

Sini Saarimaa

Better Living Environment Today, More Adaptable Tomorrow?

Comparative Analysis of Finnish
Apartment Buildings and their
Adaptable Scenarios

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Let's discuss!

*Ask anything,
anytime!*

Introduction

By 2050, two-thirds of the world's population is expected to be living in urban areas, with 55% already an urban dweller today (UN, 2018). Finland also follows a similar trajectory: the majority of new dwellings are, and will be, apartment buildings built in urban areas (Vainio, 2016; RT, 2019). Urbanisation comes with increasing concerns about the reduction in housing design quality in urban areas around the world (see e.g. Finlay et al., 2012; Punter, 2010), which is often driven by the need to maximise land value and to increase the number of units per plot and per building. In Finland, this trend has manifested in an increased number of small studio units (Karikallio et al., 2019), deeper building plans and, for example, poorly daylight spaces (see e.g. Helander, 2020).

Technical quality has increased.

In terms of spatial quality aspects, for example, accessibility is much more required & considered today!

Finnish Association of Architects (SAFA) raised discussion of the claimed deteriorated quality of housing in 2020

18.8.2020

SAFAn kannanotto:

Laadukas asuntotuotanto on investointi tulevaisuuteen

Suomalaisessa asuntorakentamisessa on perinteisesti korostettu toiminnallisuutta – että asuintila palvelisi monenlaisia asukkaita, tarpeita ja elämäntilanteita. 2010-luvulla kerrostalorakentamisessa trendinä on ollut pinta-alatehokkuuden maksimointi ja siitä johtuva asuntojen toimivuuden heikentyminen. Asuntojen laadun kohentamiseksi ja arvioimiseksi tulee rakennusalan toimijoiden ja asukkaiden kehittää yhdessä asuntolaatumenetelmä.

Asunnon on oltava kalustettavissa erilaisiin tarpeisiin

Kevään 2020 aikana vallinnut poikkeustilanne on nostanut esiin asuntojen joustavuuden merkityksen. Etätyö on yleistynyt ja uusperheissä asunnon käyttäjien määrä ja tarpeet vaihtelevat jopa viikoittain: asunnon on joustettava yhä moninaisempien toimintojen ja elämäntilanteiden mukaan.

Suuntaus kohti pienempiä asuntoja on johtanut entistä pienempiin huoneisiin, samalla kun rakentamisen tehokkuutta tavoiteltaessa rakennusrungon syvyyttä on kasvatettu ja huoneistojen määrä porrastasannetta kohti on maksimoitu. Tämä helposti johtaa toimimattomiin tiloihin – huoneita on vaikea kalustaa, asunnon kallista pinta-alaa menetetään käytävätiloihin ja muihin hukkaneliöihin, perimmäisten huonetilojen jopa jäädessä ilman päivänvaloa.

Huoneistokokojen, kalustettavuuden ja valoisuuden heikennyksiä on perusteltu muun muassa rakennuskustannuksilla, pienten asuntojen kysynnällä ja kohtuuhintaisuuden tavoitteilla. Pienten asuntojen rakentaminen ei ole kuitenkaan kohentanut kohtuuhintaisten asuntojen tarjontaa vallitsevassa markkinatilanteessa.

Introduction

Simultaneously, the Finnish construction sector must move towards a circular economy to enable Finland to become carbon neutral in 2035 (Finnish Government, 2020). The circular economy aims at keeping products in use and circulation for as long as possible (e.g. Huuhka & Vestergaard, 2019). In construction, this means increased attention should be paid to the use and demolition phase of a building, alongside the construction phase. Clearly, during a building's life cycle, changes in use will be inevitable due to changing needs of dwellers, and over different generations. The need for change can be driven by, for example, the pronounced individualisation in our society leading to different ways of living; new work and leisure practices promoted by growing digitalisation; the diversification of households and family structures; and demographic change (Juntto, 2008; 2010). These issues highlight the need for apartment adaptability potential. Indeed, a building's inability to adapt to the changing needs of dwellers might become a barrier to the goals of the circular economy, when buildings need to be replaced, instead of being able to be adjusted (Huuhka & Vestergaard, 2019, p. 38).

Introduction

Hence, any new apartment building should be able to spatially adapt in time and meet different dwellers' needs and expectations, to support citizens' well-being (e.g. Jusan & Sulaiman, 2005) and the broader sustainability of the built environment (e.g. Huuhka & Vestergaard, 2019). Yet this adaptability potential is not reflected in recent Finnish housing production, despite principles of housing flexibility and adaptability being a development objective - although not well-characterised - for construction since the 1990s in Finland (Hakaste, 2015). According to the National Building Code, housing design should not only promote the functionality of housing, but also its suitability for different and changing needs (National Building Code of Finland G1, 2005). However, without monitoring or specifications, adaptability has been interpreted as a recommendation, rather than a mandatory requirement in housing design in Finland.

