

FURNISH

Fast Urban Responses
for New Inclusive Spaces & Habitat

U ELISAVA



RAW

Rammed Earth for Tactical Public Space Extension

ELISAVA | Escola Antoni Brusi , Barcelona

RAW is a prototype that supports free, safe play in the city through the temporary transformation of public space. It is an open, modular system made up of prefabricated rammed earth units, which can be adapted to the circumstances of the surroundings. It is based on a single piece that can be stacked and arranged in different configurations. This generates levels, sequences, and nooks that endow the public space with qualities that attract activities associated with school environments.

Using earth as a building material for ephemeral architecture may seem paradoxical, but it has many advantages. Earth can be given a variety of finishes; as proof of this, RAW uses it in three different densities: prefabricated, rammed manually, and loose. This variability adds complexity the resulting uses and types of play. Additionally, earth is a natural, reusable, and recyclable material with a very small carbon footprint. At the end of the prototype's useful life in public space, it will be reused on the playground of the Antoni Brusi school in a new configuration co-designed by the children. As repeated use and play cause the blocks to break down, RAW will blend completely into the surface of the playground, returning to the natural cycle.

RAW represents a commitment to a non-extractive, adaptable public design that offers infinite opportunities for play.

RAW is part of Cross-KIC New European Bauhaus, a project promoted and financed by the European Union (EIT-Urban Mobility).

Support for RAW was provided by CARNET, Barcelona City Council and Antoni Brusi school. The prototype was designed and fabricated by an Elisava Research team led by Roger Paez, PhD. The prototype was tested in Barcelona in December 2021 and shared in open source so it can be implemented throughout Europe.

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Design Concept

During the design of the prototype, the concepts of “playing” and “being together” had a dominant role. These principles lead to the activation of public space and its occupation by users, an important element in its proper function. The participatory process and the construction of the prototype by the users themselves, were an important part of the process.

Time is one of the basic components of our design since the material itself and the way it was designed and is assembled (as a system) work with the notions of both temporariness and permanence. This contradiction with regard to time adds an aesthetic sincerity and a timeless value to the design of the prototype. This allows RAW to be reproduced by different groups of people, in different places and at different moments in time, maintaining the same momentum in the construction process without altering the material.

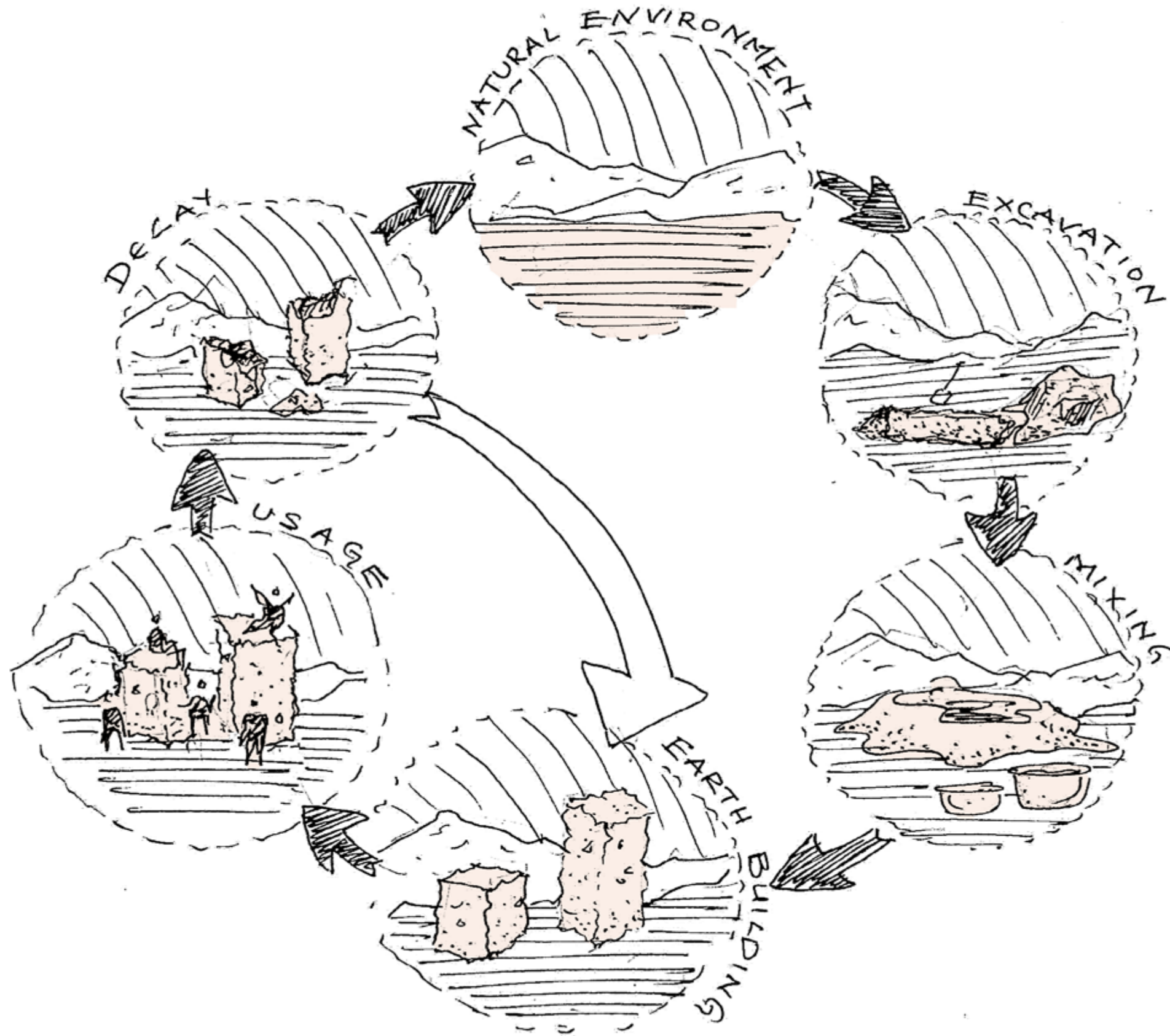
The process of building and interacting with RAW offers an educational experience through cooperation and contact with the earth (nature). The elements of system, collaboration, and sustainability are interconnected and reinforce one another in fulfillment of our initial design aims.

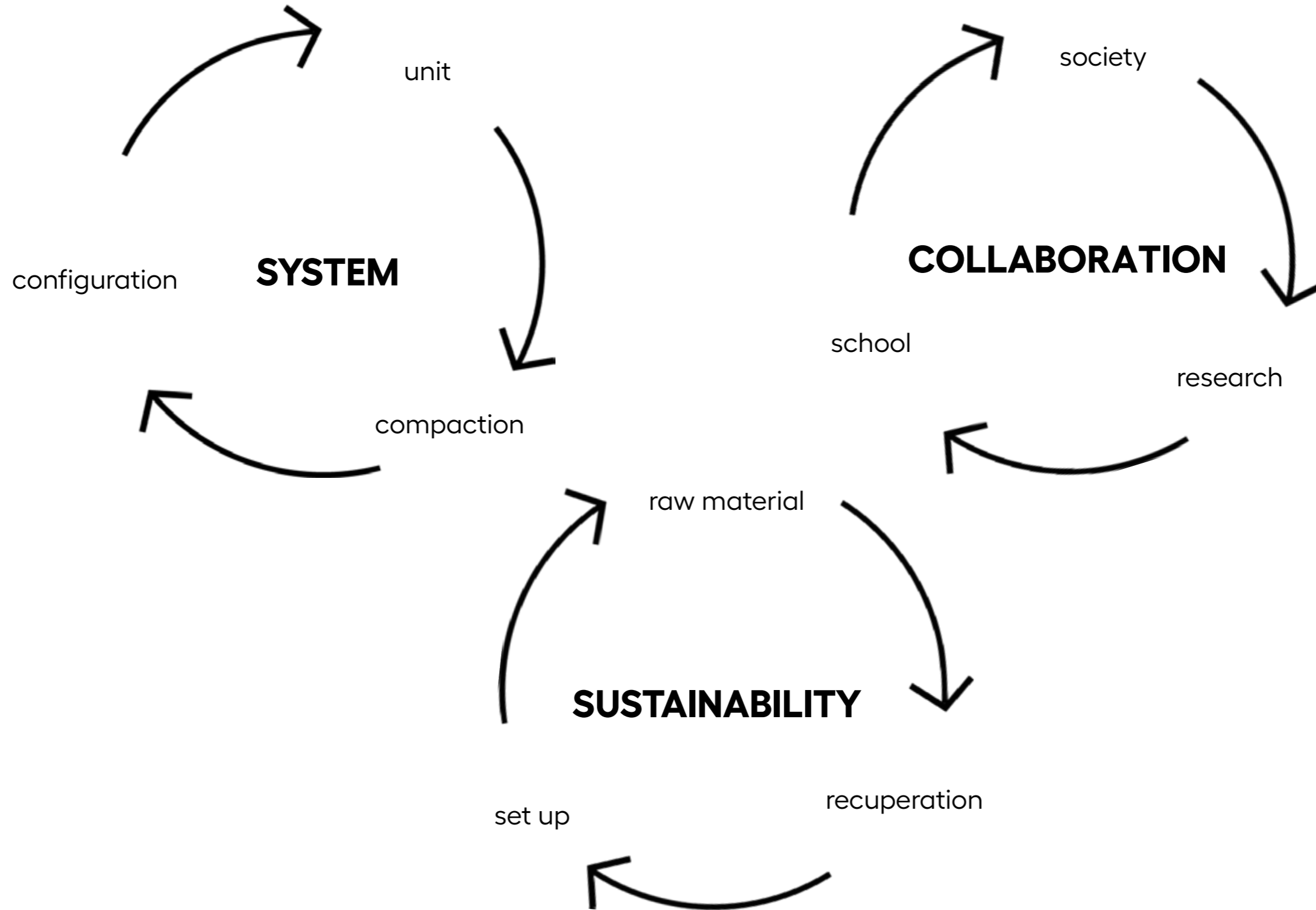


GEOLOGY _ DEEP TIME



TEMPORARY EVENT_ SHORT TIME





SYSTEM

compaction

Incorporating different levels of compaction of the same material gives us the opportunity to configure various qualities and experiences in space with the use of a single material.

unit

Defining default dimensions in prefixed molds lets us create a variety of units using the same molds.

configuration

Using a default helps us achieve the idea of a modular system that can be configured and reconfigured as many times as needed according to the timeframe, the available area and the form we want to generate.

COLLABORATION

research

The design community has the opportunity to study how the prototype works both at a social level (benefits of cooperation and citizen participation in the design of public space, occupation, creation of shared memories, etc.) but also in the aspect of the material use itself and the design possibilities it offers.

school

The students at the school learn how to collaborate to create something on their own. At the same time, they come into direct contact with the concept of construction and creation, while working with the natural element of the soil. In addition to the element of play, the experience has significant educational potential on a practical, social and interpersonal level.

society

The design process educates the neighborhood and emphasizes the dynamics of collaboration. The community recognizes the benefits of collaboration and participation in city planning, with the prospect of creating new participatory actions and community decision-making at the neighborhood and city level. The creation of shared memories helps foster a sense of communal ownership of public space, supporting its successful function.

