

Topocad

– an important link in innovative AR technology

In advanced glasses, the real terrain and digital design are simultaneously visible. It provides a more efficient way of projecting, says Rikard Svall at 5D Consultants, who developed the working method where Topocad has an important role as information carrier.

By: Love Jansson



Imagine yourself walking around in the terrain and at the same time seeing the digital drawing, exactly in the same place. It may sound like science fiction but it is a reality that will create completely new opportunities for the construction industry. This according to Rikard Svall, who is the surveyor manager at 5D Consultants.

- The designs are getting more efficient, he says.

Digital and analogue in one

The technology is based on AR, augmented reality, where the visible impression of the area is combined with the digital base. The designer walks around the terrain with a pair of very advanced glasses and views the designed area with fields, forests and infrastructure. At the same time, the drawing is projected in the glasses. In one and the same view, the designer sees both the digital and the real. All in scale 1:1.

A kind of mirage. *Hägring*, mirage in Swedish, is also the name of the product that the company Bjorkstrom Robotics has developed, and 5D Consultants were one of the first to invest in the technology. In addition to the glasses, the product consists of a computer that the user wears in a rucksack. On the glasses, a GPS is mounted that provides precise position.

Working method links information

To work with the design of this technology, 5D Consultants have developed a working method in which Topocad plays a particular role. Rikard describes how the work is done.

First, quality-assured data is needed from a proper survey of the area, by a total station or a scan. The data is provided to a designer who develops a BIM model of what is to be built.

But it's not always the BIM model considers the entire infrastructure, for example, what is underground. Then Rikard and his coworkers comple-

ment VA models and draw excavation models. It is done in Topocad.

The next step is to export the information from Topocad to Hägring software. But a basis for design consisting only of polylines is not visible enough in the glasses, they are too thin. Therefore, they must be enlarged and transformed into solids. It is also done in Topocad where each polyline becomes a solid. These are exported to Hägring.

- Topocad is a tool for creating models and solids and is necessary for us to capture the information in Hägring," says Rikard.

Topocad is a link between design and being able to study it in the reality. The combined experience of digital and real reality can be spread in different ways. On the backpack, a screen can be mounted that displays the same image as the user sees and can be displayed to the project group immediately behind. The images can also be streamed in real time on a YouTube channel to a construction site elsewhere or stored in a USB.

Easier to make decisions directly in the field

Rikard points out several advantages of the advanced technology with the glasses.

- Those involved in the project get a better understanding of the model when they see it in the area. As the person moves, the solids in the area follows and one can determine how placements of objects match the reality. This makes it possible to make decisions on-the-spot for changes and to discuss if the items will get a new location. Data that had not been detected or observed at the computer in the office. Working in the field helps to prevent problems.

- It may have been a long time since the survey was made and the area has changed. A newly constructed cycle path or manhole means that the design is not correct and can delay production. Therefore, it is important to evaluate whether the design documentation is correct and

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if no new surveys are needed.

It saves time, says Rikard.

- Problems are prevented and the schedule is kept because the documentation is verified based on what it actually looks like in the area.

But it is not only in the design that the technology can be used but also at the start of production. It can also be used for stake outs when lower tolerances are accepted, a kind of rough stake out.

Above all, the experience in the field is the great profit, to be able to study how the thought can be realized appropriately to eliminate obstacles and make the right decisions. BIM models are combined with innovative technologies, and Topocad has an important function for linking the information flow. A creative society where different forms of technology work together to facilitate and improve the construction process.