Maankäyttö- ja rakennusasetus 51 § 1 ja 2 mom.:

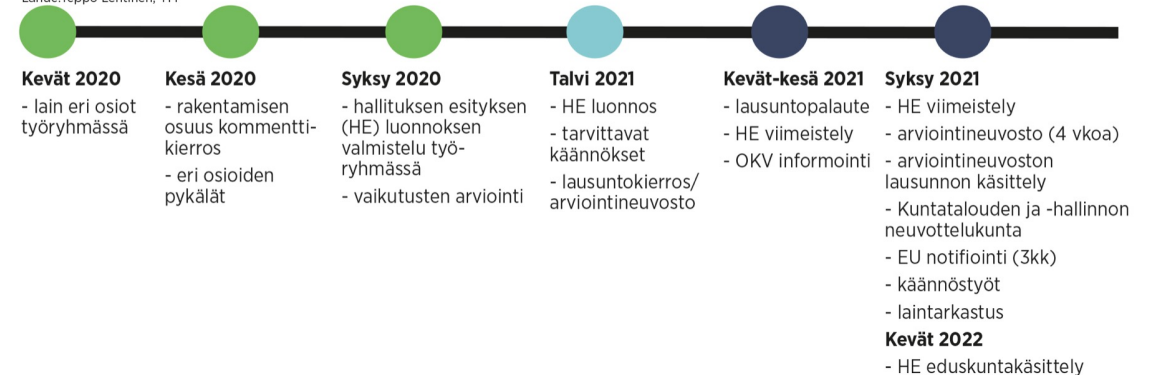
Asuinrakennuksen sijoittelussa ja rakennuksen tilojen järjestelyssä sekä muussa asuntosuunnittelussa on erityisesti otettava huomioon ympäristötekijät ja luonnonolosuhteet. Asuinhuoneen tulee saada riittävästi luonnonvaloa.

Asumiseen tarkoitettujen tilojen tulee olla tarkoituksenmukaisia ja viihtyisiä. Asuntosuunnittelulla tulee edistää asumiseen tarkoitettujen tilojen toimivuutta sekä soveltuvuutta erilaisiin ja muuttuviin asumistarpeisiin.

