

Source book

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Artificial Mountain

Pasila high-rise

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Performative Patterns of High Density

ARK-E3009 Design of Structures Studio
ARK-E2514 Design of Structures Theory
ARK-E5518 Digital Speculative Urbanism Studio
ARK-E5514 Digital Speculative Urbanism Lecture

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Design of Structures

A!CM Aalto University
Computational Methodologies for
Landscape Architecture and Urbanism

SUTD
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ARLAB
architectural intelligence
research lab

Synopsis

The process of establishing vertical village typology consists of exploration, interpretation and formalization of data sets. At the first stage, the building site was imposed to local field conditions. Initial boundaries of the volume have been formed as the result of sun analysis. To meet the required insolation parameters and avoid self-shading, the shape should gradually unfold from southern part of the site to northern one. Next, the stability can be ensured by the twist towards the northeast winds. To deal with the excessive level of railway noise, the form should be developed primary (mostly) at the eastern part of the site. Eventually, the study of pedestrian flows at the surrounding context concludes that the northern part is the most applicable for an access.

As the result of data analysis, it was possible to determine a bounding box. (pic.1) Created volume, as the basis, has later been interpreted into the concept of vertical village. A mental image (pic. 2) was designed to provide understanding of such typology. The urban context of the site had a direct influence on the characteristic of the ground layer. The features follow the parameters of the population density, building coverage ratio, and living areas range, as well as the circulation principles. Additionally, site specific elements were considered, such as existing landscape and pedestrian flow connections. Correspondingly, village (rural) cluster's characteristics are defined under the same set of rules. To ensure a smooth connectivity between strong urban context and locality of the village, suburban cluster was introduced. This cluster combines the features of both previous ones, emphasising the diversity of various environmental conditions. Finally, the last cluster, called natural, reinforces particularities of the rural spaciousness completing a trail from the urban context to nature.

Field conditions

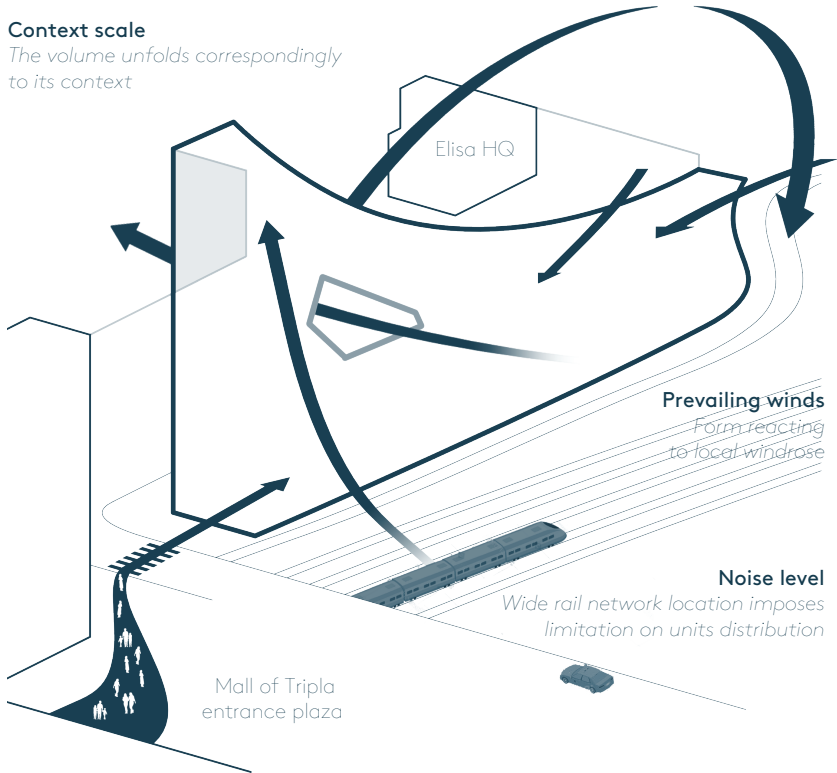
Proposal shape is formed on the basis of site local forces (pic. 1)