SUSTAINABILITY

raw material

One of the most beneficial properties of building with earth is that, when it is free from chemical-based additives, it can be recycled infinitely or folded back into the ground. The same material, maintaining the exact same qualities and characteristics, can be reused as many times as needed.

setup

Building with a system of modular units allows us to set up prototypes that serve various needs in different contexts. We don't need to produce new constructive elements for each new design context rather than use the same system to set it up on various configurations. In that way, we save both materials and energy.

recovery

Loam is a material that can be recycled over and over again without a loss of quality. That means that every final product made out of the same earth will have the same quality as the first one.

Rammed Earth

Earth is one of the most widely available and venerated materials in human history. Moreover, it is not just a building material, it is a process – a catalyst. There is no other material that can be recycled over and over again without a loss of quality.

Loam has many advantages in comparison to common industrial building materials, especially when used in public space:

It saves energy, reduces environmental pollution, and absorbs pollutants.

It is always recyclable and reusable.

It is ideal for do-it-yourself construction on the community level.

The material for rammed earth is a damp mixture of subsoil that contains suitable proportions of sand, gravel, clay, and in some cases stabilizer.

There are two means of producing rammed earth elements: prefabricating them in blocks or creating them in situ. In both cases, moist earth is poured into a formwork in layers of up to 15 cm and then compacted by ramming.



EARTH



RAMMED EARTH

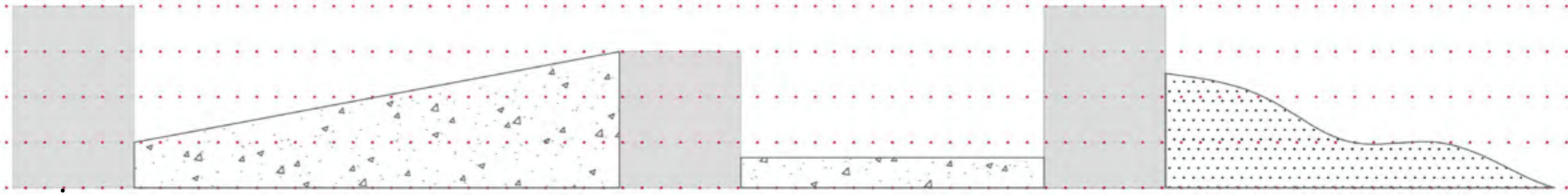


PREFABRICATED COMPRESSED RAMMED EARTH

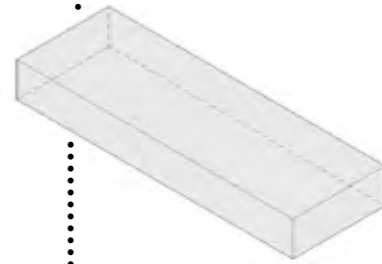


System

RAW is a modular system that can be configured according to the space, time and occasion. The variety in the level of compaction of the material and in the configuration of the modules offers unlimited options for generating infrastructures. The rectangular modules of RAW have been dimensioned so that, in combination, they can form seating, dividers, and surfaces for playing, running, and jumping etc. The different conditions of the earth offer qualities for various experiences during play (prefabricated units, loose earth, rammed earth, etc.) The plasticity of the rammed earth allows for creating interesting surfaces and forms (slides, ramps, platforms, etc.).



The three different compactions give as variety in qualities and experience in the use of the prototype.



COMPRESSED RAMMED EARTH (PREFABRICATED UNITS)

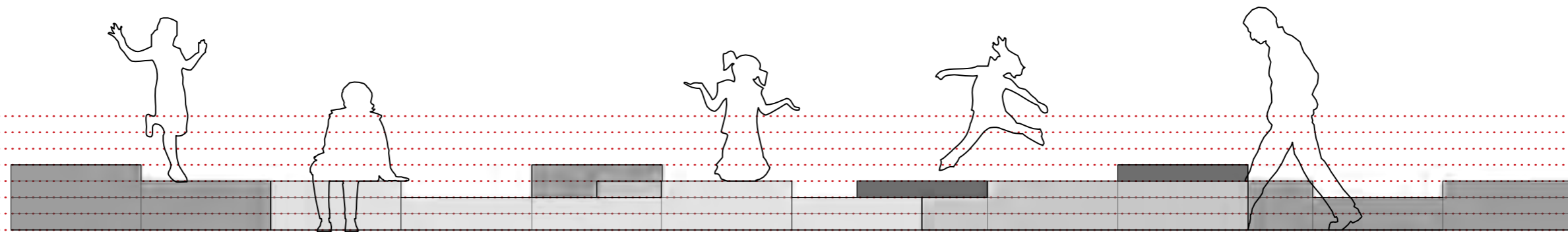


RAMMED EARTH

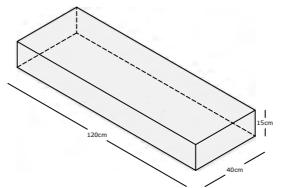
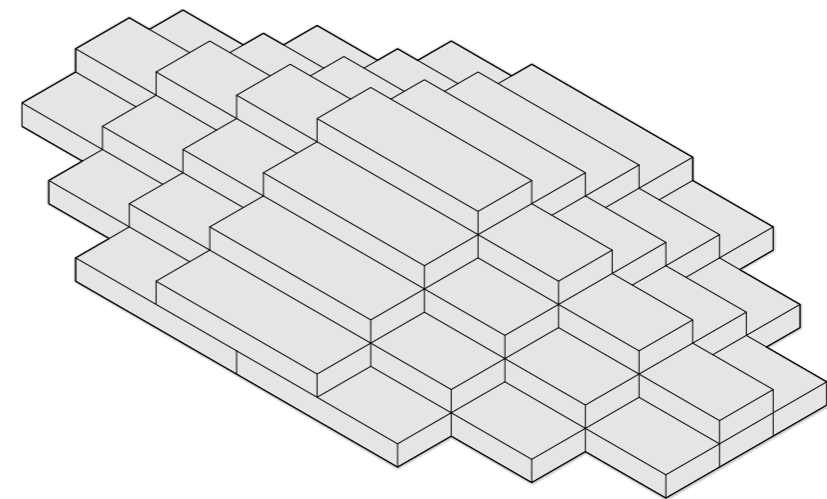
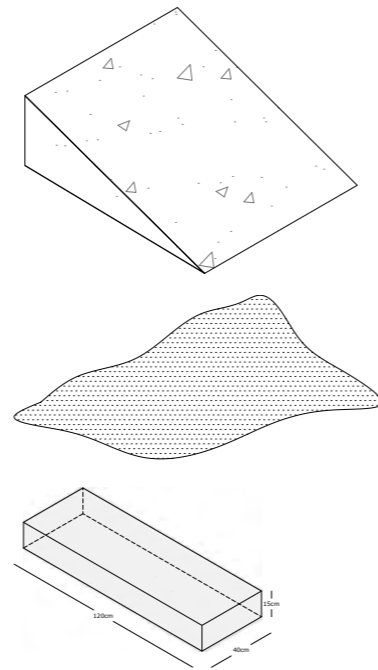
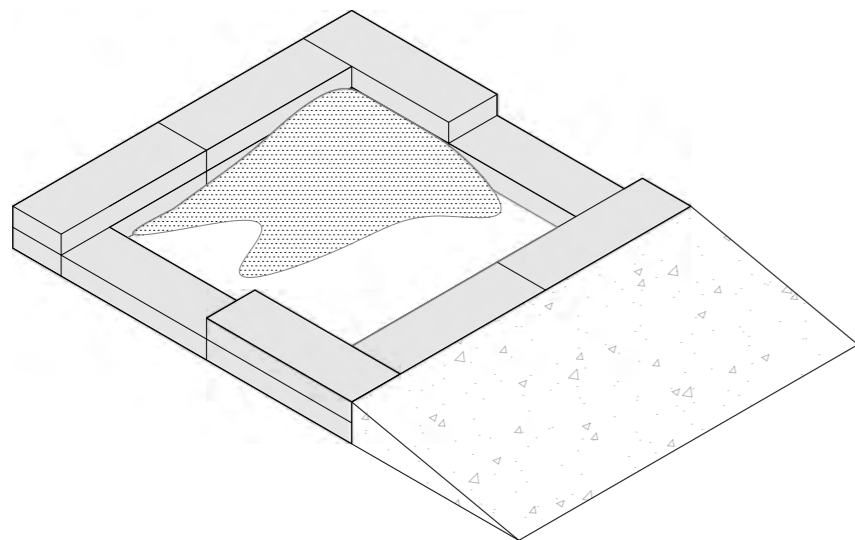
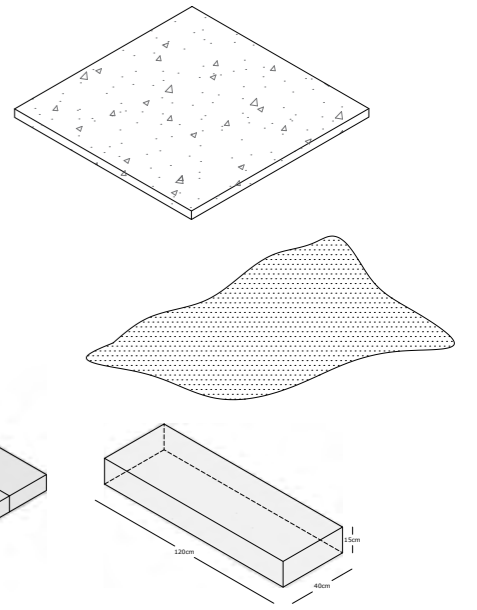
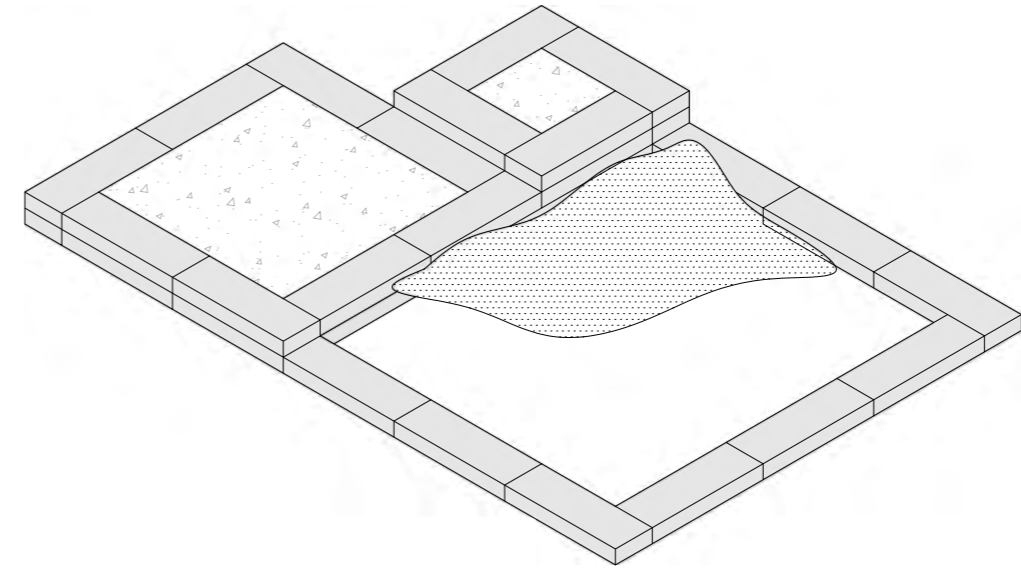
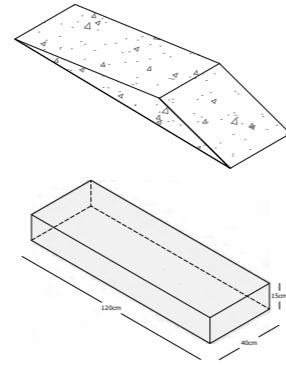
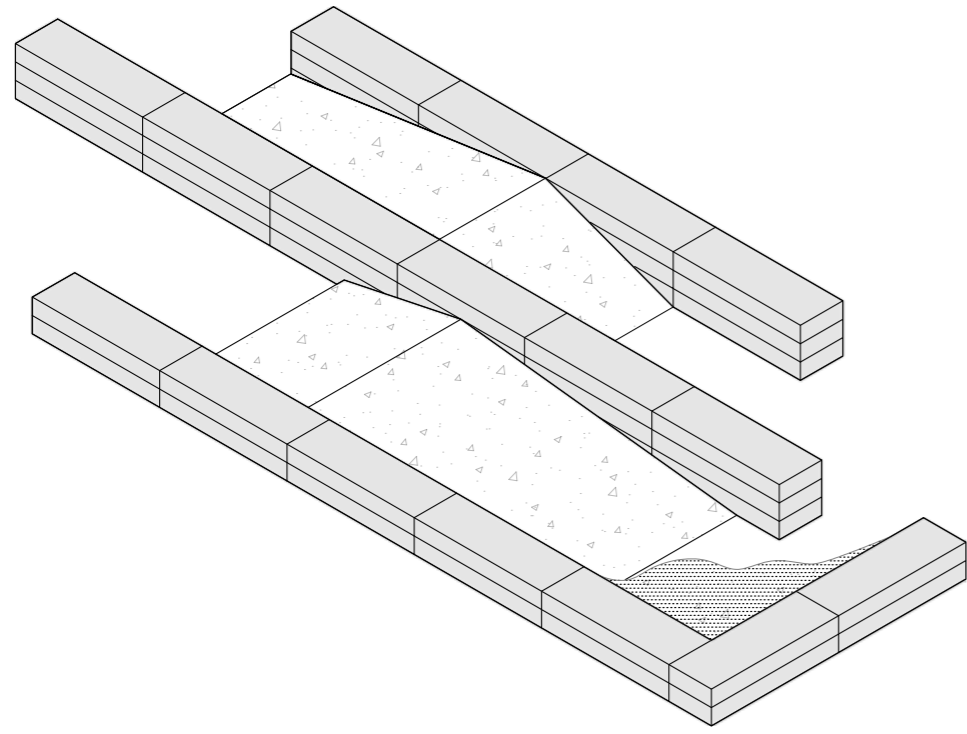