The Land Use and Building Act is currently changing

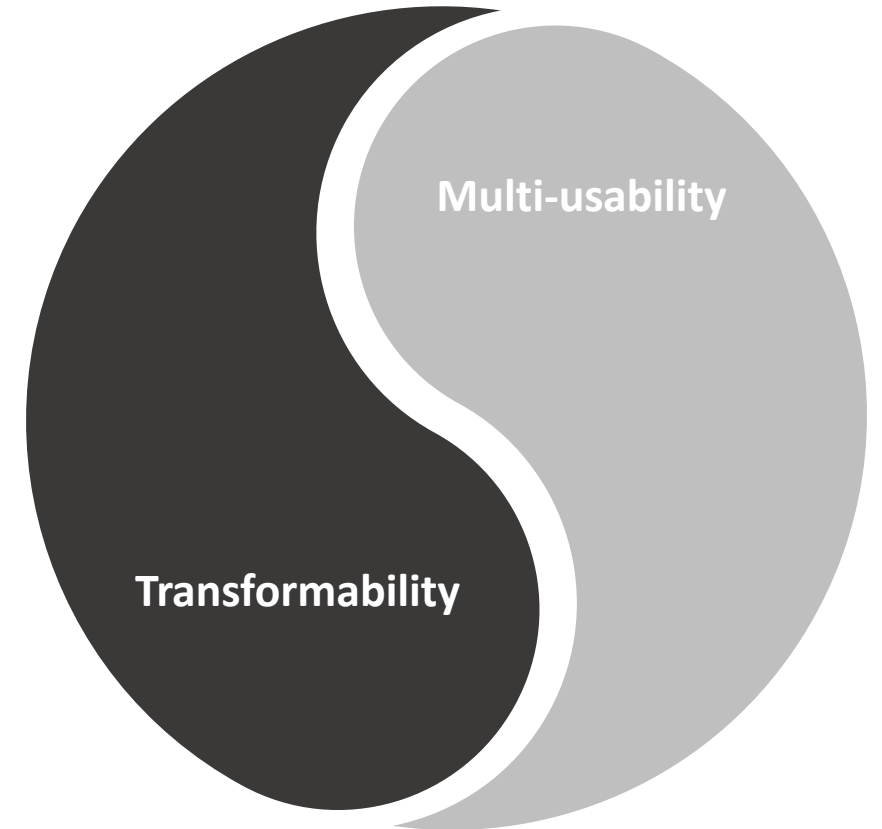
Maankäyttö- ja rakennuslain eteneminen

Lähde: Teppo Lehtinen, YM

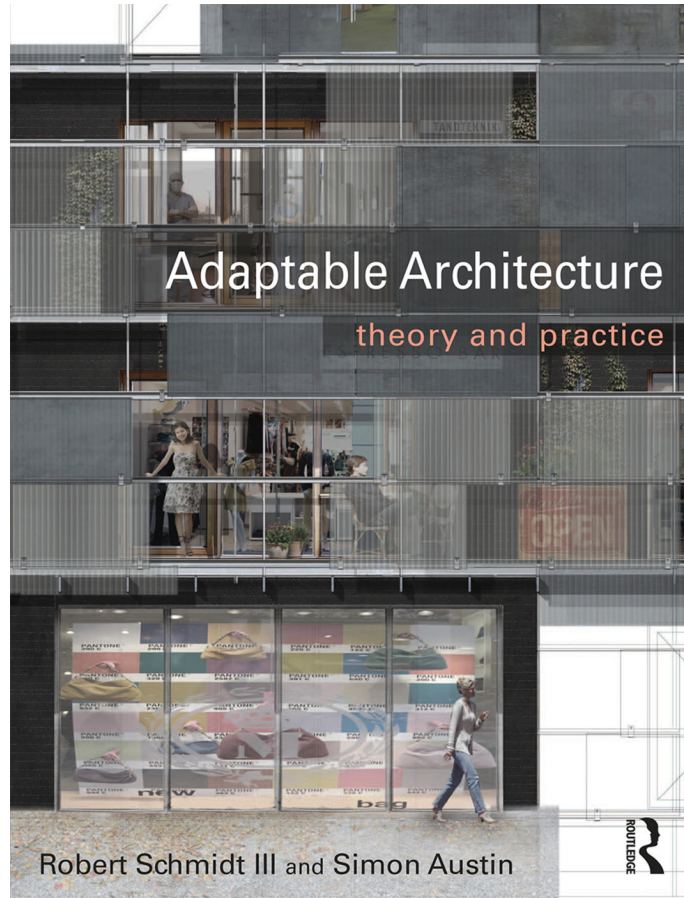


Theoretical background

Buildings are usually presented as if they were constant artefacts. In reality, all buildings eventually change, even if they are not specifically designed for adaptation. Homes, to a greater or lesser extent, are modified by their users throughout their lifespan, whether the designer intended this or not (Brand, 1994). There is an extensive research tradition relating to the flexibility and adaptability of housing architecture (e.g.; Habraken, 1972; 1998; Schneider & Till, 2007; Leupen, 2006; Schmidt & Austin, 2016; Krokfors, 2017; Pinder et al., 2017; Braide, 2019). These concepts are usually divided into two subcategories: the multi-usability approach (often labelled as 'multi-functionality' or 'polyvalence', but also 'adaptability') and the transformability approach (often labelled as 'flexibility', 'modifiability' or 'transformability'). In general, the multi-usability approach emphasises how a fixed spatial configuration can allow for varied uses of a building or a dwelling, whereas the transformability approach covers physical changes in a building or a dwelling.



Theoretical background



tives. The recent categorisations have used the term adaptability as the main umbrella for the capacity of a building to be adjusted to suit new situations (see Schmidt & Austin, 2016; Pinder et al., 2017) with both passive and active ways of adjustment. For example, Schmidt & Austin (2016) see adjustability, versatility, refitability, scalability, convertibility, and movability as subtypes of adaptability. Thus, the terminology of the discipline is far from unambiguous.

Theoretical background

Adaptability

capacity of a building to be adjusted to suit new situations

(Schmidt & Austin, 2016)

Adjustability

ensures that the 'stuff' inside the building, can be reconfigured to meet the changing needs

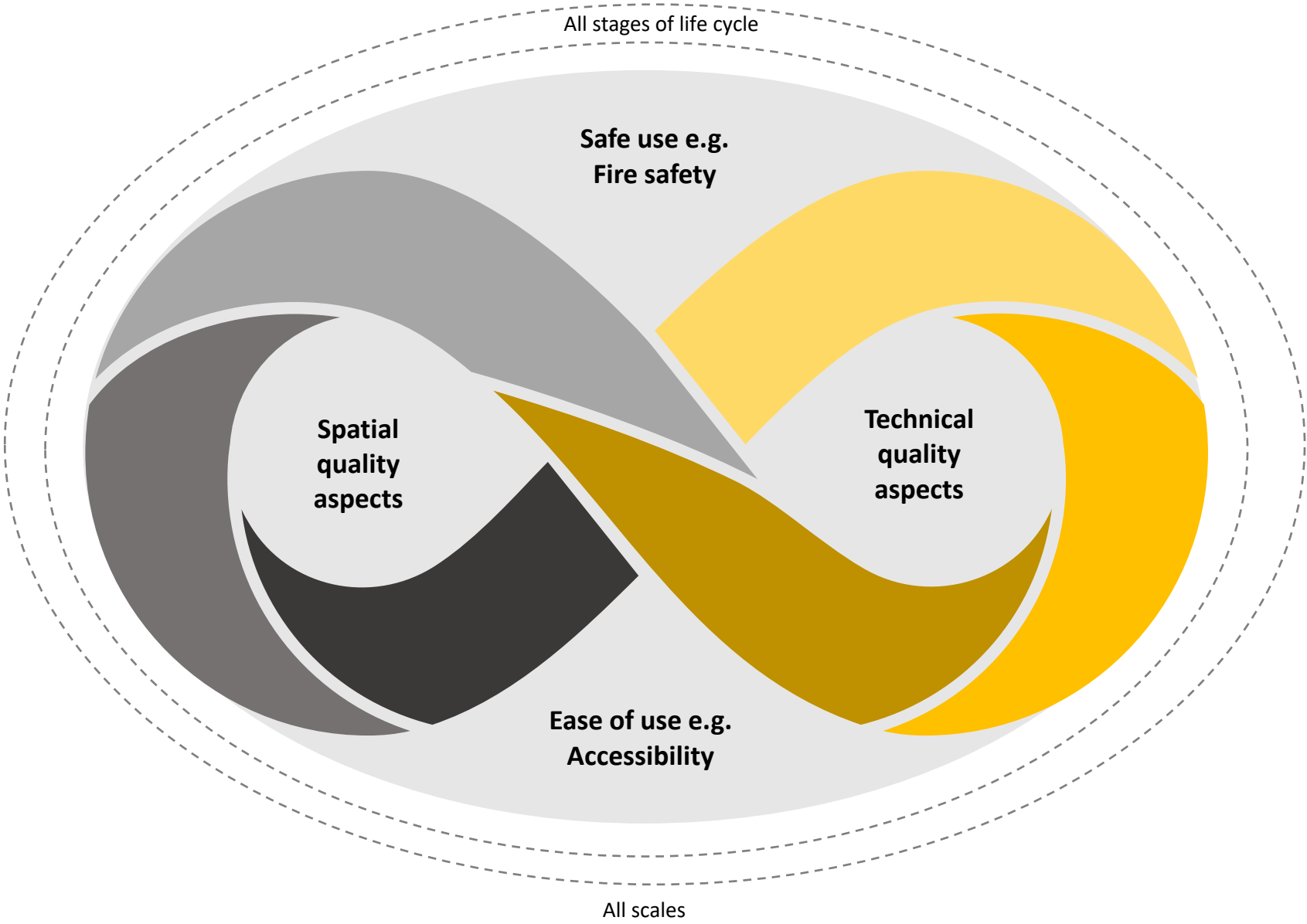
(Schmidt & Austin, 2016)



FIGURE 1 Illustration of the difference between the apartment 'support' (on the left) and 'infill' (in the middle), as used in this study. The illustration on the right presents 'support' and 'infill' together. The apartment 'support' i.e. community-controlled and slower changing building aspects, as used in this study, is highlighted in darker grey. The apartment 'infill', as used in this study, can be adjusted more easily by dwellers, and is highlighted in lighter grey. Storage cabinets and replaceable furniture are highlighted in a light grey dashed line. The arrow indicates the apartment entrance.

