



The Louhisaari pursuit

Revitalising small scale lime burning tradition in Finland

NORDISK KALKFORUM 2024

Martti Peuransalo

Livady Arkitekter

Livady

Content

Forgotten skills and revitalising

Marketing the project

Mortar combat – mortar making process

Testing and research – defining mortar qualities



Photo: Ala-Kulju, Reijo, 1931; The Finnish Heritage Agency



Photo: Ala-Kulju, Reijo, 1931; The Finnish Heritage Agency

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Forgotten skills and revitalising

Louhisaari pursuit

Personal introduction

Martti Peuransalo

Architect, M.Sc.Tech (industrial management)

Livady Architects, Finland



Louhisaari manor 1650s



Louhisaari Mörka

400 years old

Dark and hard mortar



Pursuit of forgotten skills

History of centuries...millennia

Some recent attempts: successes and failures



Louhisaari pursuit

Revitalising small scale lime
burning tradition in Finland



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Panu

Martti

Marko Selja

Lauri

+Mikki

Louhisaari Mörka – Seir Analyses

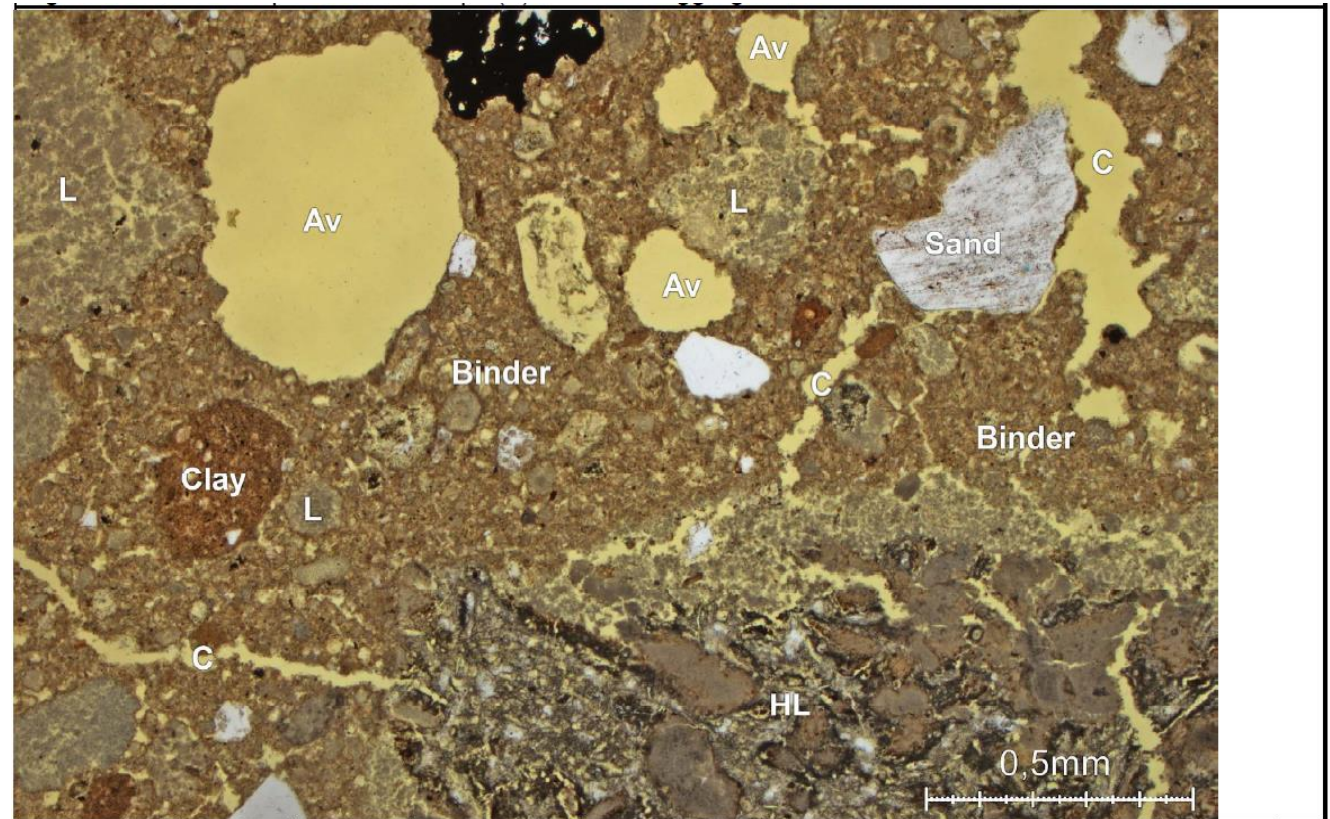


Photo: 8 (F1398-4) **Type:** Micro photo **Sample no.:** P151204-4 **Lighting:** A **Filter:** -N
Sample marked: Sample 4. The lime used is prepared by burning a sedimentary limestone with some impurities of clay. During burning these impurities has partly been transformed to other minerals that have done the mortar slightly hydraulic. The aggregate used has contained some lumps of clay. Lumps of pure lime (L) and impure lime (HF). Air-voids = AV. Shrinkage cracks = C

SEIR–materialeanalyse A/S. 2016. File: 151204, Report: R151204

Louhisaari Mörka – Seir Analyses, 2016

Source:
SEIR—materialeanalyse A/S
File: 151204
Date: March 30th, 2016
Report no.: R151204

