

Reloading Walls

Can reclaimed concrete walls carry new buildings?

Purpose of the project

The project will investigate barriers and potentials for reusing concrete walls from existing buildings as walls in new buildings. Today, concrete walls are usually crushed during demolition despite their potential for reuse. The project will help generate knowledge needed to assess whether reclaimed concrete walls can be safely reused in compliance with current building requirements.

The reuse potential of concrete walls

The building industry has a large environmental footprint, including high CO₂ emissions, and waste generation. To reduce this impact, it is important to consider how existing materials can be used in the most value-preserving way. Concrete is the most widely used building material, and a large part of the existing building stock contains concrete walls. When concrete buildings are demolished, the concrete walls are typically crushed and used to replace natural sand and stone in roads. However, when concrete is crushed, its original function as building components is lost. Reusing concrete walls instead of crushing them preserves their functional value and reduces the industry's CO₂ footprint. Despite the widespread availability and the environmental potential, concrete walls are rarely reused.

Challenges hindering reuse

A key barrier hindering reuse is the lack of documented knowledge on how concrete walls perform after many years in use and after being reclaimed from an existing building. Before a concrete wall can be reused in a new building, it must be documented that it can safely carry what is needed. If its capacity and structural behaviour are unknown, the wall cannot be approved for reuse. As a result, concrete walls that may still be functional risk being crushed instead.

Generating knowledge on performance

To help address this knowledge gap, the project will carefully reclaim a number of concrete walls from existing buildings. The walls will be examined and tested in full scale to determine their actual capacity and how they perform. The results will be compared with their expected capacity calculated using today's methods. This will provide valuable data on the actual capacity and behaviour of reused concrete walls to help assess whether the capacity can be reliably predicted using current calculation methods. This is expected to showcase that reuse is feasible and reduce the need for costly test.

Project information

The project participants are COWI, Danish Technological Institute, and Tscherning. The project runs from August 2026 to January 2028.