Theoretical background

*Housing
quality*



Research methods

Sixty apartment building projects to be built in 2019-2022 were selected from the largest cities in Finland; the sample included about 4000 apartments

The selection was made from Etuovi service in 2019-2020: the first 10 different cases from the six largest Finnish cities were included.

The goal is to get a cross-section of what kind of apartment buildings were built today.

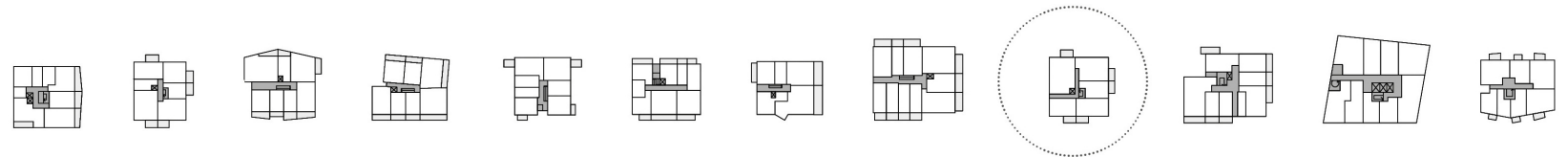
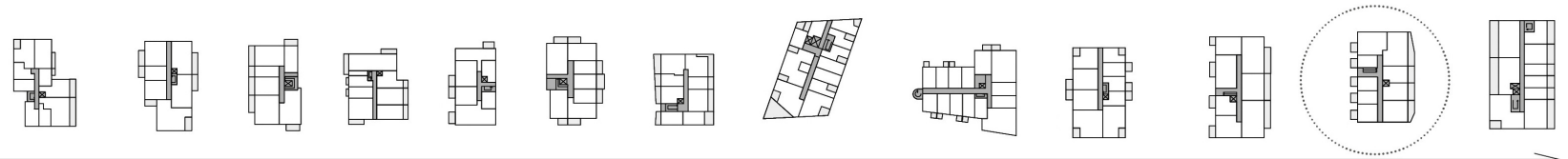
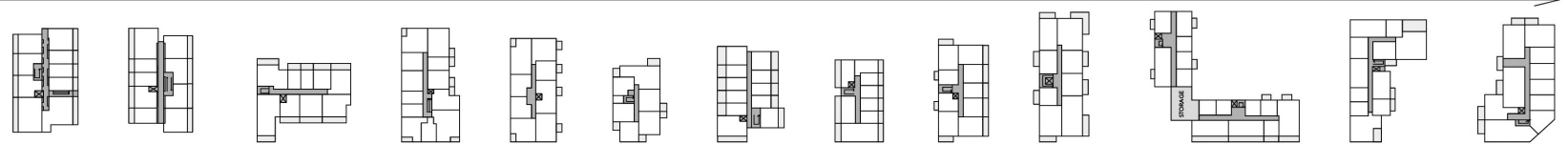
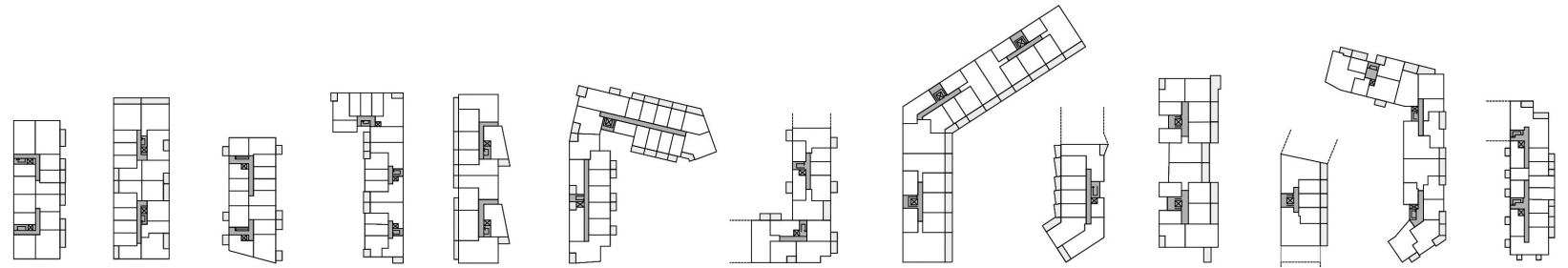
Recurring features of the building types were analyzed.

The data collection of the 60 cases led to the selection of two cases for in-depth analysis.

The research focused on the adaptability of apartments over 36m²

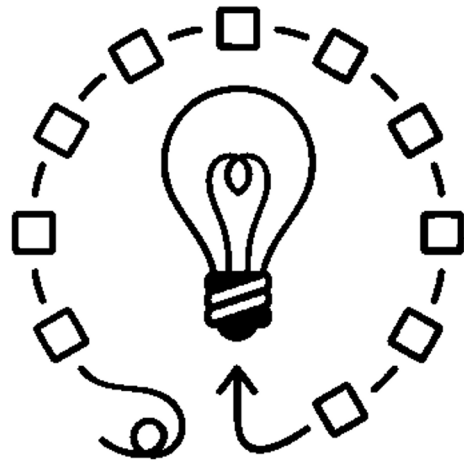


The five columns represent a continuous gradation of the collection of cases, as it is a more appropriate way to describe the differences of building types, compared to strict categories.