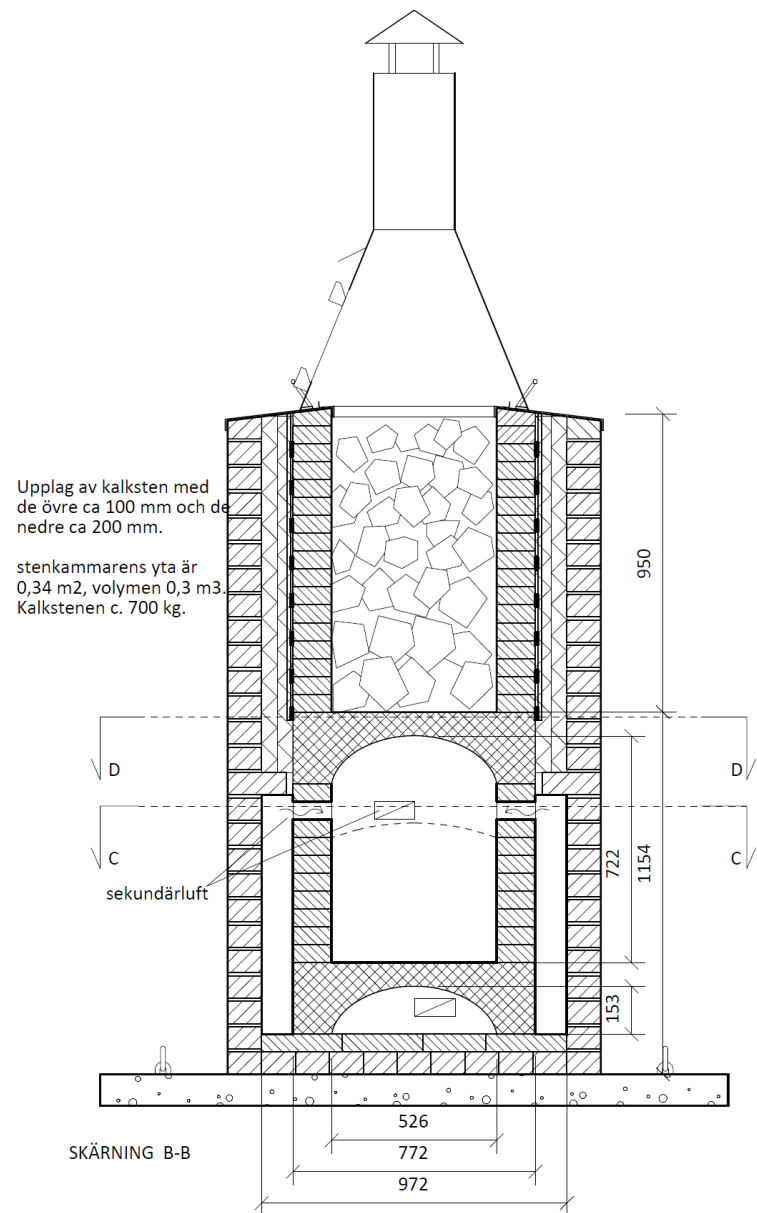
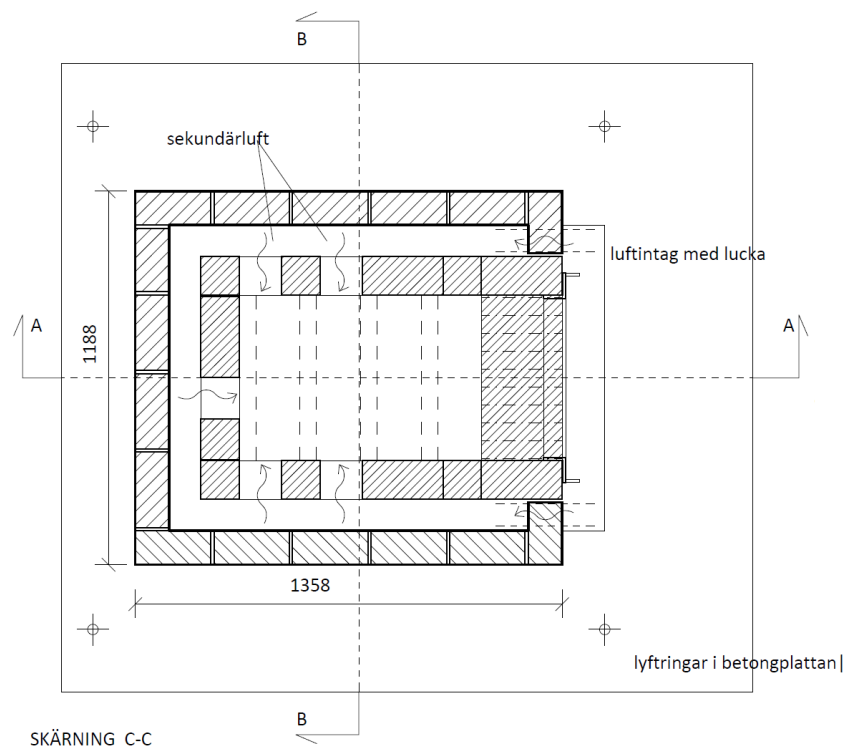
Sample 1: brick laying mortar

- The source for the lime...is a metamorphic limestone (marble) with content of calcium carbonate (mineral name: calcite) and silicate minerals like pyroxene and mica. The silicate minerals have by burning been partly transformed to hydraulic minerals. The calcite has by the burning been transformed to quicklime, which later has been slaked by addition of water.
- ...the strength of the hydraulic lime ... weaker than a modern NHL 2....

