

STRABAG and PERI constructing Austria's first building using 3D printing technology

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Materials

- Print-quality photo material
- Videos
- Renderings

- **STRABAG office in Hausleiten to be 3D-printed in just 45 hours**
- **Technology partner PERI also behind first 3D-printed house in Germany**
- **Special mortar for construction printing supplied by Lafarge**

Vienna/Hausleiten, 28 October 2021 Austria's first 3D-printed building is being constructed in Hausleiten, Lower Austria. Construction technology group STRABAG, together with PERI, the formwork and scaffolding manufacturer and a pioneer in 3D concrete printing, is realising a roughly 125 m² office building next to its asphalt mixing plant in Hausleiten. The special dry mortar for the construction 3D printing project, with long workability and good pumpability, is being supplied by Lafarge.

"3D concrete printing gives the construction industry an important boost of innovation and represents an exciting addition to the range of available construction methods. With this practical test, we want to further develop the technology of 3D concrete printing together with our partners PERI and Lafarge. The joint planning and design for Hausleiten has already yielded some important insights for the future," says Klemens Haselsteiner, the STRABAG Member of the Management Board responsible for digitalisation and innovation.

"At PERI, we believe in the enormous potential of the fledgling technology of 3D concrete printing. Just under a year ago, we printed Germany's first residential building using a BOD2 printer from our Danish partner COBOD. Since then, the PERI team has successfully realised several additional printing projects. Together with our partners STRABAG and Lafarge, we are now bringing this new form of construction to Austria and are pleased to be realising the first 3D-printed office building in Hausleiten," explains Thomas Imbacher, Director of Innovation & Marketing at PERI AG.

Enormous potential: complex designs in a short amount of time

Construction 3D printing offers several advantages where its use makes technical and financial sense. The COBOD BOD2 gantry printer used in Hausleiten can print concrete at up to one metre per second, which significantly shortens the construction time. The structural works for the building in Hausleiten can be completed in

around 45 hours of pure printing time. Construction 3D printing also offers significantly more design freedom compared to classic concrete construction, with the possibility of easily creating architecturally complex rounded designs.

“3D-printed buildings will help to establish a new, digitally and environmentally advanced language for concrete. The intelligent material is convincing in its application and provides a high degree of architectural freedom in design. It allows us to build more with less,” says Berthold Kren, CEO of Lafarge Austria.

Technology and training to combat the skilled labour shortage

“Currently, 3D printing is only suitable for construction projects up to a certain size, so having a skilled workforce remains crucial for the successful realisation of construction projects,” Thomas Birtel, CEO of STRABAG SE, points out. “The severe shortage of skilled labour that currently prevails will remain with us in the future as a challenge that we have to cushion with two strategies: by investing in training, for example with our new STRABAG Camp[us] Ybbs, and by increasing productivity with new technologies.”

Background knowledge: How does 3D concrete printing work?

PERI is using the COBOD BOD2 gantry printer for the construction printing project in Hausleiten. This printing technology comes from Danish manufacturer COBOD, in which PERI acquired a significant stake in 2018.

The print head moves about three axes on a securely installed metal frame. This allows the printer to be moved to any position in the structure being built, requiring only a single calibration. The 3D printer applies the print material (dry mortar) in layers to create the walls. Laying down two parallel printing paths creates a hollow wall that is then backfilled with cast-in-place concrete as a load-bearing system. To create the outer wall, a second cavity is formed by printing another mortar path further outside the previous wall and filling this with thermal insulation material. The printed walls can be regarded as a kind of lost formwork system.

During the printing process, the printer already takes into account the water, electricity and other utility lines and connections that will be installed at a later point. The BOD2 is certified in such a way that work can also be carried out in the print room during the printing process. This allows manual work, such as the laying of pipes and connections, to be easily integrated into the printing process.

The printing material is stored in silos. The ready-to-use dry mortar is then pumped directly into the print head during the printing process after the addition of water. The Tector Print brand material used for printing the office building in Hausleiten was developed by Holcim and is adapted to the special requirements of 3D concrete printing.

STRABAG SE is a European-based technology partner for construction services, a leader in innovation and financial strength. Our services span all areas of the construction industry and cover the entire construction value chain. We create added value for our clients by our specialised entities integrating the most diverse services and assuming responsibility for them. We bring together people, materials and machinery at the right place and at the right time in order to realise even complex construction projects – on schedule, of the highest quality and at the best price. The hard work and dedication of our more than 75,000 employees allow us to generate an annual output volume of around € 16 billion. At the same time, a dense network of numerous subsidiaries in many European countries and on other continents is helping to expand our area of operation far beyond the borders of Austria and Germany. More information is available at www.strabag.com.

About PERI

With sales of € 1,503 million in 2020, PERI is one of the leading manufacturers and suppliers of formwork and scaffold systems in the world. The family-owned company, with its headquarters in Weissenhorn (Germany), a workforce of 9,400 employees, more than 60 subsidiaries and well over 160 warehouse locations, provides its clients with innovative system equipment and comprehensive services relating to all aspects of formwork and scaffolding technology.

About LAFARGE

In Austria, Lafarge is represented by Lafarge Perlmooser GmbH and Lafarge Zementwerke GmbH. While Lafarge Perlmooser GmbH is 100% owned by Holcim, Lafarge Zementwerke is a joint venture with the construction technology group STRABAG. In Austria, the company has two cement plants in Mannersdorf (Lower Austria) and Retznei (Styria) with an annual production capacity of around 1.6 million tons of cement. The company enforces green product solutions such as climate cements and circular economy. More information: www.lafarge.at