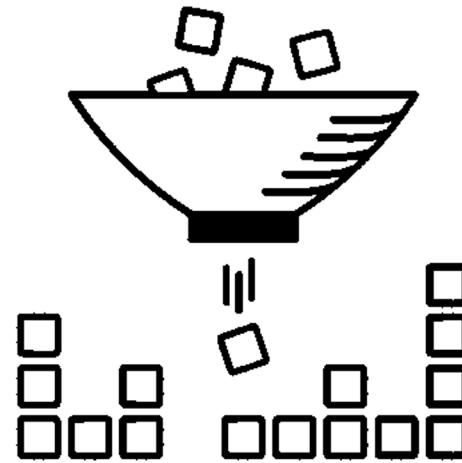


central stair core building middle corridor building

Research methods

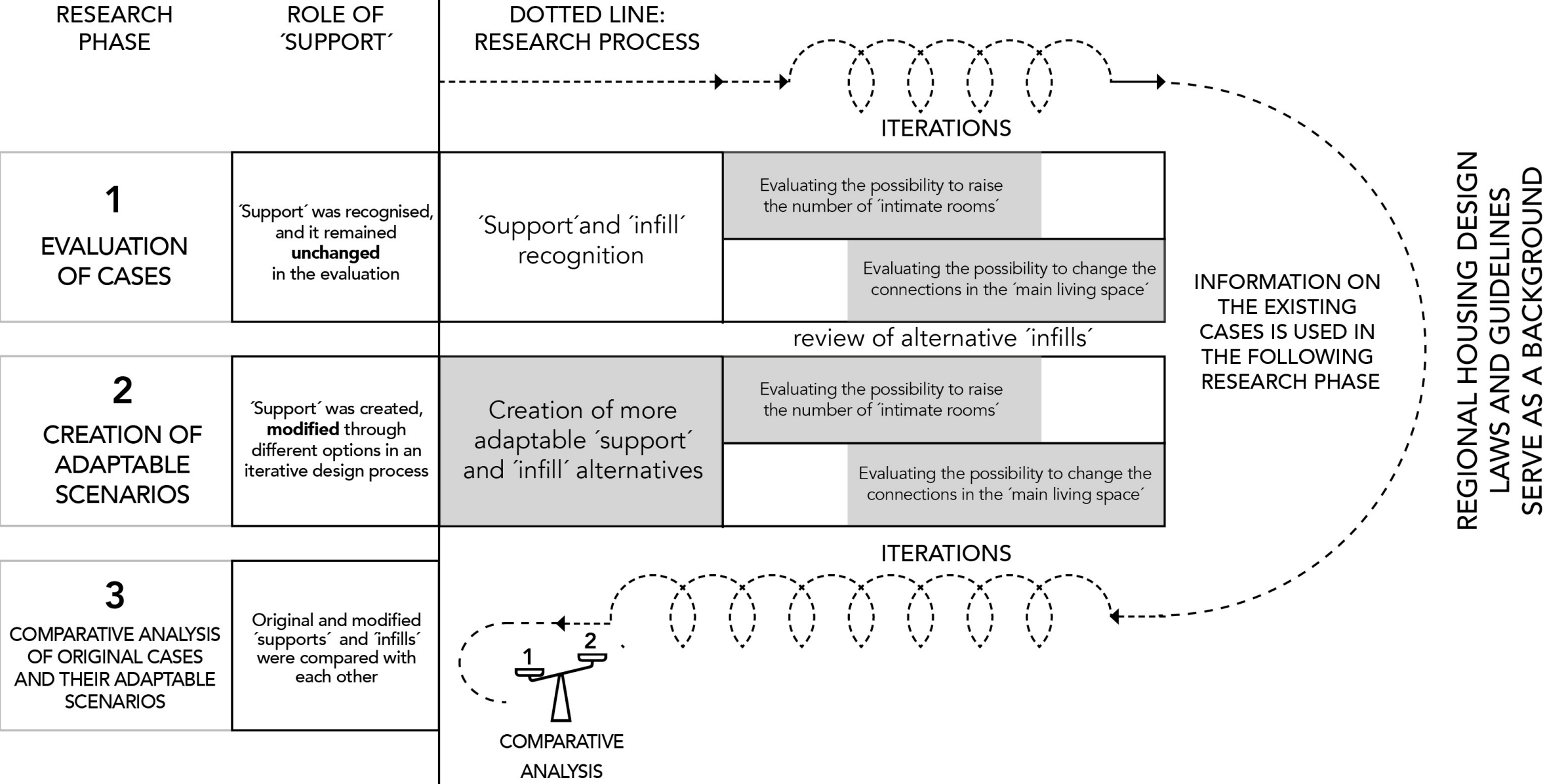


Qualitative



Quantitative

Research methods



Research methods

TABLE 1 Evaluation indicators for adjustable apartments and their description as used in this study.