Sample 4: Lime mortar

- Binder: Slaked lime (weak hydraulic). ...a sedimentary limestone... some content of clay and silt minerals have by burning partly been transformed to hydraulic minerals.
- Pigment: Carbon black
- Aggregates: Natural coarse-grained sand (0-5 mm), rich in clay.
- Mix proportions: 3 parts of slaked lime to 1 part of aggregates
- Air void content: 4 vol%

Lime kiln design 2023



Lime kiln in action

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Marketing the project

Louhisaari pursuit

Smoke in the garden



People were invited...



...to experience



...and to enjoy



Mortar combat

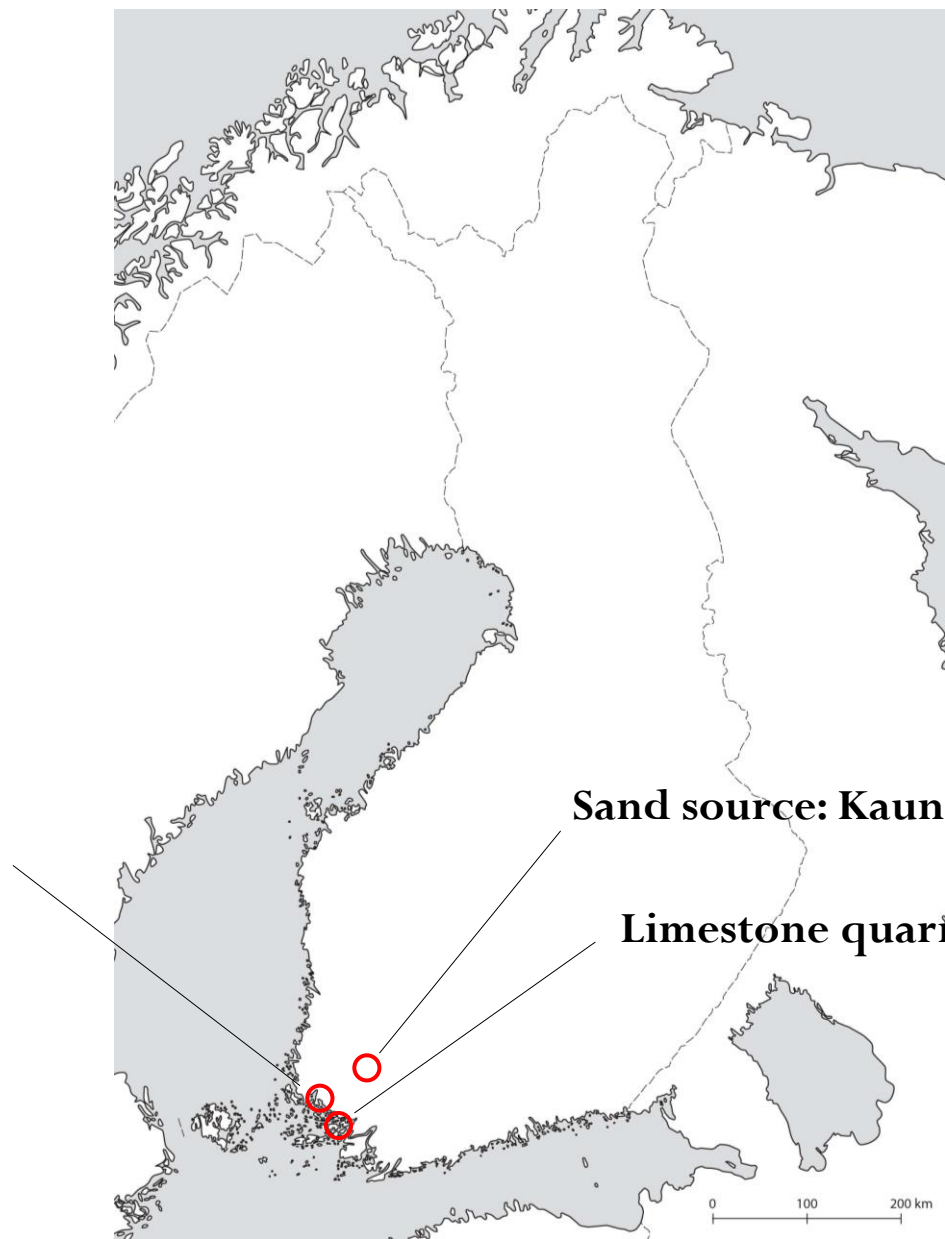
Mortar making process

Locality

**Louhisaari manor
& lime kiln**

Sand source: Kauniston sora

Limestone quarry: Nordkalk Parainen



Metamorphic limestone from Nordkalk, Parainen



Marble — stones to be burned



It's cooking

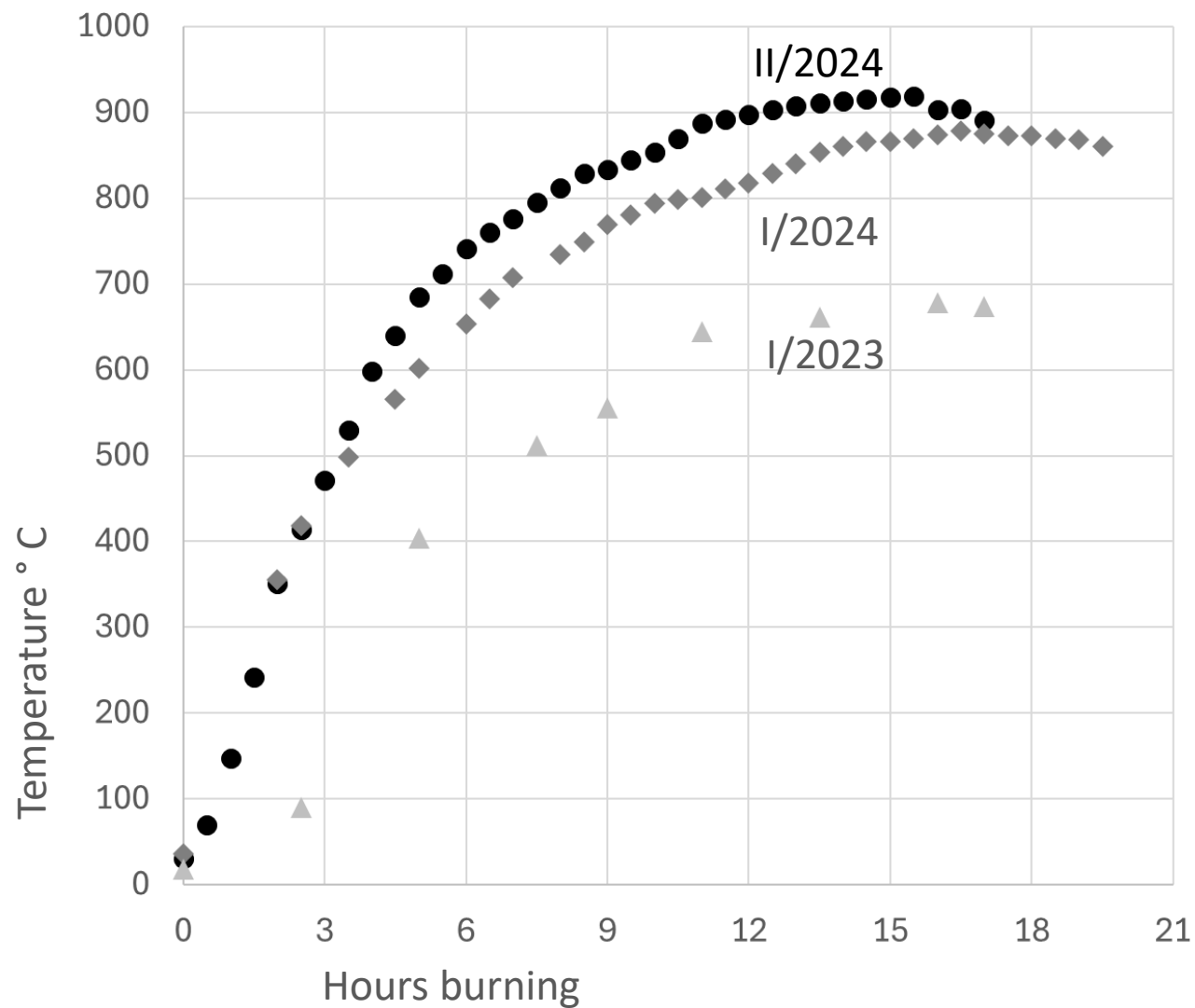
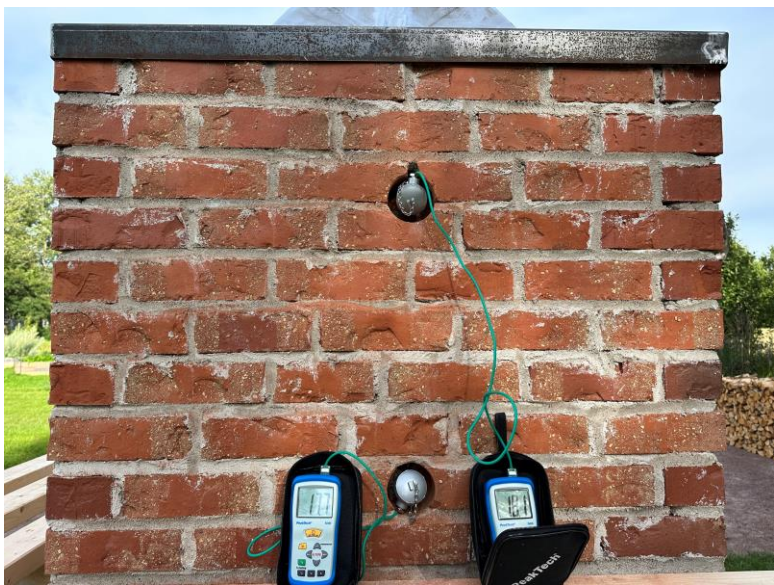
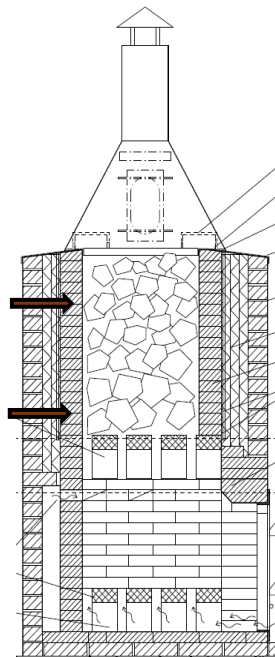