LOOSE EARTH





The rectangular modules (15 cm x 40 cm x 120 cm) that consist RAW have the adequate proportions so that, in combinations, they can form various versions of infrastructures.





RAW

System | 23



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Prototype 1

(Public Space)

The street in front of the Antoni Brusi school is quiet, with the dominant element of a canopy of trees that extends along the entire length of the street, emphasizing its linearity. It is located in a residential area next to the Ciutadella park and library.

We studied the mobility and the activities of people in the area during the day (while the school is open) and also during the afternoon when the activity and its intensity change completely.

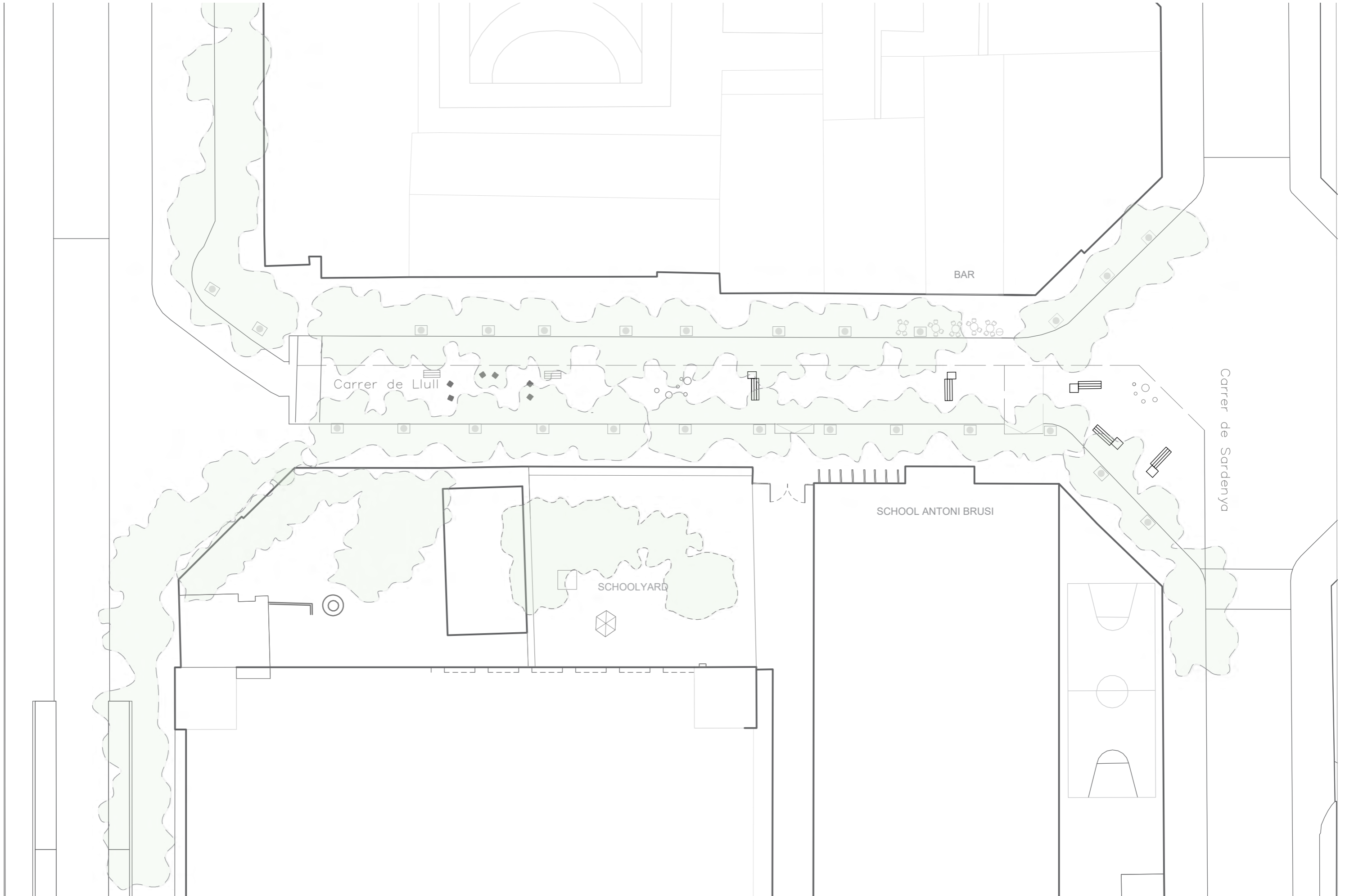
However, despite the nature of the street, vehicles still pass at high speeds creating insecurity and danger for children and pedestrians.

Drawing on our study of the area, we chose a configuration of the prototype that would operate as protection between the cars and the playing area. RAW is a magnet for activities in the center of the road. It is multifunctional and responds to the form and the needs of the space in question, without introducing hard limits and offering a smooth transition to and from the entrance to the school.

During the design phase, we accounted for the existing furniture, thus extending the experience along the entire length of the street. To achieve this, we introduced a grid into the design that is derived from anthropometric and in situ measurements.

We applied the idea of a “score” and studied the dynamics between the furniture and the prototype to create a functional space and experience for the user.









RAW

MOBILITY |

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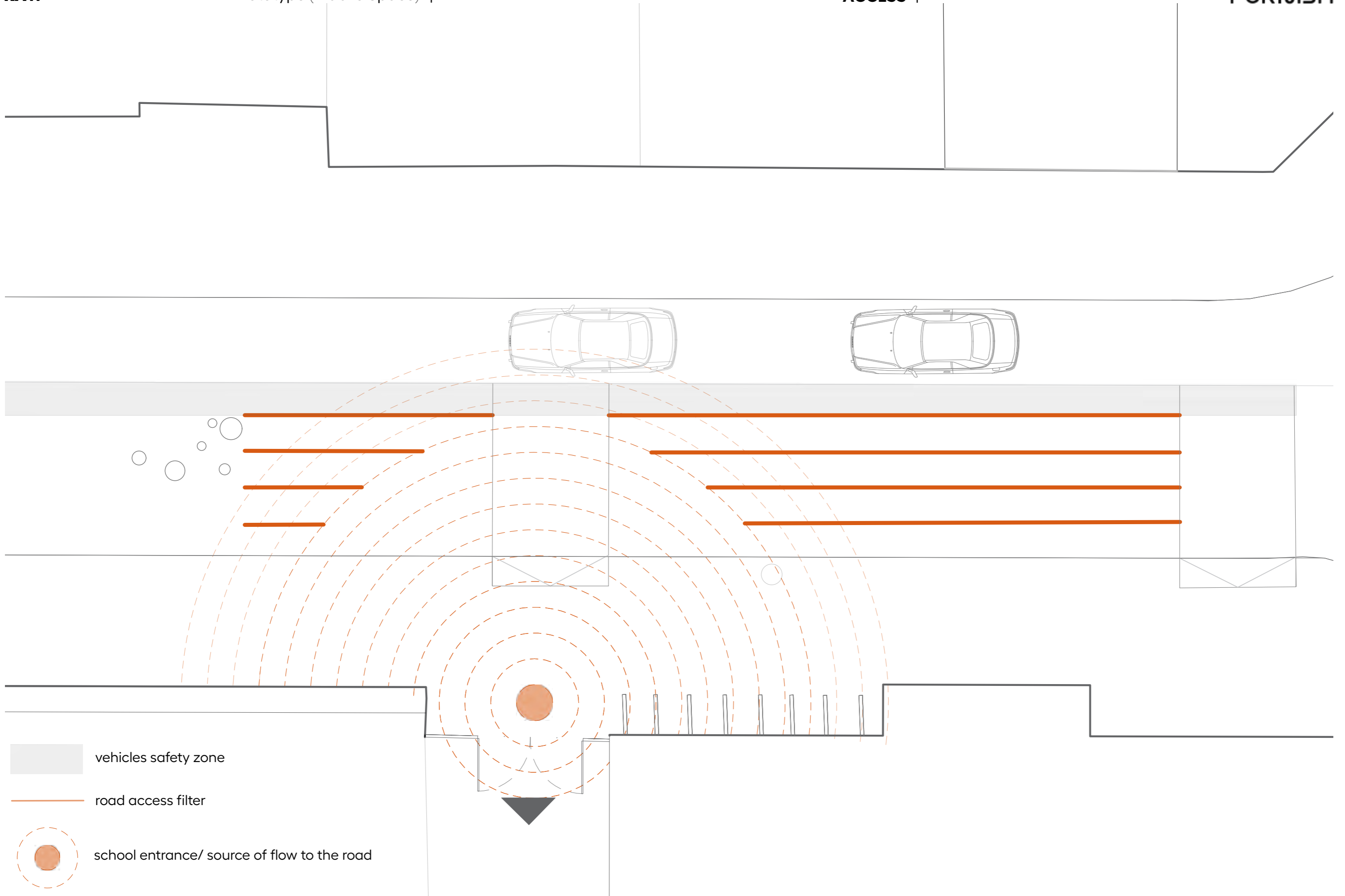
-  people principal mobility
-  vehicles mobility
-  people concentration afternoons
-  people concentration mornings