Sun path

The dominant volume is generated under the influence of sunlight

Context scale

The volume unfolds correspondingly to its context

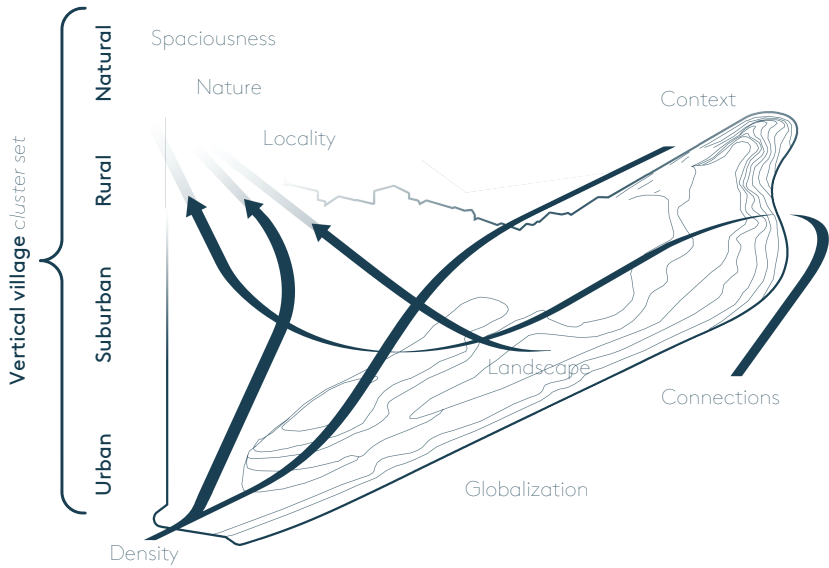


Pedestrian flows

The highest circulation is concentrated next to the mall, forming the main access to the building

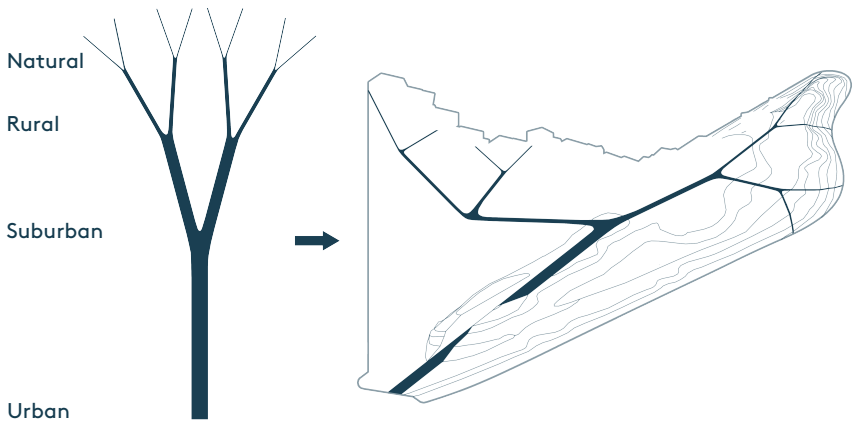
Mental image

Understanding of vertical village concept (pic. 2)



