



# Mikkeli

# Optimised Implementation Plan – CDW

# Miksei Mikkel



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Abstract	This Optimised Implementation Plan explains how Mikkeli will implement the tools and processes developed in the project preparation phase in its demonstration actions, and how relevant local stakeholders and CityLoops project partners will be involved.
Keywords	Demonstration; implementation; plan
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# 1. Demonstration action: Circular demolition of 2 buildings

## 1.1. Short description

Mikkeli's demonstration involves the demolition of two public buildings using circular material management methods, including digital tools: Pankalampi Health Care Centre and Tuukkala hospital. In the preparation phase, Mikkeli Development Miksei Ltd and South-Eastern Finland University of Applied Sciences (XAMK) have engaged relevant stakeholders such as the municipality, the operations centre responsible for public equipment, and the public waste management company (Metsäsairila Ltd). To carry out the demolitions with circular material management, the sites will be scanned and a pre-demolition audit will identify potentially recoverable materials and their characteristics. After a selective demolition procedure, salvaged materials will be incorporated into the digital databank and construction material marketplace. Miksei Mikkeli will promote use of the marketplace by other construction sector actors, private and public, both to offer and to obtain secondary construction materials. After evaluation of the pilot demolitions, the learnings and experience will be incorporated into a circular demolition operations model and generic demolition contract that can be applied in further public projects.

## 1.2. Activities

Activities	Timeline	Responsible partner
Procurement of demolition contractors (2 separate contracts - Terra Infra Oy for Tuukkala and Ahosen Palvelut Oy for Pankalampi)	January 2021	City of Mikkeli, Miksei Mikkeli
Screening of the buildings to be demolished (including 3D drone scan and flow-tracking, pre-demolition audit, and environmental health and safety check)	June 2020 – May 2023	Contracted consultants for pre-demolition audit, and XAMK for drone scan and health and safety check, with oversight by Miksei Mikkeli
Selective demolition procedure	April 2021 – September 2022	Contracted demolition contractors, with oversight by Miksei Mikkeli
Integration of the recovered materials data into the	May 2021 – October 2022	XAMK/ Miksei Mikkeli

databank and digital material marketplace		
Stakeholder engagement and matchmaking to maximise high value reuse of reclaimed materials	November 2019 – October 2022	Miksei Mikkeli, XAMK, Metsäsairila, Mikkelin Toimintakeskus
Evaluation of the demonstration action, with the aim of applying a similar approach in other public buildings and enshrining these circular practices as standard in the municipalities' own projects as an operation model.	October 2021 – October 2022	XAMK, Miksei Mikkeli
Revision of the procedures and tools, and sharing them with others interested in using them.	October 2022 – September 2023	Miksei Mikkeli, XAMK

## 1.3. CityLoops tools/processes tested

### **Life Cycle Assessment for demolition and renovated sites or assessment of environmental impacts of the CDW from the demonstration objects**

May 2021 – October 2022: XAMK will test the LCA tool developed by Roskilde in the demonstration phase on both Tuukkala and Pankalampi demolitions, using the soil, concrete, and mixed CDW versions of the tool to calculate the carbon impact of actions taken and compare the two demolitions.

### **Pre-demolition screening procedure & selective demolition guidelines**

October - December 2020: Pre-demolition audit for Pankalampi by contracted consultant, Ramboll, following the procedure developed in CityLoops.

October 2020 - April 2021: Screening of buildings using the 3D-modelling tool. Removal of equipment and interior finishing material, e.g. doors, tables, technical ceilings.

April - October 2021: (Selective) Demolition works in Pankalampi and Tuukkala

Afterwards, the demonstrations will be evaluated and Miksei Mikkeli and Xamk will prepare for replication, in cooperation with environmental authorities and planning officials of the City of Mikkeli

### **3D-modelling tool for tracking the flows of on-site CDW**

XAMK has developed drone imaging for tracking the material flows on demolition sites. The drone with a mounted camera feeds data into a professional photogrammetry software to create a 3D point cloud with quantity and quality information on materials in the buildings. The result is a 3D model including photos, data on volume/ weight and type of materials present on the demolition site, which can be updated as the demolition procedure progresses.

March - October 2021: Use on both Pankalampi and Tuukkala demonstrations.

Thereafter, the tool will be revised and tested further. Regional meetings and seminars will be held to consider its use in other projects.

