



Min(d)ing fragments

Research Plan

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**Exploring the importance of limestone in the context of
Tallinn, Estonia**

Research Plan

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A Matter of Scale

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a fragment

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a fragment

noun

“small piece or part,” from Latin fragmentum “a fragment, remnant,” literally “a piece broken off,” from base of frangere “to break” ¹

a small piece

a part of a whole

a broken piece

the existence of multiple things

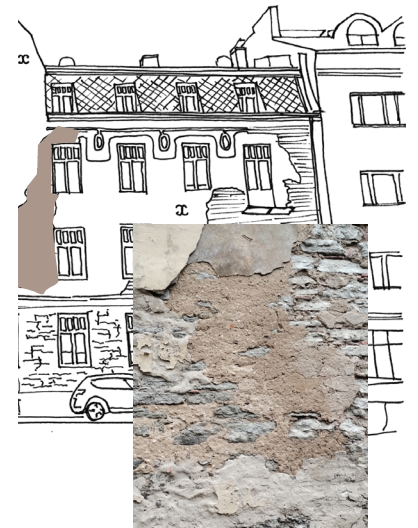
remnants, decayed materials

a disconnected, unused place

a brief or unfinished work (in literature)

a sentence not containing a subject (in language)

a compositional technique (in music)



1. ‘Etymology, Origin and Meaning of Fragment by Etymonline’, accessed 9 November 2023, <https://www.etymonline.com/word/fragment>.

Introduction

Tallinn - a Limestone City in Fragments

Lying on a bed of limestone, historically and geologically Tallinn has been a city of limestone. Limestone has been quarried throughout Estonia, but mostly around Tallinn, to be used as construction material, for decorations and sculpture. which is still visible in the Medieval Old Town (Fig.1)



Fig.1 Facade of the Brotherhood of the Blackheads Guild in Tallinn by stonemason Arent Passer from 1597. Image by author.

This specific condition of the city used to be taken as an expression of local context and national identity by architects during the First Independence period in the 1930s. For example, the works of Estonian architect Herbert Johanson is described as 'limestone functionalism' seen in his design of the Fire Service Building (1939). Later, Reine Karp also used the national stone for all major public buildings he designed - Linnahall, the National Library and Sakala Centre. The map in Fig.2 shows the presence of limestone in the city but also in the landscape, by mapping the quarries where it is extracted.

Today there are 24 active quarries with total output of 2.4 million m³ per year. However, the art of working with limestone is almost forgotten, as 70% of the material is used as aggregate for roads, 15% used for the production of cement, and the remaining for lime burning or exported for use at other industries. Only a small part is used for traditional building and decoration.²

2. Alo Adamson et al., 'Perspectives for the Mining of Oil Shale and Limestone with Surface Miner in Estonia', in *Proceedings. 8th International Symposium. Continuous Surface Mining: 8th International Symposium.* (Aachen, Germany, 2006), 4.