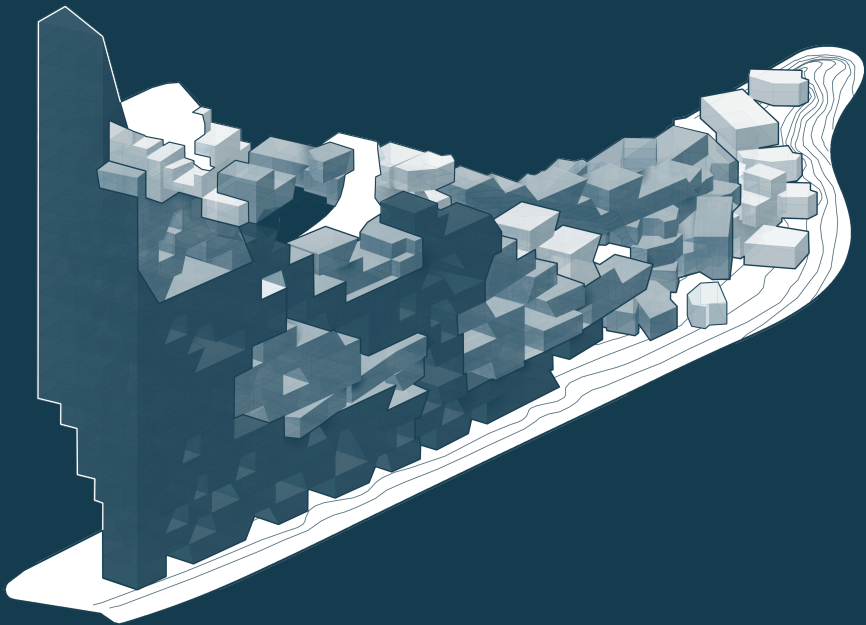
Hierarchy

Cluster arrangement based on L-systems subdivision



The clusters

L-system arrangement within the bounding box results in overflowing of different data sets

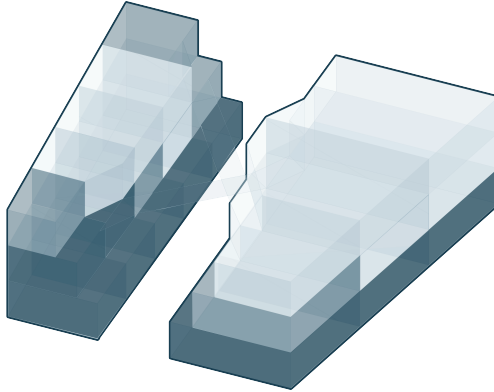
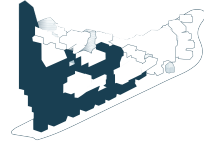


- Clusters**
- Urban
 - Suburban
 - Rural
 - Natural

Urban

Living areas range (m²)
Circulation
Building coverage ratio
Population density (p/ha)

25-50
Strong
0.8
400-450

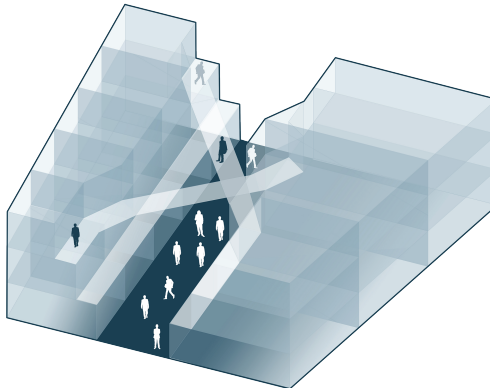


Composition

*Commercial units at the ground level expand public area of the boulevard
Living units allocated higher to preserve privacy of residents*