### **Databank and digital market place for recovered materials**

The data generated by the 3D modelling tool for tracking CDW on the demonstration demolition sites will be input into a databank, essentially a database managed by XAMK to store information about salvaged materials relevant for their reuse.

Selected materials recovered from the demolition of the two buildings will be put on offer on the digital marketplace from April - December 2021. From February 2021 and through the rest of CityLoops, Miksei Mikkeli will support the growth of the marketplace (encouraging both supply and demand) and analyse its use, aligned with the business case development.

The tools can be seen here: [CityLoops Tool Factsheets](#)

## **2. Expected outcomes & evaluation**

Two demolition projects of public buildings will have been completed applying the new circular planning approaches and tools. Mikkeli will be using new digital solutions (databank and market place), connected to each other, using the API-technology. This will improve the implementation of CE in CDW management processes. 3D modelling tool for onsite material flows will utilize the drone-camera technology and bring efficiency and promptness to data collection on supply of CDW for optimised logistics.

By the end of the project, the reuse and recycling possibilities of materials will be considered an essential part of the procurement processes within the City of Mikkeli. The recycling rate of construction waste will be close to 95%. Within 5 years after the end of the project, the City of Mikkeli aims to be a nationally well-known "Circular Economy City", offering possibilities for CE and new business opportunities through different networks.

Further information on Mikkeli's demonstrations can be seen at: <https://cityloops.eu/cities/mikkeli>

## 3. Planning & Decision Making Guidelines

Miksei Mikkeli aims that the CityLoops planning and decision making guidelines become part of a stable decision making process with good buy-in from city-companies and city departments involved. Miksei Mikkeli will implement and test the guidelines before, during and after the demolition of the two buildings, including through workshops with stakeholders who impact the local building material and demolition value chain. Following the pilot demolitions, Miksei Mikkeli will consider application of the guidelines in other areas of the internal organisation, and seek out the opportunity to apply them in other public construction and demolition projects of the city.

[\*Factsheet for Planning and Decision Making Guidelines\*](#)

## 4. Business Cases

To explore the potential business case for scaling up circular CDW management practices, Miksei Mikkeli and XAMK are holding innovation workshops (in the form of virtual meetings due to covid-19) with stakeholders including the City of Mikkeli, local waste management company and the operational centre responsible for public equipment at least once per month during the preparation and implementation phase of the demonstrations.

One focus on business cases is to collect and analyse data in order to calculate a feasible, scalable model based on experience in the demonstrations. This involves active efforts from Miksei Mikkeli to encourage users (both supply and demand) of the digital material marketplace and find buyers for the salvaged building parts and equipment.

[\*Factsheet for Business Cases\*](#)

## 5. Risks

Potential risk	Mitigation approach
Poor condition of the buildings – many harmful substances could be found in the buildings to be demolished, as they have been unoccupied for many years.	If very few materials can ultimately be salvaged from a demonstration site due to contamination, Mikkeli can try to identify and plan for testing the CityLoops tools on a different building demolition.

Covid-related delays due to personnel limitations.	Adapt workflow, team and tasks to meet major project milestones.
Higher costs of selective demolition procedure prevent the city from applying this approach, especially to large-scale buildings.	Collect and demonstrate the business case behind recovering materials from buildings to be demolished, to show what value can be recovered by revalorisation of salvaged content, e.g. materials sold on the construction material marketplace.
Low take-up of the marketplace by regional construction sector actors – resulting in too low supply and demand of materials that prevents proper functioning of the platform.	Involvement of stakeholders from the local construction ecosystem in the development of functional requirements for the marketplace has ensured it is fit for purpose for their activities. Miksei Mikkeli undertakes promotional activities from Feb. 2021 on to encourage use of the marketplace.





CityLoops is an EU-funded project focusing on construction and demolition waste (CDW), including soil, and organic waste (OW), where seven European cities are piloting solutions to be more circular.

Høje-Taastrup and Roskilde (Denmark), Mikkeli (Finland), Apeldoorn (the Netherlands), Bodø (Norway), Porto (Portugal) and Seville (Spain) are the seven cities implementing a series of demonstration actions on CDW and OW, and developing and testing over 30 new tools and processes.

Alongside these, a sector-wide circularity assessment and an urban circularity assessment are to be carried out in each of the cities. The former, to optimise the demonstration activities, whereas the latter to enable cities to effectively integrate circularity into planning and decision making. Another two key aspect of CityLoops are stakeholder engagement and circular procurement.

CityLoops runs from October 2019 until September 2023.



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