



LEART SEJDIU

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Designing with Code

Designing in VR with Pointclouds

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# CURRICULUM VITAE

## STUDIES

Kantonsschule Obwalden	2010 - 2016
Studio Deplazes	HS 17 / FS 18
Studio Spiro	HS 18 / FS 19
Studio Meteora	HS 19
Studio Topalovic	FS 20
Studio Theriot	HS 21
Studio Girot	FS 22
Studio Caminada	HS 22

## WORK

Internship SGGK Architects	HS 20 / FS 21
Teaching Assistant Prof. Gramazio/Kohler	HS 22 - now
Teaching Assistant Prof. Dillenburger	HS 22 - now

# FORBIDDEN CITY

*Over the years Novartis has spent millions for their architecture. Their master plan was intended for 13'000 workers. What happened and how can the campus move forward?*

Armin Linke's "Operating Theatre" depicts people working in what seems to be a surgery room. The caption gives clarity: It is a remotely controlled surgery. We extended our natural organs through tools. The human being transcended evolution and created an "exo-evolution". It is not limited to purely physical functions. With the first computer we started to outsource our intellectual functions too. Computers are our exo-brains, our exo-memories and exo-databases. Through the process of exo-evolution the human has created an "info-sphere" that makes it possible to be anywhere at any time. Virtual space becomes an integral part of the physical space or even replaces it to the degree where they are indistinguishable.

These developments also triggers a reaction at the global headquarters of pharmaceutical company Novartis. Before the pandemic 7'500 people worked at the Novartis Campus. In 2021 only roughly 2'500 people worked on site. What is going to happen with the leftover space? To this day the campus is hermetically sealed and not accesible for the public. We see plenty of potential for the campus to get reintegrated to the city. There are cafés, restaurants, parks, convencience stores etc.

**The project proposes to repurpose mostly empty office towers from the Sixties to dwelling spaces for cooperative housing programmes. The transformation of an office into an apartment is not only an act of recycling an increasingly underutilized typology, but also a way of giving spatial form to the contemporary condition of work, in which labor, domestic work, socialization, recreation, and exchange are no longer understood as separate spheres, but as part of the same productive stream.**

HS 21  
Studio Theriot  
*Borderline Investigations #6 Visibility  
Operating Theatre  
Group Work*  
Liam Buffat, Leart Sejdiu, Nicolas Graf



South facade; cooperative housing in Novartis Campus



“Operating Theatre” (Armin Linke, “The Appearance of That Which Cannot Be Seen”).



Pointcloud; Revisiting and experiencing space anytime and anywhere through VR.



“Da Vinci”; Surgeon doing heart surgery remotely (Yuri Ancarani, 2013).



Digital collection of spaces and objects.



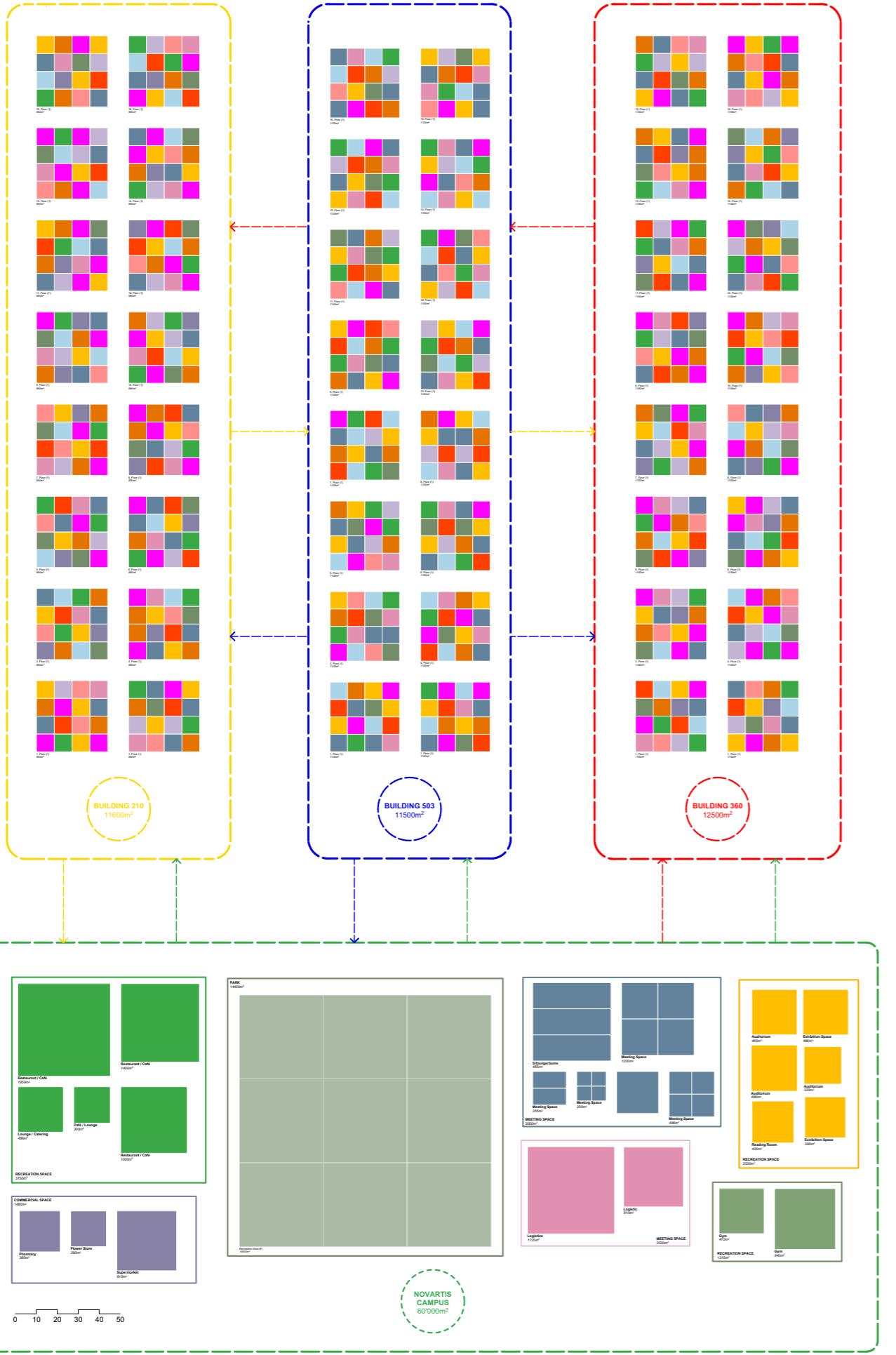
Orthographic image; Basel.



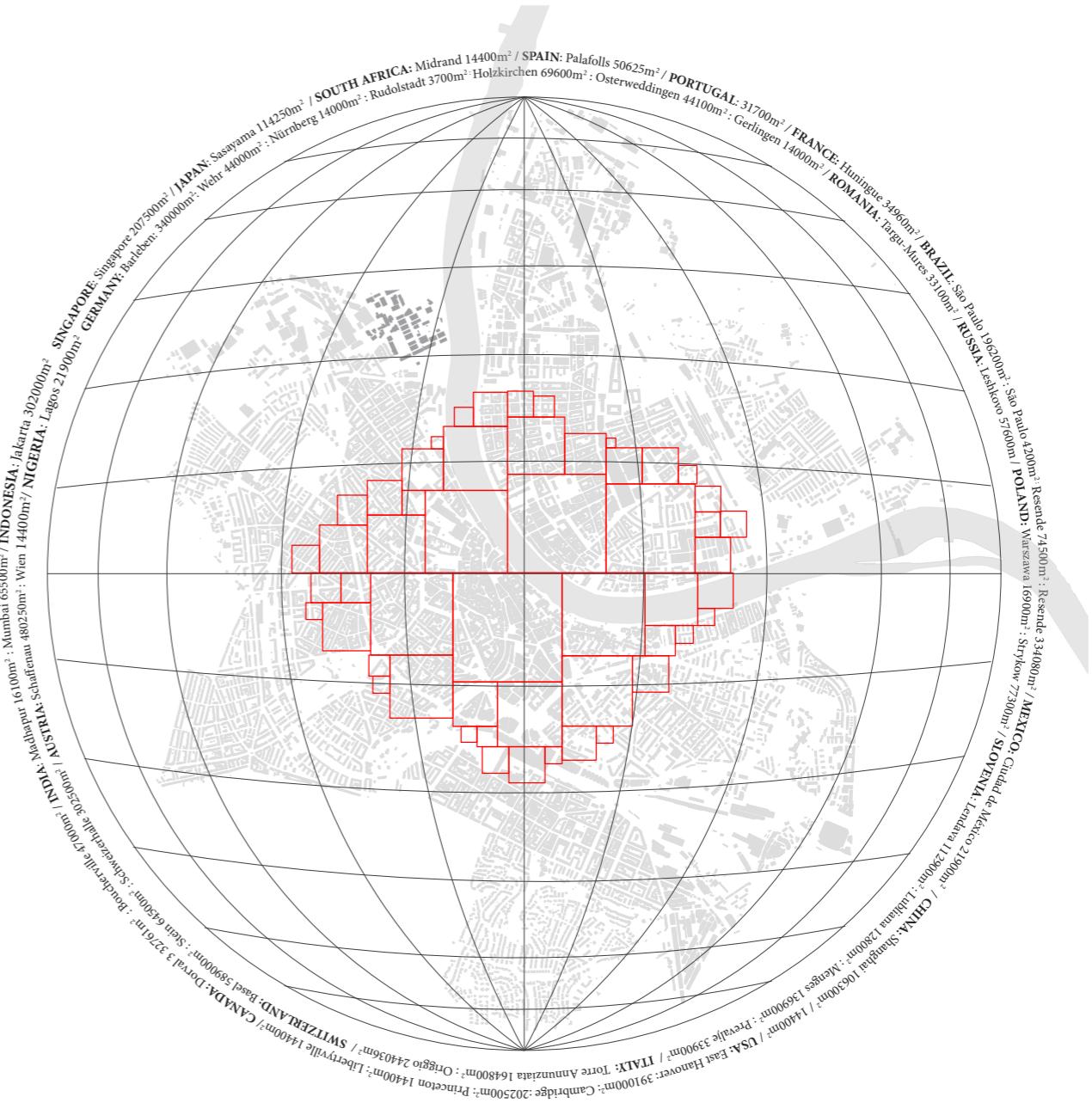
Revised orthographic image; Novartis Campus with interventions.



Aerial Image; Buildings of interest.



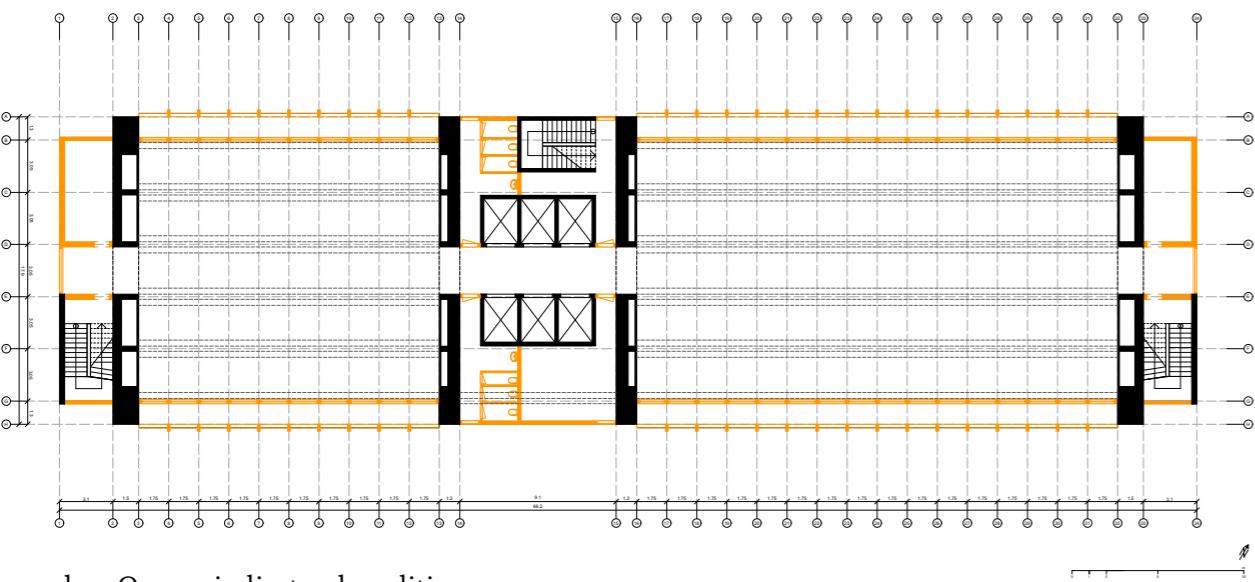
Organigram; Understanding how the housing towers can relate with the campus.



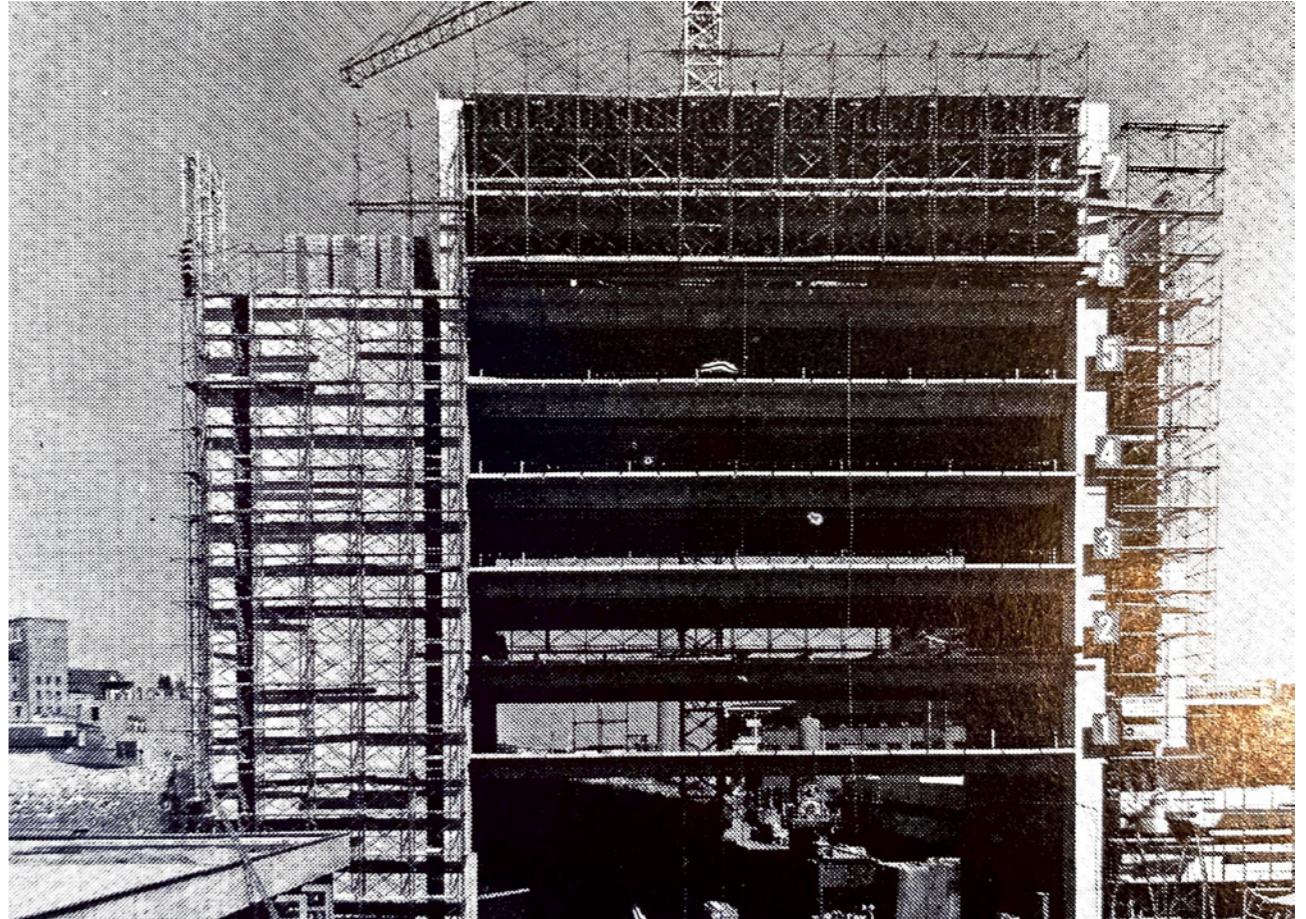
Analytical drawing; Area of all Novartis facilities compared to the city of Basel.



WSJ 503; Case study for the project.



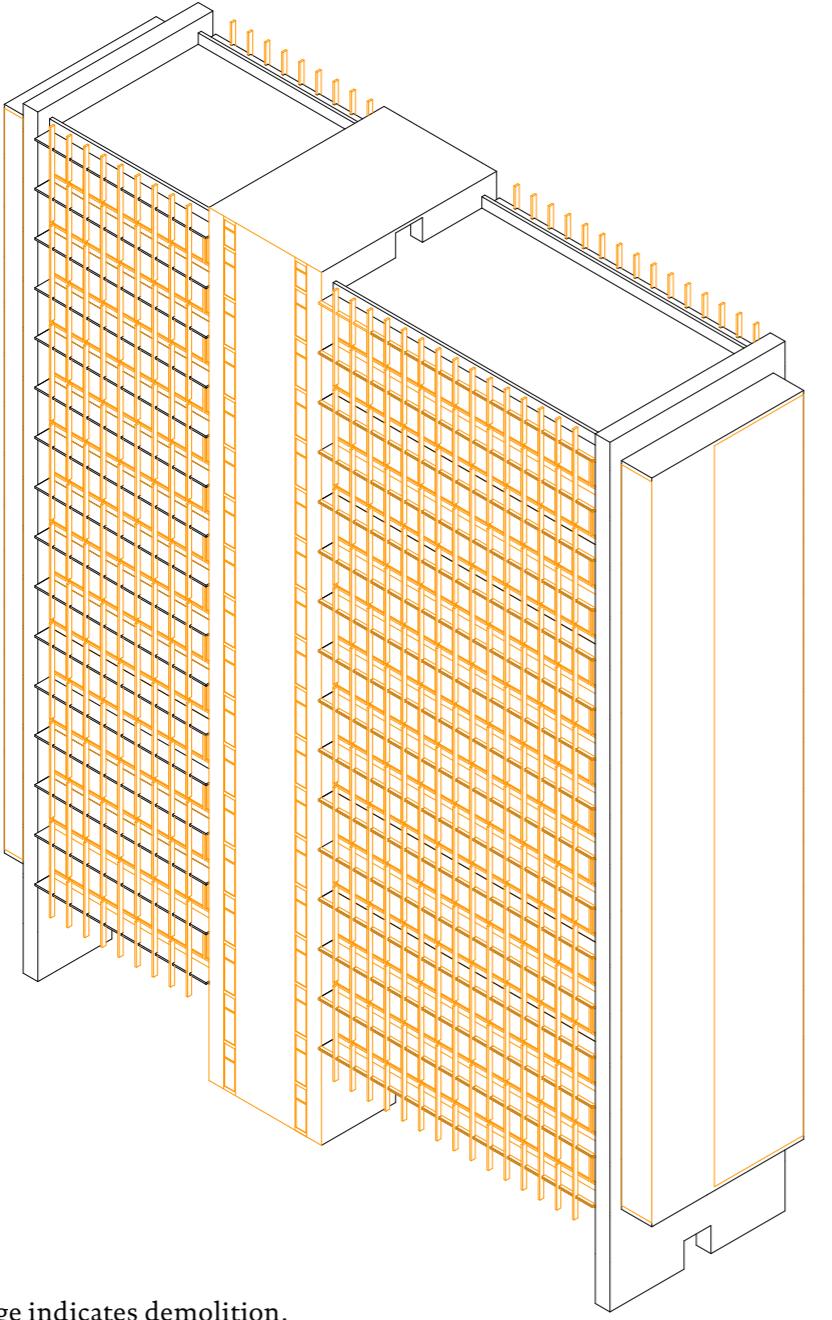
Floor plan; Orange indicates demolition.