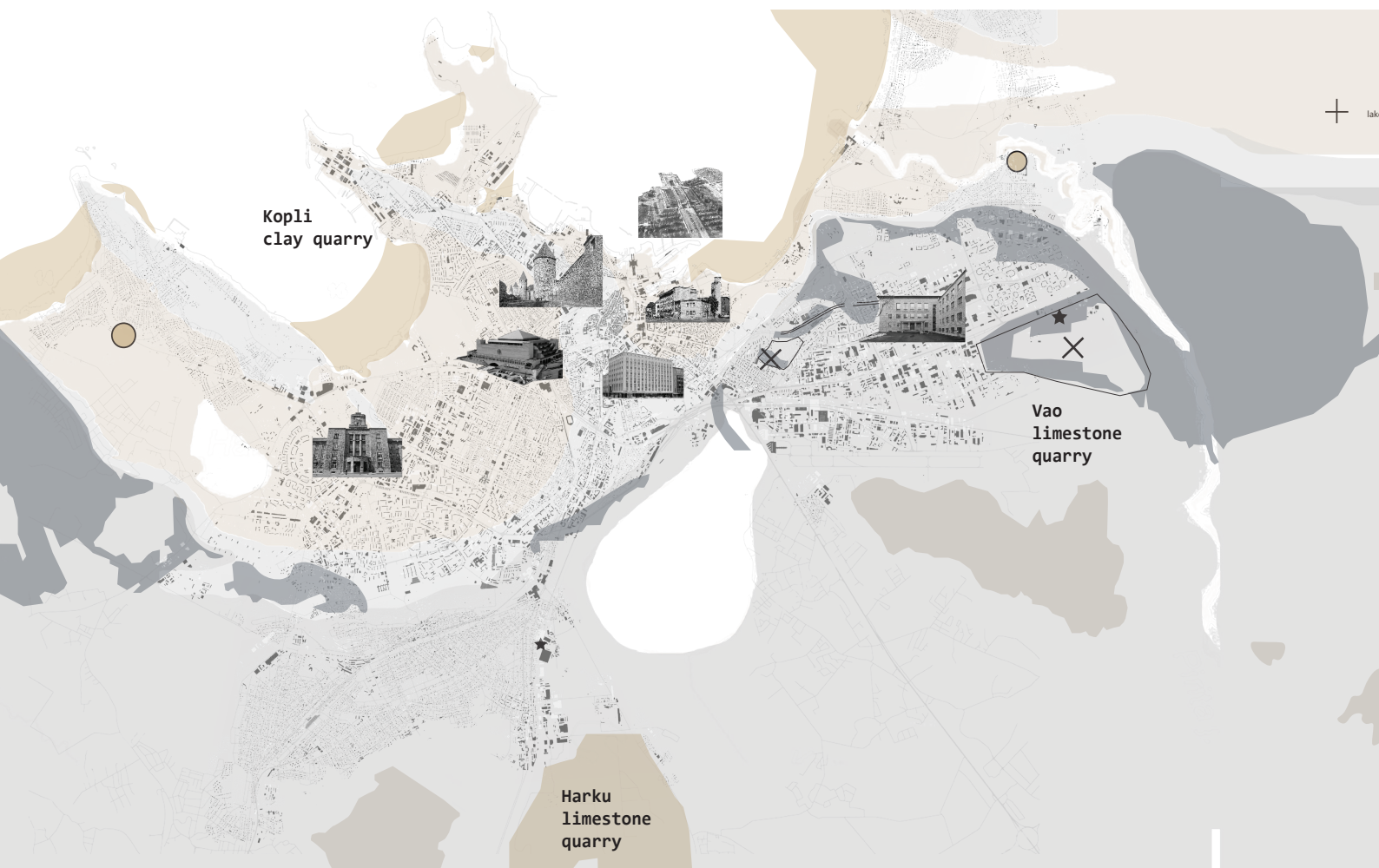


Fig.2 Map of the limestone bed, including main quarries for limestone and clay near Tallinn. Photos indicate important limestone buildings from different periods throughout the city. Image by author.

Peter Hasdell in 'Tallinn: A Map of Provisional Territory' discusses the physical, cultural, symbolic and ideological dimensions of limestone use in Tallinn through history. In his opinion, the material was grounding the city to its landscape until Soviet planning went against the natural growth of the city, leading to a disconnection between the ground and the urban fabric, but also in fragmentation of the city itself.³

The city of Tallinn today is often described as 'fragmented' and 'unfinished' being 'a collage of memories' from all material legacy from various foreign influences. As claimed by Klaske Havik 'the identity of the city is its non-identity composed of fragments that interfere with each other.'⁴ These qualities of Tallinn's architecture and city planning are a topic of an long-ongoing debate about its identity, historical development, and future visions. However, this 'state of incompleteness, smallness and scarcity ' is also seen as idiosyncratic to Estonia and while posing a challenge to the city's development, its is also seen as a valuable potential by considering 'the unfinished as an asset'.⁵

3. Peter Hasdell, 'Tallinn : A Map of Provisional Territory', *Nordic Journal of Architectural Research*, 11, no. 1-2 (1998): 72.

4. Klaske Havik, 'Tallinn. A Movie Scene', *MAJA Estonian Architectural Review* 2/3, no. 26 (2000): 22.

5. Tadeas Riha, Laura Linsi, and Roland Reemaa, eds., *Weak Monuments. Architectures Beyond the Plinth* (Zurich: Park Books, 2018), 61.

This became apparent though our group research. Exploring ‘Changing Expressions’ through the Old Town to Uus Maailm, we observed the fragmentation of the city in the renovated city centre but decaying periphery and disconnected green areas. Renovation processes left the original limestone of the buildings as fragments embedded within the plaster or to decay and get overgrown by moss, becoming one with the landscape again (Fig.3).



13: Slowly we got to the Old Town, which presented itself in different faces. Here we see a side street, which was in huge contrast to the very touristic core of the Old Town: the plaster is falling off exposing the stones composing the buildings and graffiti layers have accumulated over time.



14 A strikingly ornamented brick facade appears between the plastered series as we walk along the street.



15 Here we encountered a building which was undergoing a facade reconstruction.



16 Another building in the Old Town displayed patches in its plaster, revealing the original stonework beneath.

Fig.3 A fragment of group work. Image by author in collaboration with Lindsay Menasse and Iveta Nikolova.

Buildings are archives and assemblages of materials, histories, and influences that often contrast sharply with one another, while allowing the whole to carry multiple meanings. This research will focus on the relation between limestone ruins and urban fragmentation. Its main aim is to explore how a local material such as limestone can be used to re-connect the city to its landscape. It aims to bring together the flow of materials, urban processes and landscapes in a design of a new public building dedicated to the art and requirements of this material.

Problem statement

Minding Fragments

Social, political and economic aspects have influenced the city's layout and materiality, leading to highly perceptible fragmentation that can be observed on different scales and levels of complexity in Tallinn – urban, material, social, and functional. The problem of fragmentation of the urban environment results in segregation, varying densities and scales through the urban tissue, as the lack of consistency in planning policies leads to discontinuities, contradictions and voids. Disconnection of the areas is most often marked by a boundary such as the green belt, major roads and train infrastructure, building ruins, and parking spaces. The resulting fragments on urban and material scale of different densities and character that are difficult to be dealt with and, hence, mostly avoided.