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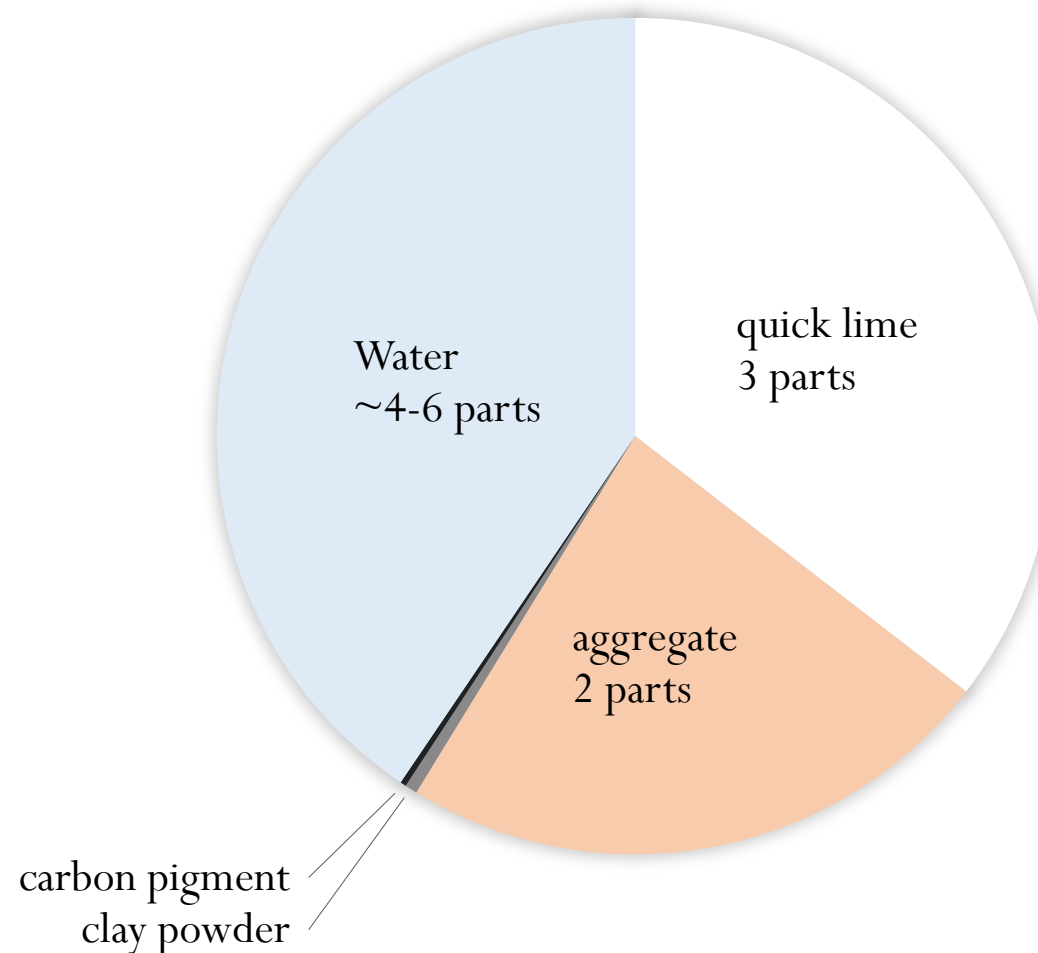
Temperature



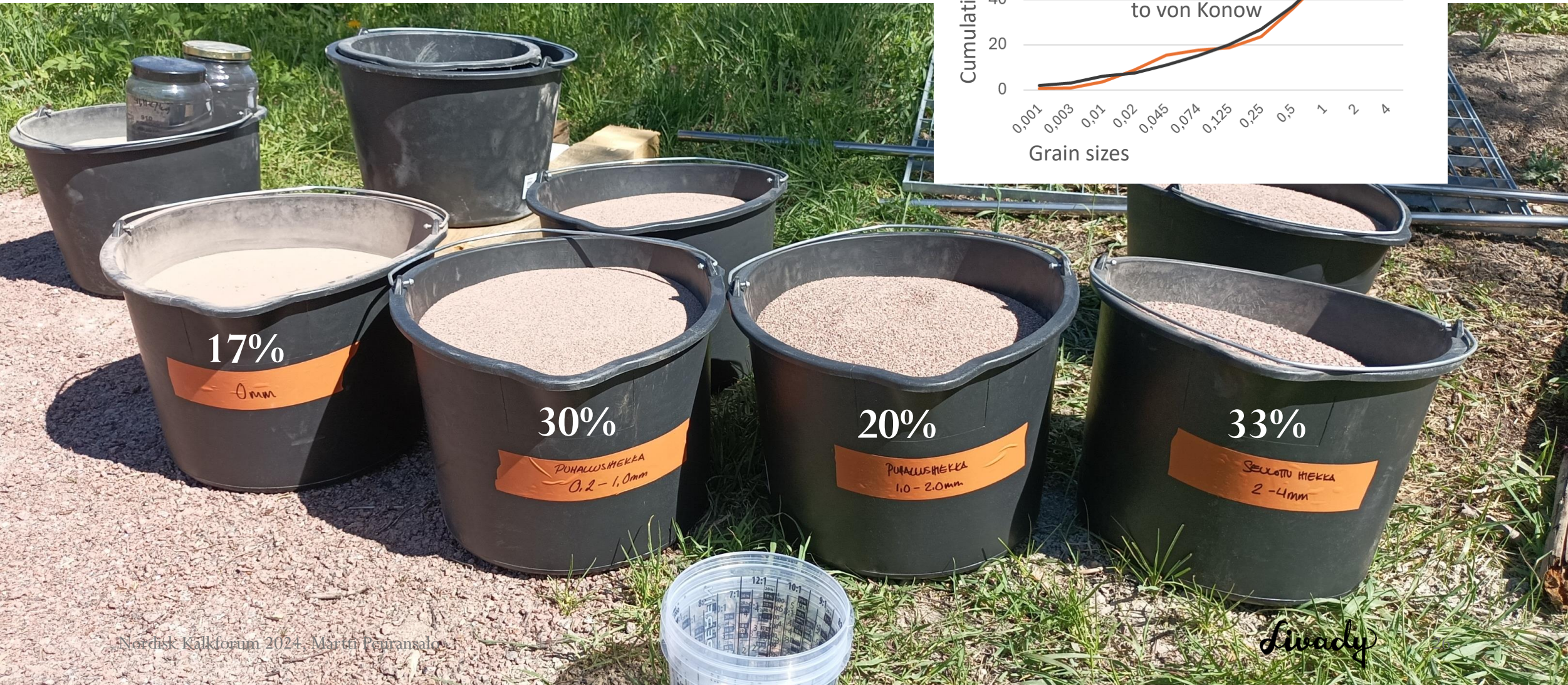
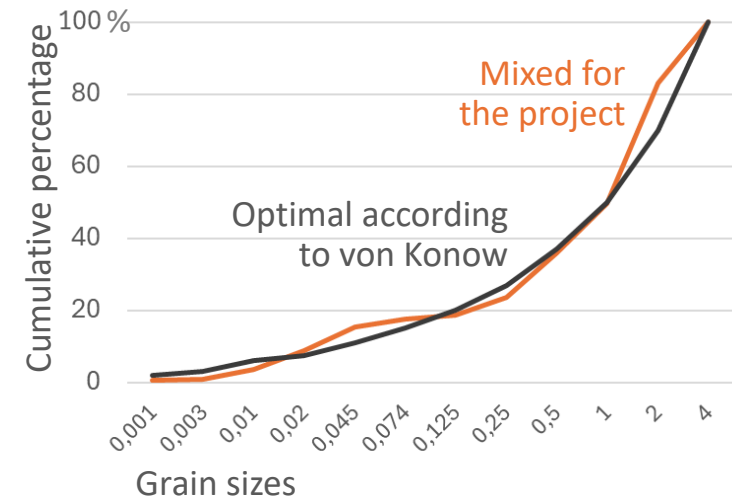
Burned limestone - quicklime