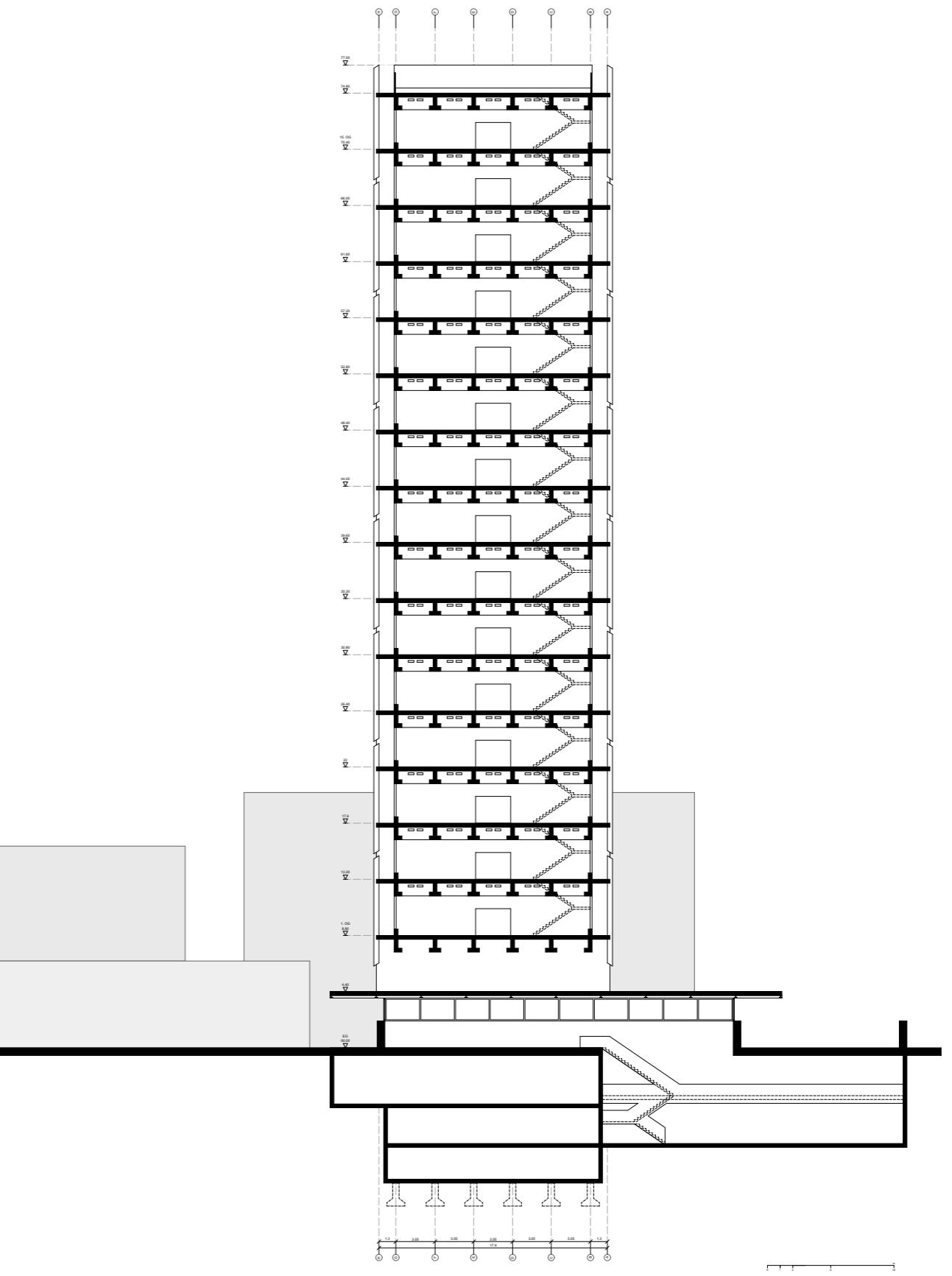
First stage of construction in 1968.



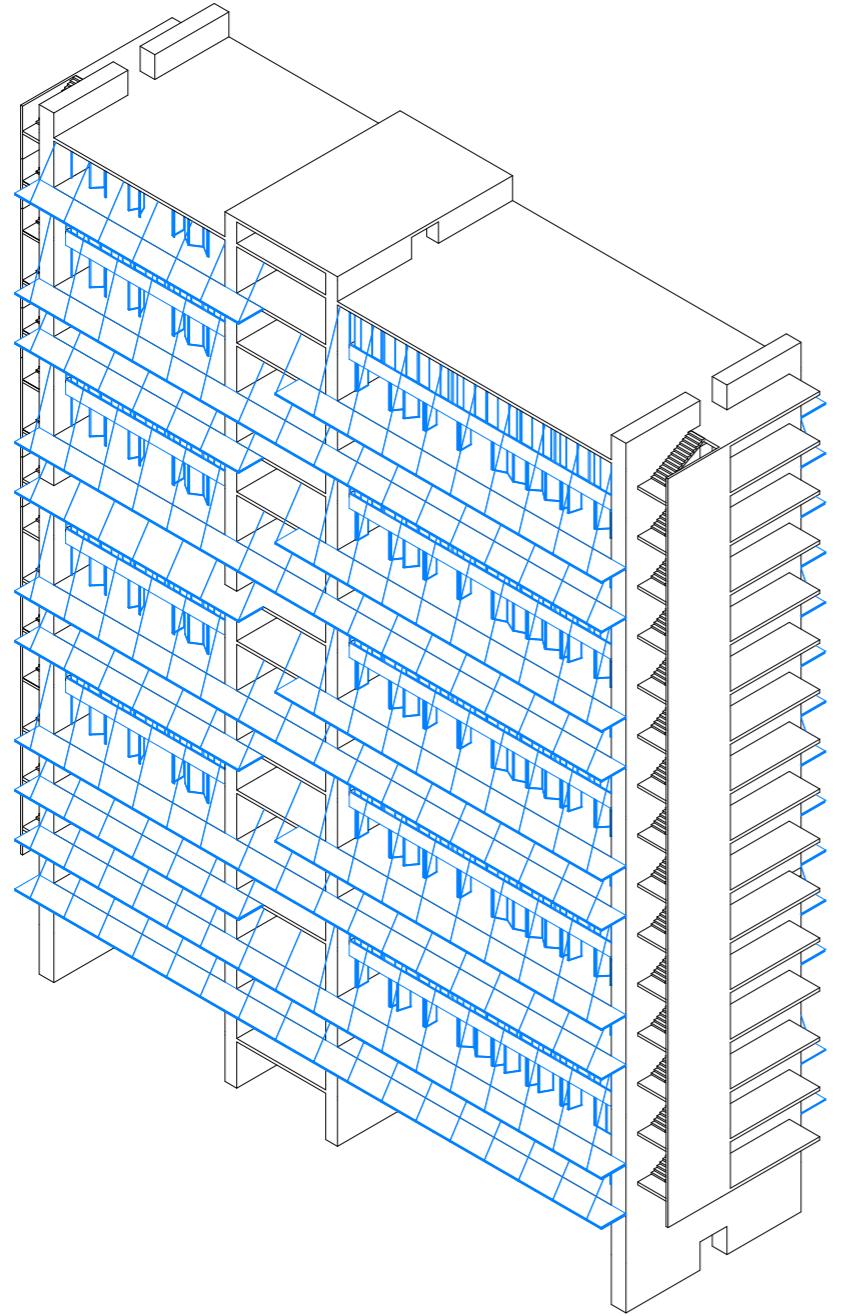
Free spanning construction; Thick and prestressed concrete beams allow maximum flexibility.



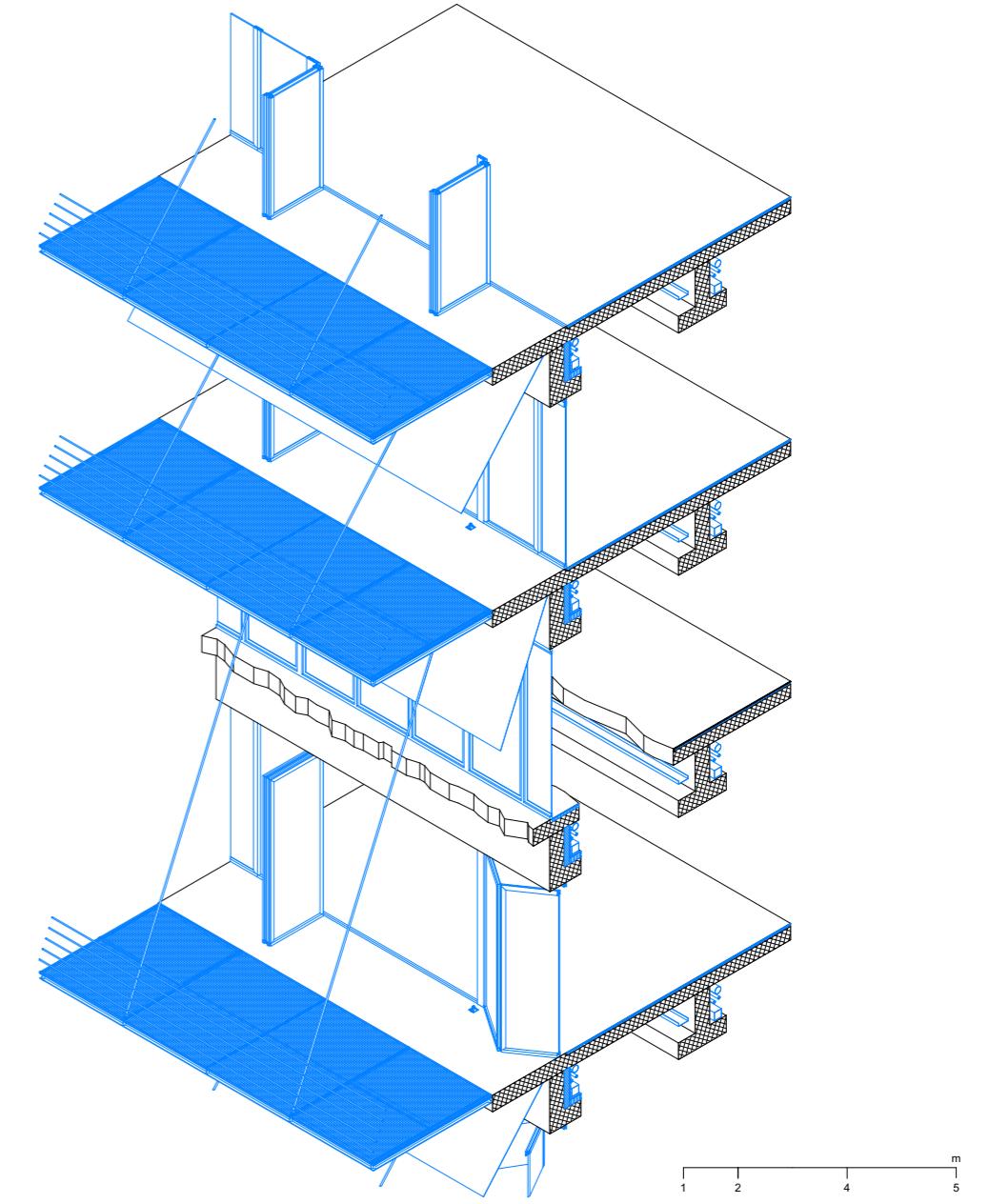
Axonometric; Orange indicates demolition.



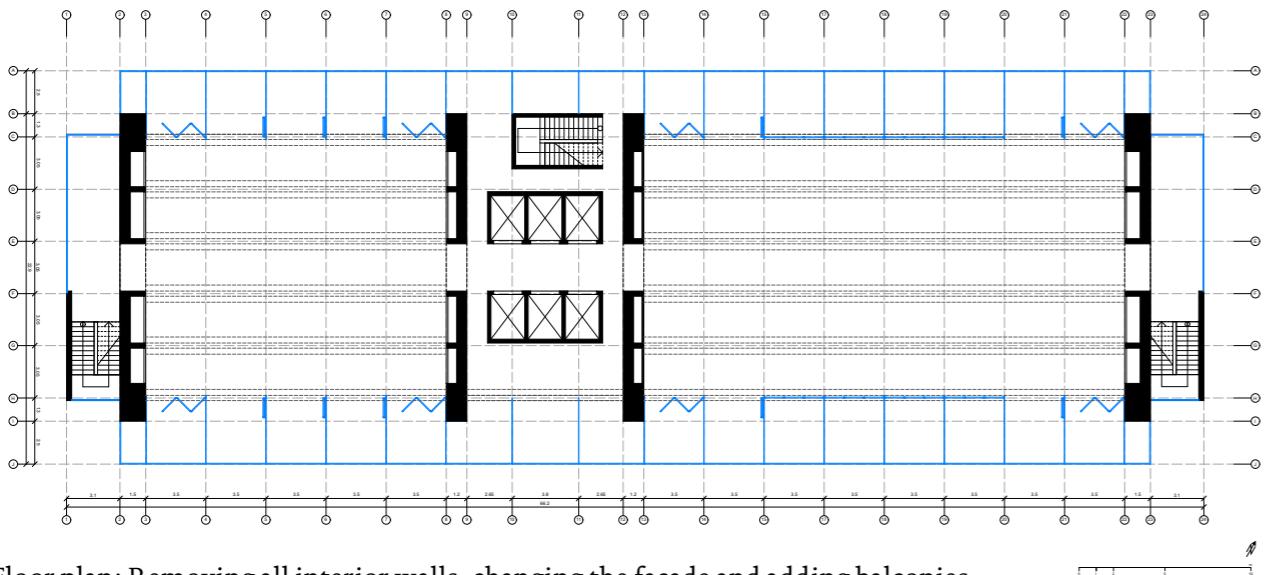
Section; Existing condition.



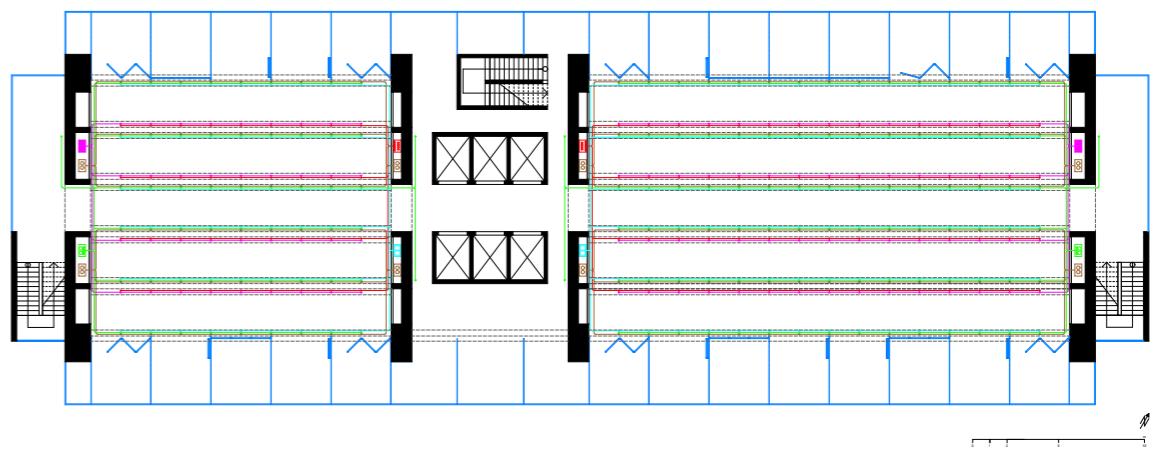
Axonometric; Blue indicates intervention.



Facade detail.



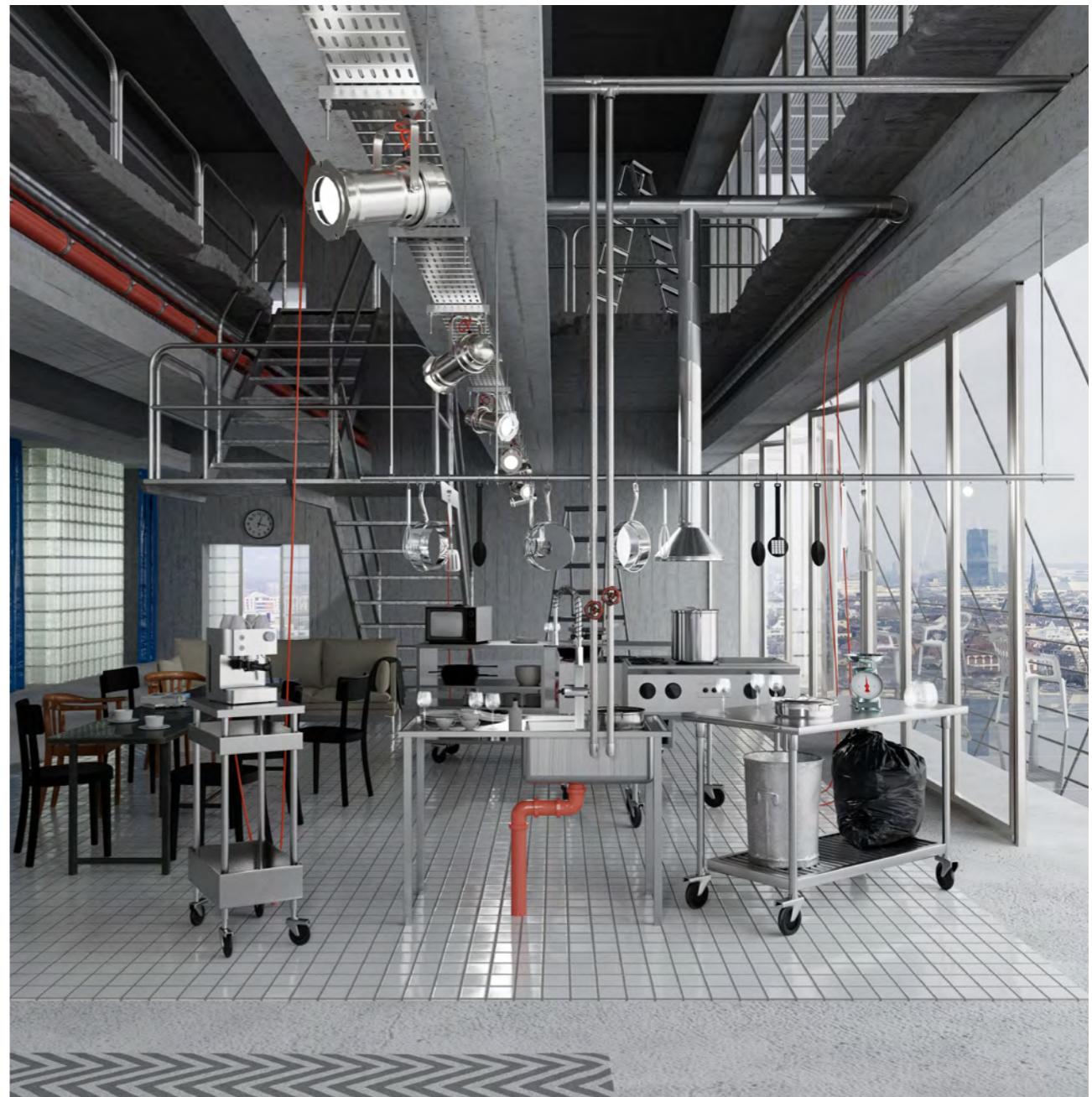
Floor plan; Removing all interior walls, changing the facade and adding balconies.