Adjustable apartments: Evaluation indicators**	Description *
Task: Mapping of the 'support' and 'infill'	Mapping of community controlled aspects of the apartment, such as load-bearing structure, facade, the kitchen's building services and bathrooms (i.e. 'support'), and the other parts which are dweller-controlled (i.e. 'infill'). This is based on, and adapted from, Habraken (1972; 1998), as described earlier. Reason: To evaluate an apartment's capacity to adapt from a user perspective, there is a primary need to first distinguish what usually can and cannot be easily changed by the users.
Indicator 1: Is it possible for a user to add an intimate room?	Identification and analysis of the possible number of intimate rooms. Reason: An apartment that accommodates a changeable number of 'intimate rooms' is more likely to meet the needs of various households of different sizes (e.g. Keurulainen, 2014) and with different needs (Juntto, 2008; 2010). For example, one of the common needs for dwelling adjustment is to provide an additional room (Wong, 2010, p. 177).
Indicator 2: Is it possible for a user to change the connections in the 'main living space'?	Identification and analysis of the different connections in the 'main living spaces' shared in the household unit. Reason: If the apartment's design can accommodate a number of options between 'main living space' connections, this will support dwellers' different preferences at different life stages. For example, some prefer open plan layouts (a joint space for preparing food, eating and spending time together), while others prefer a separate kitchen, dining and living room (Finlay et al., 2012, p. 24).
Indicator 3: Are there two or more orientations in the apartment?	Identification and analysis of the number of orientations and facades of the housing unit. Reason: A sufficient number of windows available is needed to allow the separation of spaces. Also, an apartment with more than one orientation is more likely to accommodate different spatial configurations (Živković & Jovanović, 2012, p. 20).

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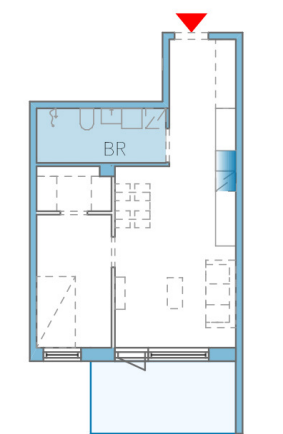
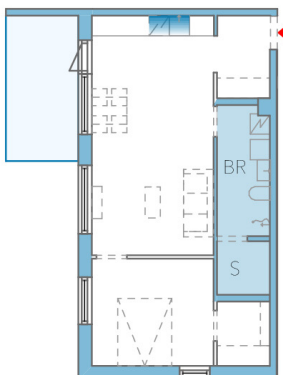
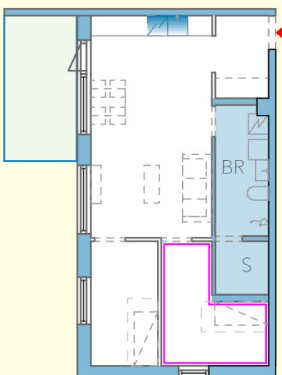
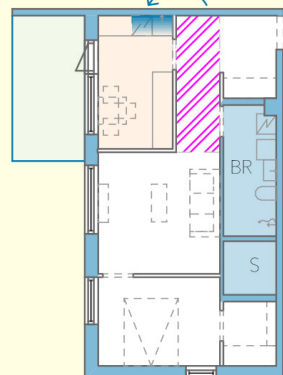
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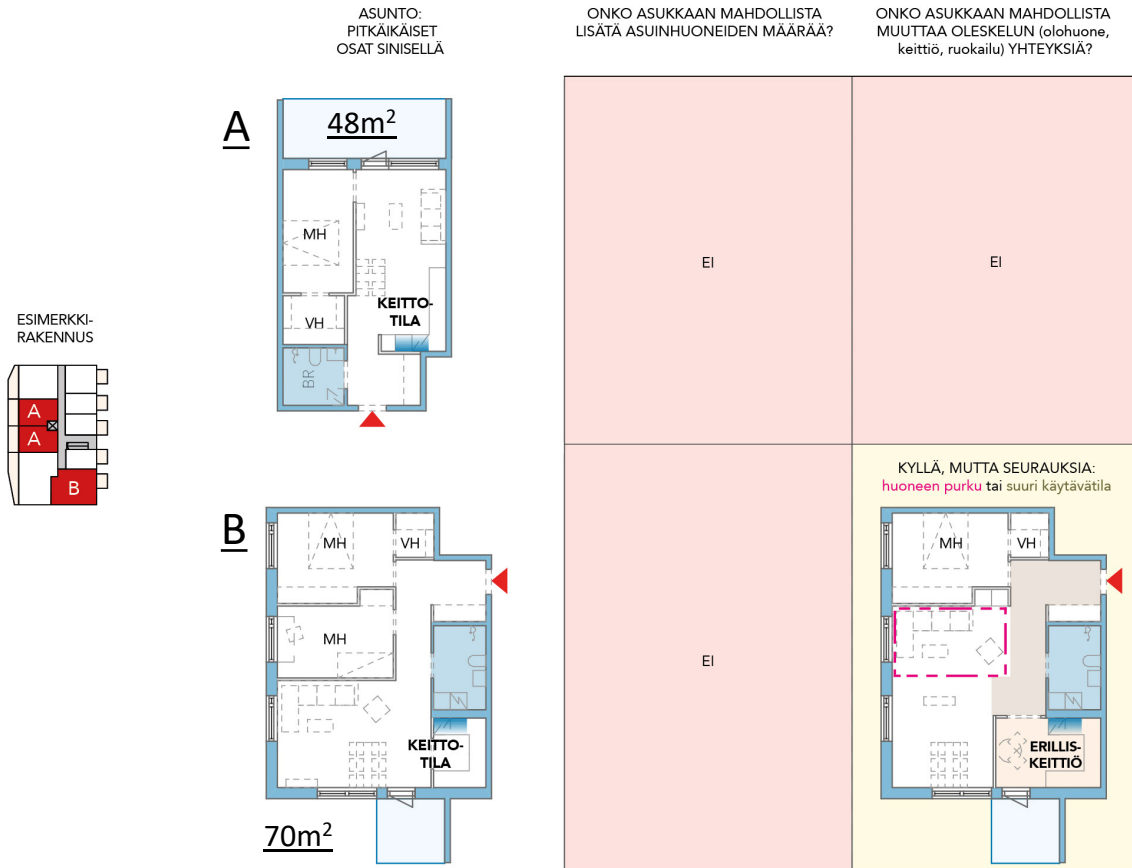
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Research methods

