**, two new building complexes are being constructed, for which Bauer executed extensive pile, MIP, and sheet pile wall works using a BG, two RGs and a KLEMM rig. **below**







For the new Loisach Quartier in the Bavarian town of **Wolfratshausen**, Bauer constructed an excavation pit and installed 5,500 m<sup>2</sup> of static MIP wall in total up to a depth of 22.6 m. **above**

As part of the new construction of Terminal T3 in **Frankfurt**, the Bauer team installed 1,200 m<sup>2</sup> of sheet pile wall along with 1,500 m of anchors. An RG 19 from RTG and a KLEMM KR 806 were used. **right**







On the grounds of a bentonite plant in the Swabian city of **Harburg**, 130 foundation piles were drilled for a furnace system with a max. length of approximately 24 m and diameters between 620 mm and 1,180 mm using a BG 30. **left**

For a new wood-fired power plant in **Dinslaken**, Bauer Spezialtiefbau executed approximately 15,700 m of vibration compaction including preliminary drilling in order to strengthen and compact the construction soil. **below**





# Joint Venture

## “Vertical Approach” in deep-sea mining

Seafloor massive sulfides are a valuable mineral raw material found at the bottom of the deep sea. The “Vertical Approach” is a method for extracting seafloor massive sulfides using the diaphragm wall method, an established technique in specialist foundation engineering that is operated and supported in the deep-sea environment from a ship on the open sea. As a relatively small-scale intervention with a minimal ecological footprint, this approach is an ideal method for test mining and exploration of deposits up to a depth of 3,000 m. The approach was conceived in discussions between BAUER Maschinen GmbH and the Harren & Partner Group concerning opportunities to combine the expertise of both companies and to develop new strategies for sustainable mining approaches in accordance with the standards of the International Seabed Authority (ISA).

On August 26 of this year, a joint venture agreement was signed between the two companies and Seabed Mineral Services GmbH was established. The first stage is to determine the economic viability and, in particular, the environmental compatibility of the “Vertical Approach.”

“We are thrilled to have found an expert partner in Bauer who is willing – just like us – to seize opportunities and take on a pioneering role in the area of deep-sea mining,” says Heiko Felderhoff, Managing Director of Harren & Partner. Leonhard Weixler, head of the Diaphragm Wall Equipment division at BAUER Maschinen GmbH, adds: “The chemistry between us is very good; we share a similar spirit. This partnership is an ideal union of specialist knowledge and experience in the area of offshore technologies and services with expertise in the development and production of specialist foundation engineering equipment for onshore and offshore customers around the world.” In the future, Heiko Felderhoff and Leonhard Weixler will serve together as



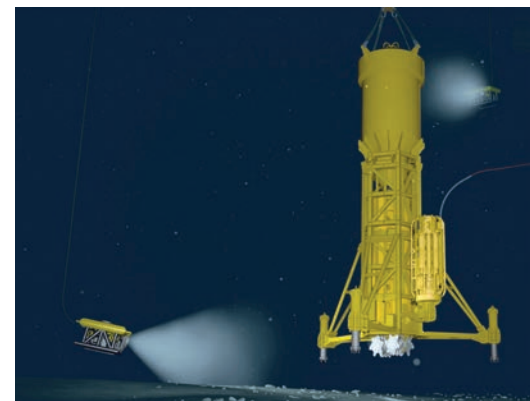
*From left to right: Matthias Müller, Legal Advisor for Harren & Partner, Leonhard Weixler and Heiko Felderhoff, both Managing Directors of the new Seabed Mineral Services GmbH, Verena Schreiner, Product Manager for Maritime Technologies at BAUER Maschinen GmbH, Dr. Rüdiger Kaub, Chairman of the Management Board of BAUER Maschinen GmbH and René Gudjons, Member of the Management Board of BAUER Maschinen GmbH.*

managing directors of Seabed Mineral Services GmbH.

### The concept behind the “Vertical Approach”

Deep-sea sampling undeniably has an impact on sensitive deep-sea ecosystems. Nevertheless, the “Vertical Approach” makes the utmost effort to minimize the ecological footprint. To prevent fine material from escaping the cutting area, a protective collar is positioned around the cutting wheels at the start and the actual cutting process is protected by the surrounding ore. As a result, fine material from the cutting process remains within this area, while the water mixed with fine sediment and cutting chips is pumped into the ore container. The separation process is carried out within the ore container to separate the particles from the sea water via sedimentation. Sampling is selective: the template and trench cutter are lowered using a

cable winch instead of being initially positioned then moved horizontally along the seafloor. This restricts the sphere of influence to the base area of the template feet and trench cutter. Zones with ore can be clearly separated from zones without ore.