Mortar recipe – “Louhisaari Mörka”



Aggregate — assembled





Slaking with aggregate



Mixing with hand tools



Mixing with hand tools



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Sensory evaluation



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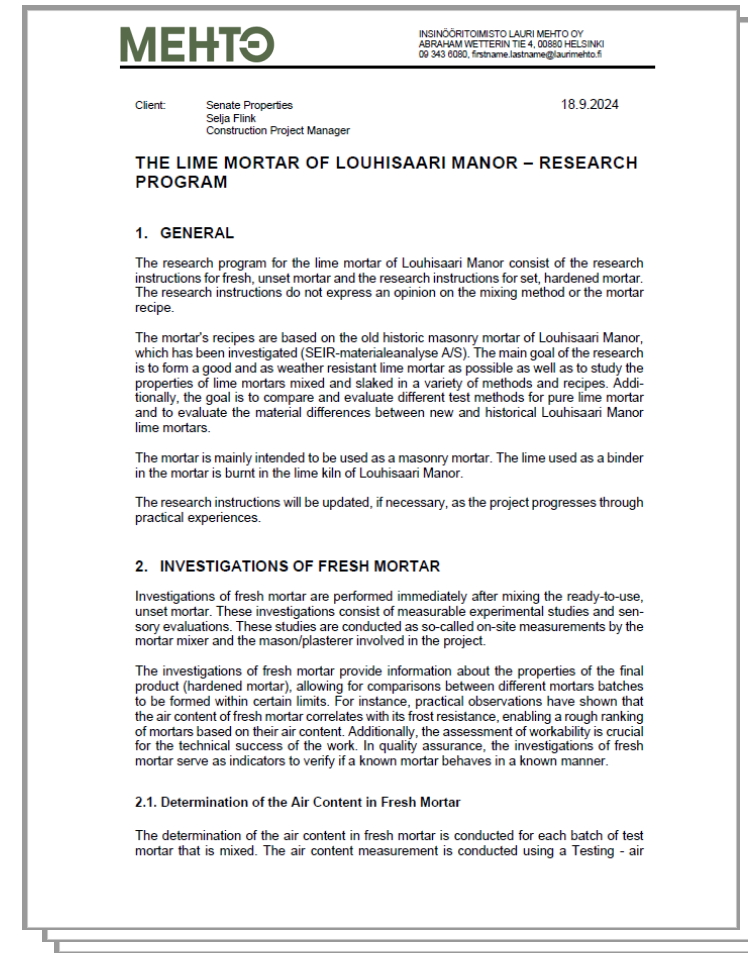
Testing and research