EXISTING UNIT: ADJUSTABILITY EVALUATION - Building case 1				
Case	Task: Recognition of support and infill	Indicator 1: Is it possible for a dweller to add an 'intimate room'?	Indicator 2: Is it possible for a dweller to change the connections in the 'main living space'?	Indicator 3: Are there two or more orientations in the apartment?
1B(B) 46m ²				
1C 55m ²		<p>yes, but consequences (unusual room shapes)</p> 	<p>yes, but consequences (5,5 m² wasted area)</p> 	<p>2 orientations, 2 facade planes</p>

Research methods

Original

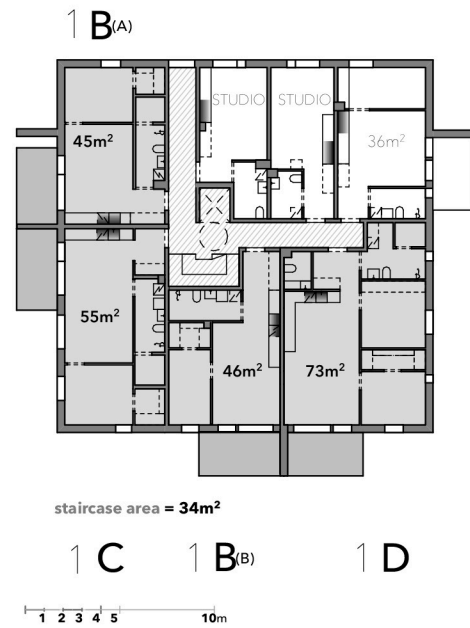


Modified

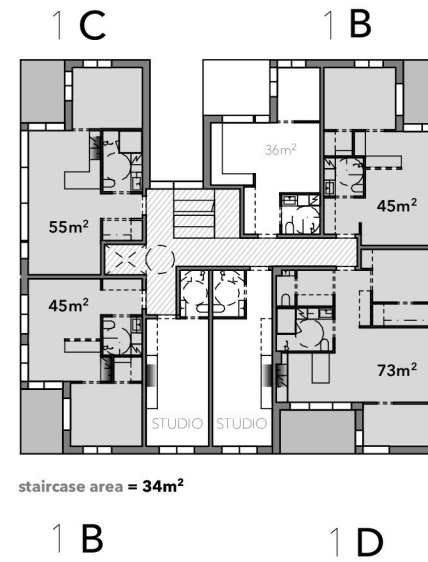


Research methods

Original building plan

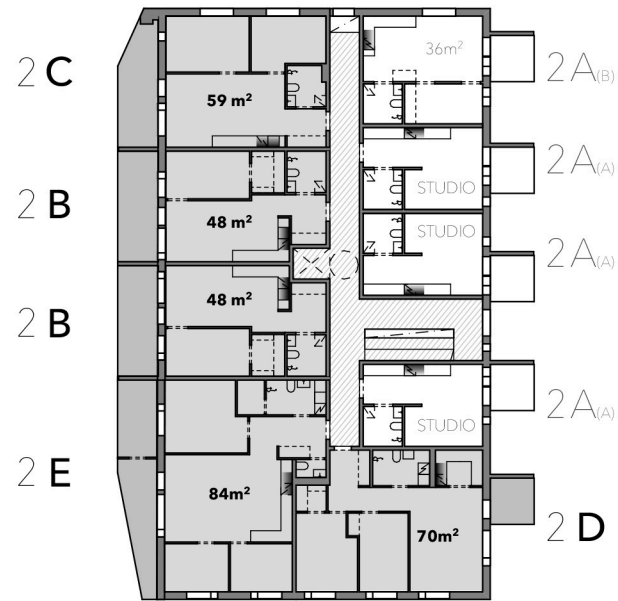


Modified building plan

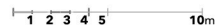


Research methods

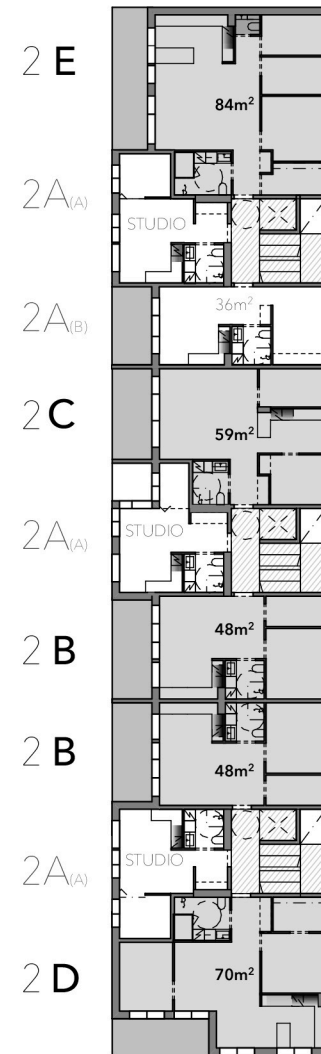
Original building plan



staircase area = 53m²



Modified building plan



staircase area = 3x16m²
= 48m²

Results

Overview of the 60 apartment cases and case selection for detailed study

The 60 selected cases were first categorised according to their staircase configurations and the way in which the apartments were arranged around them (Fig 3). This is because the location of the staircases and potential corridors appeared to have a significant impact on dwelling characteristics. While there are clear distinctions between circulation systems of buildings (highlighted with darker grey, Fig 3) there are many gradations in between. Hence, rather than a strict categorisation of the case study buildings, a continuous gradation is more appropriate to describe the differences in the cases. The three most common building types were:

- central stair core buildings with varying corridors (for example, 5-10 to 3-9, Fig 3)
- middle corridor buildings (for example, 3-1 to 6-2, Fig 3)
- slab buildings with varying corridors (for example, 6-5 to 1-4, Fig 3).