*With the “Vertical Approach,” the template and trench cutter are lowered using a cable winch instead of being initially positioned then moved horizontally along the seafloor.*



KLEMM

# Compact, lightweight and versatile

In 2021, KLEMM Bohrtechnik GmbH presented a new universal drilling rig with the KR 606-3, which is predestined for approaching extreme drilling positions under particularly tight conditions. This modular drilling rig concept covers a wide range of applications: underpinning, injection drilling, micropiles, nail installation, and anchoring are all possible applications

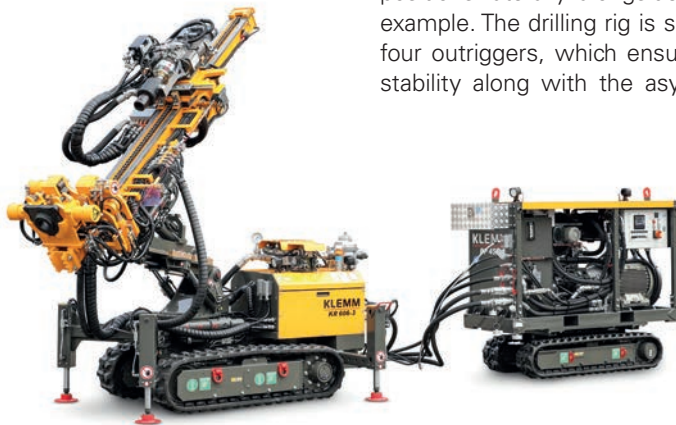
for the currently smallest and lightest KLEMM drilling rig.

The newly developed drilling rig kinematics enable rotation of the boom around the vertical axis of the drilling rig. Other features include the telescoping function of the height-adjustable boom as well as the tilting and rotating function of the feed carrier. This makes it possible to conveniently set up drilling positions laterally alongside ferries, for example. The drilling rig is supported by four outriggers, which ensure excellent stability along with the asymmetrically

telescopic chassis. With its compact dimensions, the equipment is optimally suited for use in buildings and other structures.

Thanks to the established wireless remote control with display, the operator can adopt a secure operating position anywhere around the drilling rig at any time. High flexibility is also achieved with the newly developed modular system of the Power Packs PP 45E and PP 55G. Both Power Packs and the drilling rig itself feature a very slim design in order to drive through tight spaces. They are available on a wheeled chassis for trailer operation, on a self-driving undercarriage with rubber tracks, or without a chassis as a stationary unit.

The Power Pack PP 45E is powered by a three-phase motor with 45 kW capacity, while the Power Pack PP 55G has a diesel engine with 55 kW capacity. The diesel engine complies with exhaust class EU V. A version in exhaust class EU IIIB is also available.



BAUER MAT

# BE 300-C plant sets standards

Since 1990, BAUER MAT Slurry Handling Systems has developed machines and equipment for mixing, pumping and separating slurry in specialist foundation engineering and tunnel construction, the production of construction materials, and environmental services. In separation technology, this branch of BAUER Maschinen GmbH in the Allgäu region is setting a milestone this year with its new BE 300-C: The extremely compact desanding plant is the only one of its kind worldwide that is installed in a 20-foot-tall cube container. The double cyclone design achieves optimized separation with a cut point of 30 µm. This PLC-controlled equipment is outfitted with remote maintenance and a data transmission module. CSC certification of the container and an additional enclosure for noise reduction are available as optional features for a complete package. This innovation is distinguished by its rapid and easy commissioning.





# News flashes

## Virtual General Meetings

After the extraordinary General Meeting in March, during which the planned capital increase was resolved, the ordinary General Meeting was held at the end of June – both in virtual form due to the pandemic. “The COVID-19 pandemic posed a number of challenges, but we were able to overcome them successfully thanks to



the commitment of our employees. We worked very consistently on further implementation of our restructuring measures and also optimized our portfolio. Improvements were also achieved in the development of liquidity and net debt,” remarked the CEO Michael Stomberg to the shareholders during an online broadcast. In his presentation, he discussed the opportunities offered by the major trends of infrastructure, urbanization, climate change, and environmental awareness, as well as how Bauer will make greater use of opportunities in order to advance the business in the long term. The medium-term goals newly set in May were also explained and emphasized. In addition to this, the CEO remarked that he was very satisfied with the subscription of new shares as part of the capital increase and thanked the shareholders and investors for their considerable interest and participation. The shareholders approved the agenda items up for resolution by large majorities, thereby supporting the company’s proposals.