Units

- Private
- Social
- Public



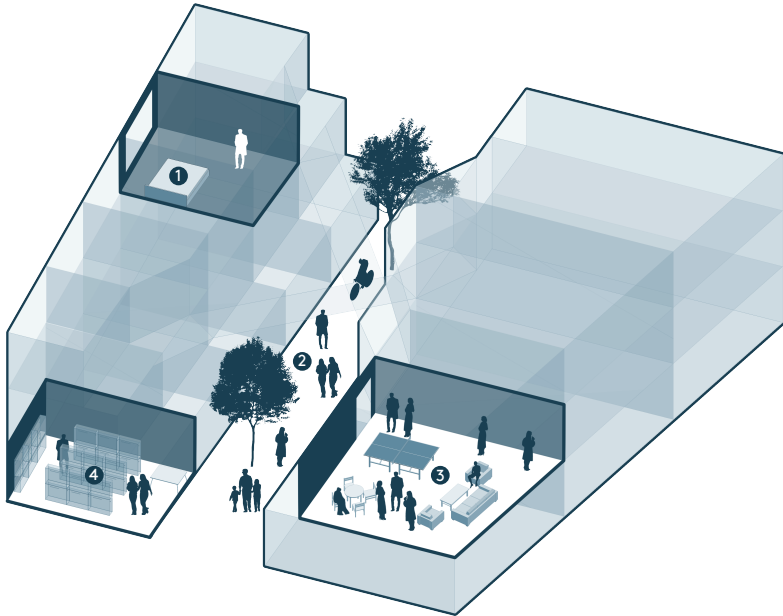
Circulation

Public and private flows exist independently

Access

- Private
- Public

Urban



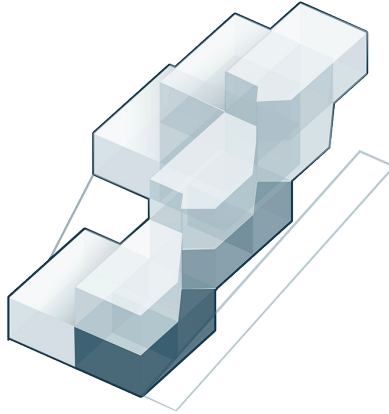
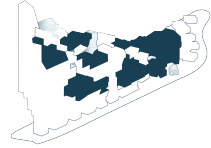
Features

- 1 *Predominance of compact apartments*
- 2 *Wide central boulevard*
- 3 *Multifunctional social spaces*
- 4 *Commercial and public units form internal urban context*

Suburban

Living areas range (m²)
Circulation
Building coverage ratio
Population density (p/ha)