RAW

Prototype (Public Space) | 29

ACCESS |

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vehicles safety zone

road access filter

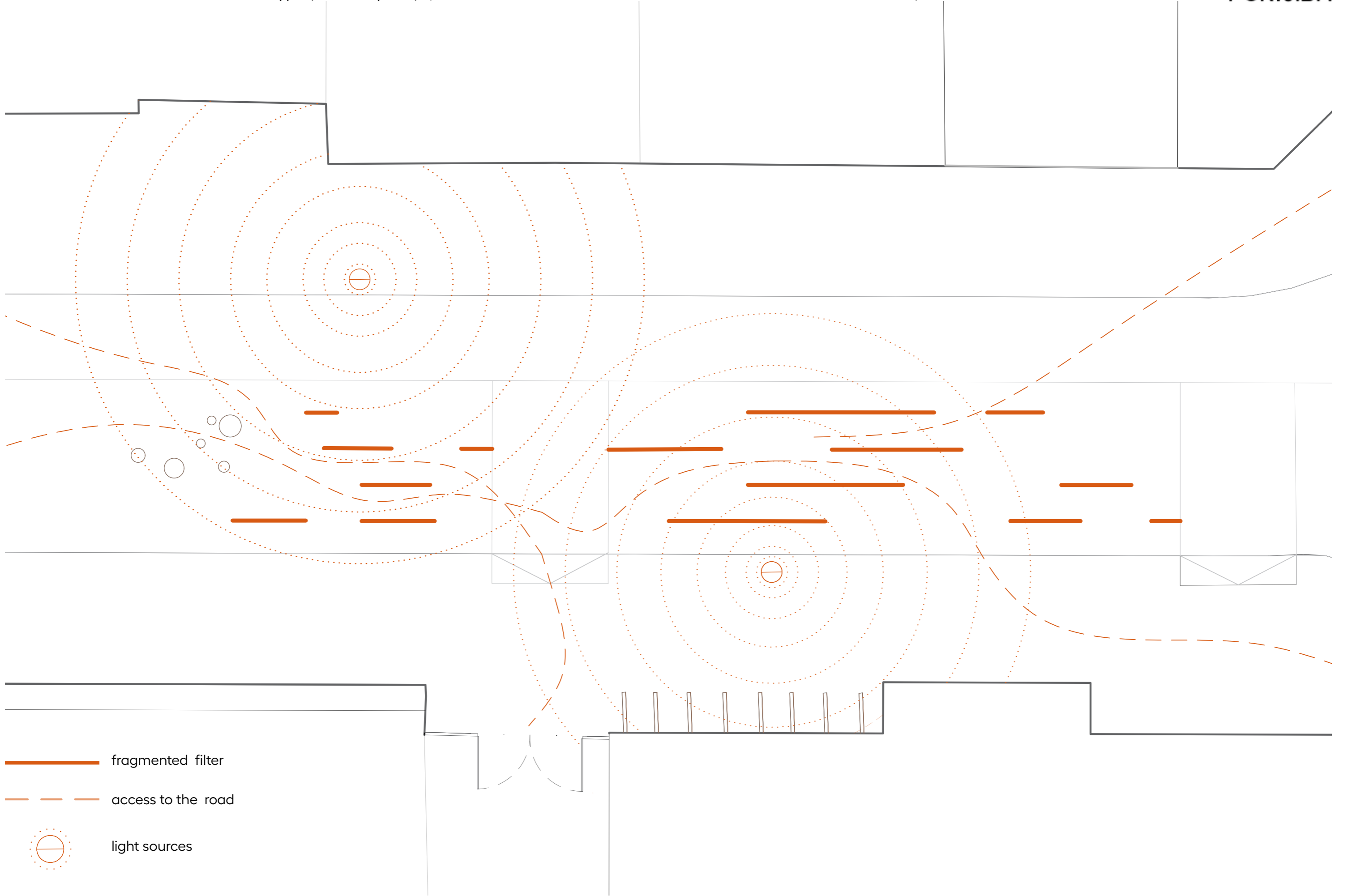
school entrance/ source of flow to the road

RAW

Prototype (Public Space) | 30

FRAGMENTATION |

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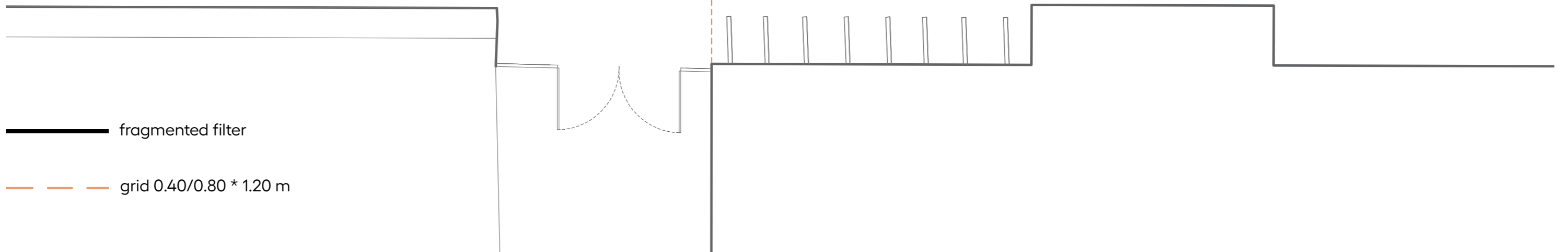
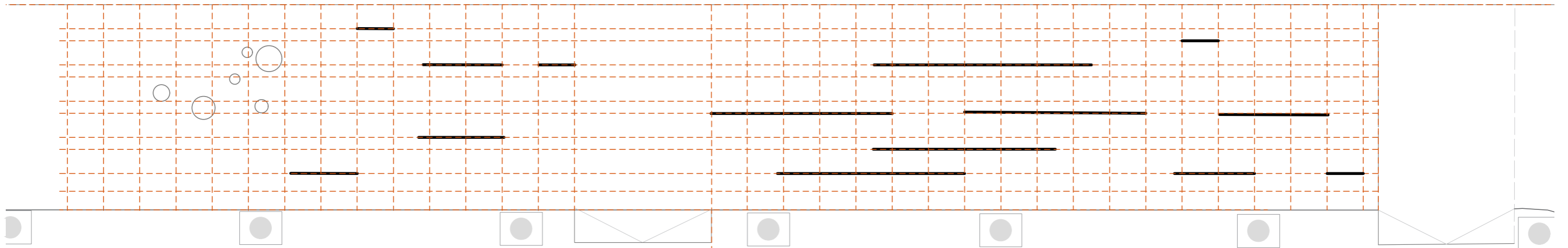
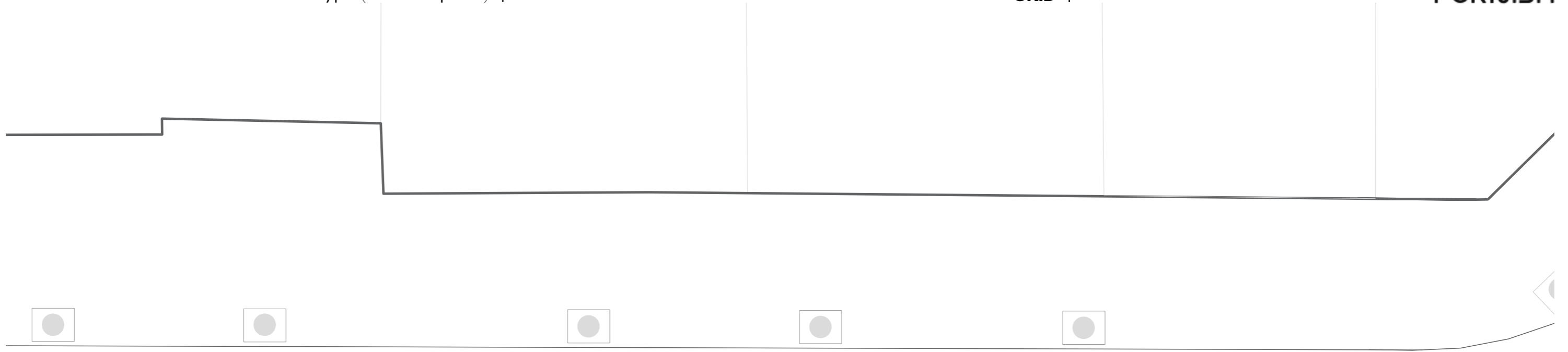


RAW

Prototype (Public Space) | 31

GRID |

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— fragmented filter

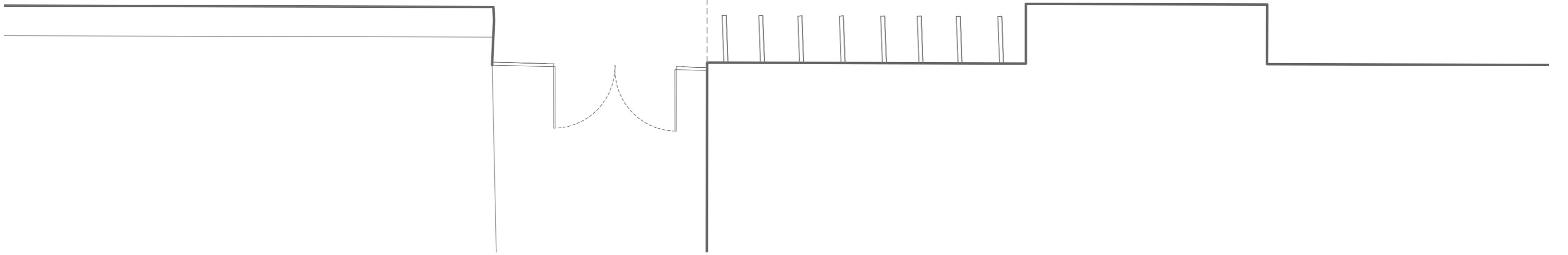
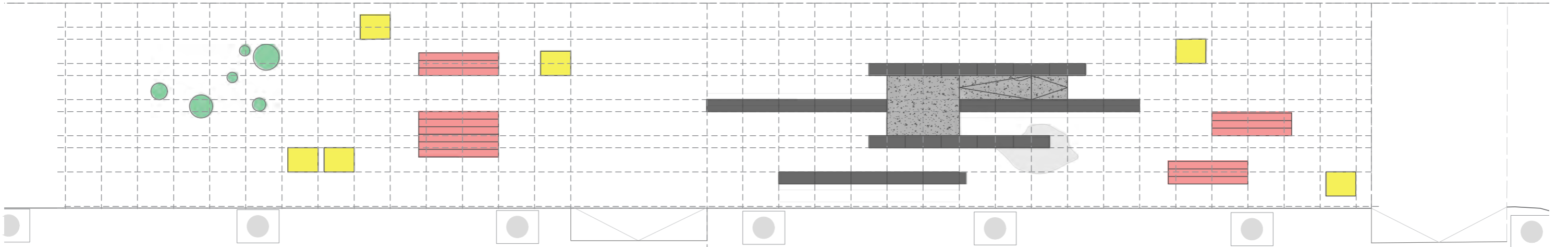
- - - grid 0.40/0.80 * 1.20 m

RAW

Prototype (Public Space) | 32

PROPOSAL |

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The set-up process is very simple, clean and streamlined, allowing to incorporate changes in the layout in real time.