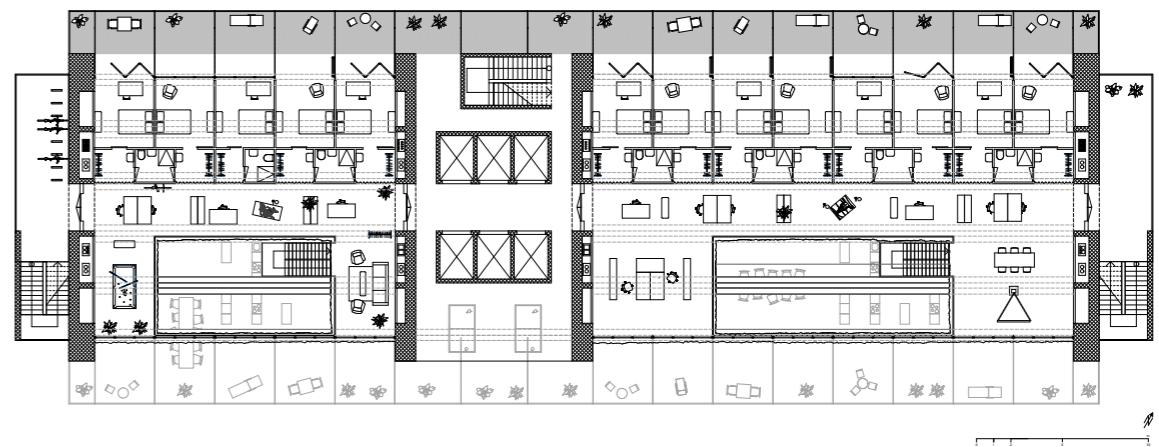
Infrastructure plan; Water, heat and ventilation routed through the ceiling



Ambiguity; Housing as a process of constant change.



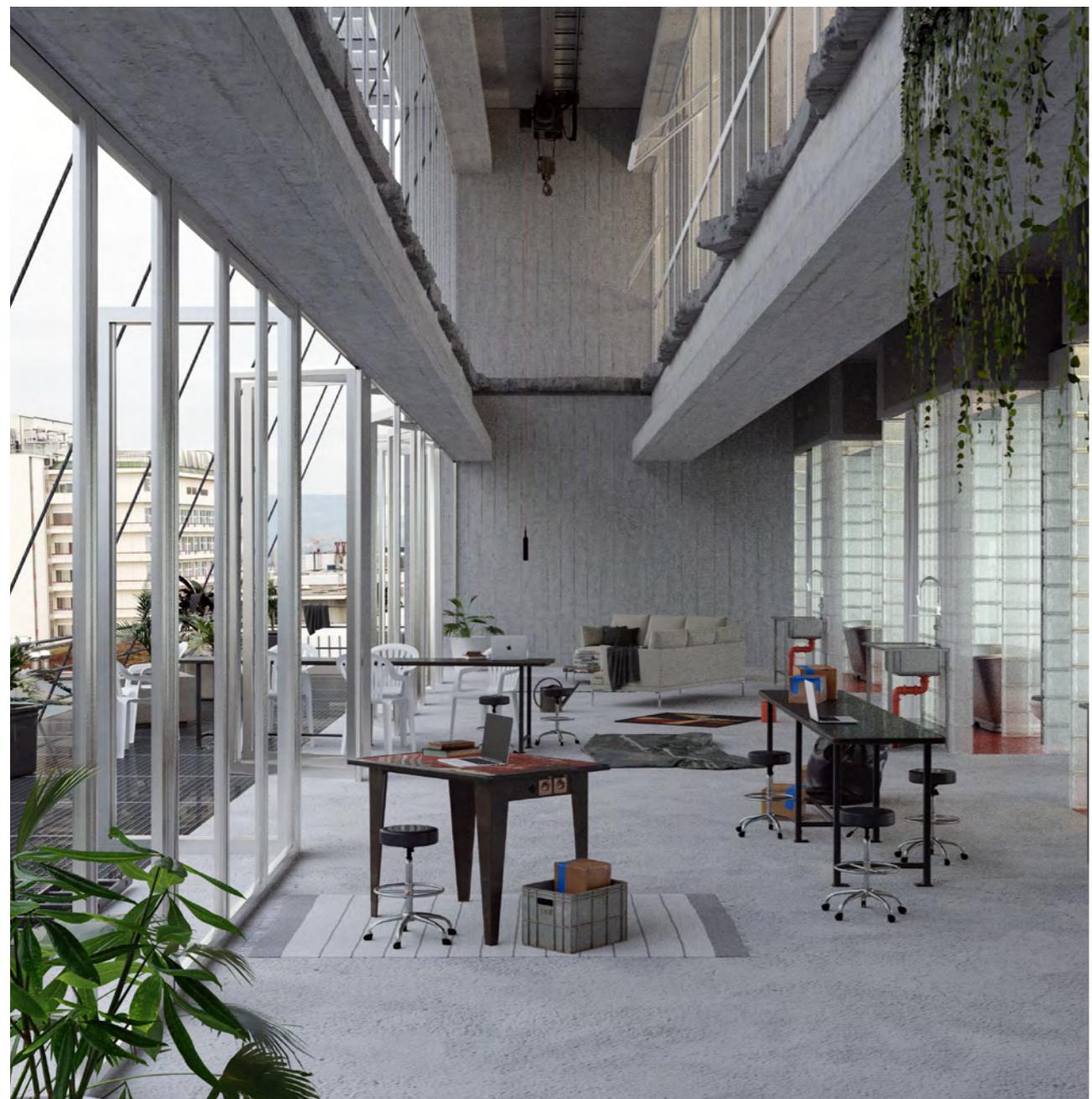
Communal kitchen.



Floor plan; communal kitchen and working spaces.



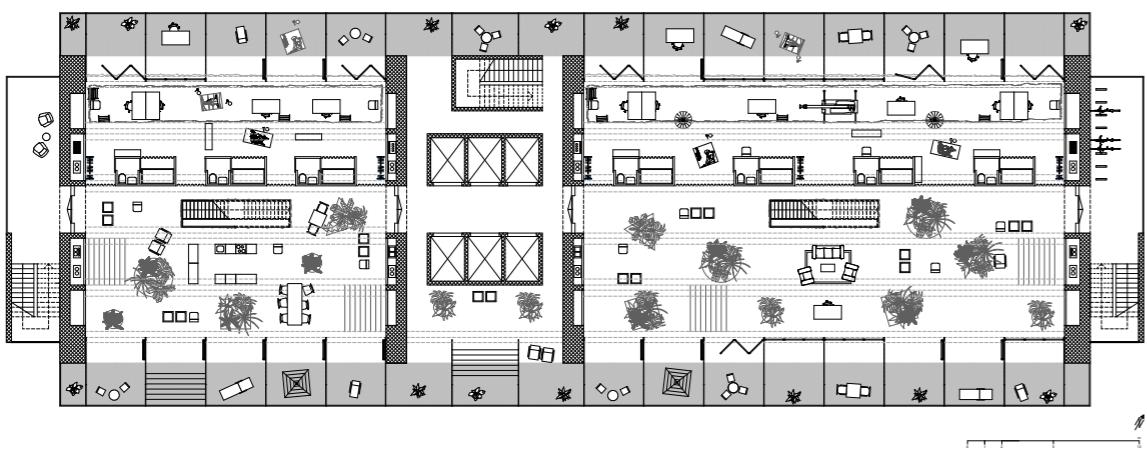
Laundry room.



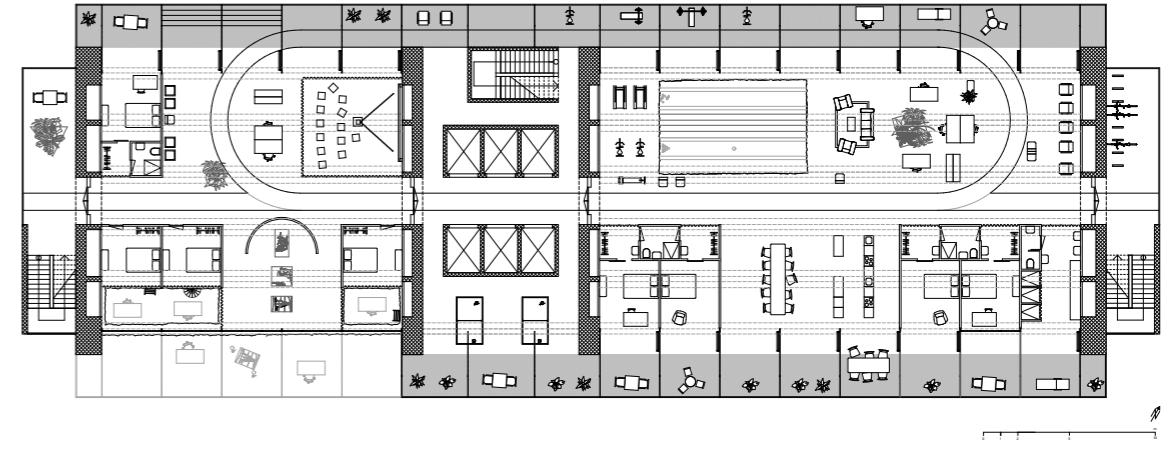
Atelier.



North facade.



Floor plan; semi-private atelier space with public laundry and sleeping cells in the top floor.



Floor plan; the system allows for maximum flexibility.

# HOTEL ON A HILLSIDE

*Is there a separation of nature and culture? How do we build in a comprehensive worldview in which humans are not a separate part of creation but an actor in a network?*

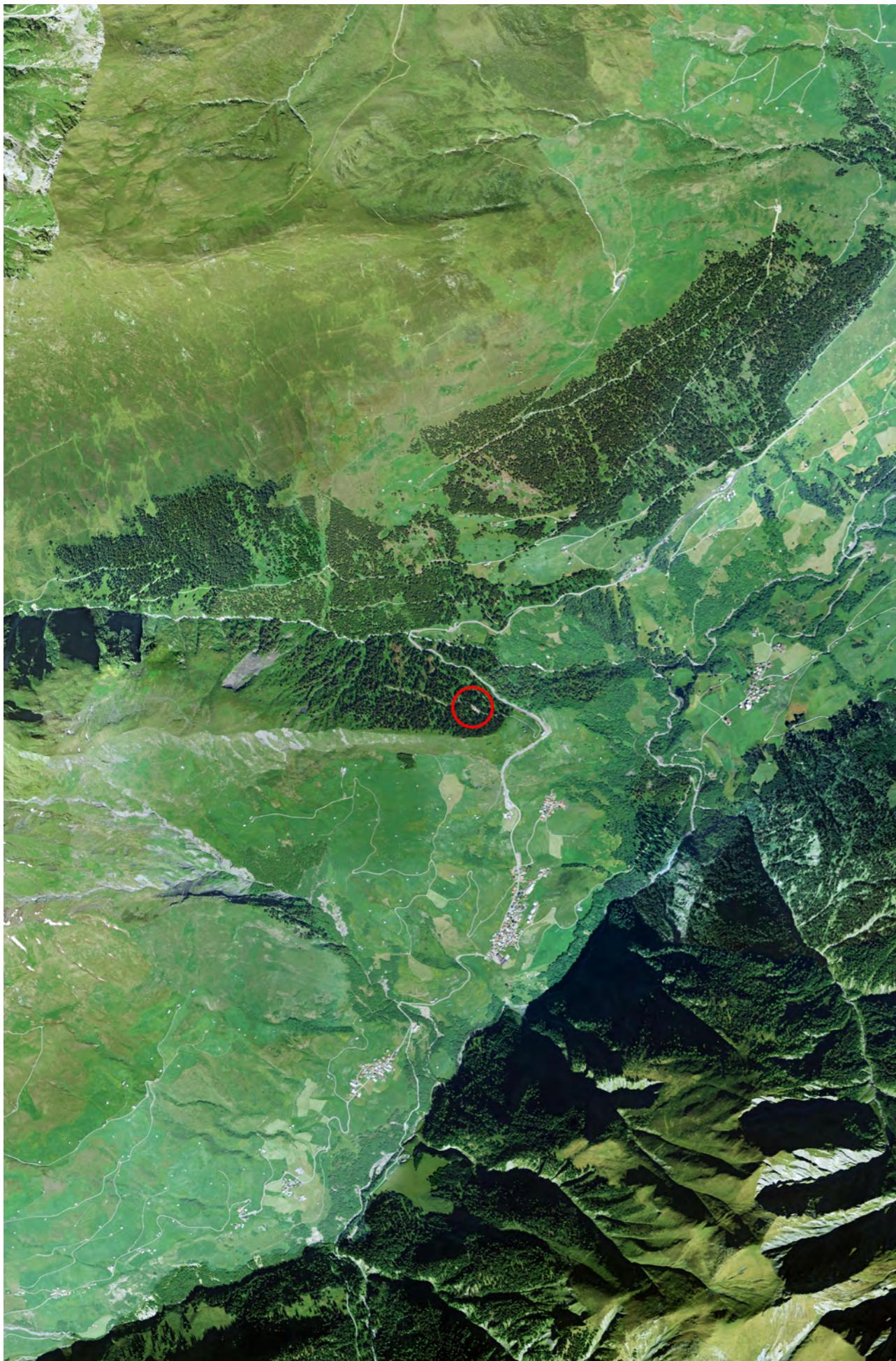
The history of the hotel industry in Graubünden is as an interesting example on how the concept of nature has undergone transformative changes over the last century. Initially, nature was seen as a wild frontier for adventurers and hotels catered to their needs. As tourism flourished, a deeper appreciation for nature's beauty emerged, influencing hotel design and experiences. Grand hotels integrated seamlessly with the surrounding landscapes, offering panoramic views and gardens. In the mid-20th century, nature shifted towards a recreational perspective, with hotels serving as gateways to skiing and outdoor activities. Today, sustainability is a key focus, with hotels providing authentic nature experiences and promoting responsible tourism. Graubünden's hotels have evolved into guardians of the region's natural heritage, ensuring future generations can cherish and engage with the surroundings.

**The goal is to create places that give people support and confidence. Culture is in some cases a complement or extension of nature, in other times a counterpart and a coping mechanism. A greater reconciliation of nature and culture cannot work as a matter of course. We do not live in nature and culture, but in concrete situations in specific places.**

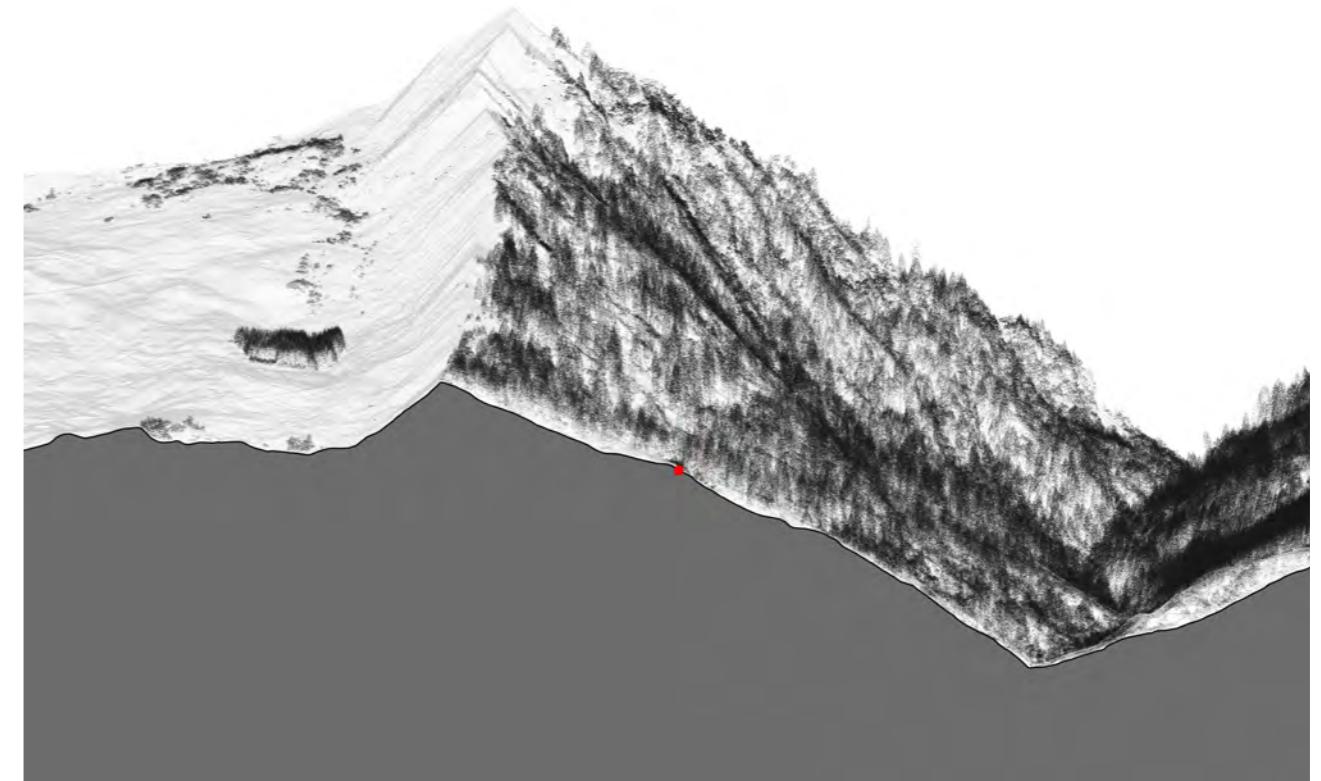
HS 22  
Studio Caminada  
ORTE SCHAFFEN XXIVV  
*Hotel on a Hillside*  
Individual work  
Leart Sejdiu



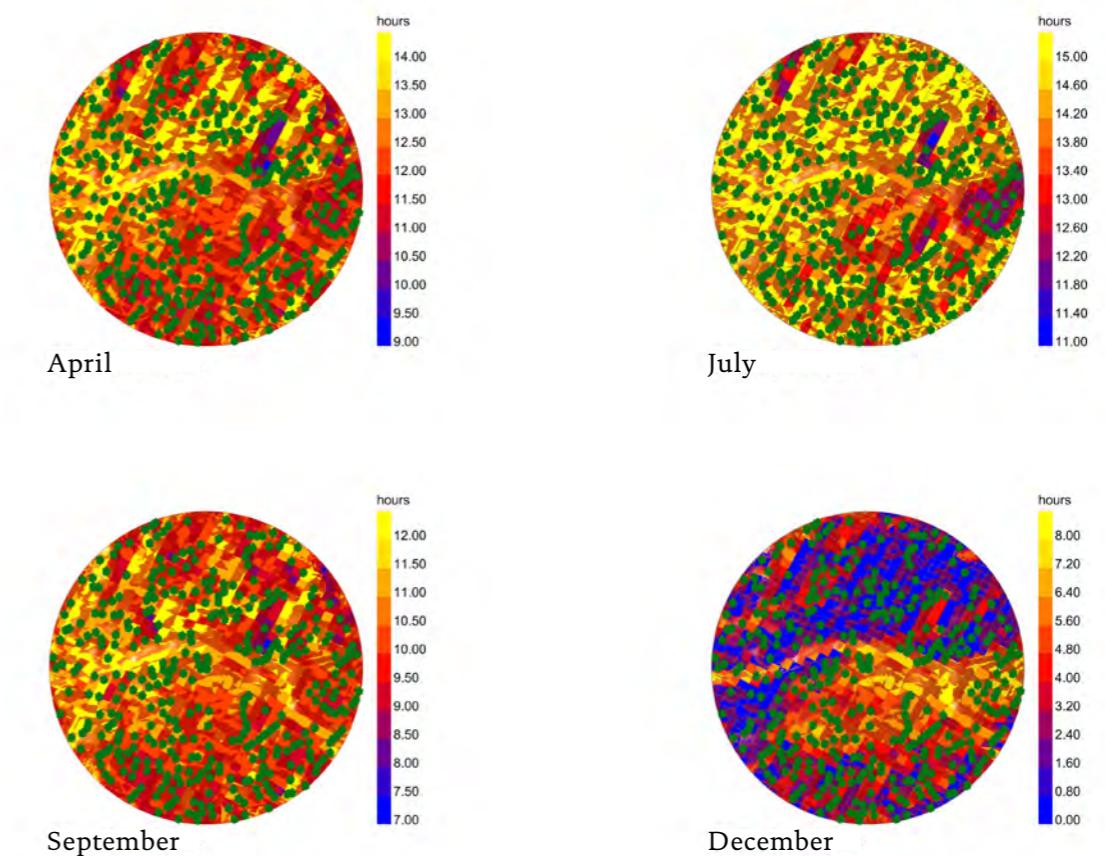
Site in Vrin, GR (46°39'53"N 9°05'47"E).



