

Specialist Press Release

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Little helpers, big results: Digitalization facilitates soil remediation on gas works site

Arnstadt, Germany – The images that Friedrich Leifheit generates on his tablet using many gigabytes of data almost seem like surreal works of art. In fact, it's not actually art, but rather a digital site model. You can distinguish the grounds of the former gas works in Arnstadt, which now contain nothing but piles of debris and the ruins of buildings. All other traces of an industrial history spanning more than 70 years have already disappeared, except for environmentally hazardous materials, such as tar, heavy metals, phenols or hydrogen sulfide compounds, still lurking deep underground. The task of the Bauer Umwelt division of BAUER Resources GmbH, in collaboration with BAUER Spezialtiefbau GmbH, is soil remediation including the construction of an excavation pit and groundwater treatment.

In January 2021, the work of digital surveying the 12,000 m² 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 after the digital collection phase 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 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. In the process, a total of 9,100 m³ of material was removed and disposed of, including approximately 16,000 tons of polluted soil and construction debris as well as roughly 500 tons of soft tar. The encountered foundations were recorded in 3D on a tablet using surveying software, then forwarded to the BIM department at Bauer Resources to calculate volumes. After construction of the largest of the three excavation pits (approximately 4,200 m³ removed), replacement boring was carried out with a diameter of 1,800 mm up to depths of 7 m below the ground surface to remove the tar hotspot. For processing, the excavated soil was transported to the soil treatment center of the Bauer Umwelt division in Bleicherode 150 km away. The polluted dripping water from the drilling process was treated using the established groundwater treatment system. Work will be concluded with construction of the last excavation pit followed by earthworks.

To sum it up, this is for the most part a classical rehabilitation project but is still characterized by an ambitious use of digital tools. Along with drones, rover rods and tablets, the Bauer team also relied on digital tools for site documentation. Rather than using pen, paper and cameras, the team led by Friedrich Leifheit, Site Manager at 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 – a convenient web application – on the tablet. 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: “In addition, the information is available for all parties involved, around the clock and from any location. This greatly facilitates and improves communication on the site.” The work executed by Bauer is expected to be completed by September 2021.

Images: 2021-07_BAUER_Arnstadt ...



(1) In addition to drone, rover rod and tablet, the Bauer team also relied on a digital tool for site documentation: the digital construction diary.



(2) The area was surveyed with centimeter precision using a drone and rover rod.



(3) A total of 9,100 m³ of material was excavated and disposed of.

All images: © BAUER Group

About BAUER Resources Group

The regionally organized BAUER Resources GmbH is aligned to projects around the world with its subsidiaries in Germany, Africa, the Middle East and South America and has extensive expertise in the areas of drilling services and water wells, environmental services, constructed wetlands, mining and rehabilitation. With more than 30 years of experience, BAUER Resources GmbH's Bauer Umwelt business division is one of the leading specialists in site remediation, soil remediation and waste disposal, both in the domestic market and internationally. As an expert in pollution reduction, Bauer Umwelt offers a diverse range of services for all environmental issues. Other companies of the BAUER Resources Group are the GERMAN WATER and ENERGY GROUP (GWE) – manufacturers of pioneering products and developers of integrated applications for well-drilling and geothermal – as well the Site Group for Services and Well Drilling Ltd. in Jordan. More at bre.bauer.de

About Bauer

The BAUER Group is a leading provider of services, equipment and products dealing with ground and groundwater. With over 110 subsidiaries, Bauer can rely on a worldwide network on all continents. The Group's operations are divided into three forward-looking segments with high synergy potential: Construction, Equipment and Resources. Bauer profits enormously from the collaboration of its three business segments, enabling the Group to position itself as an innovative, highly specialized provider of products and services for demanding projects in specialist foundation engineering and related markets. Bauer therefore offers suitable solutions to the world's greatest challenges, such as urbanization, the growing infrastructure needs, the environment, as well as water, oil and gas. The BAUER Group was founded in 1790 and is based in Schrobenhausen, Bavaria. In 2020, it employed about 11,000 people in around 70 countries and achieved total Group revenues of EUR 1.5 billion. BAUER Aktiengesellschaft is listed in the Prime Standard of the German Stock Exchange. More information can be found at www.bauer.de. Follow us on [Facebook](#), [LinkedIn](#) and [YouTube](#)!