Defining mortar qualities

Research Program by Mikki Keltto, Mehto

Investigations of fresh mortar

Investigations of hardened mortar



Water content in fresh mortar



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Air content in fresh mortar

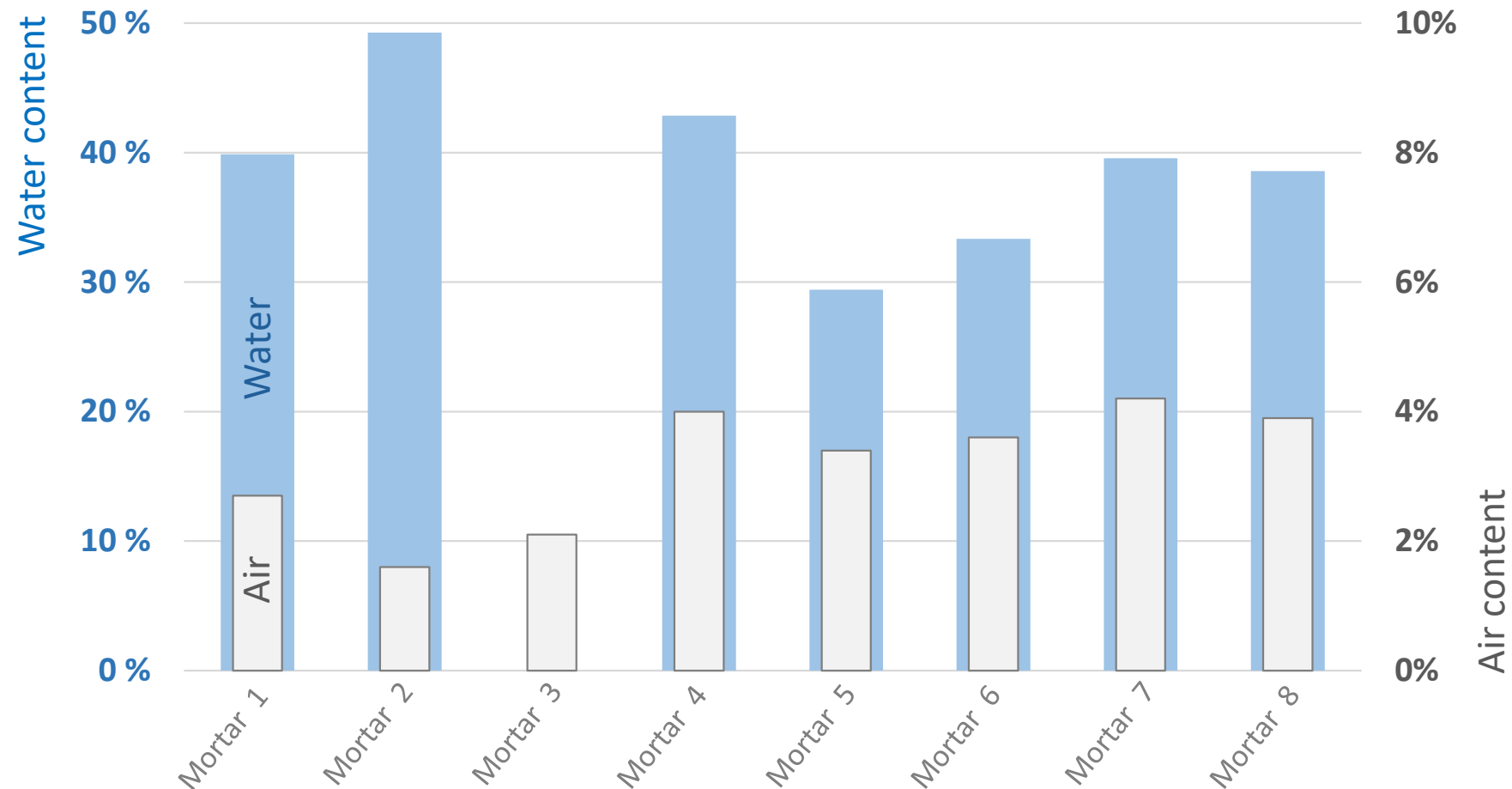


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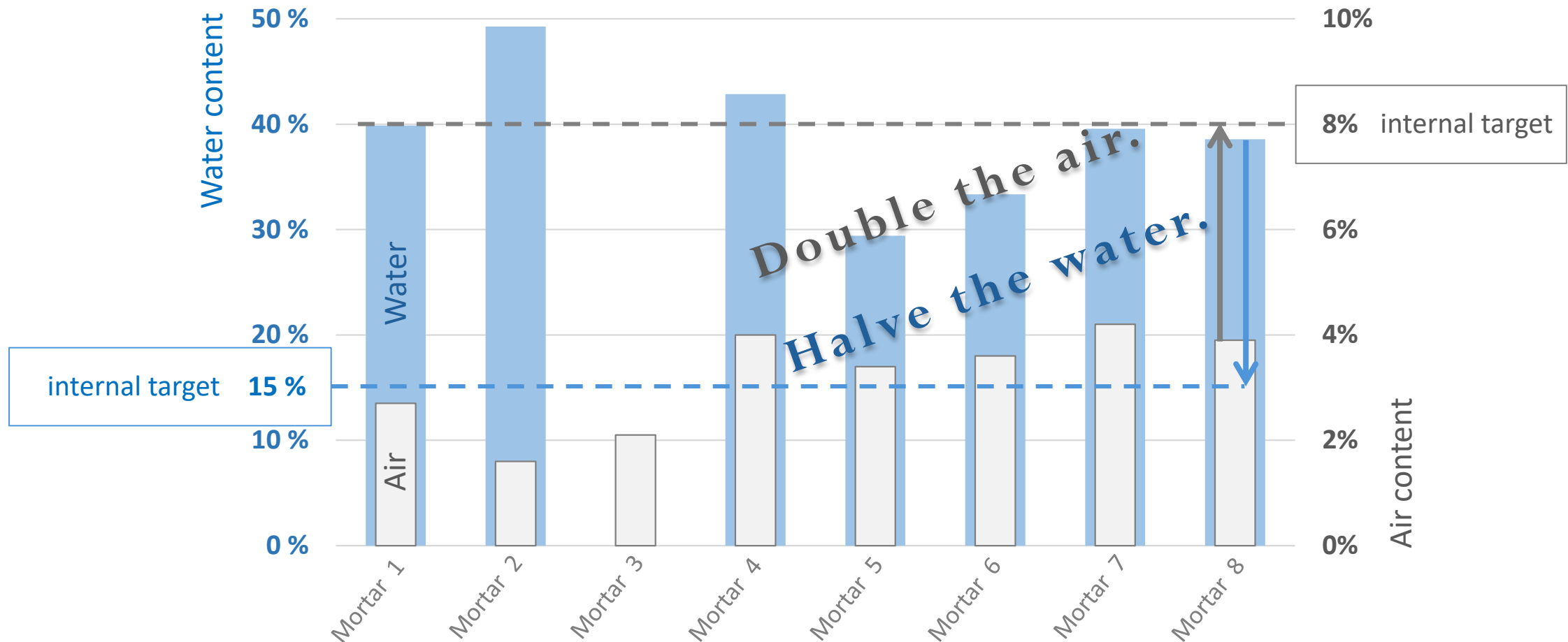