Orthographic image; Site in Vrin, GR.



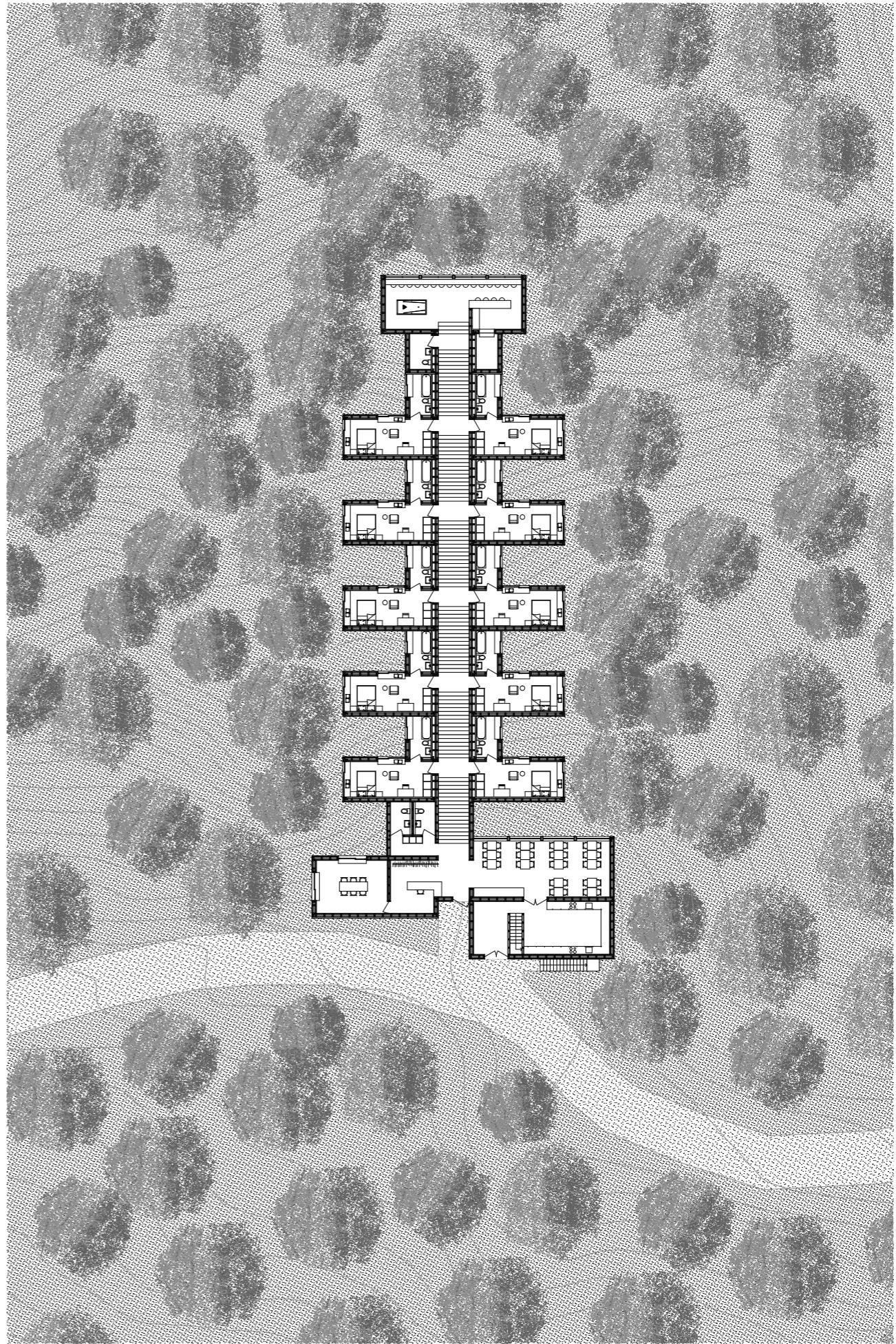
Pointcloud; Section through the valley.



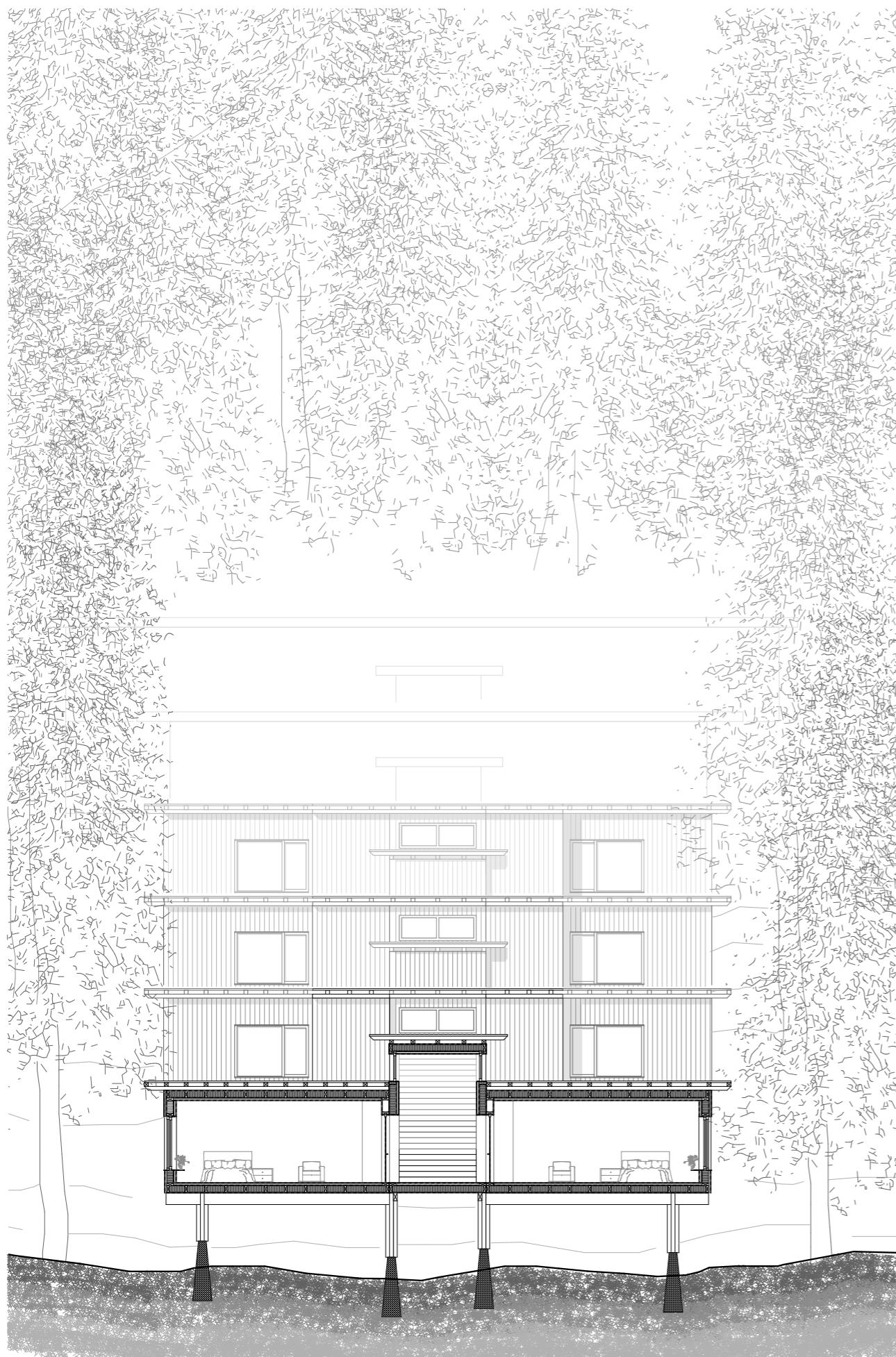
Diagram; Ladybug direct sun hours analysis in Grasshopper.



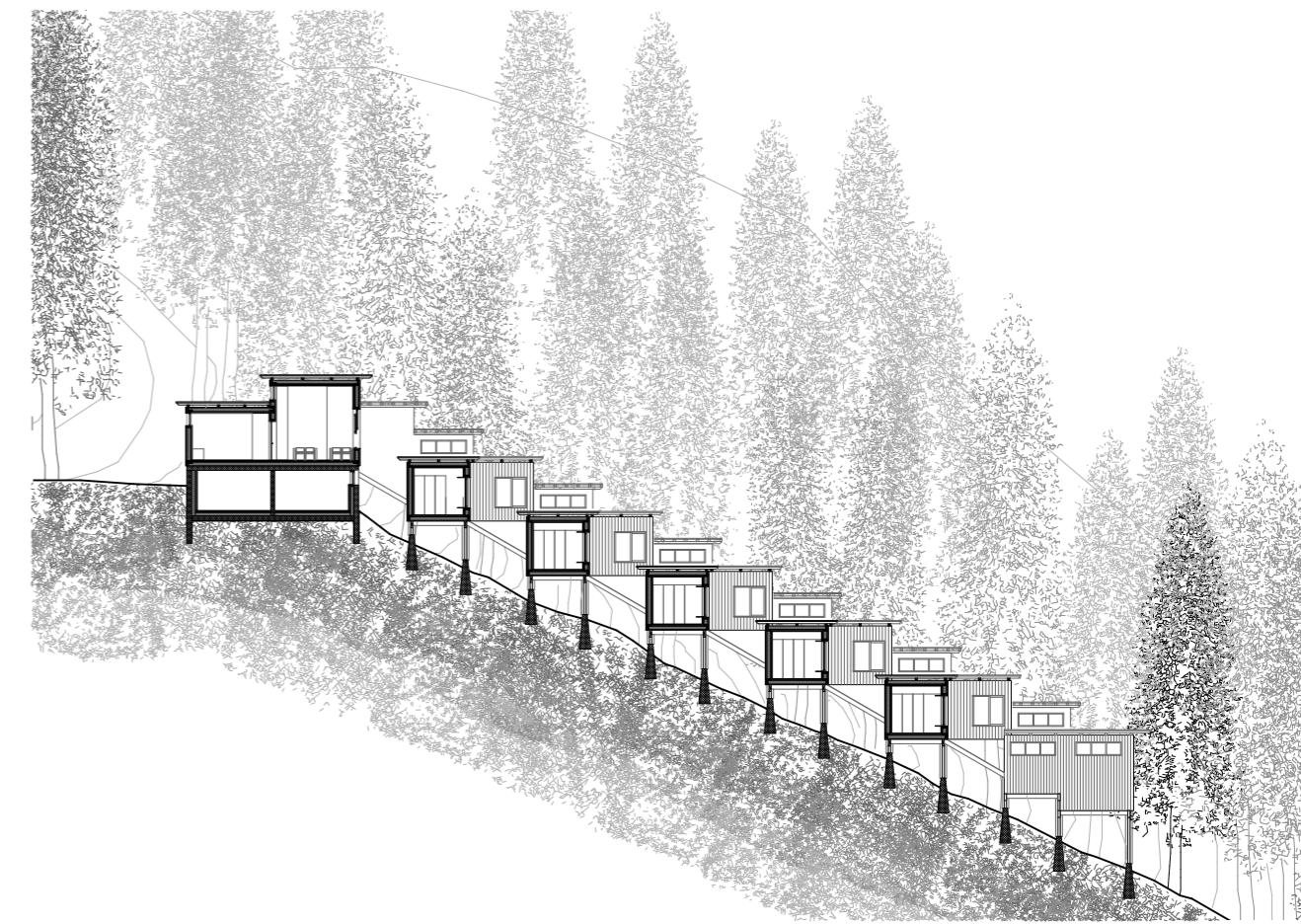
Clay model; "Ideenmodell".



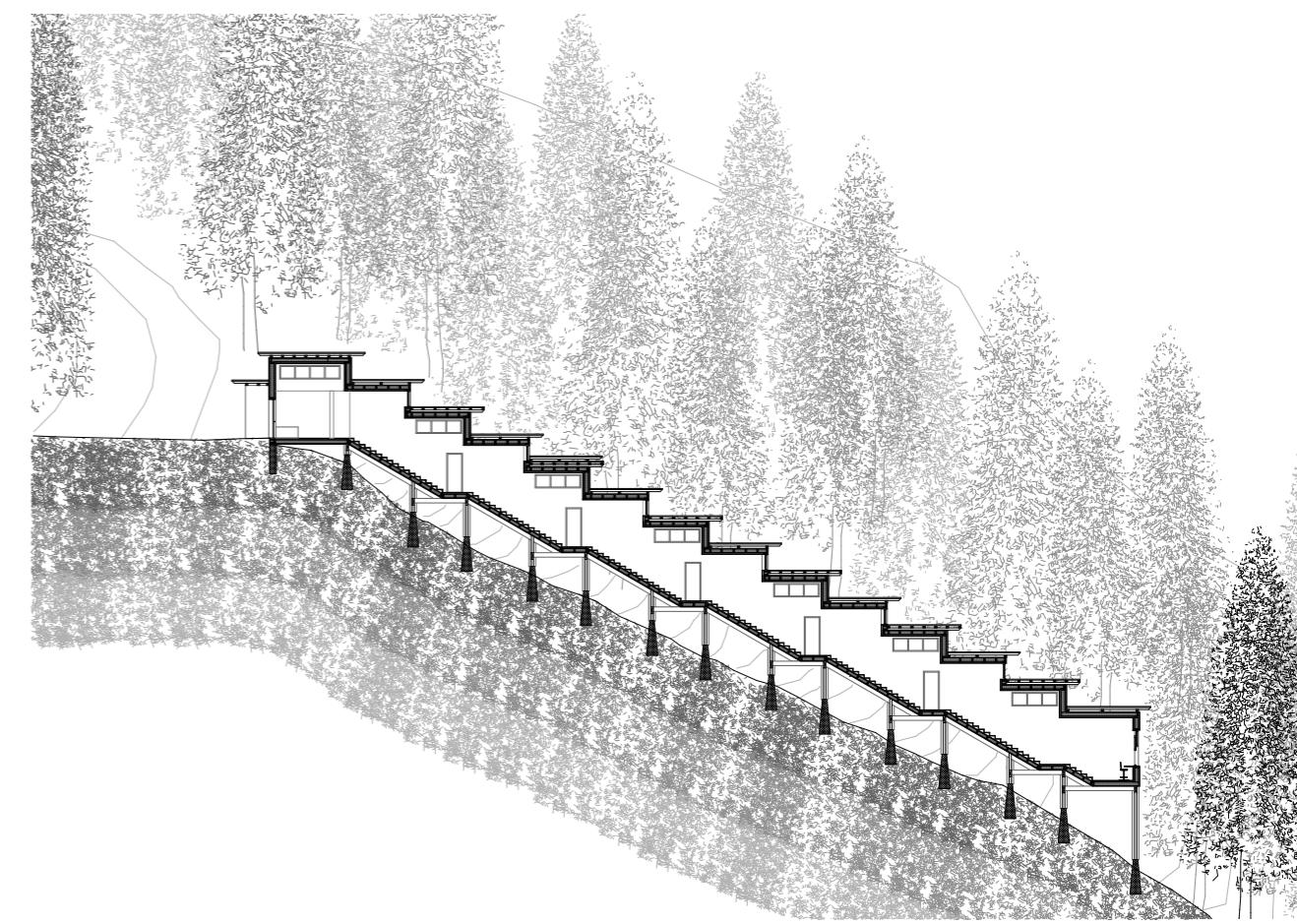
Floor plan; The dimensions of the volume are oriented on the existing clearing.



Section.



Section; Restaurant and hotel rooms.



Section; Stair hall.



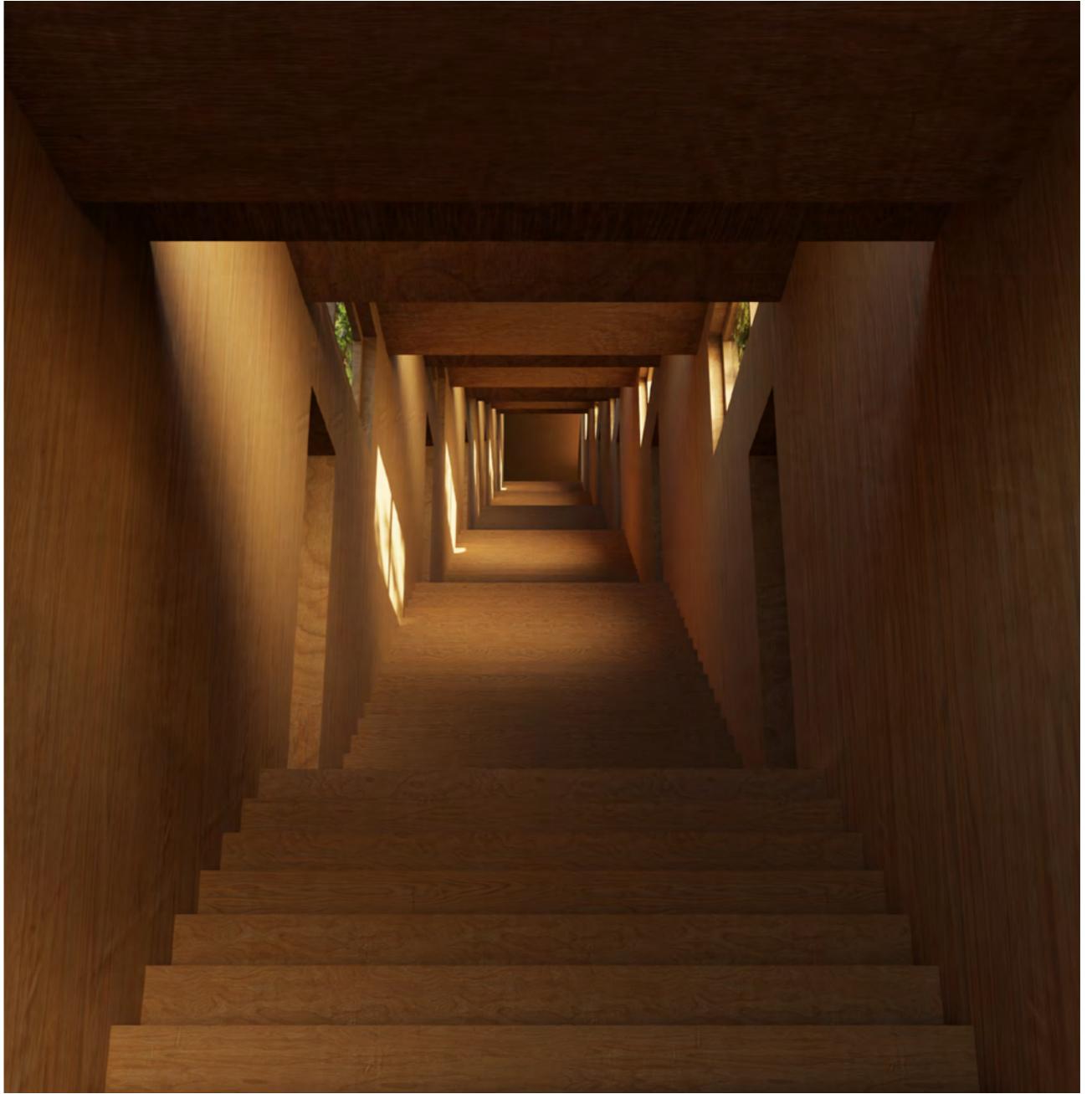
View from the forest.



