

# LEAN Construction:

## The lean way to build

### More sustainability through efficient processes

Reducing emissions is not always about developing entirely new materials or particularly innovations. Another powerful lever for change consists in utilising existing resources as effectively as possible and avoiding wastefulness. To achieve this, STRABAG uses the LEAN Construction way of thinking and working.

**Cover** In asphalt paving, lean asphalt planning helps ensure the smooth, continuous forward travel of the paver with no waiting times for the trucks.



**STRABAG**  
WORK ON PROGRESS



## What is LEAN?

LEAN Construction transfers the lean principles that were originated in the Toyota production system to the construction sector. The aim is to design processes and workflows to be as efficient, as precise and as lean as possible. In LEAN Construction, people, machines and methods work together optimally to avoid disruptions and waste in the process flow.

**By planning and controlling all processes as effectively as possible** STRABAG is able to not only optimise time and cost structures and closely coordinate the individual work steps, but also to reduce unnecessary resource waste – without compromising on quality.

LEAN Construction starts even before the actual construction work begins, thereby laying the groundwork for a successful, sustainable construction project already in the early project phases. STRABAG plans precisely which resources are needed when, where and to what extent. Processes on the construction site and in areas close to the construction site are analyzed, efficiently planned and optimally timed. The logistics partners are also included in the planning process. When producers and suppliers are properly integrated into the construction site, this reduces the amount of storage space that is needed, avoids unnecessary heavy traffic and so greatly minimises the emissions caused by fossil fuels used for heavy goods transport. With LEAN Construction, processes and process steps are thought through systematically and holistically so that knowledge that is gained and the improvements that are achieved are not limited to a single project. Instead, they are transferable, scalable – and in the best sense of the word: sustainable.

**1** The entire construction team benefits from the results of the process analyses, as it allows them to identify optimisation potential and possible solutions.  
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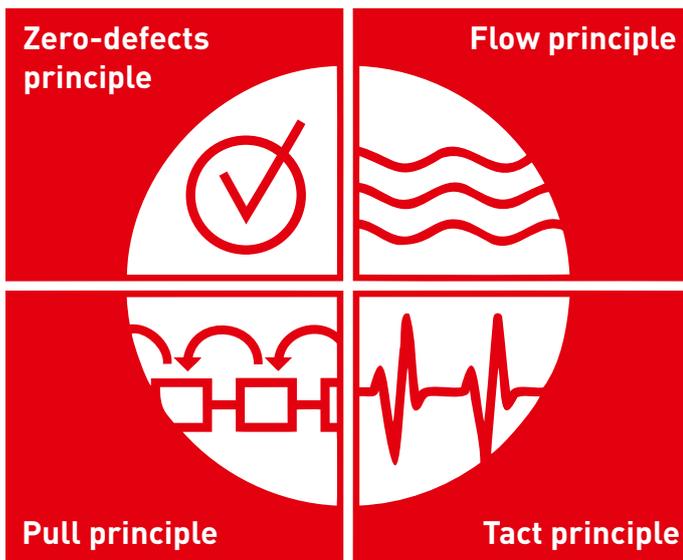
LEAN Construction enables us to avoid idle times for all persons involved in the construction process and to minimise other forms of wastefulness as well.

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## LEAN Construction in practice

STRABAG uses LEAN Construction to achieve the defined project goals with the most sustainable and efficient possible use of resources. That is both economical and environmental! The STRABAG team does so by taking an end-to-end view of the construction projects – from planning and design to the actual construction – and arranges the work processes according to the four LEAN principles:



The **flow principle** describes the continuous flow of all necessary resources and information. This minimises disruptions in the workflow and prevents the need for emergency action.

The **tact principle** identifies repetitive work steps and optimally coordinates them with each other. This helps to identify and overcome challenges at an early stage.

Applying the **pull principle**, machines, materials, information and people are assigned to the process as needed. Among other things, this prevents overproduction and waiting times.

The **zero-defects principle** aims at talking openly and honestly about errors. Mistakes can happen, but they should be discussed and analysed in the team afterwards. Agreeing on a set of common standards helps to avoid deficiencies, rectifications and problems in the long term.