On the other hand, while the demand for limestone is increasing as the city is expanding, the quarries are near the most densely populated areas, limiting the demanded expansion of the quarry.⁶ At the same time, however, based on the group research, there are many limestone ruins throughout the city, which are neglected, left to decay or underused as huge parking plots.

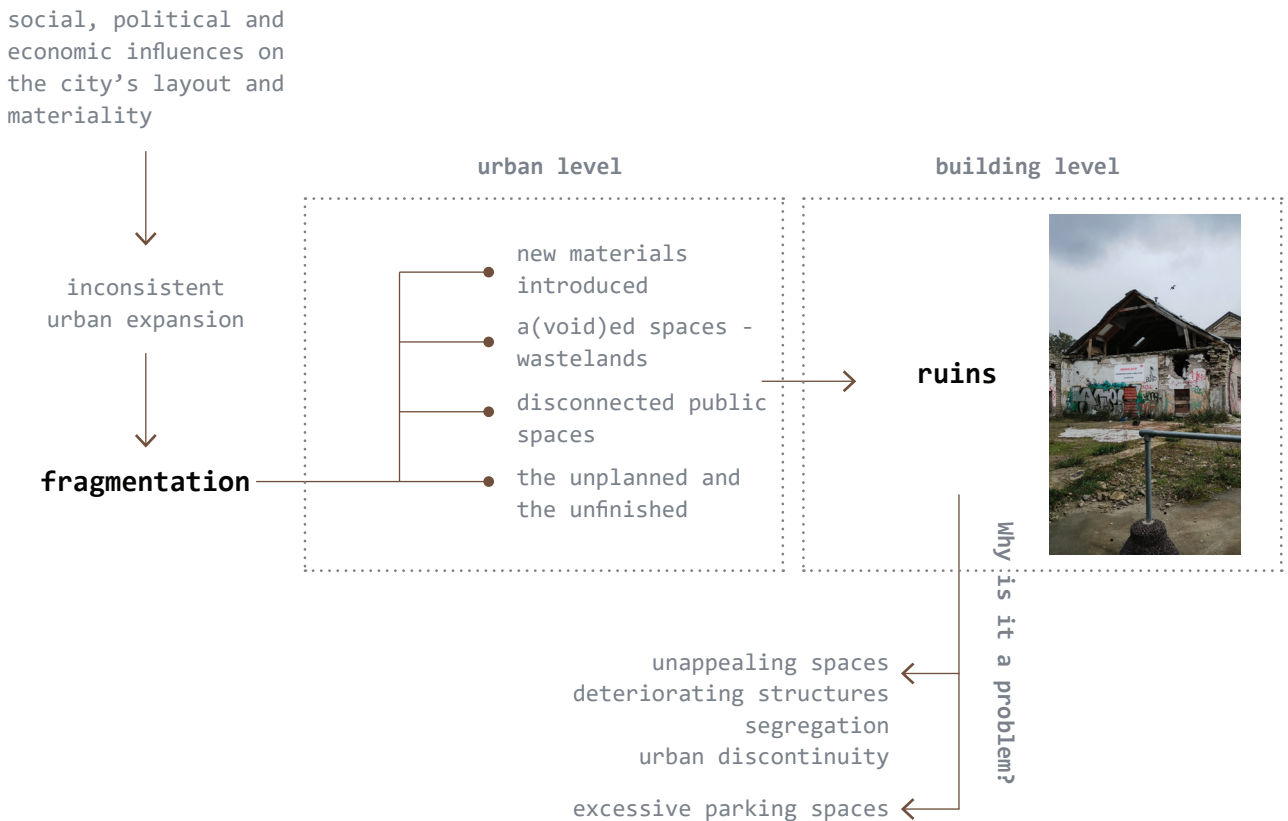


Fig.4 Problematisation diagram. Image by author.

This lead to the following research questions:

6. Madis Hindre, 'Tallinn Would Rule out Quarries in Its Territory', *ERR*, 30 March 2023, <https://news.err.ee/1608932339/tallinn-would-rule-out-quarries-in-its-territory>.

Research questions

How can an architectural material help activate avoided fragments in the city and reconnect them to urban life and the landscape?

- How is fragmentation expressed on urban and architectural level?
- Where are conditions of fragmentation observed?
- How can a design intervention take advantage of the process of fragmentation?
- How are certain materials involved in the (de-) fragmentation of the city?
- What is the role of limestone in Tallinn's architecture historically and today?
- How could a project respond to material decay and highlight issues of extraction, finiteness and historical value in a sustainable way?

Conceptual framework

These questions will be investigated through an initial theoretical research on urban fragmentation, material flows and the role of limestone in Estonian architecture.

On the topic of urban fragmentation, the key sources specifically on Tallinn would be Francisco Martínez's article 'Tallinn as a City of Thresholds' and *City Unfinished : Urban Visions of Tallinn* by Kaja Randam et al. which outline the urban problems of Tallinn and sketches proposals for their resolution.