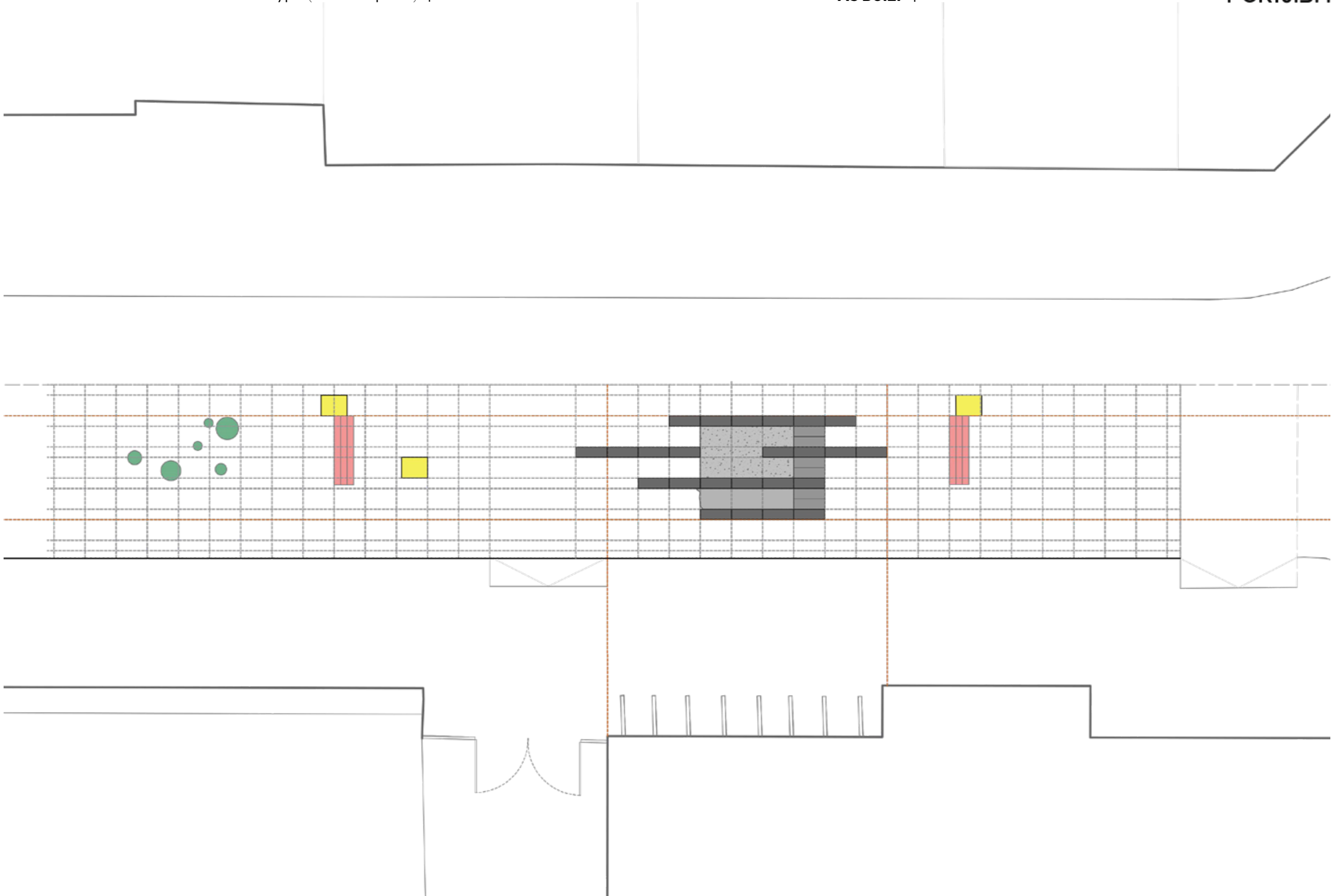
The designed layout was changed on-site in order to circumvent unforeseen problems (such as manholes and slight bumps in the asphalt) and to respond to on-site conditions which are difficult to detect in the drawing board.

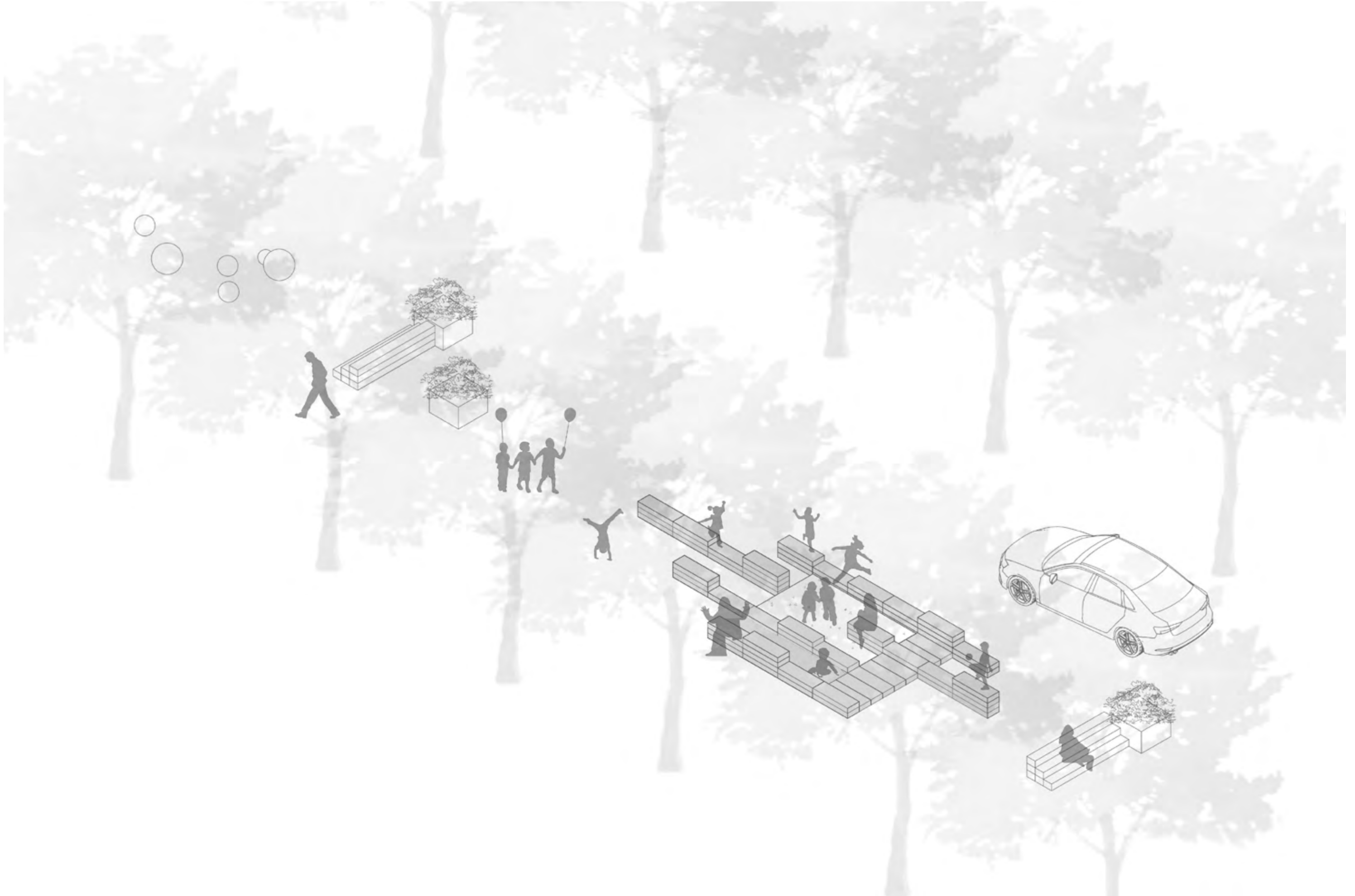
RAW

Prototype (Public Space) | 35

AS BUILT |

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Prototype 2

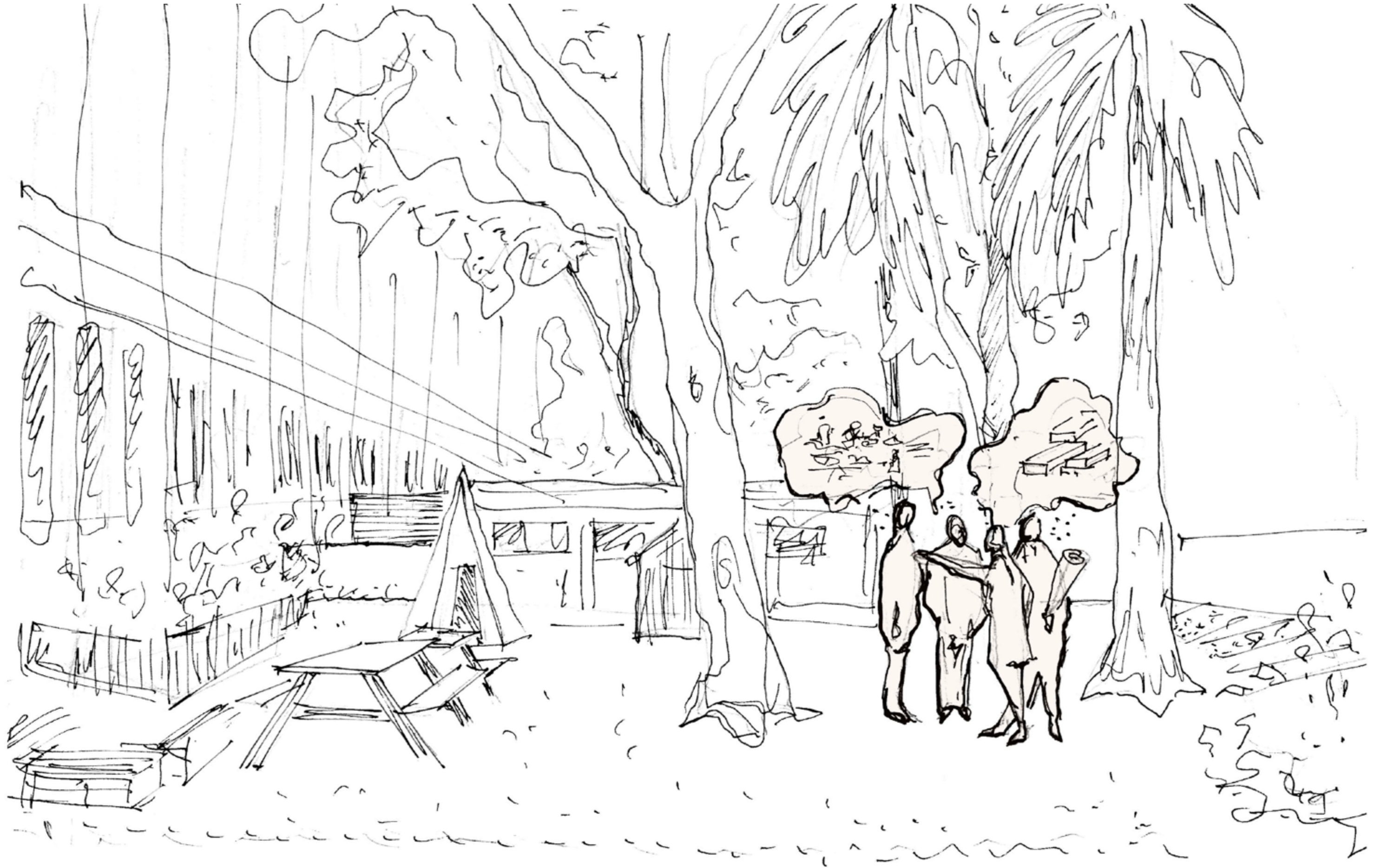
(Schoolyard)

An important part of the design strategy for the prototype are the ideas of participation, modularity, and sustainability (reuse).