Results

Generally, the selected cases lack the capacity to accommodate spatial changes, despite adaptability having been regarded as a recommended goal in the development of Finnish urban housing (Hakaste, 2015).

This suggests that even though knowledge of adaptable architecture has increased significantly, it has seemingly not influenced actual housing design.

Results

This study highlighted not only the importance of orientation and number of windows for adaptability, but of the appropriate positioning of windows together with shallow plan designs.

The results indicate that even daylight provision, determined by building 'support' features, is a precondition for enabling apartment adaptability.

Also, modifying the plans so that poorly usable hallway spaces ("hukkatila" / "dead spaces") turned into habitable rooms, increased potential for adaptability.

Adaptability and other spatial quality factors have synergies?

Results

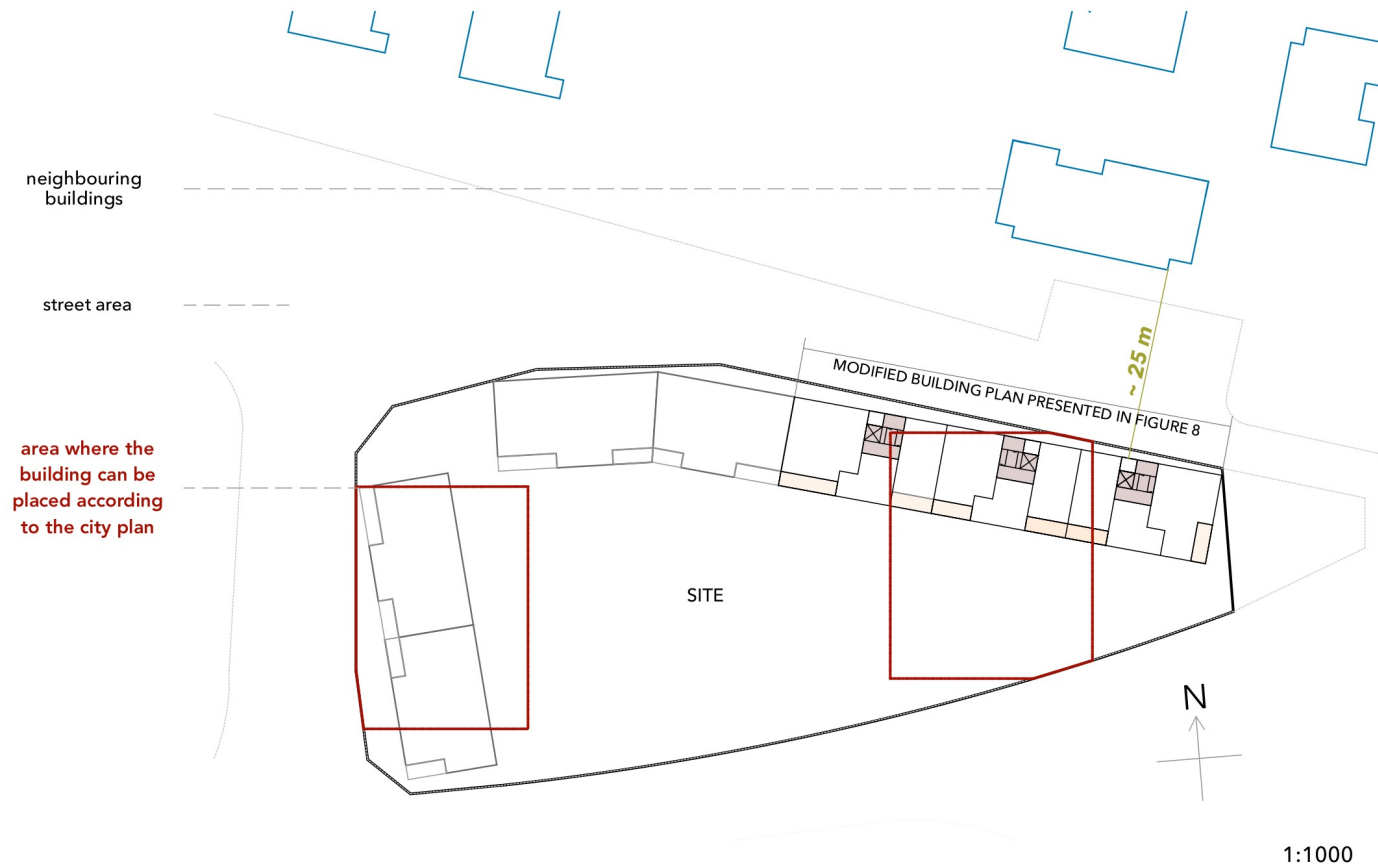
Seeking statistical significance of the results, which were obtained from research-by-design and a small, purposively selected sample of case studies, in the wider Finnish housing stock is neither possible (Robson, 2011; Flyvbjerg, 2006), nor the purpose of this study.

Findings are specific to the individual cases, they provide conclusive empirical proof that deep plan, single-aspect apartments do not provide an adaptable plan, especially when the window number and placement is not well thought out.

These results provide a critical lens to view the wider future Finnish housing stock to understand their potential for adaptability.

Results

Land use, modified building plan (case 2)



While modified building 2 can be accommodated on the building site, it challenges the city plan.

This highlights the often under-acknowledged interrelationship between the different scales of the urban plan, the building typology and the apartment plan.

Results

If these findings are representative of the wider (future) housing stock, this risks 'locking in' poorly daylit housing that is unable to accommodate user changes for years to come.

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