View from the hotel room.



View downstairs.



View upstairs.

# INTERWEAVING

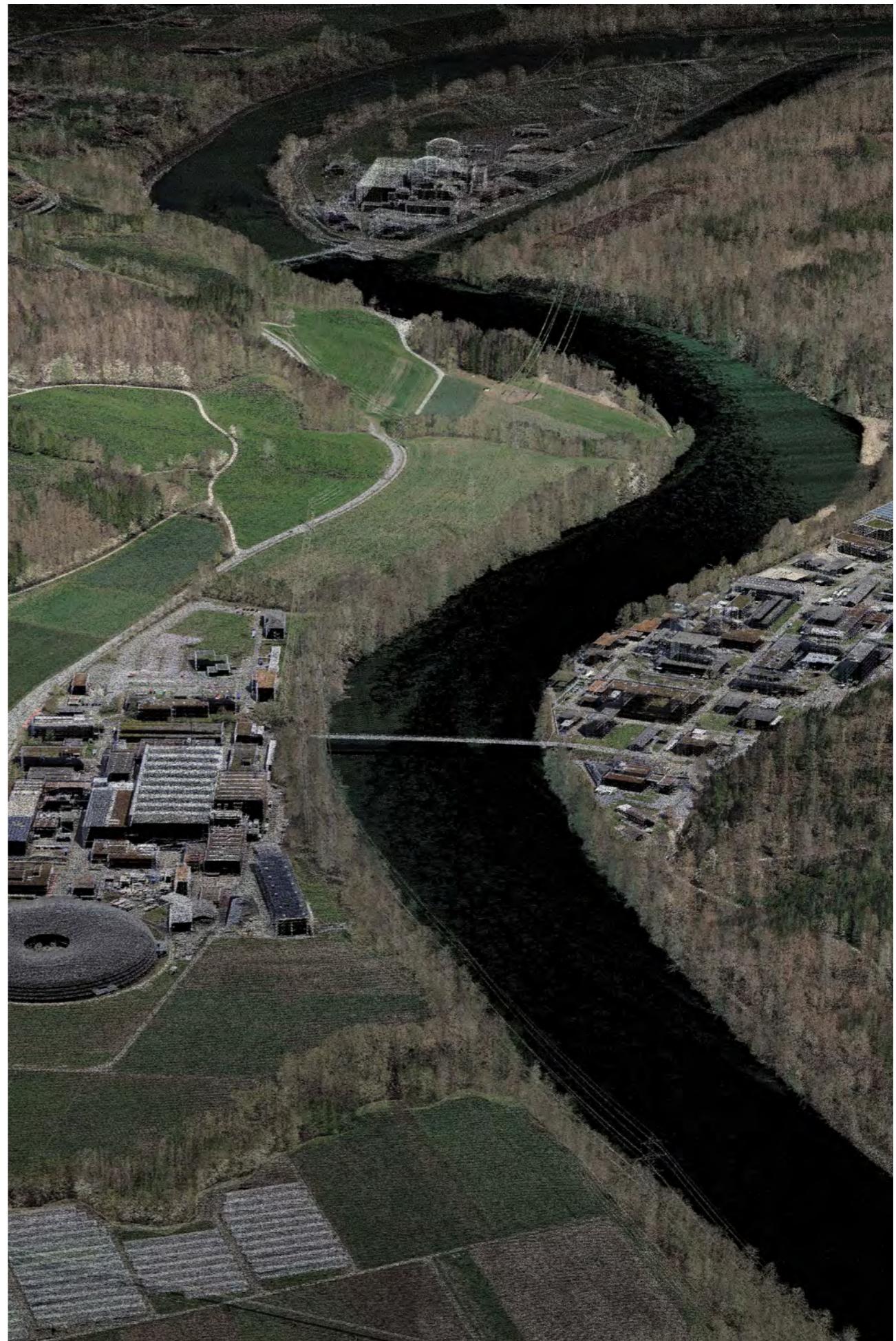
The Paul Scherrer Institute, often referred to as Switzerland's "Silicon Valley," has earned a global recognition as a prominent hub of innovation. What strategies can be implemented to efficiently accommodate a projected influx of 3000 coworkers in their expansion plans for 2035?

Nestled amidst picturesque fields and forests, the preeminent nuclear research facility in Switzerland is situated within an exceptional landscape between Villigen and Würenlingen, spanning both sides of the tranquil river Aare. This location also boasts the presence of the Jurapark Aargau, an esteemed regional nature park of significant national significance, which neighbors PSI West.

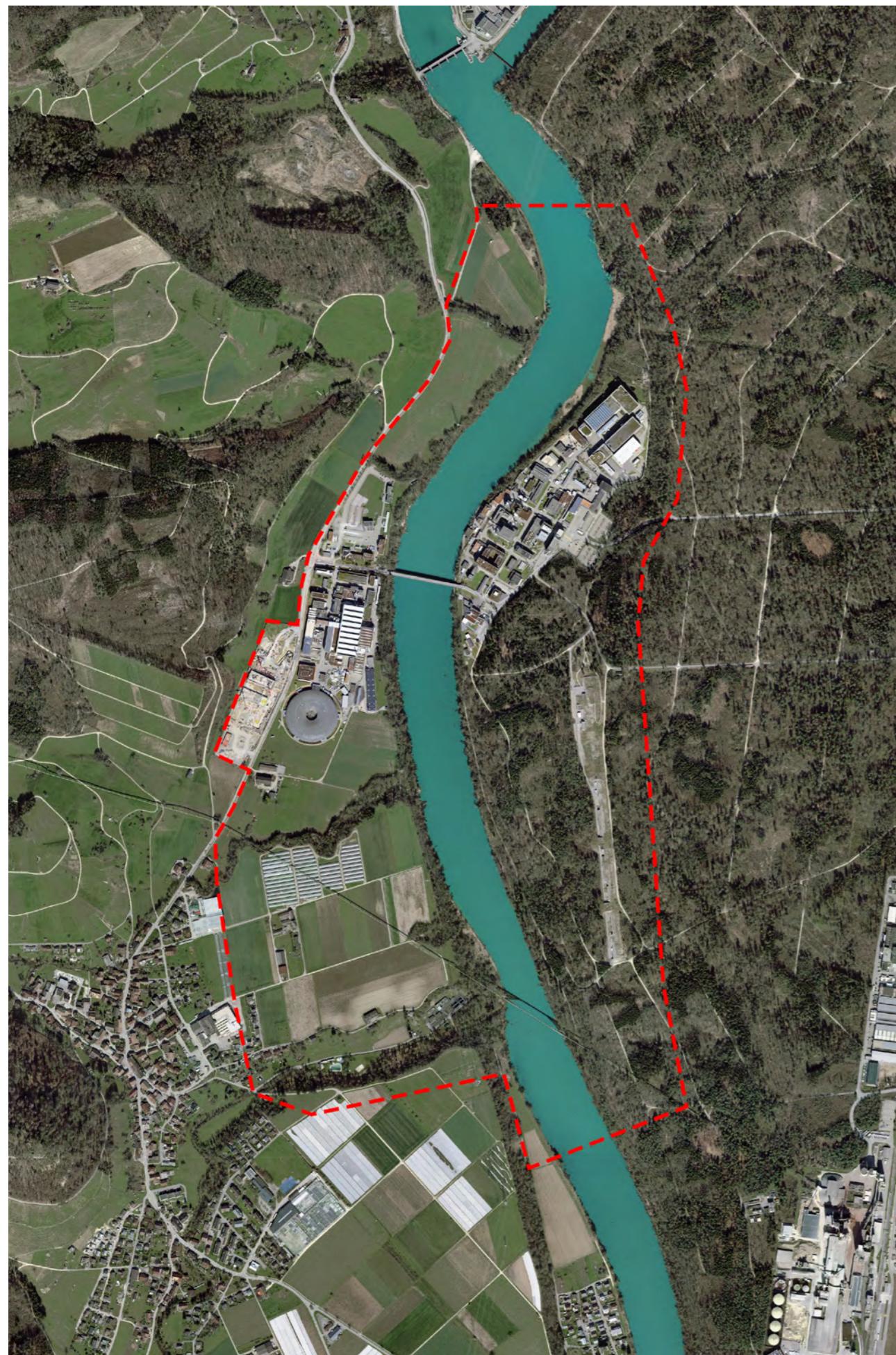
However, the PSI campus is separated from its surroundings by a security fence, resulting in haphazard urbanization and neglect of public spaces. In anticipation of the future expansion of the campus the aim is to integrate the principles of urban design and large-scale landscape architecture with contemporary concepts of open spaces and gardening. This endeavor seeks to restructure and enhance the spatial qualities along the river. Throughout the process, the existing landscape is aimed to be augmented through innovative and conceptual topographic approaches, resulting in a vibrant and sustainable riverfront space.

Dynamic river processes are employed as a design tool to reintegrate a campus with its surrounding environment. By embracing the natural flow and characteristics of the river, the campus can harmoniously merge with its surroundings. Utilizing dynamic river processes allows for the restoration of natural habitats and the creation of diverse ecosystems along the riverbanks. This approach not only enhances the aesthetic appeal of the campus but also fosters ecological sustainability. By incorporating elements such as groynes, controlled erosion/sedimentation and riparian vegetation, the campus becomes an integral part of the riverine ecosystem, promoting biodiversity and reconnecting with the landscape.

FS 22  
Studio Girot  
Atom Heart River  
Interweaving  
Group work  
Leart Sejdiu, Lukas Schütz, Shota Shiratori



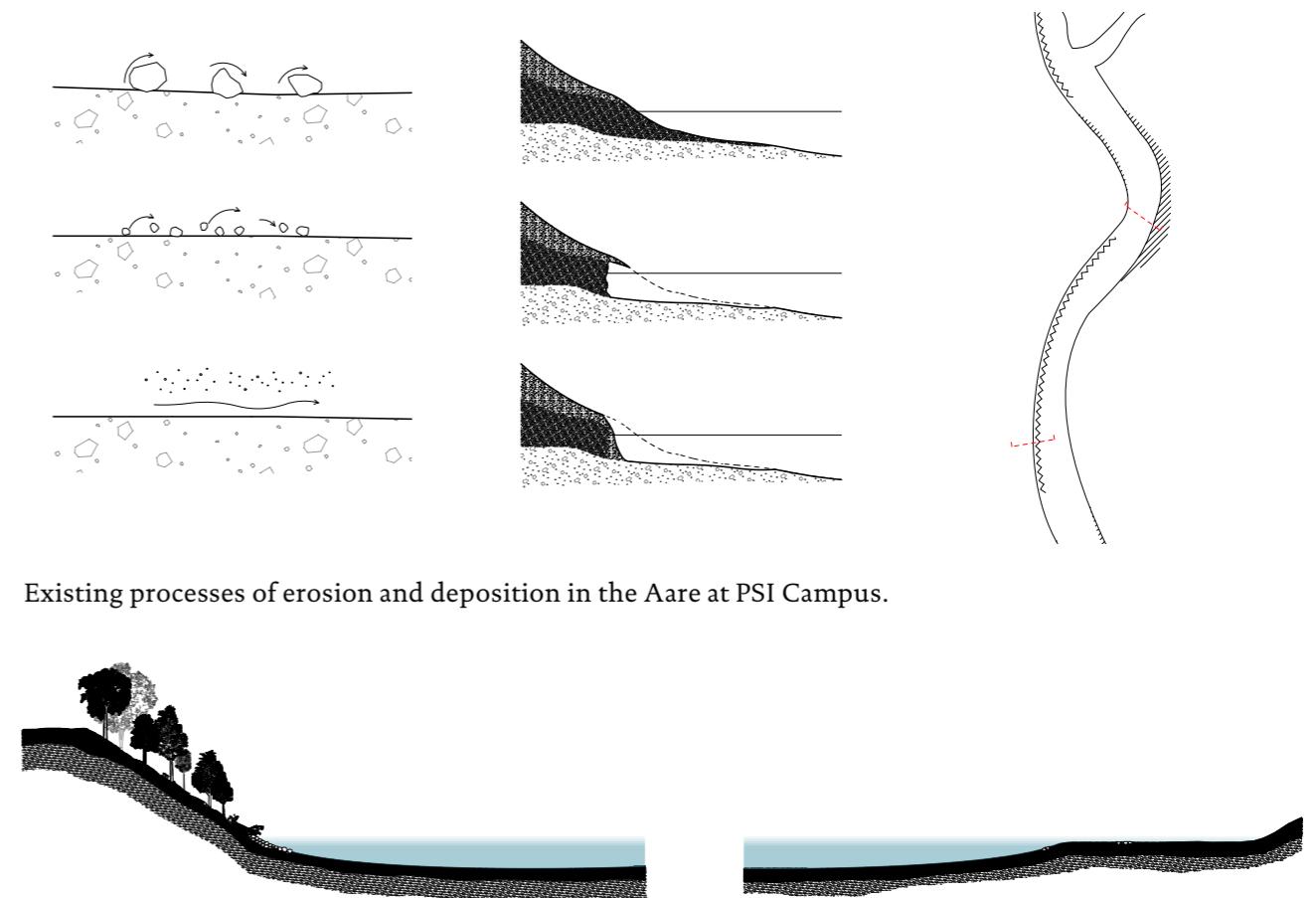
Pointcloud; PSI Campus.



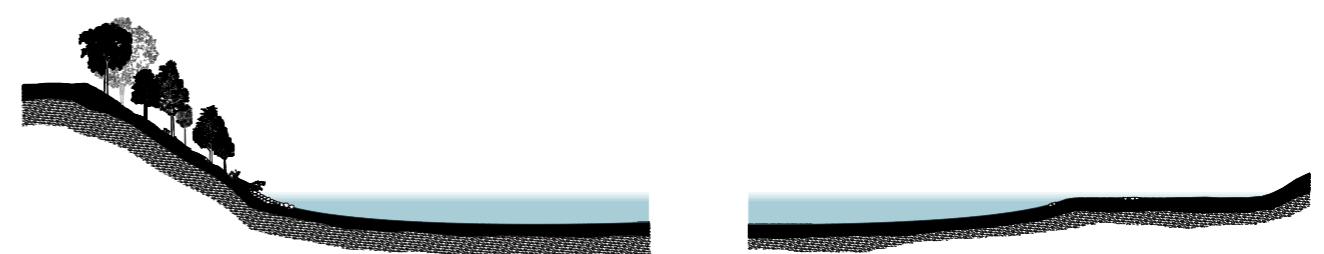
Orthographic image; Design perimeter PSI Campus.



Aerial image; PSI Campus in 1969.



Existing processes of erosion and deposition in the Aare at PSI Campus.



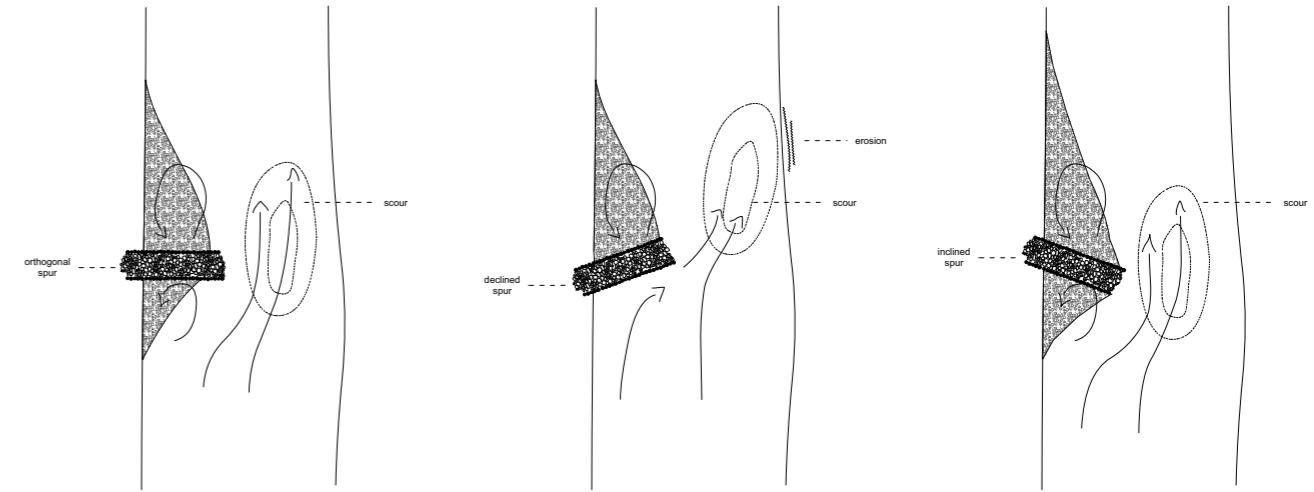
Section existing condition.