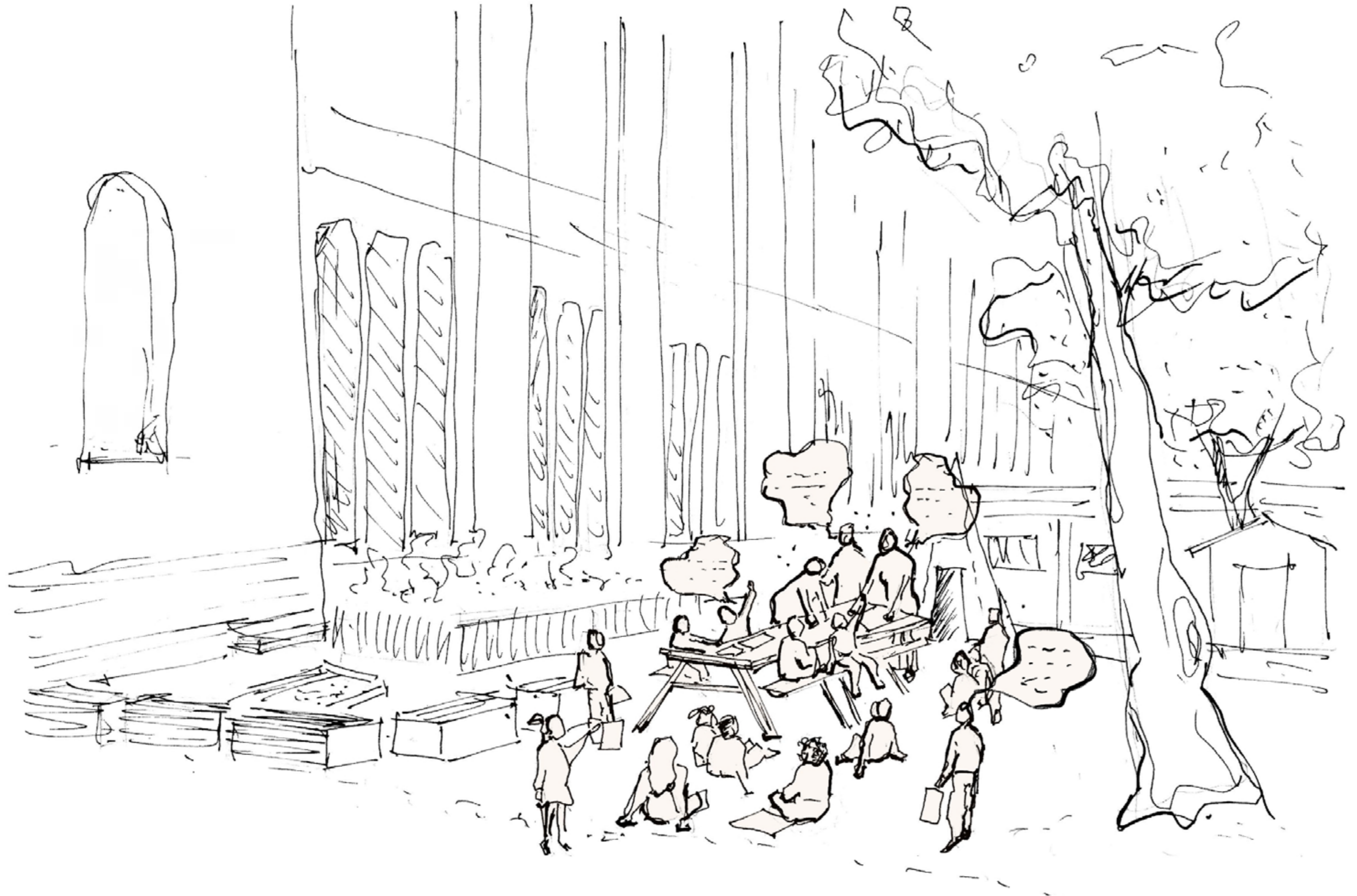
After the installation of RAW on the street, a series of actions that involve the students and the community in the design are carried out.

During these activities, with partial guidance from teachers and architects, the students determine how the prototype will be relocated on their playground. During this process we follow a series of steps and, finally, based on the students' plans we install RAW on the playground to function in a new context.