50-150
Intermediate
0.4
200-250

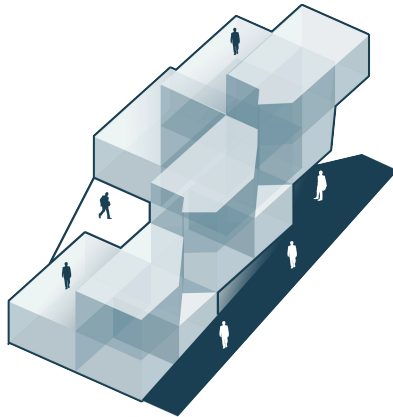


Composition

Terraced structure form courtyards and enlarge private areas

Units

- Private
- Social
- Public



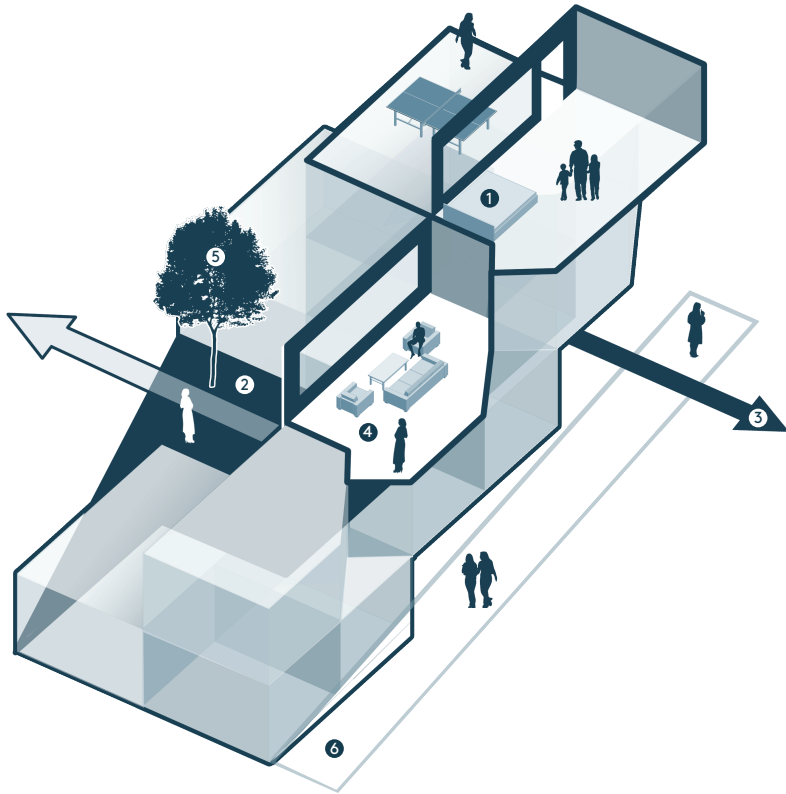
Circulation

Build environment separates private and pedestrian flows

Access

- Private
- Public

Suburban



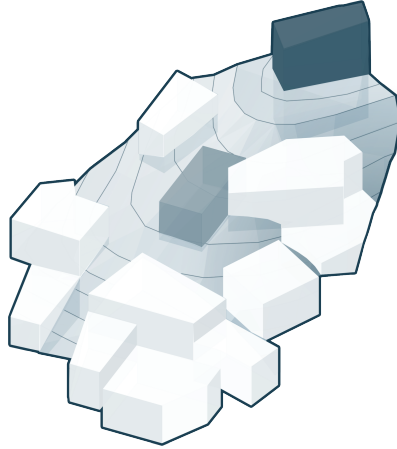
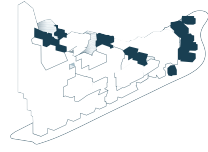
Features

- 1 Enlarged terraced apartments
- 2 Private courtyards
- 3 Open spaces on the trail
- 4 Local social areas
- 5 Foothill woodland
- 6 Narrow paths
- 7 Quarter development

Rural

Living areas range (m²)
Circulation
Building coverage ratio
Population density (p/ha)

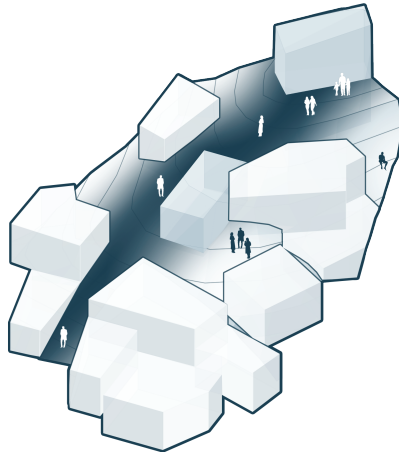
100-200
Low
0.2
30-35



Composition

*Units start to split
Landscape fills the voids*

Units
○ Private
● Social
● Public



Social fabric

Overflowing of public and private flows

Access
○ Private
● Public

Rural



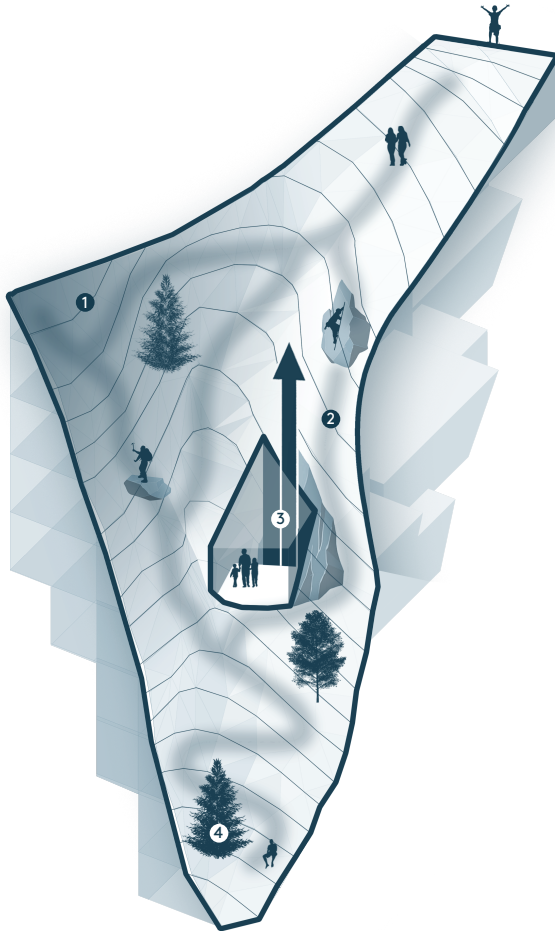
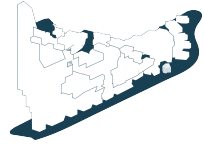
Features