Through a material culture approach I will investigate the materiality and fragmentation of the city and how the city can be reconnected with its landscape. I consider limestone ruins as fragments of the city, but also fragments from the landscape, extracted from the quarries. The approach by Jane Hutton is relevant to this exploration, as she looks into the **'reciprocal landscapes'** of materials in cities and their value by comparing the original and designed landscapes (Fig.5).⁷ Following this method, I will trace the origin of the limestone back to the 'reciprocal' landscapes - the quarries around Tallinn, and the people who are involved in its extraction, processing and placement on a building. For this a number of sources specifically on the limestone industry would be used, especially the two volumes by Helle Perens *Paekivi Eesti Ehitistes* would be fundamental in understand the geology and craft associated with the material.⁸

Related to this is also the essay by Mark Wigley *Non-Extractive Architecture : On Designing Without Depletion* by the V-A-C Foundation, which argues for architectures more closely related by local economies and such that turn

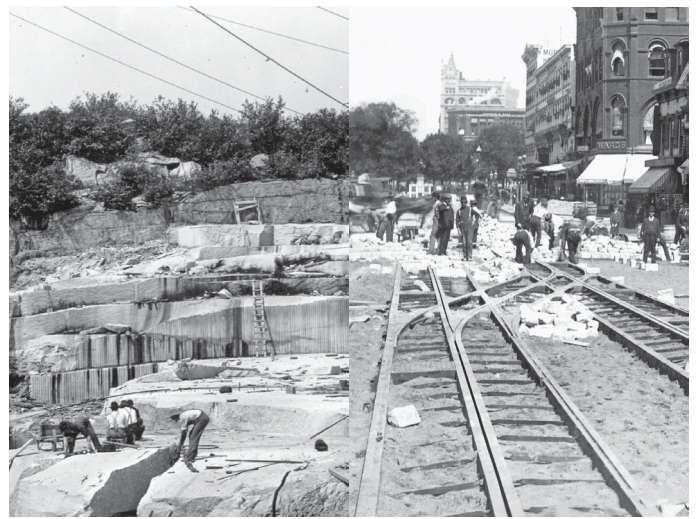


Fig.5 Chapter image for "Chapter 2 Range of Motions: Granite from Vinalhaven, Maine" in Hutton, *Reciprocal Landscapes*, 65-66.

7. Jane Hutton, *Reciprocal Landscapes; Stories of Material Movements* (New York: Routledge, 2020).

8. Helle Perens, *Paekivi Eesti Ehitistes I. Üldisloomustus. Lääne-Eesti.* (Tallinn: Eesti Geoloogiakeskus, 2003); and Helle Perens, *Paekivi Eesti Ehitistes II. Harju, Rapla Ja Järva Maakond* (Tallinn: Eesti Geoloogiakeskus, 2004).

architecture from ‘an art of taking’ to one of giving.⁹

Considering the relationship of limestone to the city I will explore the material in terms of its ‘**resource**’ and ‘**symbolic**’ **capital**, following the works of Bourdieu. He refers to ‘symbolic capital’ as ‘the social importance’ and ‘manifestations of grace (charisma)’.¹⁰ This would provide a theoretical understanding of the materials various values.

Finally, the idea of **weak monument** would help me consider limestone ruins no longer as explicit monuments, but also their implicit political charge. The ruin is seen ‘not as a finished product, but a point of balance between rigidity and destructive forces.’¹¹

In the process of research, these ideas and perspectives will be synthesised to give a theoretical backbone to the design.

9. V-A-C Foundation, *Non-Extractive Architecture : On Designing Without Depletion* (Moscow: V-A-C Press, 2021).

10. Pierre Bourdieu, *Pascalian Meditations*, trans. Richard Nice (Stanford, California: Stanford University Press, 1977), 241.

11. Riha, Linsi, and Reemaa, *Weak Monuments*, 13.

Methodology

Mining Fragments

Working through an assembled collection of images, maps, and texts the research develops as an exploration of different conditions of fragmentation present in the city of Tallinn on urban and building scale and incorporates material culture, ecological and semiological approaches. The initial theoretical research into the key concept of fragmentation and the object of research - limestone, will be supplemented by a mix of qualitative, historical, experimental, and disciplinary research though mapping, cataloguing, drawing and case studies. The methods chosen correspond to each of the posed research questions, as seen in the diagram (Fig).

