

Bauer Spezialtiefbau

## Laser scanning

Modern, digital as-built documentation on the construction site

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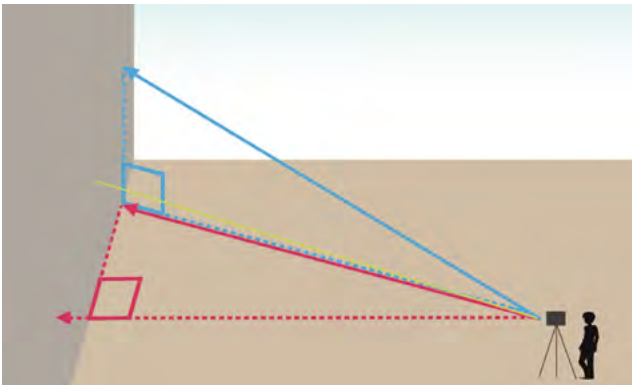
## Description

The **Technical Service** Department of BAUER Spezialtiefbau GmbH has a **Leica ScanStation P30** as well as the associated software packages Cyclone and Cyclone 3DR and iPad with LIDAR.

**Laser scanning** is an efficient procedure for making assessments of existing conditions (visualization, planning and specified/actual comparison), for monitoring (structural deformation) and for documenting the progress of construction of existing structures. For instance, in specialist foundation engineering the procedure allows for documentation of the progress made at various stages during the construction of foundation pit walls. Moreover, laser scanning can be used to make archival records of existing buildings or the like for later reference.

## Measuring principle

The laser scanner is equipped with a laser as well as further additional sensors. In order to capture the contour of a surface or of other three dimensional bodies during the measuring process, the laser beam moves at a high speed and in a predetermined grid over the object to be measured. To capture large or complex object geometries, measurements are



Sketch of the measuring principle

carried out from different positions. The individual measurements obtained are finally combined into a point cloud and georeferenced using linking points, which were recorded tachymetrically.

Depending on the number of measuring positions, the on-site measuring process is fast and straightforward. Processing the data after it has been captured can be time-consuming, however, depending on the assigned task. As a result, coordinates of the measured points are generated, which are also displayed in true color when using the laser scanner's integrated camera. These will in turn serve as the basis for computer-generated visual image representations.

## Measured data

### Example: Scan of a technical plant

The following example shows the scan of a technical plant for documentation purposes as well as for planning renovation work. The digital 3D model shown here allows an engineer or other professional to easily add the desired modifications with modern drawing software and to take exact measurements.



On-site measuring of an existing cleaning plant