## In operation for 10 years

In the middle of the desert in Oman, BAUER Nimr LLC, a subsidiary of BAUER Resources GmbH, has now been operating the world’s largest

commercial reed bed treatment plant for ten years. With an area of 13.5 km<sup>2</sup>, it is roughly the size of 1,600 football fields and can even be seen on satellite images. The plant is a multi-award winning flagship project for the biological cleaning of polluted water from oil production at the Nimr oil field in the south of the country. The first phase of the project was completed by Bauer Nimr in 2011. In total, around 370 million m<sup>3</sup> of water has already been cleaned and roughly 1,275 million t CO<sub>2</sub> emissions have been saved – by the end of operation



in 2044, estimates predict a total of 4.5 million tons of CO<sub>2</sub>. With an order volume of roughly 600 million US dollars over its entire period of operation, the reed bed treatment plant in Oman is one of the most significant projects run by Bauer Resources.

## Bauer equipment used for rescue mission

After an explosion on January 10 in a mine in eastern China, 22 miners were buried at a depth of more than 600 m. In the ensuing rescue mission, which involved an assistance and rescue team of several hundred people, specialists from Bauer and two pieces of Bauer equipment – an RB-T 90 deep drilling rig and a BG 30 – also stepped in to contribute. “We are aware of the responsibility involved in this type of rescue operation. This operation has reminded our customers once again of the importance of our equipment in such cases,” says Dr. Rüdiger Kaub, Chairman of the Management Board of BAUER Maschinen GmbH. “We will continue to emphasize the importance of such rescue equipment in the future.” Of course, this concerns not

only the equipment itself but also, to an equal extent, the maintenance of the equipment and ongoing training for the crew; after all, they do not carry out rescue drilling operations every day.



## Bauer acquires Gefco

In October 2020, BAUER Equipment America Inc. concluded an asset deal to take over the water well drilling rig business established in the USA under the Gefco brand. “In comparison with the cyclical oil and gas markets, the market for well drilling in the USA has developed very consistently over the past 25 years or so. This market is experiencing growth in North America overall, and we would like to be active players and tap into this growth for our development,” explained Jochen Grundmann, Managing Director of BAUER Equipment America Inc. Wolfgang Pünnel, Head of the Water, Energy & Mining division, adds: “Our goal with Gefco is to gain a foothold in the growing North American market for water well drilling rigs. We are able to benefit from the extensive local sales structure that we already built up here.”





## Continued strong performance in Kazakhstan

On March 19, the breakthrough between the two tunneling sites at the south-east track and haulage road east occurred in the Donskoy GOK mine in Kazakhstan. In addition to reaching this milestone for TOO SCHACHTBAU Kazakhstan, the customer also signed a new contract: the planned excavation of a ramp to the base at -400 m and the connecting section from there to the ventilation shaft is scheduled by the end of 2022. "With this order, the customer relies on the professionalism, quality, and reliability of the team on site and this deepened our tried and tested partnership," reports Olaf Schmidt,



General Director of TOO SCHACHTBAU Kazakhstan. With the begin of works at the new, third tunneling site, the local project team grew by more than 30 new employees. In the autumn of 2012, Schachtbau Kazakhstan was initially tasked with 4,500 m of tunneling work at a depth of 900 m in the chrome ore mine Donskoy GOK. The first follow-up order for around 4,000 m of tunneling work followed in March 2017. Starting June 13 of this year, the next stage was reached during tunneling work with an excavated section of 8,000 m.

### Partners for three decades

BAUER Maschinen GmbH has been working successfully with its Turkish partner Karun Makina A.S. for 30 years now. More than 300 pieces of equipment have been sold to Turkey during this time, and new technologies have been introduced on the local market. Since 2016, Karun is also the official Bauer Service Center in Turkey. Because it was unfortunately impossible to celebrate the occasion in a fitting manner due to the current situation, the recognition award was



handed over in Schrobenhausen. "The work done by Karun has played a decisive role in expanding our presence on the Turkish specialist foundation engineering market. We would like to thank them for this thoroughly positive partnership and look forward to successfully continuing our cooperation," said Christian Gress, Head of Sales.

### Equipment trade fair in Belgium

In September, the international trade fair MATEXPO was held in the Belgian city of Kortrijk. It is the third-largest trade fair of its kind in Europe. BAUER Maschinen GmbH was represented at an exhibition stand shared with RTG Rammtechnik GmbH and KLEMM Bohrtechnik GmbH. In addition to an RG 22 S, a KR 806-3GS and a KR 606-3, which were presented at the Bauer stand, an RG 27 S was also



positioned at the trade fair entrance. The Bauer team was pleased not only about the interesting conversations with customers, but also about multiple equipment handovers: an RG 22 S was handed over to a customer by symbolically presenting them with a key, while the KR 806-3GS and RG 27 S also changed hands.

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#### Important notice

All group photos that were taken after the  
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the relevant hygiene and distancing rules.



