

The world's first 3-D printed reinforced concrete bridge starts to take shape

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The printing of concrete for the 3D-printed bridge has begun. Credit: Eindhoven University of Technology

Today the Built Environment department's concrete printer starts printing the world's first 3-D printed reinforced, pre-stressed concrete bridge. The cycle bridge will be part of a new section of ring road around Gemert in which the BAM Infra construction company is using

innovative techniques.

One of the advantages of printing a bridge is that much less concrete is needed than in the conventional technique in which a mold is filled. By contrast, a printer deposits only the concrete where it is needed. This has benefits since in the production of cement a lot of CO₂ is released and much less of this is needed for printed concrete. Another benefit lies in freedom of form: the printer can make any desired shape, and no wooden molding frames are needed.

An extra detail is that the researchers in the group of Theo Salet, professor of concrete construction, have succeeded in developing a process to also print the steel reinforcement at the same time. When laying a strip of concrete the concrete [printer](#) adds a steel cable so that the bridge is 'pre-stressed' so that no tensile stress can occur in the concrete, because this is something that concrete is not able to cope with adequately.

In recent months, Theo Salet's research group made an initial scale model (1:2) and tested its safety by subjecting it to a 2000 kg load. Now that the safety has been demonstrated, a start can be made on printing the concrete elements that will later be glued together to form a bridge. Provincial representative Christophe van der Maat today got the ball rolling at TU/e.

It is expected that the bridge elements will be printed and ready within two months. In September the BAM construction company will put the [bridge](#) in place in the Noord-Overtoom, a new section of ring road around the village of Gemert, where the company is also using other new innovative building techniques.

Provided by Eindhoven University of Technology

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