Stormwater purification with construction and demolition waste – StoPWa

Webinar 16.6.2026

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- **Partners**: City of Lahti, LUT University, University of Helsinki, Tallinn University of Technology, Union of Harju County Municipalities, Smiltene Municipality
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Lahti LUT University UNIVERSITY OF HELSINKI TAL TECH HOL HARJUMAA OMAVALITSUSTE LIIT Smiltenes novadā sanāk!

How to use construction and demolition waste (CDW) as filtration system for stormwater purification?

CDW material samples
- Pretreatment
- Crushing/sorting

Characterization
Leaching tests

Leaching tests
Filtration tests

Processing of material
- Agglomerates
- Solid forms
- Filter concept?

- Laboratory tests
- Lysimeter studies
- Stormwater field pilots

Field pilot execution
Stormwater sampling
Life Cycle Assessment

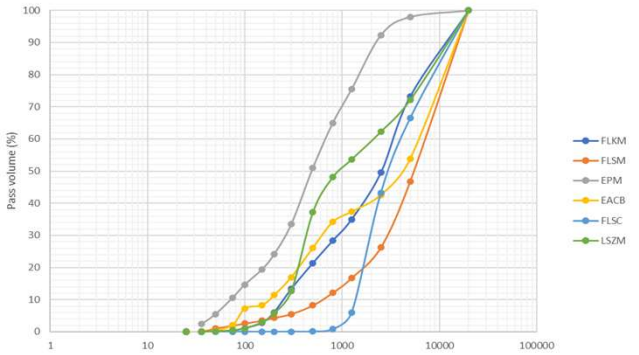
Research questions

- Which CDW streams are available?
- Need for pretreatment?
- Properties: size distribution, shape and prosity, elemental composition, specific surface area, mineralogy
- Is it safe to use? (leaching)
- Absorption / filtration capabilities?

Aim: to separate or process aggregated (granular) material that is suitable for stormwater filtration

1) Crushed concrete as such after size separation

2) Mixed waste after crushing, screening and agglomeration process



Webinar content

9.00	Foreword and introduction of project StoPWa *Arto Pennanen, City of Lahti*	
9.10	Agglomeration of mixed CDW for stormwater filtration *Ville Lahtela, LUT University*	1. Processing of mixed CDW
9.25	Filtration studies on concrete and agglomerated CDW filter media *Priit Tikker, Tallinn University of Technology*	2. Leaching and filtration of CDW-based filter media
9.40	Leaching and filtration of agglomerated CDW filter media *John Allen, University of Helsinki*	
9.55	(break)	
10.00	Implementation and findings from stormwater field pilots *Arto Pennanen, Tiina Beldsinsky (HOL), Vita Grigule (Smiltene)*	3. Stormwater field applications
10.20	Environmental impacts of stormwater treatment options *Ishika Weerawardhana, LUT University*	4. Environmental sustainability and techno-economical assessments of CDW-based filter concept
10.35	Techno-economic assessment of CDW-derived filter *Qaisar Munir, LUT University*	
10.50	Concluding remarks	

Conclusions

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- CDW based stormwater filter is promising yet challenging concept
- CDW filter media is scalable and durable, but manufacture and performance have uncertainties
- **Concrete** is less harmful than mixed CDW, but may have limited purification capacity
- **Mixed waste** leaches contaminants and has variable quality; agglomeration attenuates but does not prevent leaching of harmful compounds
- **Other** waste streams? (wood, mineral wool?)

- Stormwater treatment has strong ecological benefits
- Main environmental impacts of stormwater treatment systems are caused by the construction and maintenance of sites
- Cost effectiveness and ease of implementation are the key attributes to municipality actors, sustainability and circularity are secondary

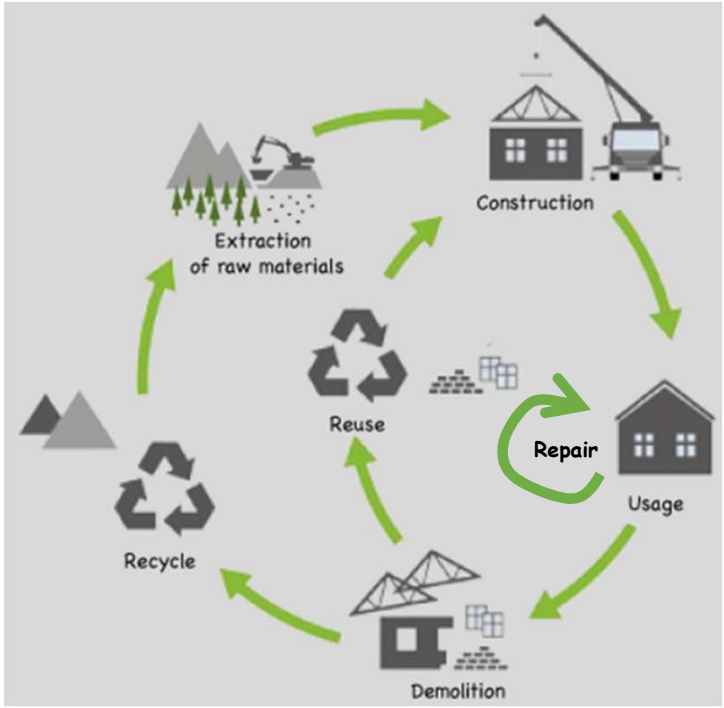
Implications

CDW

- Waste hierarchy! -> Lifetime extension, maintenance, reuse, …, better and more refined sorting at the source
- Bulding parts and materials should be reused for their original or other value-retaining purpose
- Agglomerated CDW may have other applications, but few/none service providers

Stormwater

- Contaminant leaching from CDW is a major issue
- Climate change → Increasing need for reserve capacity and more distributed treatment at the source
- Municipalities' main focus on volume control, less on water quality



Thank you!

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