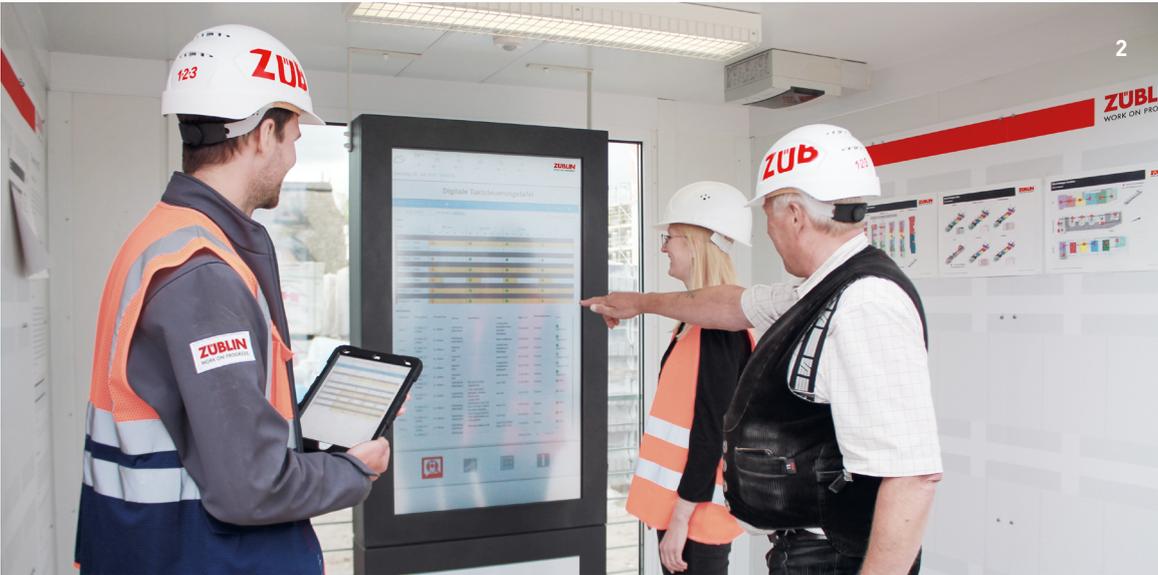
## Planning

Many details, for example the size of the excavation pit, can be determined in advance of a construction project. This helps to prevent an excessively large excavator from being scheduled, which would emit more CO<sub>2</sub> and is more cost-intensive than a smaller machine. Here, too, what is good for the economy is also good for the environment.

## Construction process

With the aid of specific analysis tools, STRABAG examines how a construction site can be designed and managed more efficiently. Resource wastage, if any, is identified and quantified. A target/actual comparison shows which materials were requested and what is actually used. On this basis, STRABAG takes appropriate efficiency measures and uses LEAN systems for construction process management to reduce or completely prevent the identified forms of wastefulness.

LEAN methods can be used to optimise processes so that trades are optimally synchronised and downtime is avoided. STRABAG also coordinates the use of equipment and construction machinery to reduce unnecessary idle times.



2 Tools such as digital takt control create transparency with regard to the construction progress and help to optimally synchronise the various trades.

## Logistics

The more integrated the production facilities, suppliers and construction sites, the better it is for the environment. Optimal timing of material deliveries, for example, not only reduces waiting times and the amount of storage space required but can also ensure that a smaller truck is used or even make entire journeys obsolete by combining deliveries.

Another example: To ensure that material mixtures arrive at the job site at a workable temperature even in the event of delays, these are often produced 20 degrees warmer than is actually necessary. LEAN enables STRABAG to clock deliveries precisely and so reduce the production temperature. This saves energy. Precise planning and scheduling also avoids having to constantly restart the mixing plant when needed. This is often the case with logistics that are not optimally coordinated, resulting in enormous additional energy consumption.

LEAN also greatly benefits the logistics on the construction site itself. The construction planners, for example, can make sure that materials, equipment and people are always in the right place at the right time. Aspects that may seem insignificant at first glance also play a role. The proper placement of materials on the construction site, for example, significantly reduces how much the crane operator needs to move the crane, which represents a powerful means for reducing emissions as calculated across all of STRABAG's large construction sites.

### Contact

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