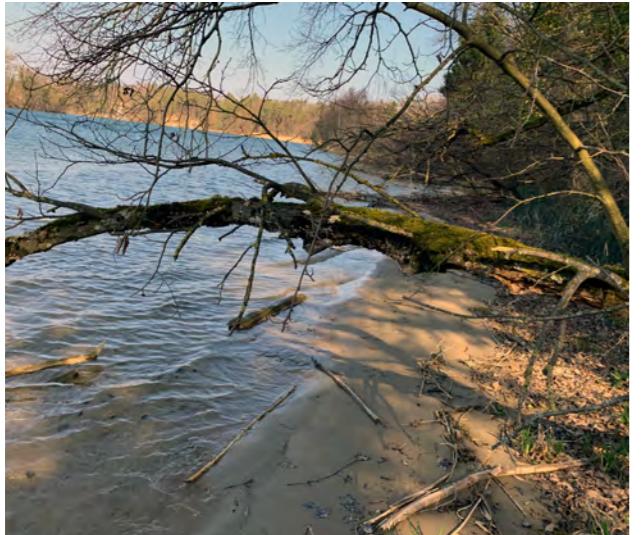
Artificial Borders



Natural Borders



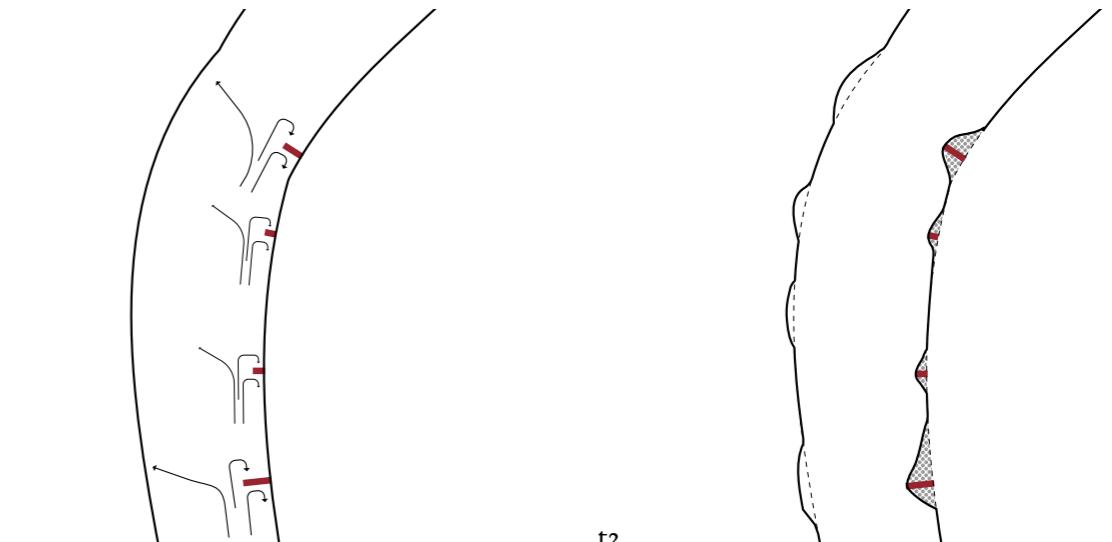
Controlled erosion and sedimentation.



Sedimentation



Erosion



t<sub>1</sub>  
Placing spurs.

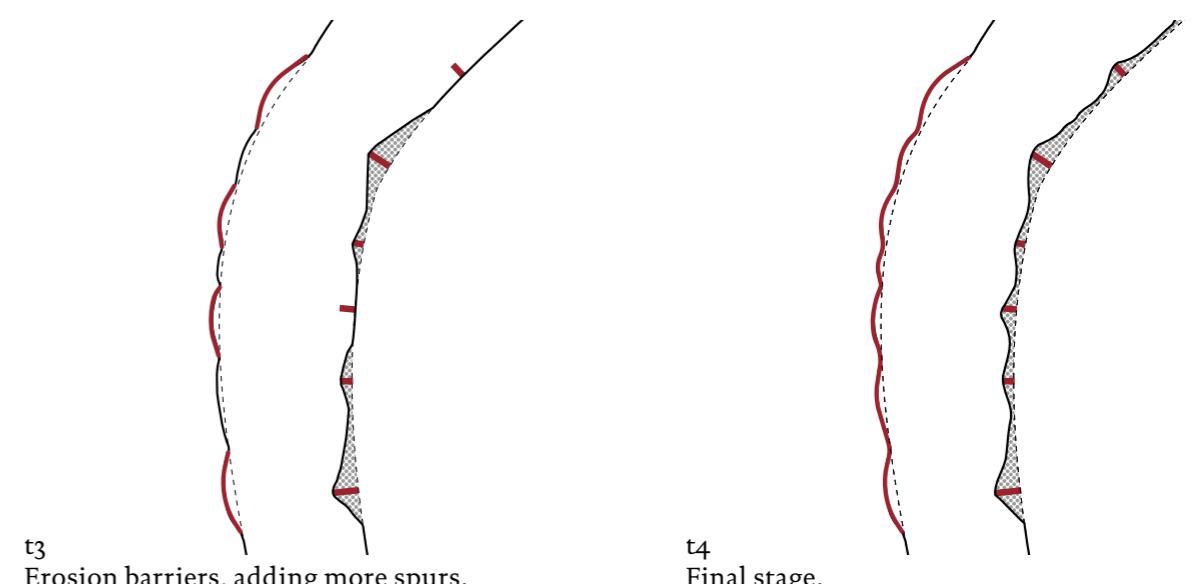
t<sub>2</sub>  
Sedimentation and erosion process.



Informality



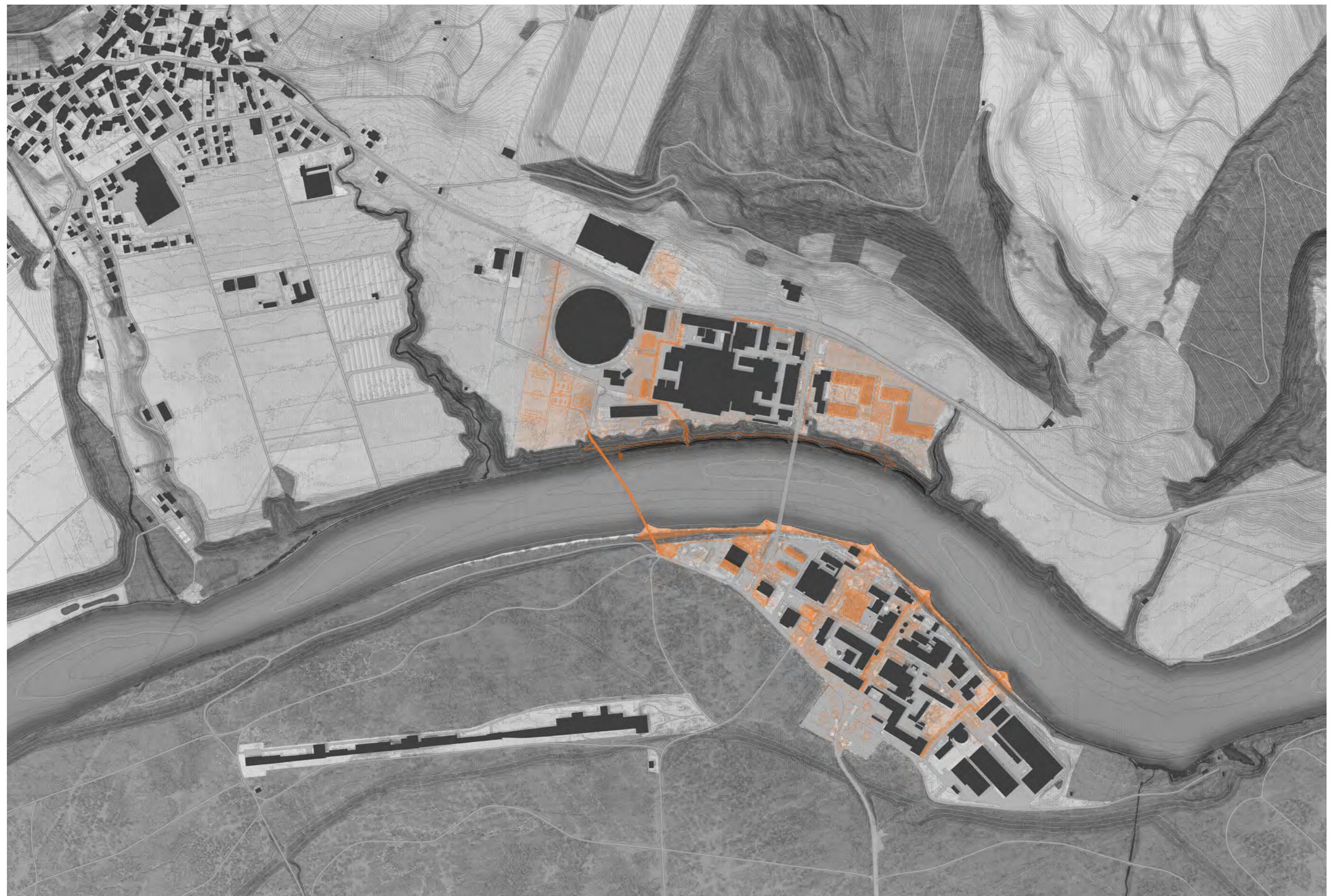
Identity



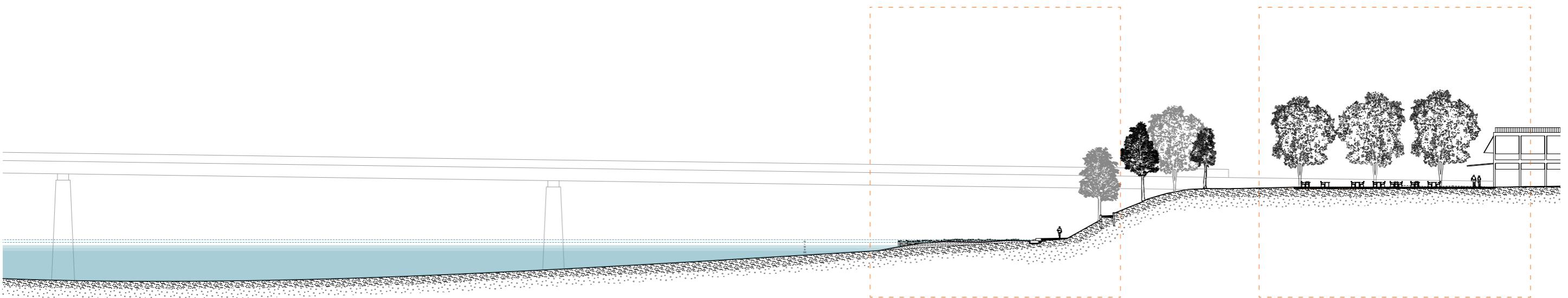
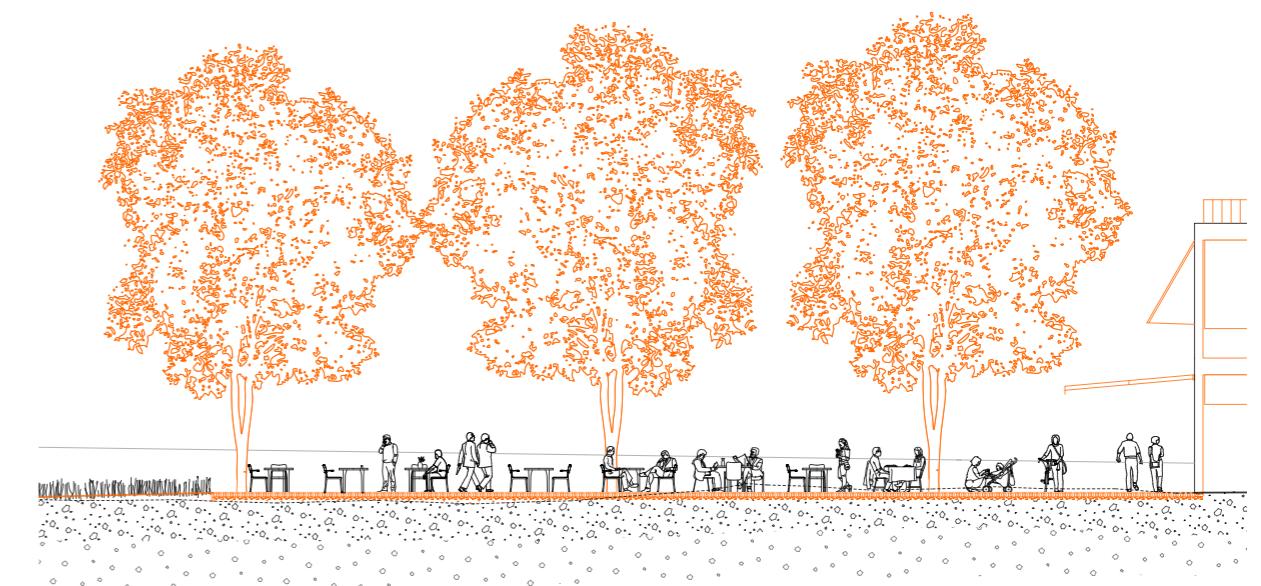
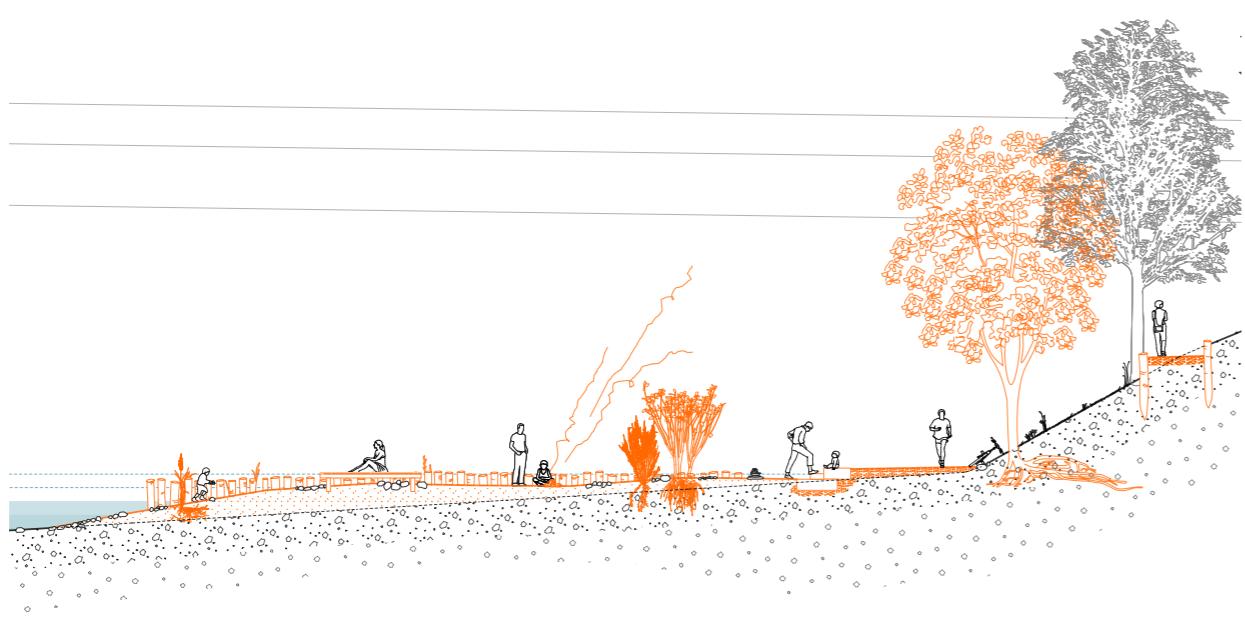
t<sub>3</sub>  
Erosion barriers, adding more spurs.

t<sub>4</sub>  
Final stage.

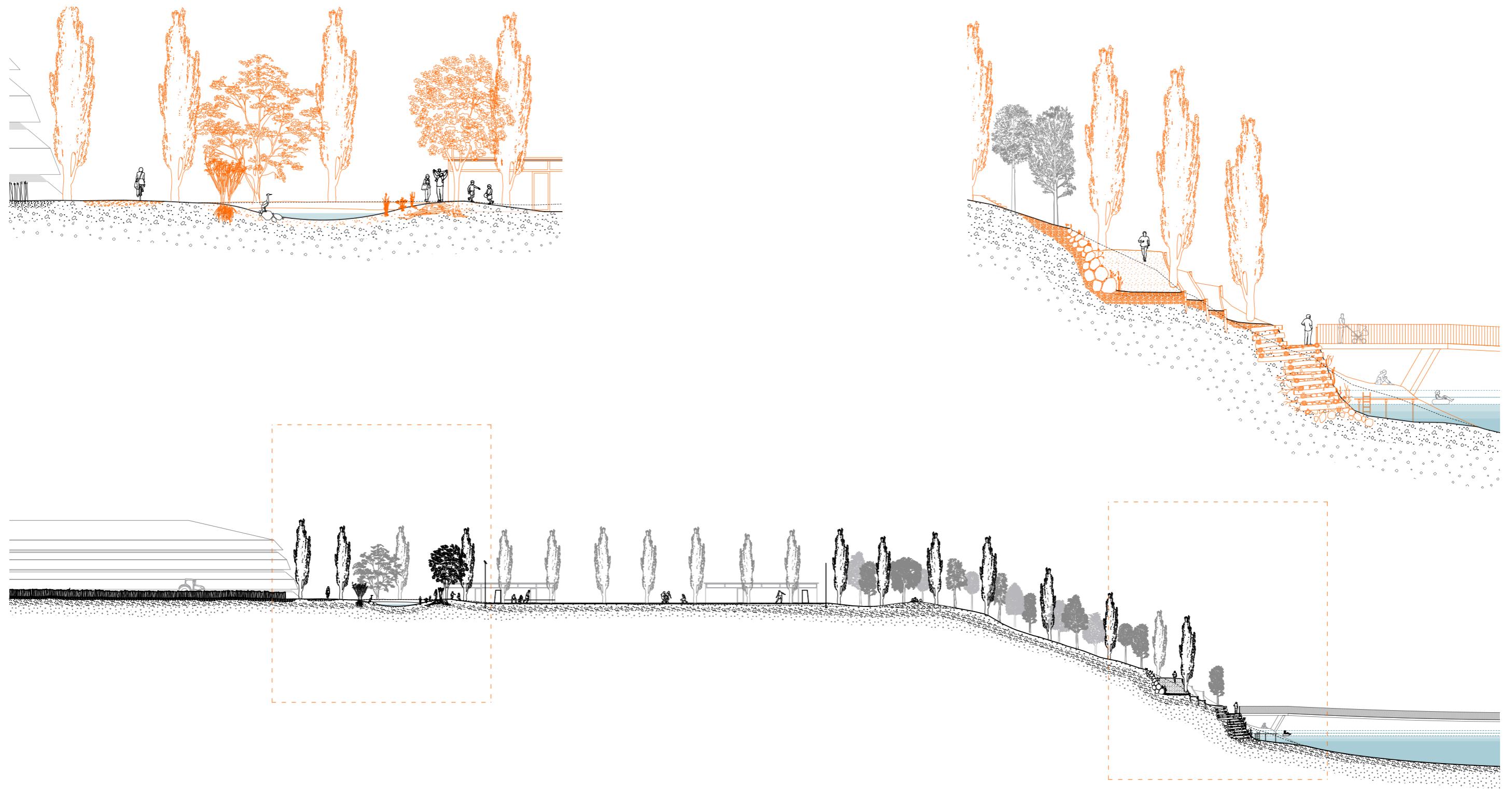
Designing with dynamic river processes in time.



Construction plan.