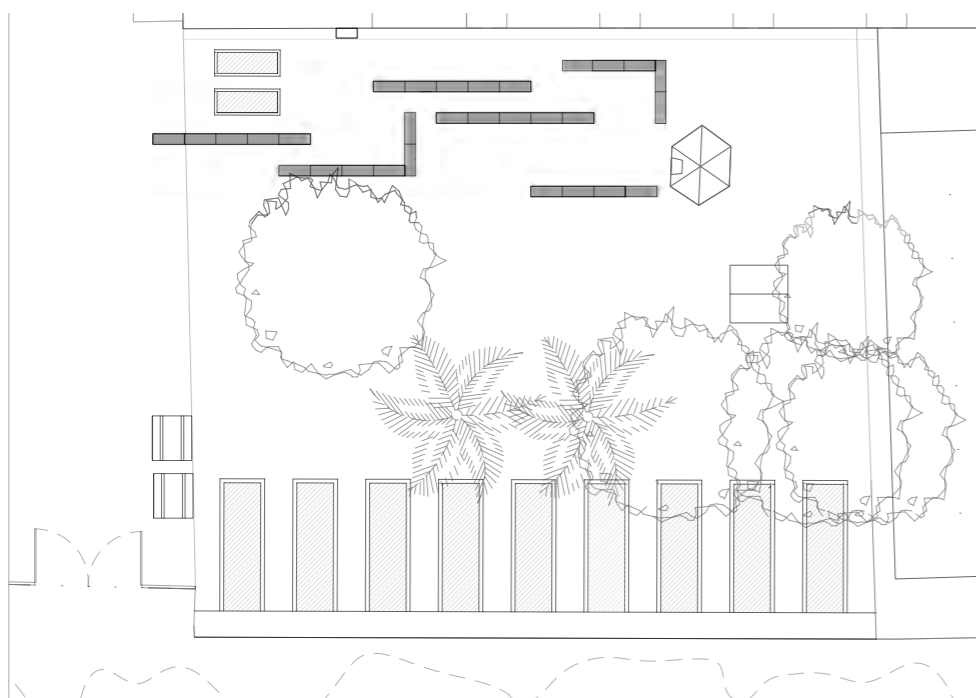




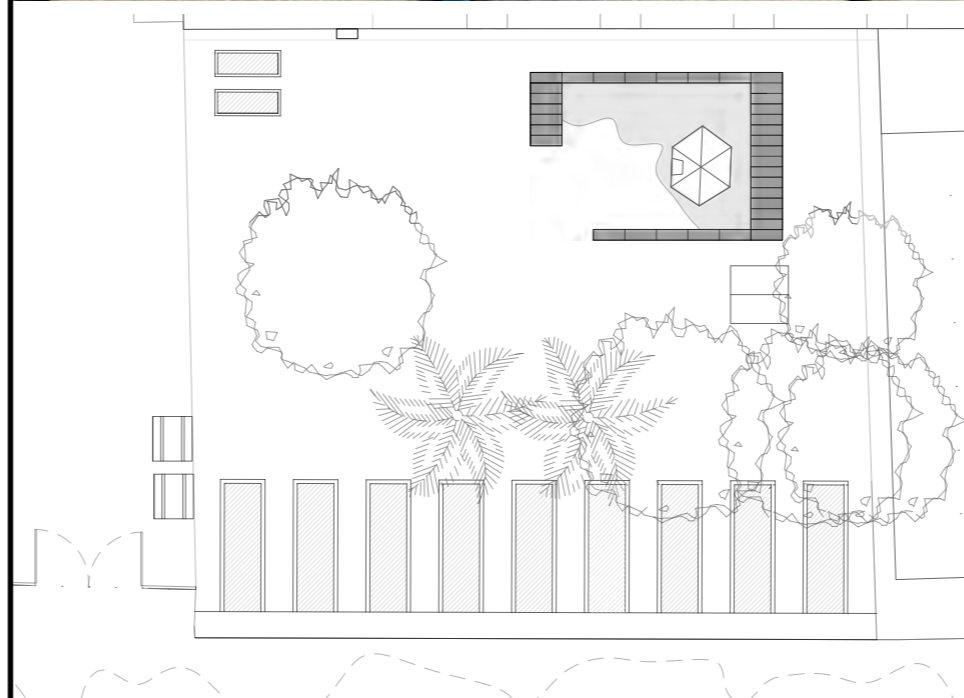




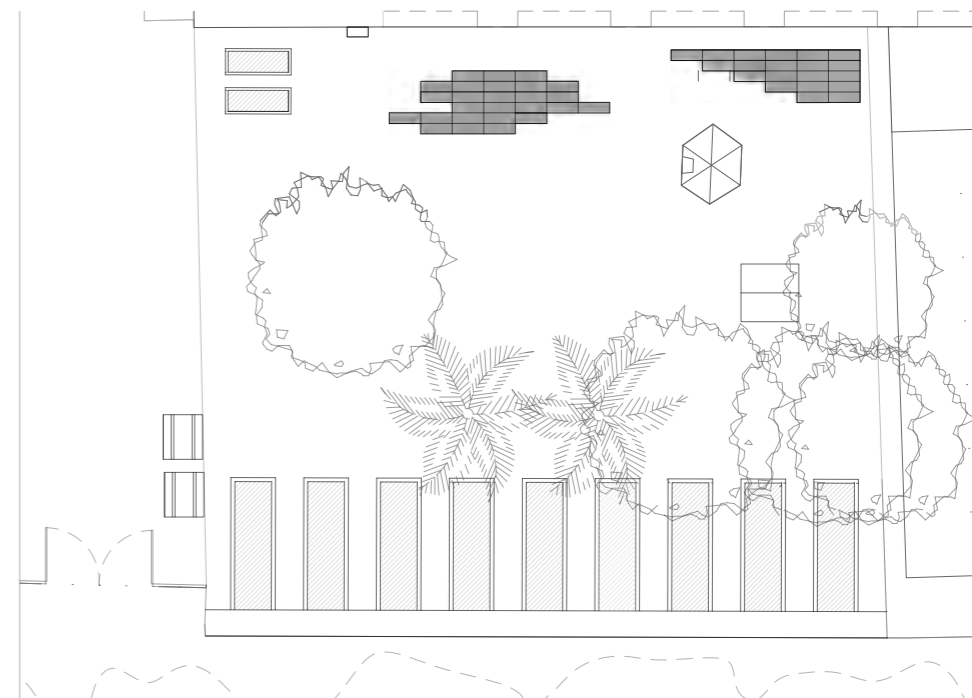




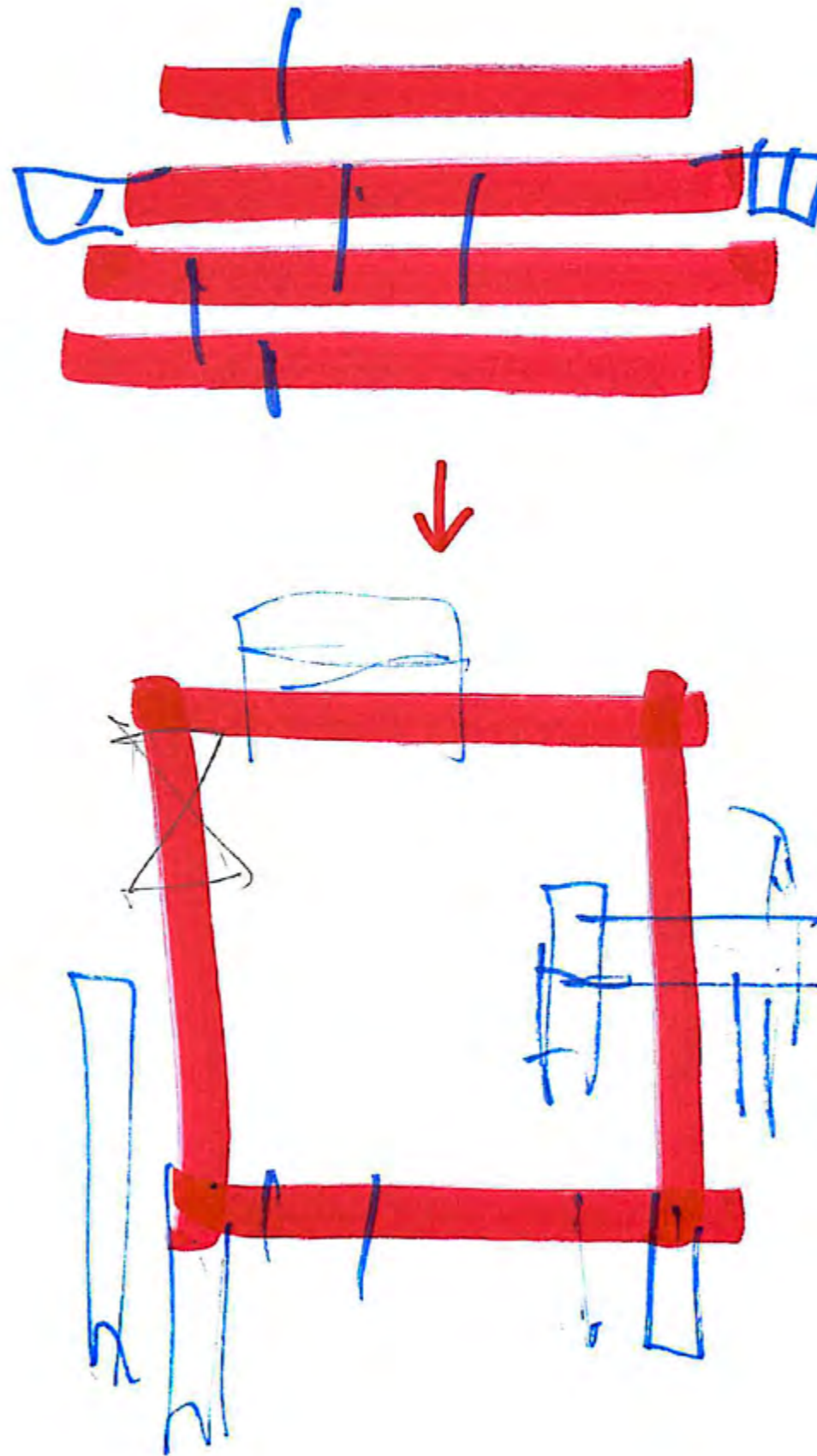
PATH
PARKOUR_CATWALK



ROOM
AGORA_PIT



MOUND
ZIGGURAT_PLATFORM





LOUNGE



BLEACHERS



STEPS



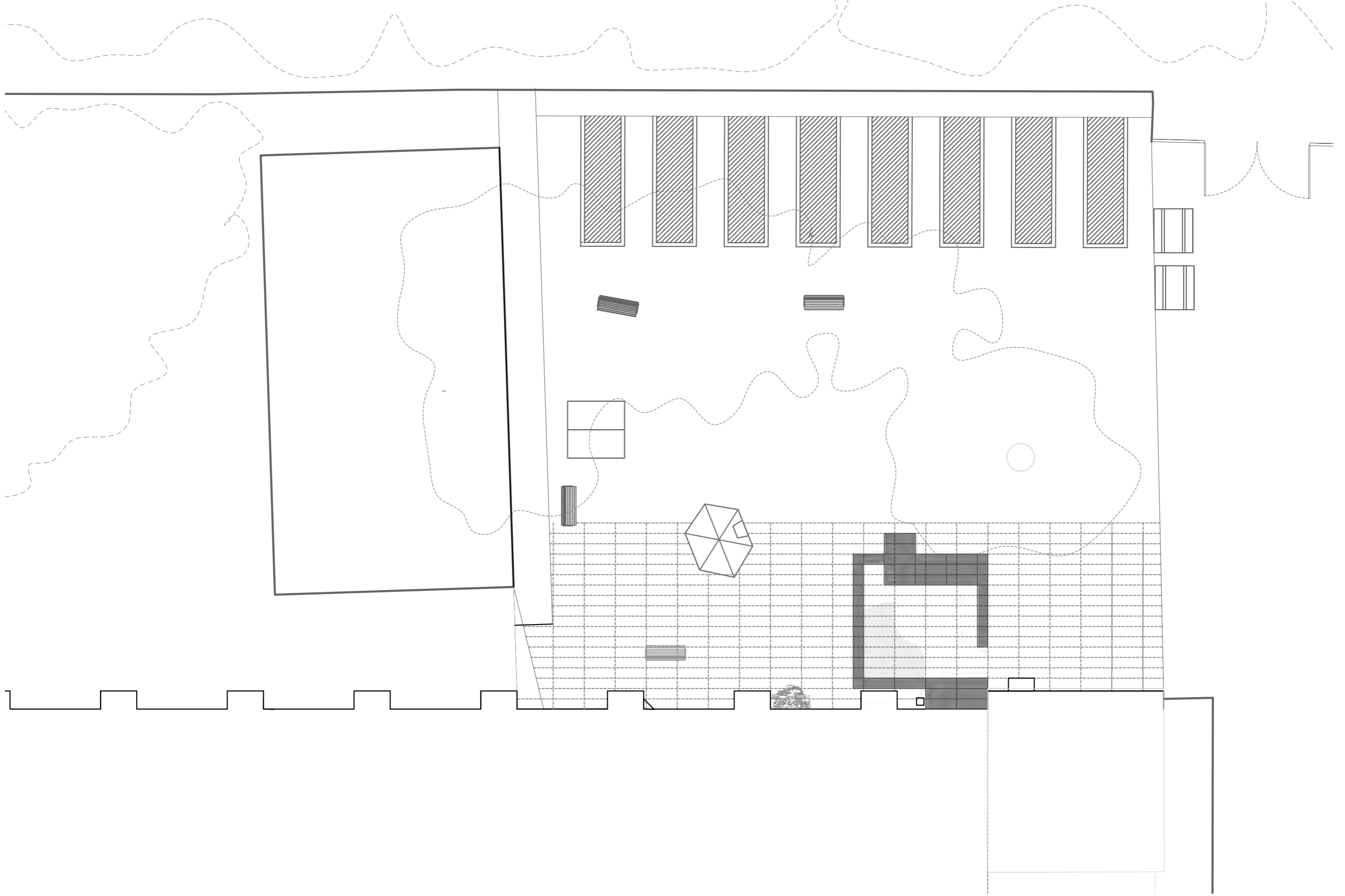
CARPET

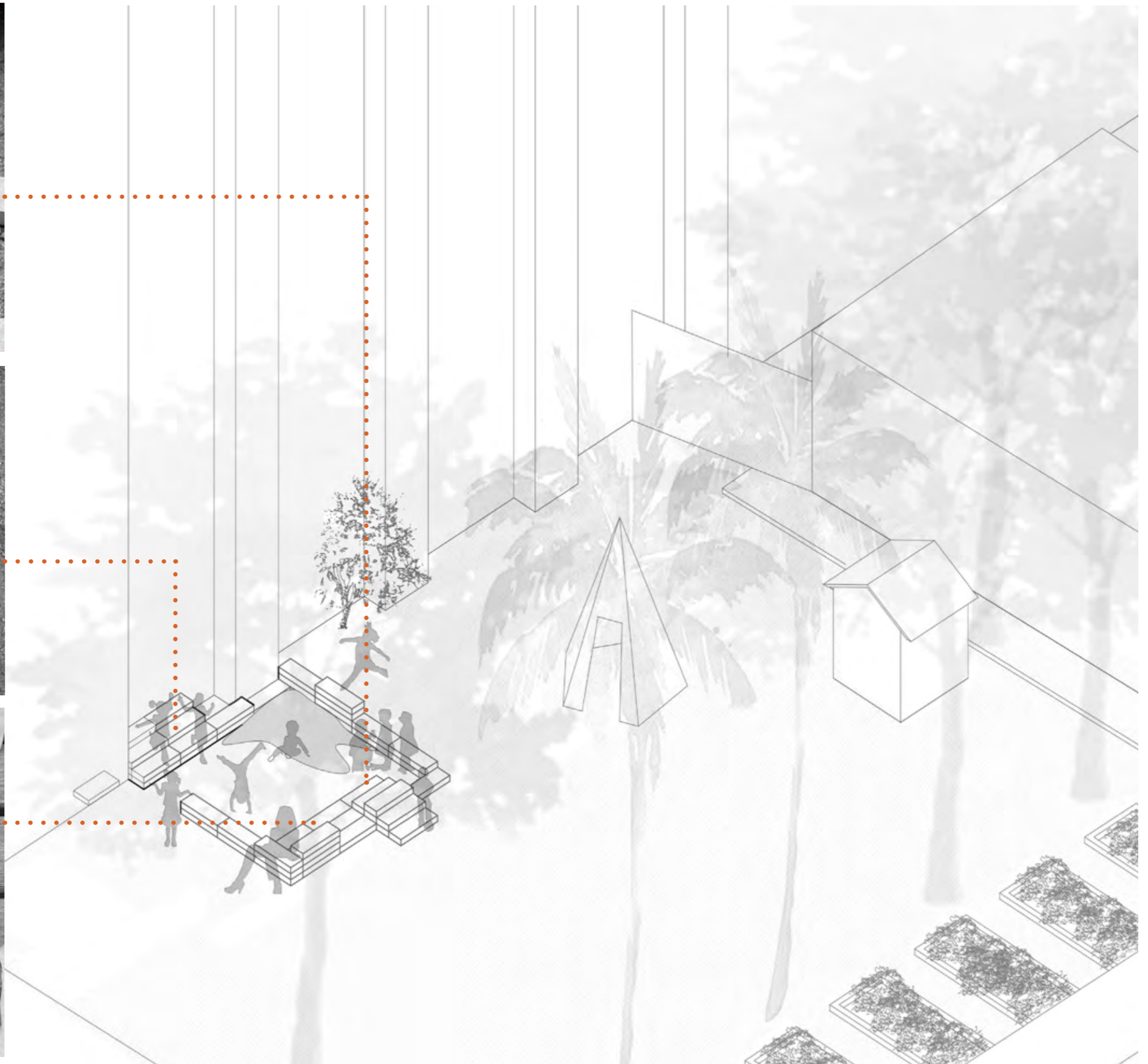
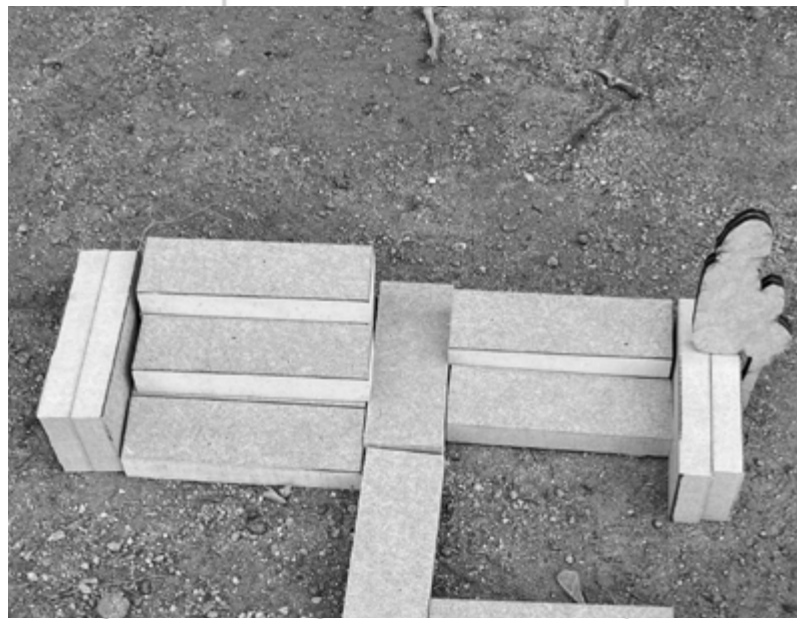
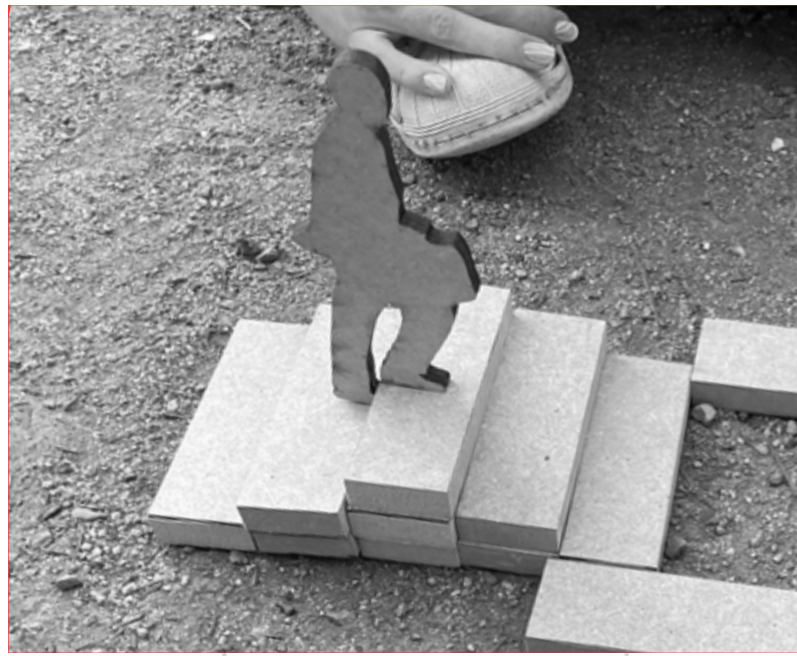


SOFA



BOUNDARY



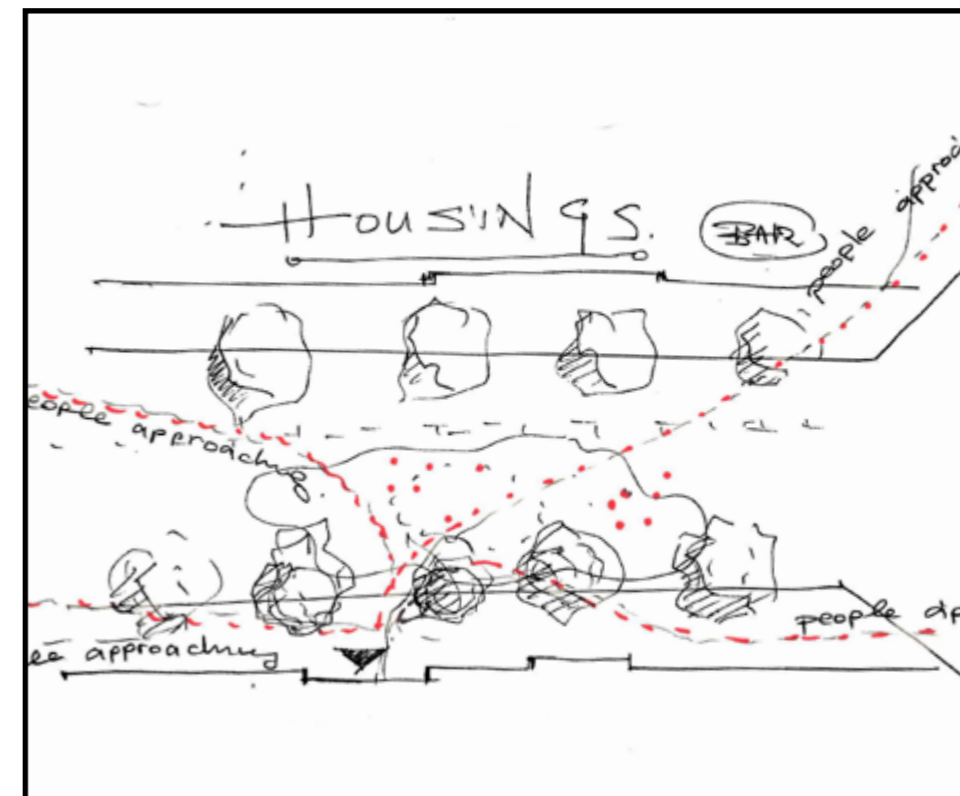


Process

01

02

03



VISIT OF THE SITE _ MORNING 28.09

28.09.2021 (morning)

VISIT OF THE SITE _ AFTERNOON 28.09