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Fresh mortar – measured results



Fresh mortar – results compared to targets

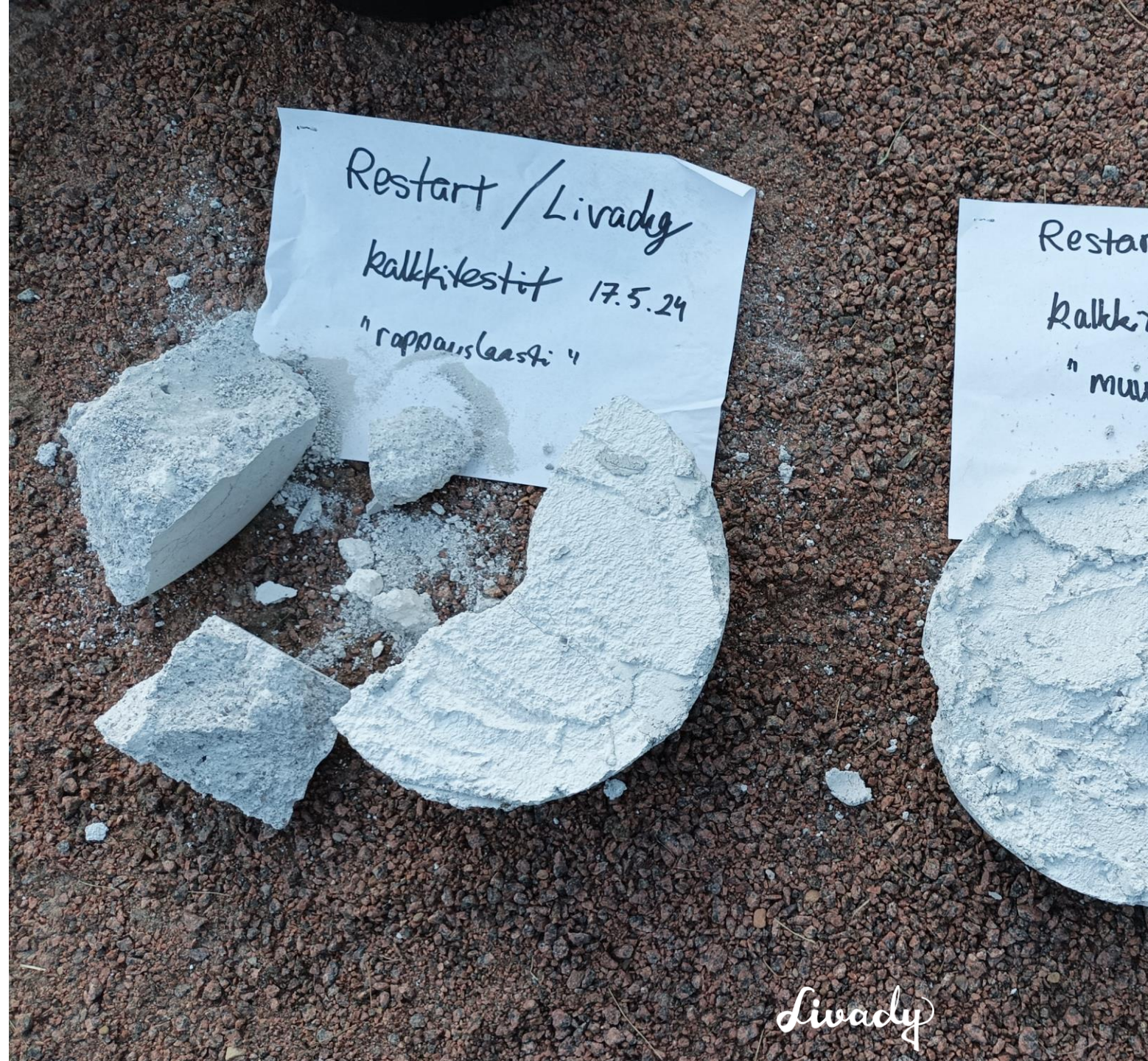


Investigations of hardened mortar

Thin Section Studies

Freeze-Thaw Tests

Determination of Porosity Values



Prism in brick mold



Cases to test further



Thank you!

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