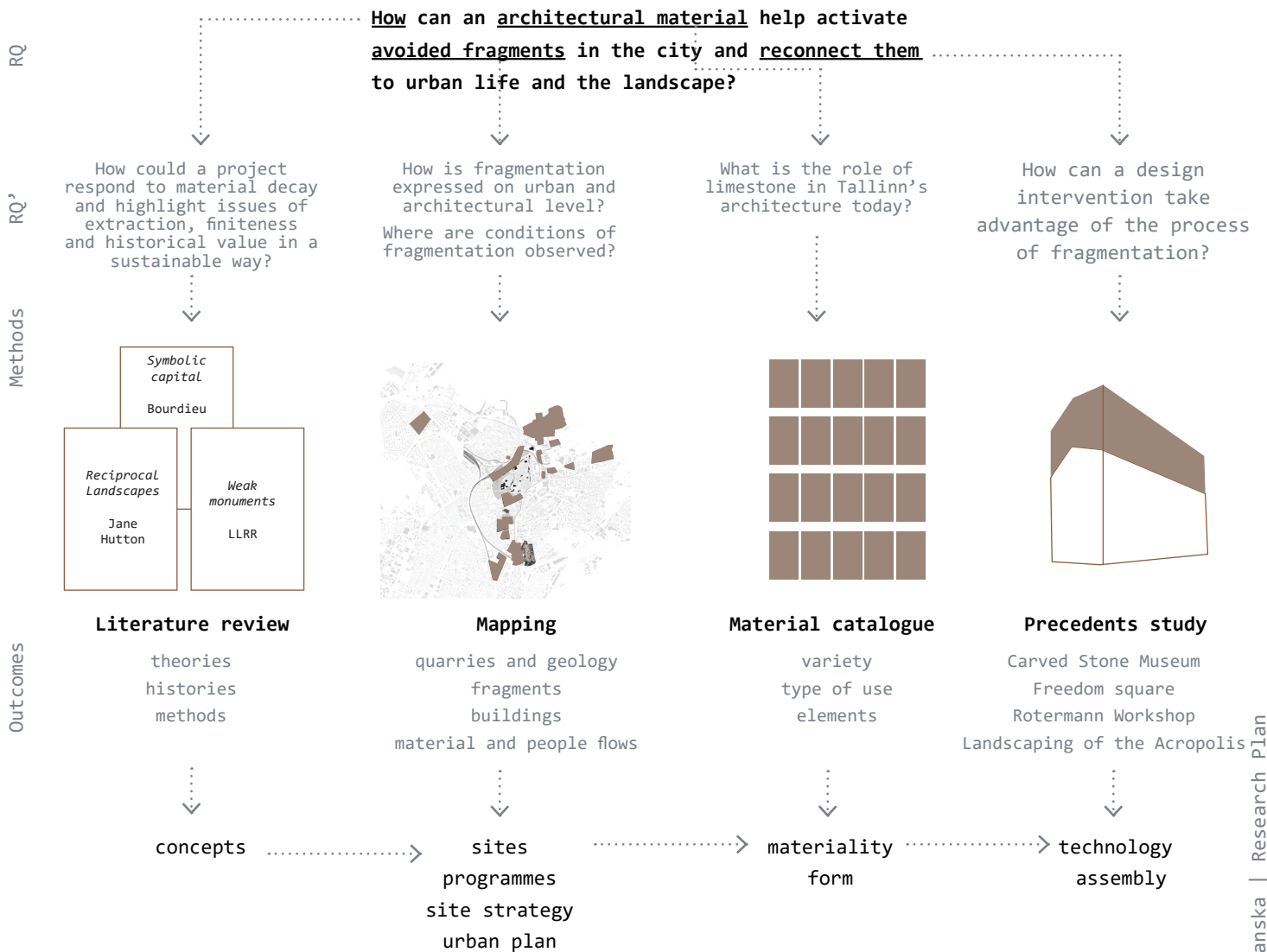


Fig.6 Methodology diagram. Image by author.

How is fragmentation expressed on urban and architectural level?

Methods: Catalogue of fragments. Tracing material circulations, showing the visible and invisible processes of fragmentation and relating them to the landscape they originated from. Mapping voids and ruins as a way of uncovering potential sites.

Where are conditions of fragmentation observed?

Methods: Mapping of boundaries, constraints, fragments, and voids that create fragmentation in the city.

How can a design intervention take advantage of the process of fragmentation?

Method: case study research to examine how have limestone fragments been integrated previously in a buildings, such as in Freedom square, Rotermann district, etc.

What is the role of limestone in Tallinn's architecture historically and today? How are certain materials involved in the (de-)fragmentation of the city?

Methods: Literature review of book on Tallinn history, stonemasons guild, case studies, a comparative timeline and a map of when and where important limestone buildings were built. Photographic documentation of how limestone is used, when, where, what is its condition today. For this, a visit to the Carved Stone Museum in Tallinn was important aspect of the research, as it provided me with information on the history of limestone in Estonia.

How should a project respond to material decay and highlight issues of extraction, finiteness and historical value in a sustainable way?

Methods: Theoretical research into theories of preservation, sustainable materials, reciprocal landscapes, extraction processes and value theories. In addition, case studies will be evaluated in their response to those specific conditions in Tallinn.

Precedents study

To support the on-site and textual analysis of the limestone use, I selected several relevant case studies. Through drawings and literature review of those I will look into:

- the integration of building in the urban or landscape context;
- how limestone, fragments or ruins have been incorporated into a design;
- the technical and aesthetic aspects of the use of limestone, including aspects of maintenance, texture and assembly.