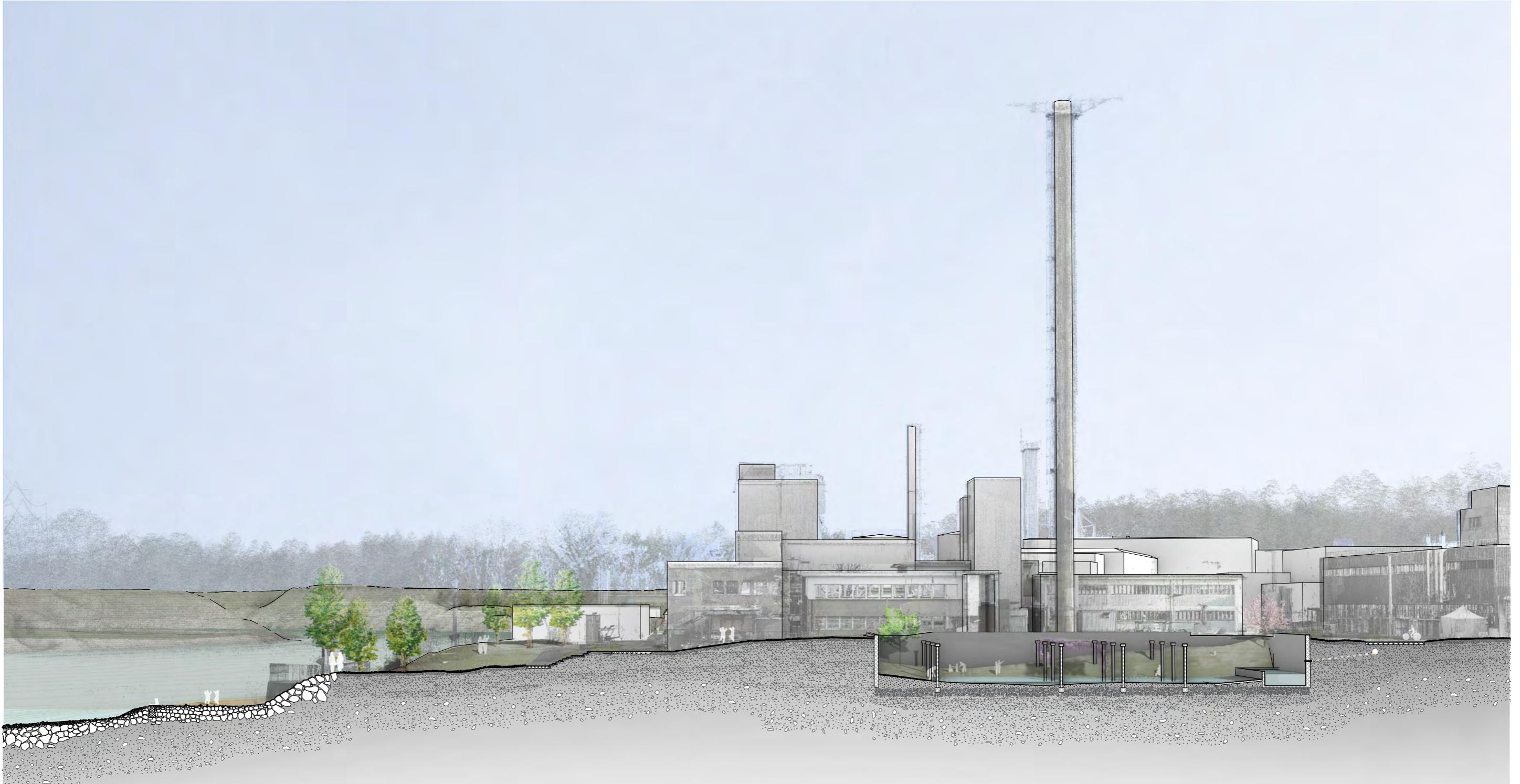
Section; Mensa on PSI West.



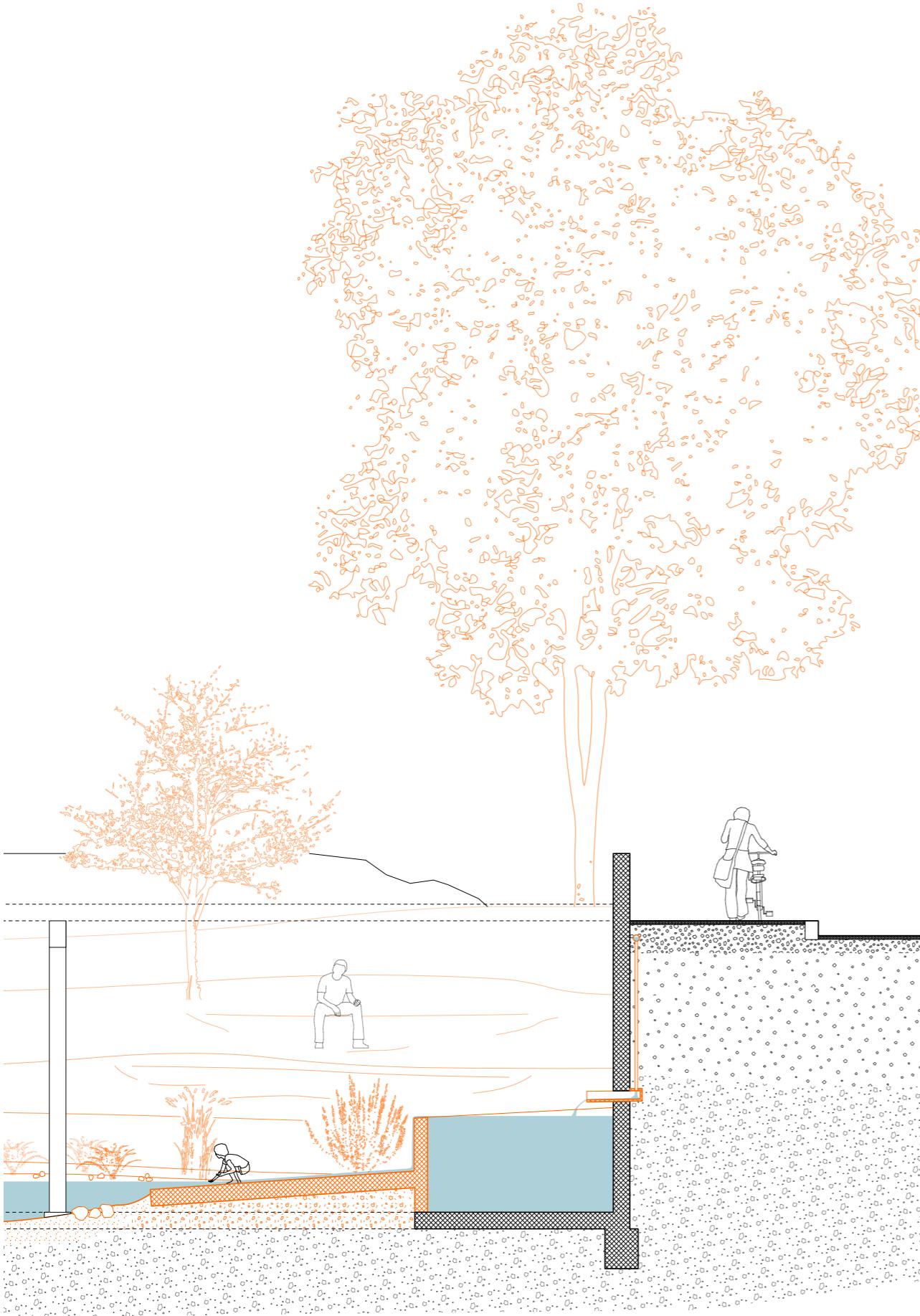
Section; Erosion barriers on PSI West and new pedestrian bridge.



Focus plan; Path from trough the Campus connecting River and Forest.



Section perspective.



Sunken Garden; Cooling water, needed for the reactors, fills the garden. There it can cool down before it enters the Aare.



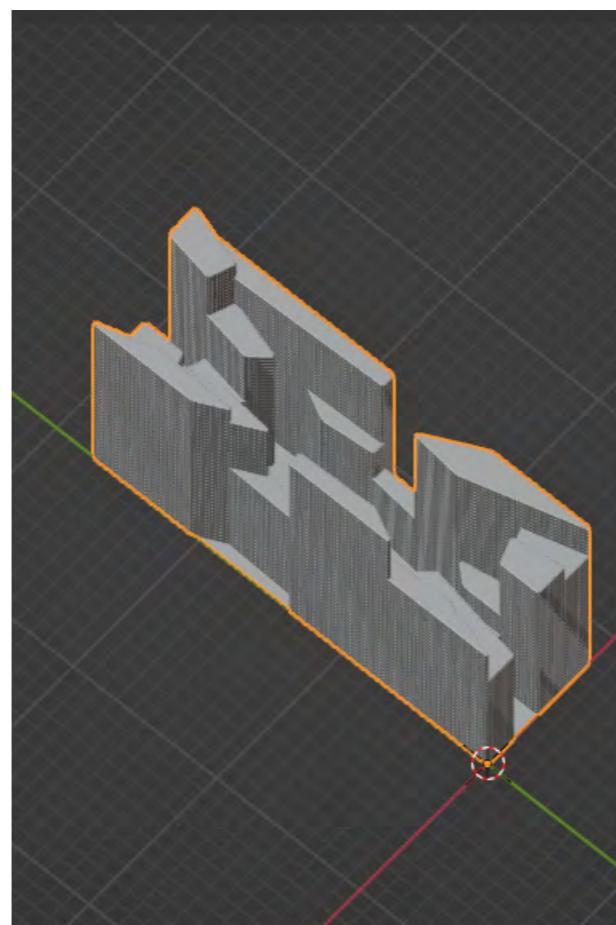
Entrance from the forest; Walls from demolished buildings create horti conclusi.



Sunken Garden; Basement level of demolished building as a garden.

# DESIGNING WITH CODE

Designing with code has transformed architecture. Through coding languages and algorithms, it is possible to generate intricate forms, optimize structures, and analyze environmental factors accurately. Parametric and generative design processes allow for iterative refinement and customization.



FS 22  
Prof. Benjamin Dillenburger  
Advanced Computational Design  
Individual Work  
Leart Sejdiu

```
import sys
#change this path to point to where your local mola folder is saved
#for windows users switch "\" to "/"
dir = "G:\LEART\ETH\TRASH\FS22\ADVANCED COMPUTATIONAL DESIGN\X\DI"
if not dir in sys.path:
    sys.path.append(dir)

import mola
import mola.module_blender
import math
import random

def block_to_plot(my_mesh):
    #step 1
    newMesh = mola.Mesh()
    for f in my_mesh.faces:
        newFaces = mola.subdivide_face_extrude_tapered(f, 0.0, 0.75,
                                                       newMesh.faces.extend(newFaces))
    my_mesh = newMesh

    my_mesh.update_topology()
    my_mesh = mola.subdivide_mesh_catmull(my_mesh)

    #step 2
    for f in my_mesh.faces:
        f.group = "plot"

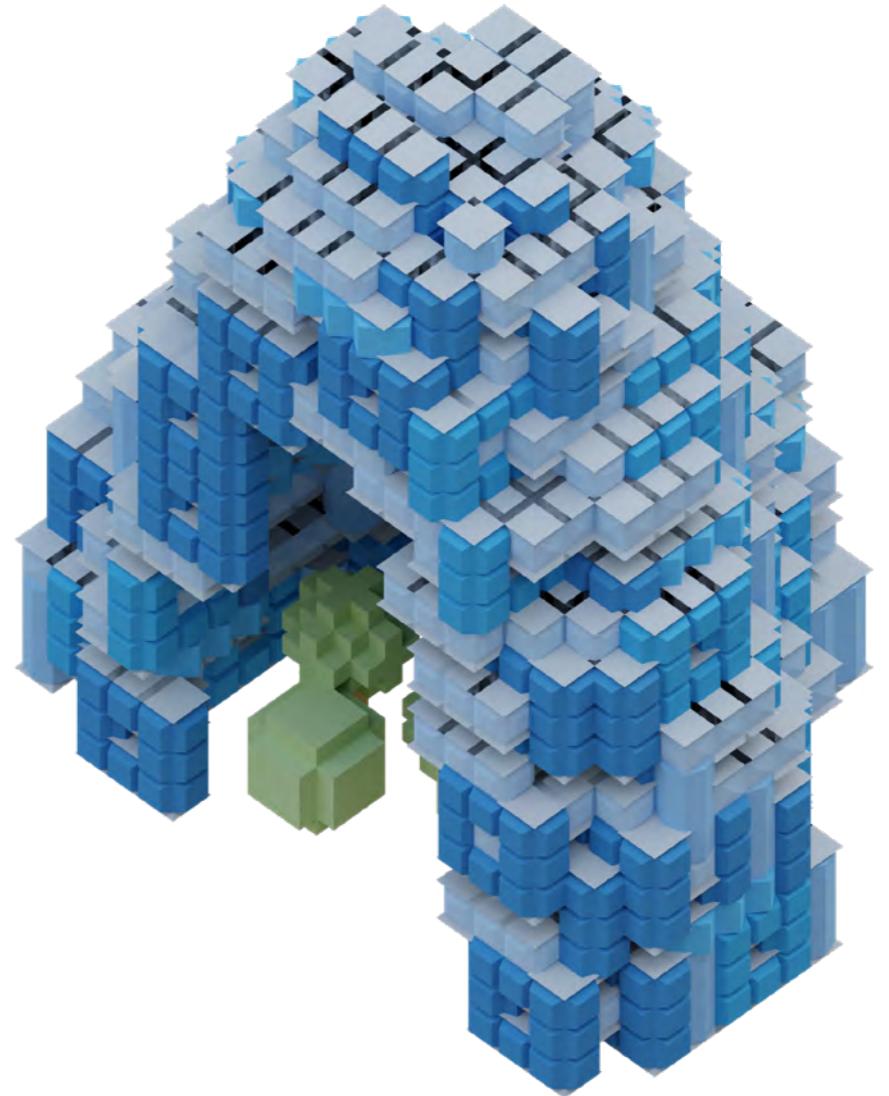
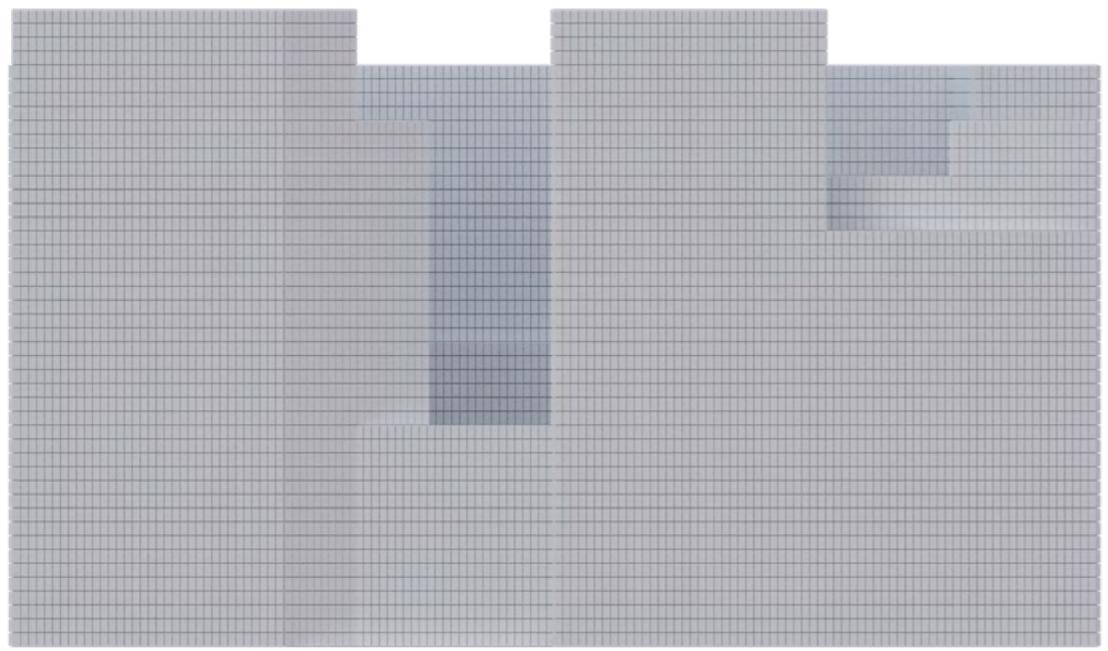
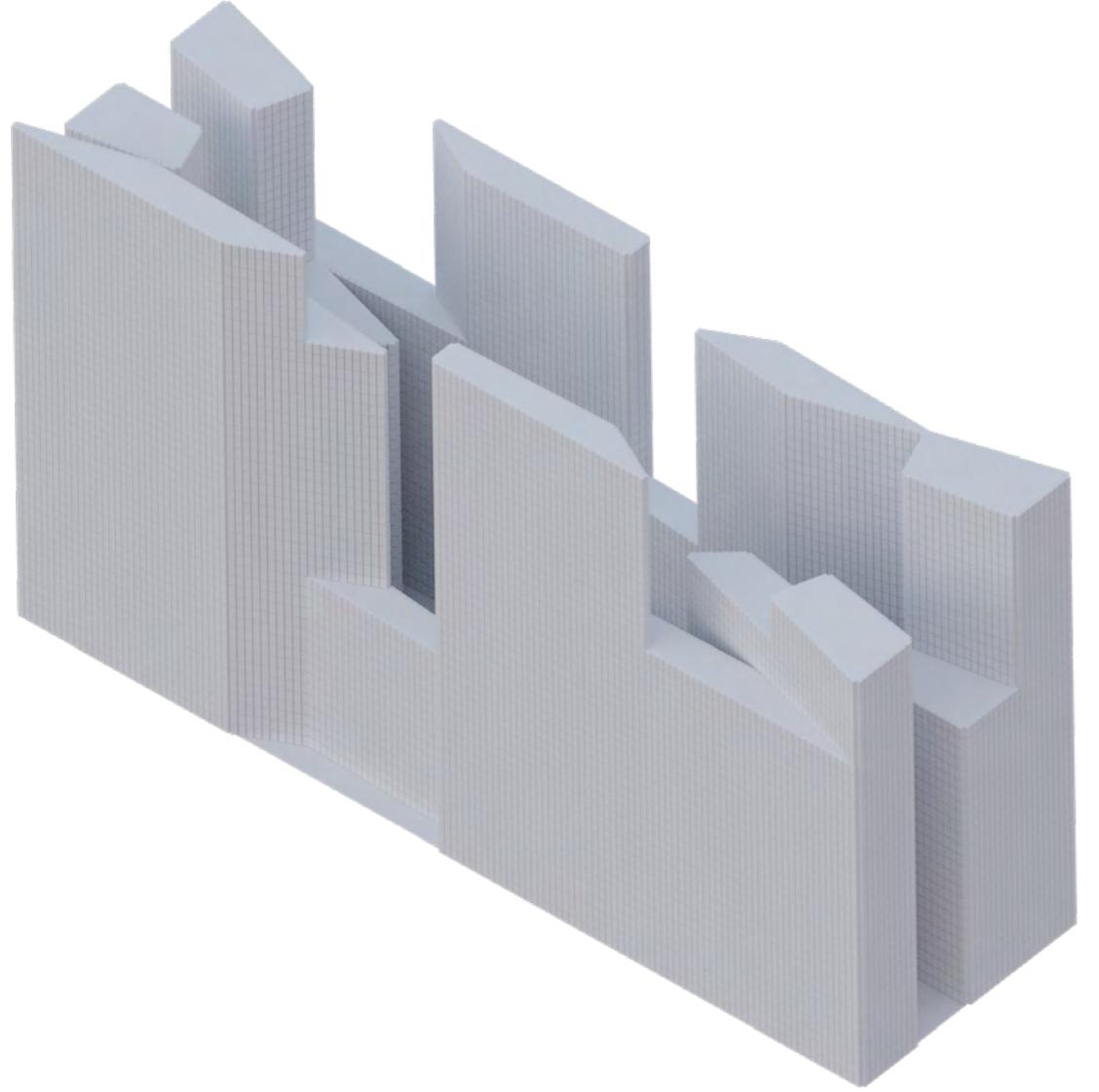
    return my_mesh

def plot_to_footprint(my_mesh):
    newMesh = mola.Mesh()

    for f in my_mesh.faces:
        if f.group == "plot":
            newFaces = mola.subdivide_face_split_offset(f, 2)
            newFaces = mola.subdivide_face_split_grid(f, 2, 2)
            for nf in newFaces[:-1]:
                nf.group = "construction"
                nf.color = (1, 0, 0, 1)
            newFaces[-1].group = "circulation"
            newFaces[-1].color = (0.5, 0, 1, 1)
            newMesh.faces.extend(newFaces)

        else:
            newMesh.faces.append(f)
```

Scripting with Python; based on subdivision rules and random parameters.



