



CASE STUDY

CIRCULAR CONSTRUCTION OF 'DE NIEUWE LUNET' CITY OF UTRECHT

KEY FACTS

- 595 m² sport facility with changing rooms
- First municipality-owned circular construction pilot project
- Reuse of a.o. shower installation, doors, scaffolding wood.
- Use of Freement concrete and ClickBrick

DO'S

- Reserve enough time for your pilot project
- When you have limited experience on circular construction: make use of a more abstract tender based on performance indicators
- Prioritize a limited number of criteria in your tender and steer on these criteria.
- Make use of an (external) process supervisor to keep track of progress and keep the momentum

DONT'S

- Avoid the inclination towards a traditional construction project cycle; collaboration and teamwork throughout the whole building chain

CONTEXT

The City of Utrecht's ambition is to be a circular city by 2050. Utrecht is taking the first step in our transition to a circular economy through the action programme Utrecht Circular 2020-2023. Circular construction is an important priority of this action programme, as the city is dealing with a large demand for new buildings. By experimenting and implementing of various pilot projects until 2023, we learn more about how to approach circular construction and development. The circular construction pilot of the sports facility 'De Nieuwe Lunet', the City of Utrecht was able to give a first good example of circular construction. De Nieuwe Lunet is therefore an important good practice for circular construction in the city

CIRCULAR CONSTRUCTION PILOT 'DE NIEUWE LUNET'

De Nieuwe Lunet is a sports facility was realized in December 2019, replacing an outdated and polluted facility from 1978 that had grown too small for the sports clubs. The goal for de Nieuwe Lunet was to both demolish the old building as well as construct a new, larger facility on the same parcel, all based on circular construction principles. The result of the tender is a 595 m² two-floor, zero energy, natural gas free and sustainable building that works on a PV installation and heat pump. The building was constructed as circular as possible, by both using secondary materials and products from the demolished sports facility, such as the shower installation, as well as from other 'harvest sites', such as secondary doors. Cavity wall insulation was made of old jeans and panelling of was made out of the scaffolding wood that was used during the construction. For concrete in the building Freement concrete was chosen that contains reused cement. Finally, virgin materials that are suitable for reuse in the future were applied, such as ClickBrick system that allows for easy demounting.

OPPORTUNITIES AND CHALLENGES

The fact that the facility is municipality-owned created the opportunity to develop an **alternative tender**, that was based on a concise statement of requirements, including sustainability performance indicators, and a lay out rather than an extensive technical list with building specifications. Through steering on performance indicators



- from supplier to architect is important for circular ambitions.

LESSONS LEARNT ON COLLABORATION

- Include your end users and stakeholders in the planning and design process as much as possible. In this way, you will reach a well-considered outcome.
- Make sure to define together what circularity exactly means in an early stage of the project
- Trust in the contractor as well as the collaboration itself is important. The soft side is as important as the hard side.
- Make use of a process supervisor to keep the momentum in the project. Do you get stuck? Do not wait too long with arranging support.
- Realize that boards of sports clubs often change in composition and have limited knowledge on the facilities of the clubs.

more freedom remained with the market, providing the space and trust to experiment and come up with innovative solutions. A **strong building consortium**, especially the building contractor, is thus also key as their enthusiasm and willingness to learn was vital for this project's success. Challenges with de Nieuwe Lunet were mostly on the themes of **reuse of materials**, the **logistics of circular construction** and the **prize and time** for the circular ambitions. Reuse from the 1978 sports facility was only possible to a small extent, as the actual construction materials were not suitable to be re-used, due to amongst others contamination with asbestos. Application of secondary materials was a challenge in the sense that the Building Decree legislation in some cases prevented the direct reuse of harvested materials. Closely connected is the issue of certification, as secondary materials and innovative new circular products often lack the right certification, which resulted in expensive testing or lowering the project's ambitions as was the case with the Freement concrete. Reuse from other 'donor' buildings required insight on material flows and organizing logistics, which proved to be very challenging with the currently limited market activity on secondary materials and products. Delay on the demolition of a donor project therefore resulted in delay at the recipient side, as was the case with the reuse of doors. Lastly, connected to the abovementioned issues is the prize and time for circular ambitions. Circular ambitions required an additional 15% on the investment, which makes circular construction more expensive. There are additional costs in the development phase as well as during the implementation. Overall, the project thus required more time and energy of the parties involved in building consortium, not to mention an overall change of traditional building approaches.

WHAT'S NEXT?

Experience gained through de Nieuwe Lunet pilot, other pilots in Utrecht as well as the pilots at the other URGE partner enriches the knowledge on how to approach circular construction in cities and how to concretize ambitions. This knowledge will feed into the upcoming construction tasks in Utrecht, most prominently in 20 urban development projects where circular construction will be a key ambition, paving the way for a fully circular city by 2050.