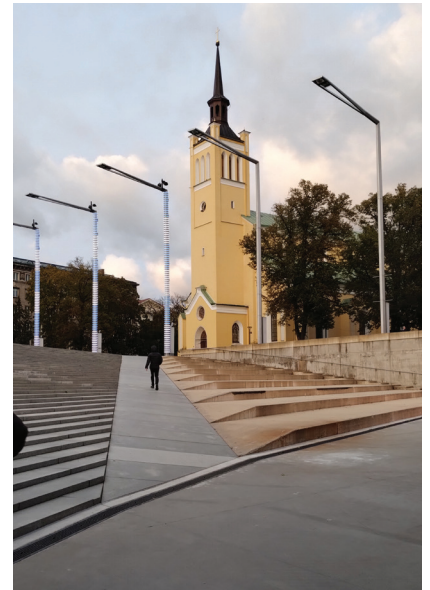
1.



3.

- **Carved Stone Museum** – An exhibition of limestone fragments, for which there are specific indoor climate requirements for their preservation.

- **Freedom square** by Alver Architects (1998)– Underneath the square there are limestone ruins, incorporated in to the circulation of the parking space, but also in the stone pattern of the pavement. The square is also an important connector of buildings from different periods.



2.

- **Landscaping and St Dimitris Loumbardiaris Church** at the Acropolis in Athens by Dimitris Pikionis (1951-7) – In the landscape and the renovation of the church his process included a careful consideration of each stone fragment.

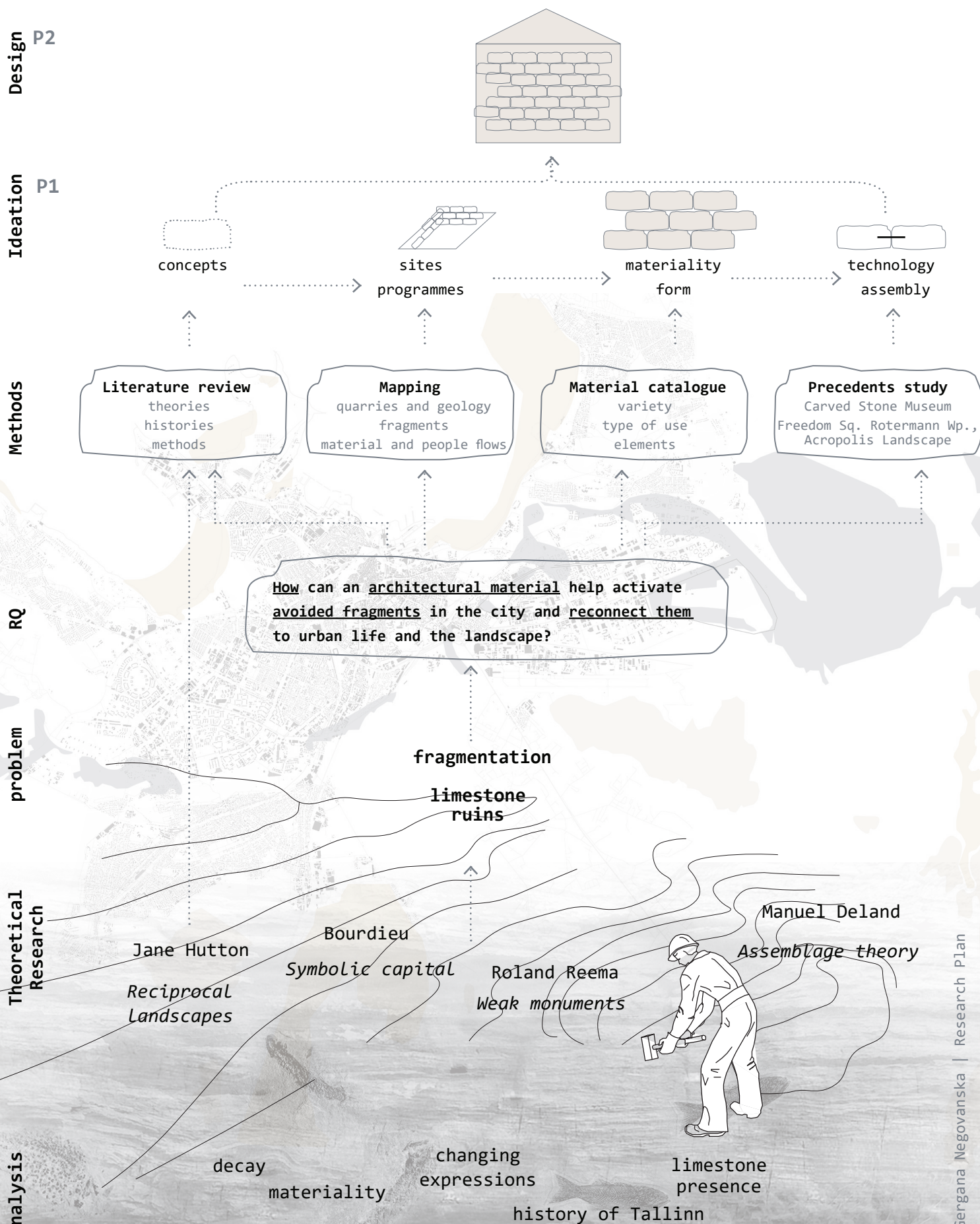
- **Rotermann Carpenter's Workshop** by Koko architects (2009) – An more recent case of integration of limestone ruin into a new building by superposition.