Rule based design; City block.

Voxel based design; building.

# DESIGNING WITH VR

VR and point clouds have transformed the field of architecture. VR immerses users in virtual environments, offering a realistic experience of unbuilt spaces. Point clouds, generated through scanning or photogrammetry, capture precise existing conditions. Integrating point cloud data seamlessly incorporates context into designs. This combination enhances design refinement and construction processes, leading to informed and successful solutions.

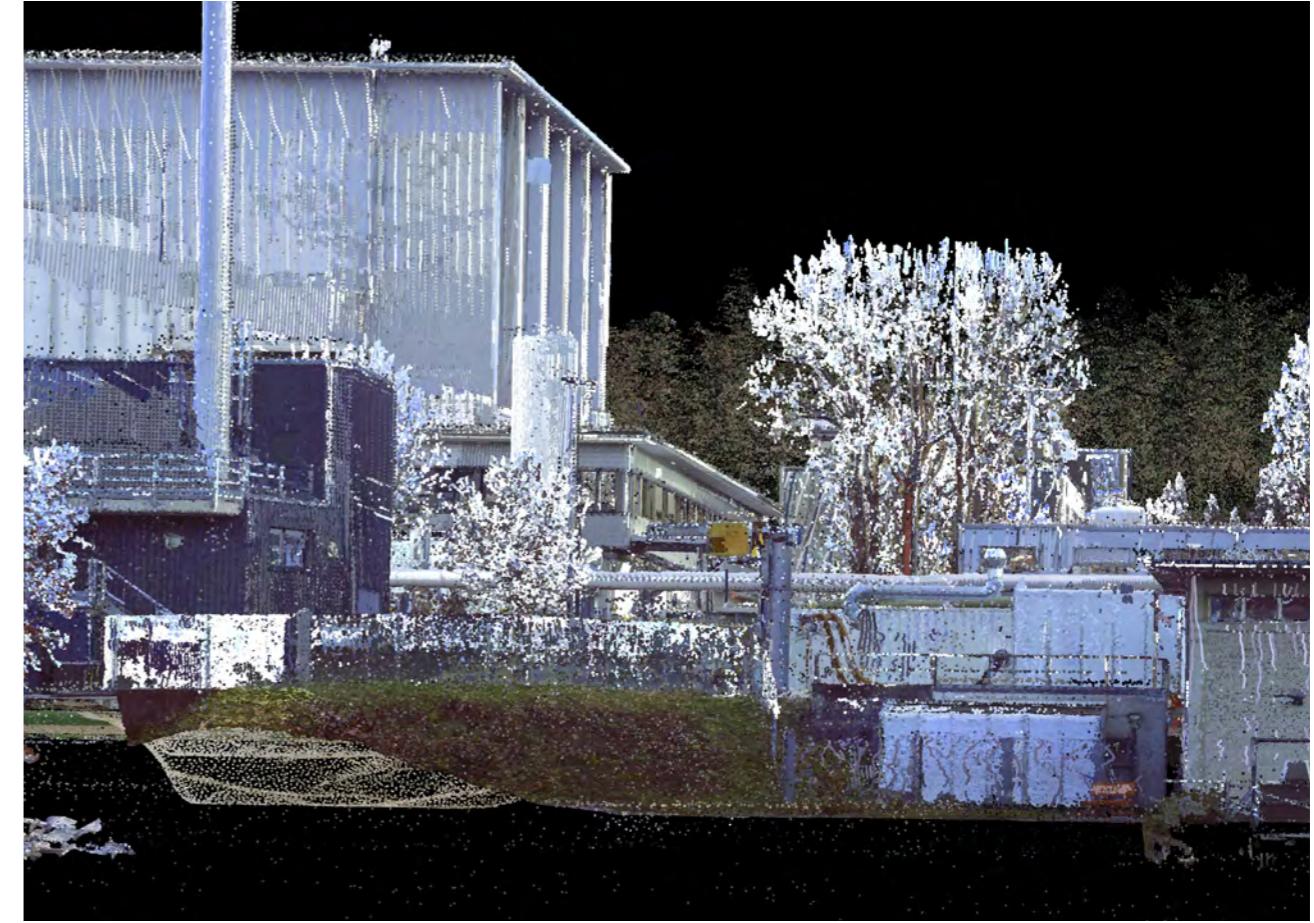
FS 22  
Prof. Christophe Griot  
Focus Work  
Designing with Pointclouds in VR  
Group Work  
Leart Sejdiu, Shota Shiratori



Pointcloud; Perspective of Sunken Garden in VR.



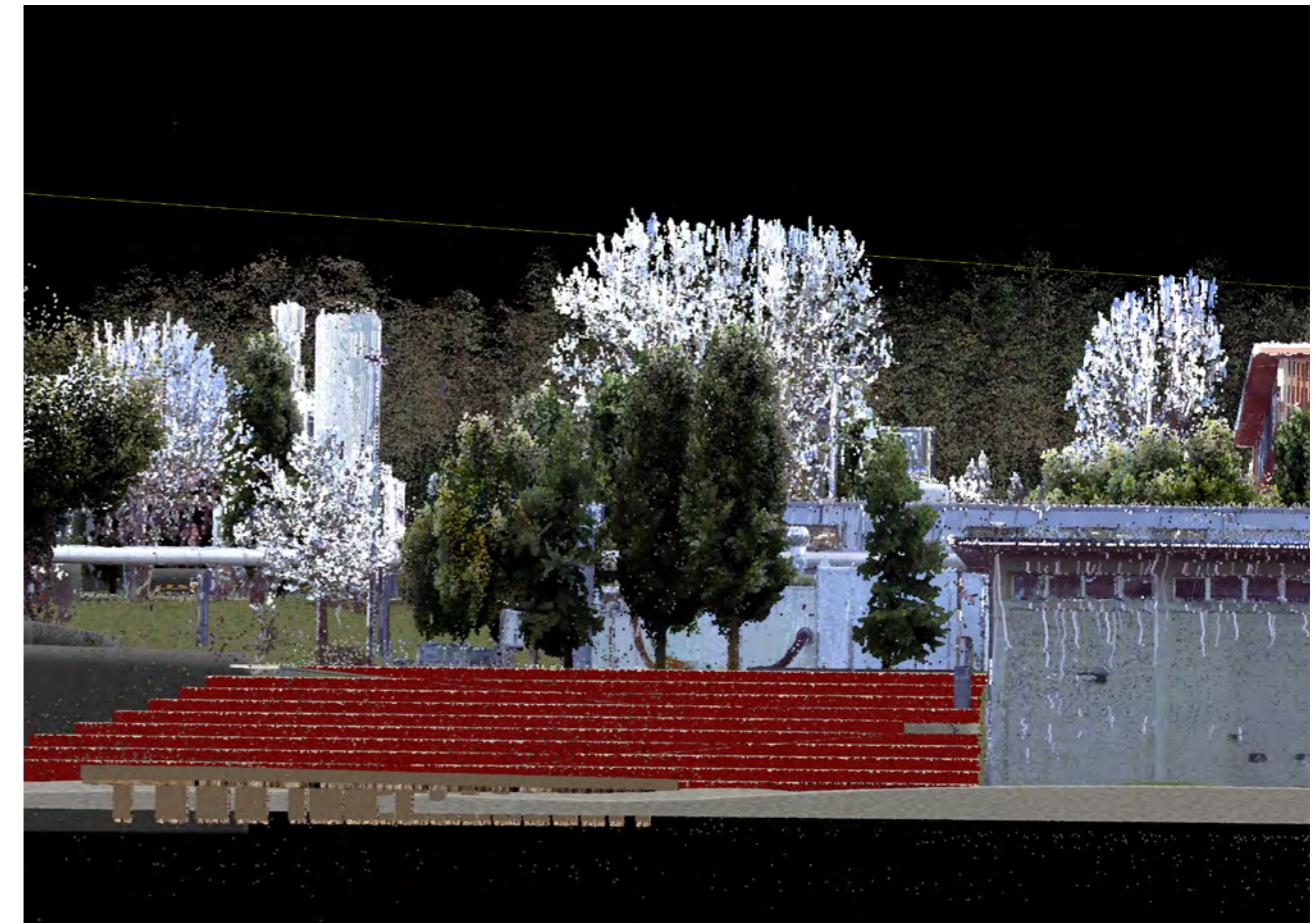
Pointcloud; Existing condition.



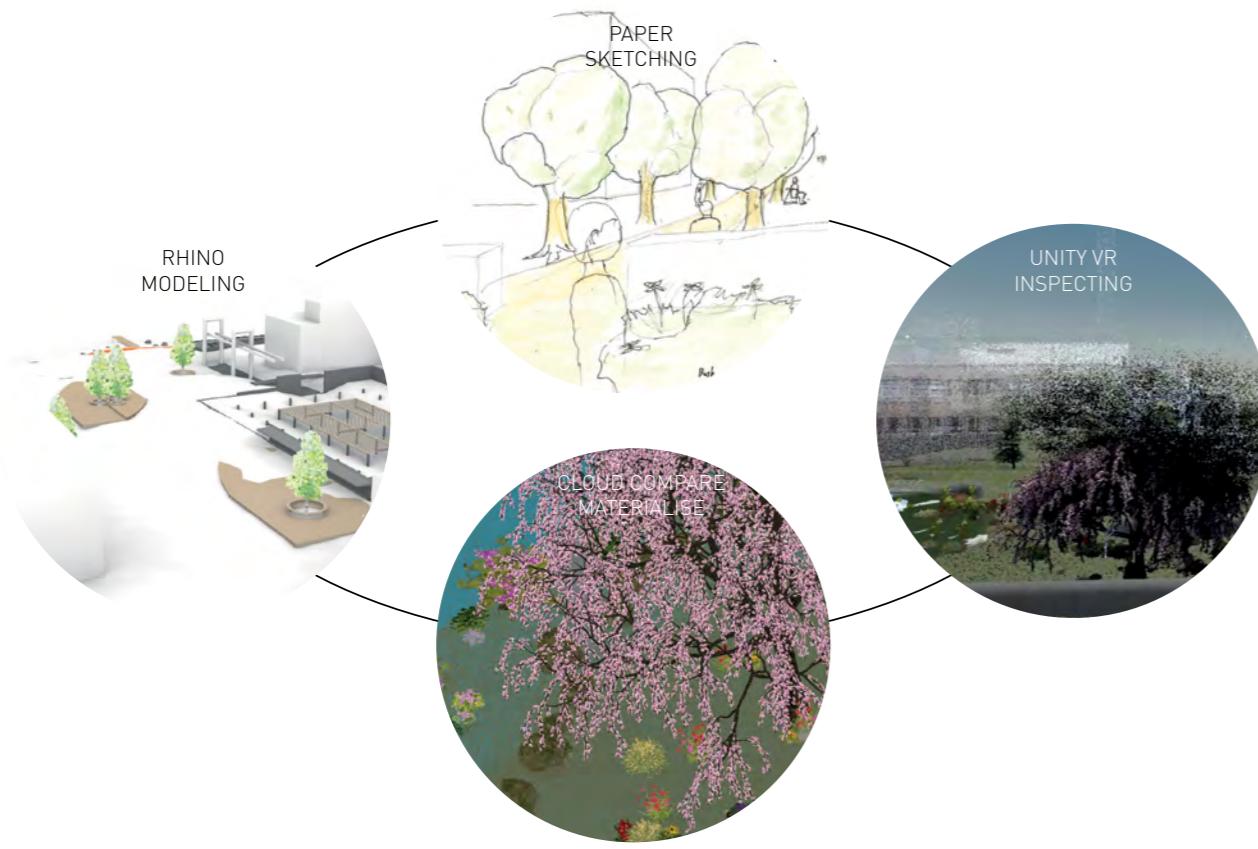
Pointcloud; Existing condition.



Pointcloud; Design implemented.



Pointcloud; Design implemented.



Exhibition at PSI Campus.



Designing and inspecting in VR.

# REINHARD SITE, SACHSELN

*The open landscape is a precious commodity! The progressive urban sprawl of the landscape is one of the biggest problems of our time. Unkindly designed and cheaply built “consumer architecture” covers the landscape and displaces the grown identity of our living space.*

The space between the houses degenerates into a residual space that can no longer assume a social function. The old is destroyed too quickly, while the new radiates an undignified arbitrariness that leads to an increasing lack of character in our cities and villages. We therefore propose not to build on the hill south of the old wall. Of course, one could offer apartments with a view of the lake. However an important and characteristic landscape element of Sachseln and thus a part of the identity of the village would be irretrievably destroyed! The old wall has marked a break in the topography for a long time. Once it was the site of a production building, and now the now becomes an interface between the settlement and the landscape. New and yet familiar: The new buildings are developed on the basis of the spatial structures of the existing buildings. The existing buildings are integrated into the development strategy. This not only ensures that the existing building fabric is treated in a resource-conserving manner. Even more: The history of the site is to live on. History of the site should live on, because it is a valuable asset that has grown over decades and has shaped the identity of the site.

**The special status of the carpenter's workshop manifests itself in the large volumes that confidently mark the prelude to the village center. Instead of filling the area with a small-scale settlement structure, we recognize the special starting position as an opportunity to build a special living environment on this historic site. A place that a solidary neighborhood in which living and working are combined.**

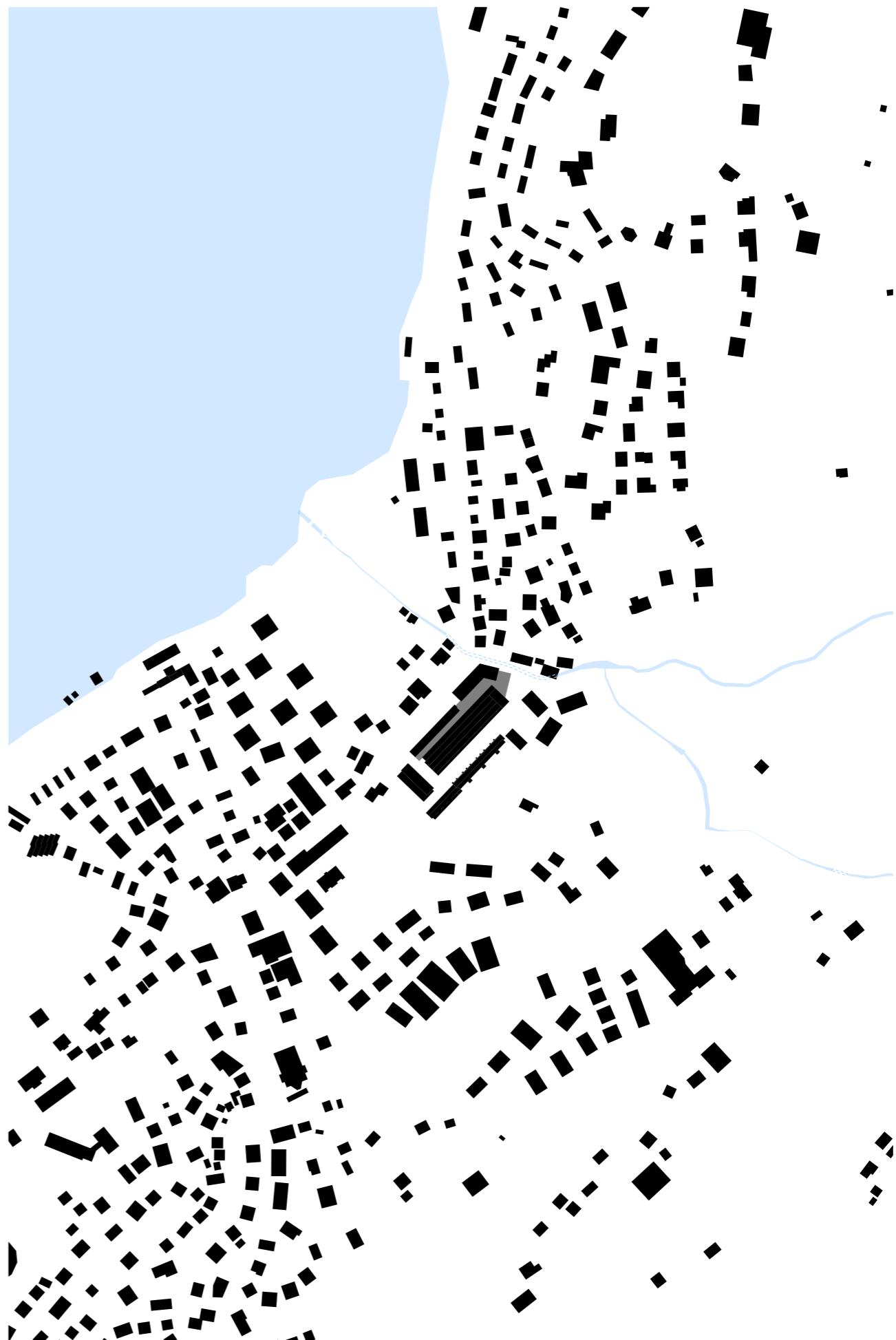


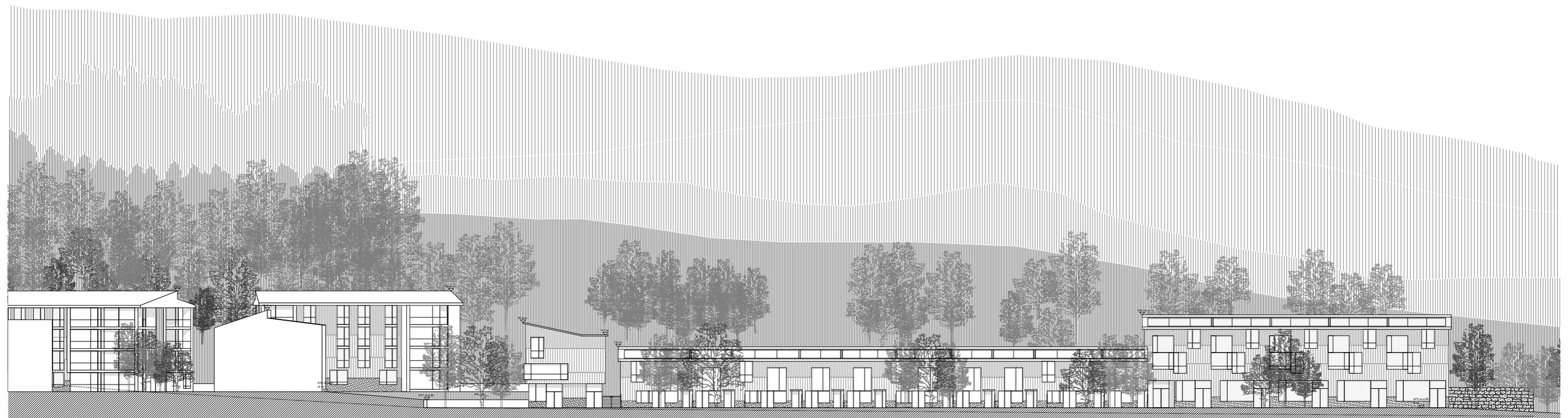
Figure ground plan; Sachseln, OW.



Figure ground plan; Sachseln, OW.



Section perspective.



Elevation; Atelier houses.

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