- 1 Spacious multi-level apartments
 - 2 Introduction of landscape
 - 3 Separate vertical connections with the ground level
 - 4 Detached common areas
 - 5 Subalpine vegetation
- Natural paths replace pavement

Natural

Living areas range (m²)
Circulation
Building coverage ratio
Population density (p/ha)

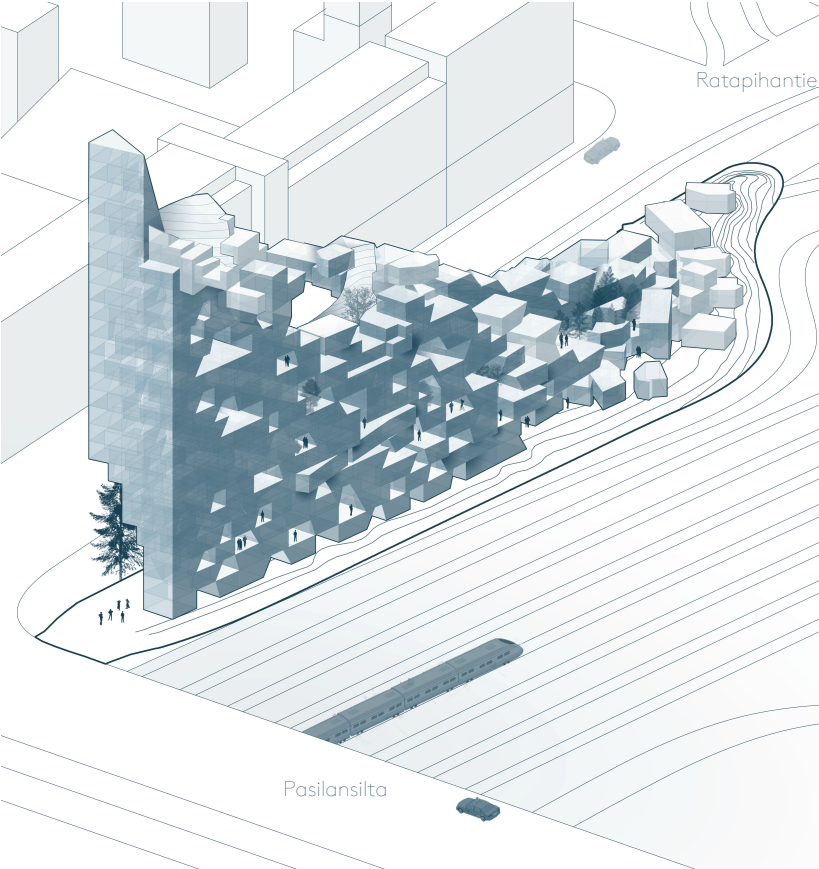
-
Sparse
<0.1
0



Features

- ① *Pronounced landscape*
- ② *Apline trails*
- ③ *Direct connection to the ground level*
- ④ *Mountainous vegetation*
- *Free circulation*

Overall shape



Bibliography and references

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