Fig.7 Photos of the precedents. 1. Carved Stone Museum 2. Freedom Square 3. Loumbardiaris Church 4. Rotermann Workshop. Images by author.

Research diagram

Assembling Fragments



Towards a Design Brief

Currently the Stone Carved Museum is located underneath Harjumägi park, in the last section of the Bastion tunnel. The exhibition titled 'The City of Ruins' contains a display of decorative stone fragments from Tallinn, such as columns, portals, coats of arms, reliefs and tombstones from the 16th to 19th century.

From my visit to the museum, I thought this is marvelous collection that tells a beautiful story of the city that the space did not enhance. While being located underground into the stone tunnel seemed suitable and provided the right conditions for the exhibits, the rest of the 500 m long tunnel is dedicated to the story of how the tunnel has been used through history. In this narrative, the exhibition of stone fragments came unexpectedly at the end and felt confined in the narrow tunnel. Therefore, I think a better space could be designed that would allow these fragments to come out of the ground and tell the story of the city through the limestone. A new space for the museum could be combined with a theater space and workshops on stone carving that would animate the fragments, while provide a space that re-connects people to the landscape. Unlike the present space, this will

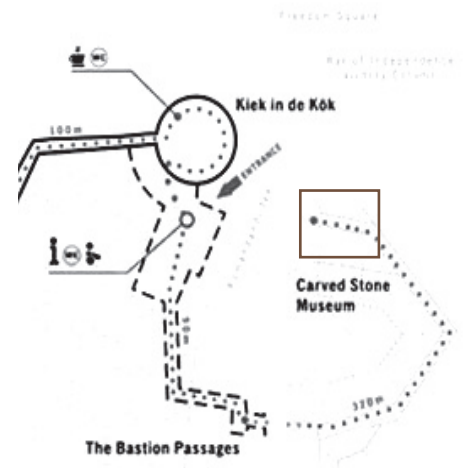


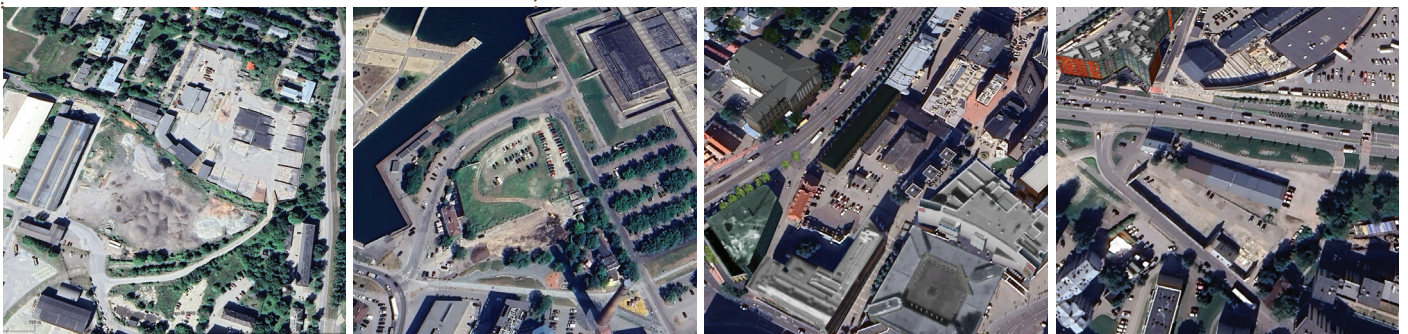
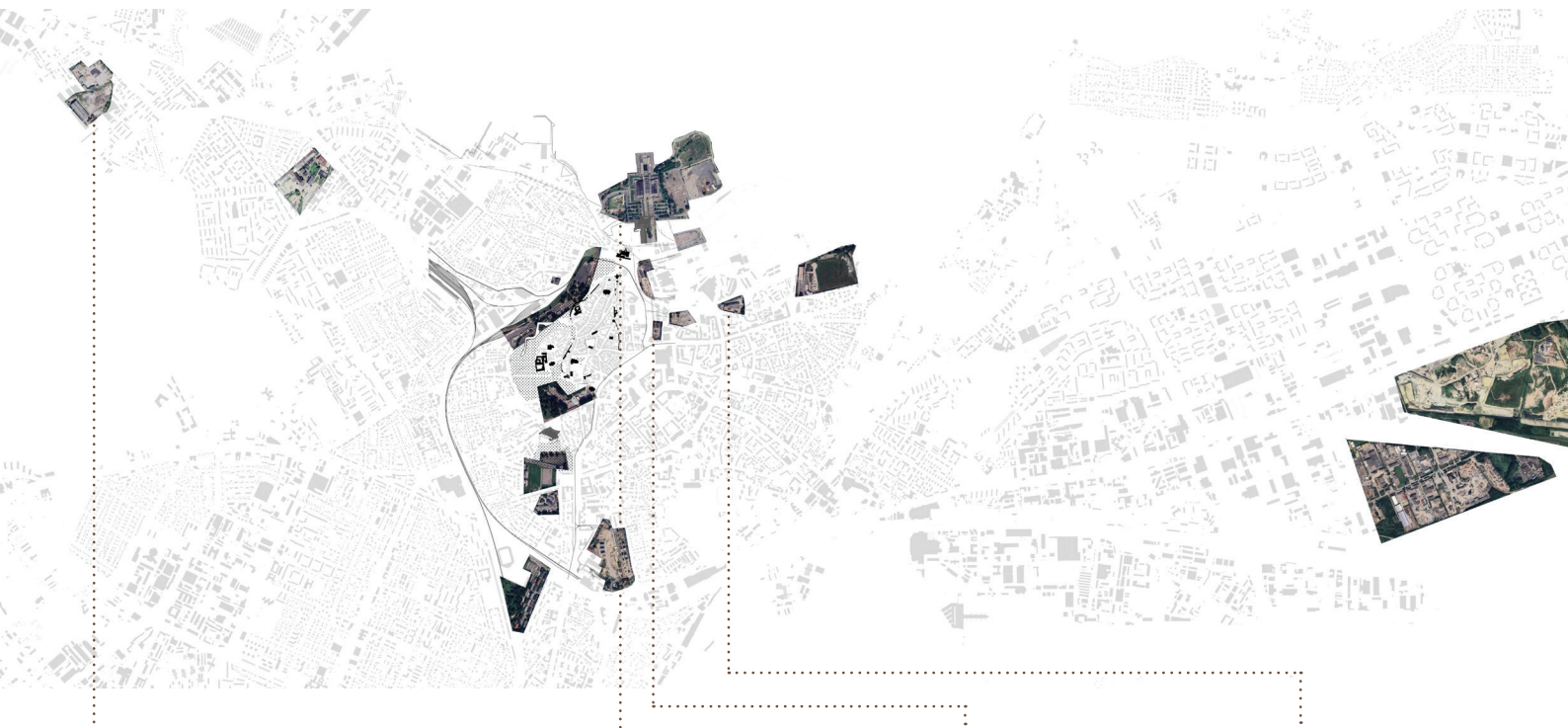
Fig. Plan of the Bastion Tunnel indicating the location of the current Carved Stone Museum. Image by author.



Fig. Photos from the Carved Stone Museum exhibition. Images by author.

not be a static display of fragments that serve not function today and are therefore put in a museum just because they are valuable, but make it possible to use them in a set design for plays.

A few potential sites for the intervention, based on the urban fragmentation plan I assembled (Fig), include the unused limestone buildings near the Kopli clay quarry or a ruined site that is used as parking space (Fig.. Each of these sites is a fragment, a(void)ed site with has a key location in the city but is currently used as parking space or not used at all. The site would be chosen based on a comparative analysis of several criteria - presence of limestone ruins, condition of fragmentation/disconnection to the city, key location for a museum programme.



Ketta 5, Kopli
Rudus granite supplier
factory



Kalasadama, Kalarand
next to Linnahall, access
to port



Rotermann district
ruin - parking and two
industrial halls



Lootsi 4, Sadama
abandoned ruin near the
port, small scale sheds on
the road

Fig. Fragmented situations as potential sites

Conclusion

Relevance for design

Limestone has historically related Tallinn to the landscape, however, fragmentation on urban scale has led to a disconnection. The research plan helped devise a strategy for the design but also to position it within the context of Tallinn in a way that re-connects an urban fragment to the city using a local material, re-establishing the lost relationship between architecture of the city and the landscape. The combination of different contextual, theoretical and disciplinary research methods provided a varied perspective on the topic and helped me establish my position but also of the project within the complex entanglement of material, human and natural processes present in Tallinn. I find that this research would be relevant to the design on several levels.

Firstly, on **urban level** it would look into a general urban proposal for the fragmented city, from which a site to be chose and explore how an avoided site can be integrated in the city by synthesizing aspects of the contextual analysis. In this respect, the research plan helped me establish the scope and direction for the design, synthesizing aspects of the contextual analysis.

On **architectural level**, through the study of a specific local material and its expressions in the city, including precedents, this research aims to compile a kind of a toolbox of approaches/ techniques to dealing with limestone fragments that can be used for the design of a building. In terms of existing academic debate, this research relates to the questions of fragmented city planning and the unfinishedness of the city. This project would hopefully address those in a novel way by using the concept fragmentation to its advantage.

On **social level** it would provide me with a potential programme though the precedent study and exploring practices related to the limestone as a material, but also symbol of the city, that would help me come up with a way to invite various groups to interact in the new building and make a ruin part of urban life. Through this research, the design would aim to taking advantage of the process of fragmentation as an aesthetic and construction process on building scale to resolve urban problems of disconnection, while revitalising a ruin, reminding of the importance of stone for the city.



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A short flyer from a limestone exhibition that took place in 1998, which gives a summary of the types of limestone present in Estonia, but also where it is used, mentioning specific buildings from various periods.

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