28.09.2021 (afternoon)

START ANALYZING AND CONCEPTUALIZING

28.09.2021 - 22.10.2021

04



MATERIAL DECISION_ EXPERIMENTATION

04.10.2021

05



PRESENTATION TO THE SCHOOL ANTONI BRUSI

22.10.2021

06



WORK IN PROGRESS

22.10.2021 - 20.11.2021

07



PREPARATION OF MODULES_step 1

3-5.11.2021

08



PREPARATION OF MODULES_step 2

3-5.11.2021

09



CRASH TEST OF MODULES

18.11.2021

10



GLS PIECES INSTALLATION

16.12.2021

11



EARTH COMPRESSION PROCESS

16.12.2021

12



MEETING WITH FURNISH COORDINATORS

17.12.2021

13



CLASS
17.12.2021

14



WORKSHOP
17.12.2021

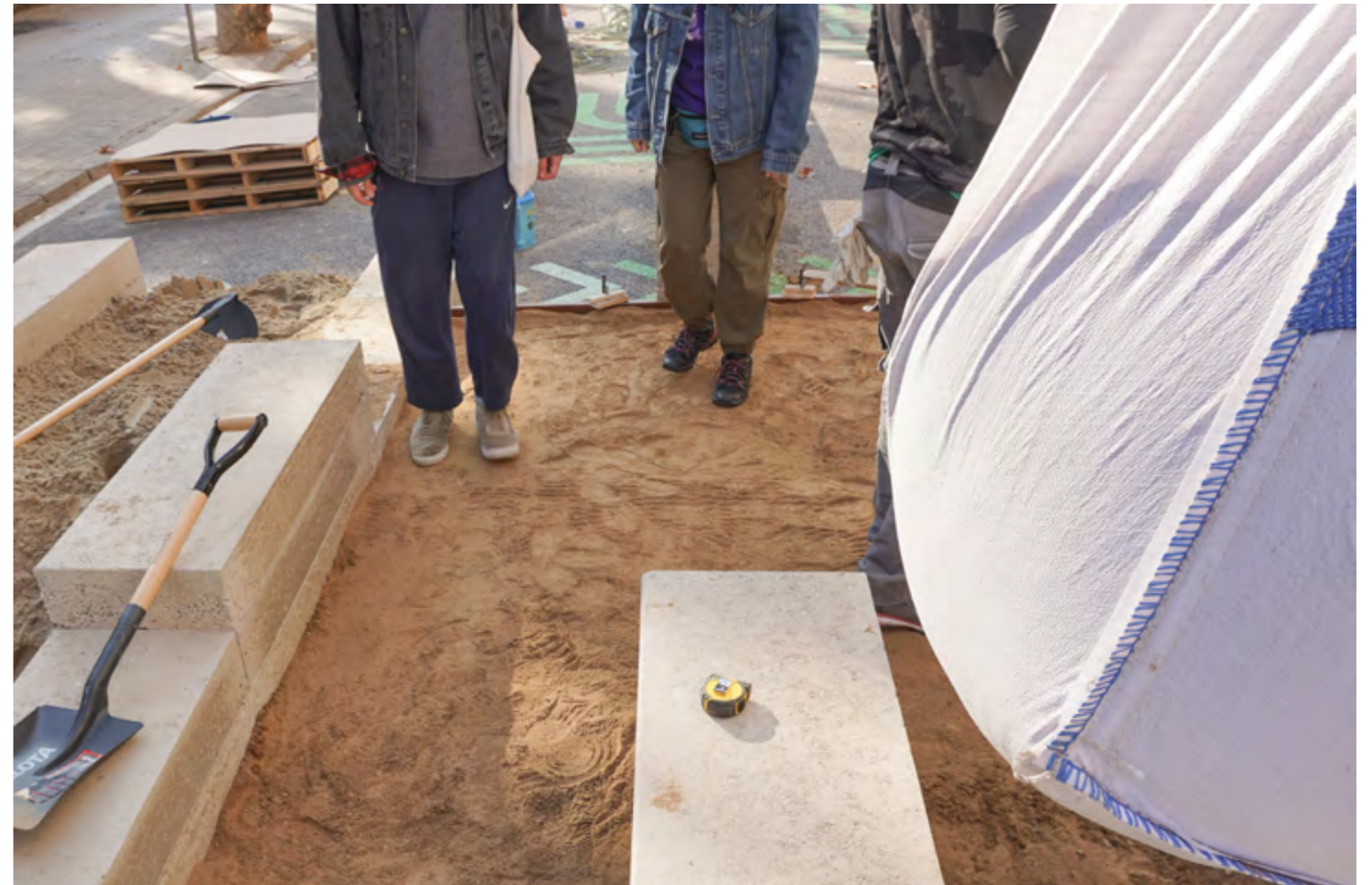
15



RELOCATION IN SCHOOLYARD

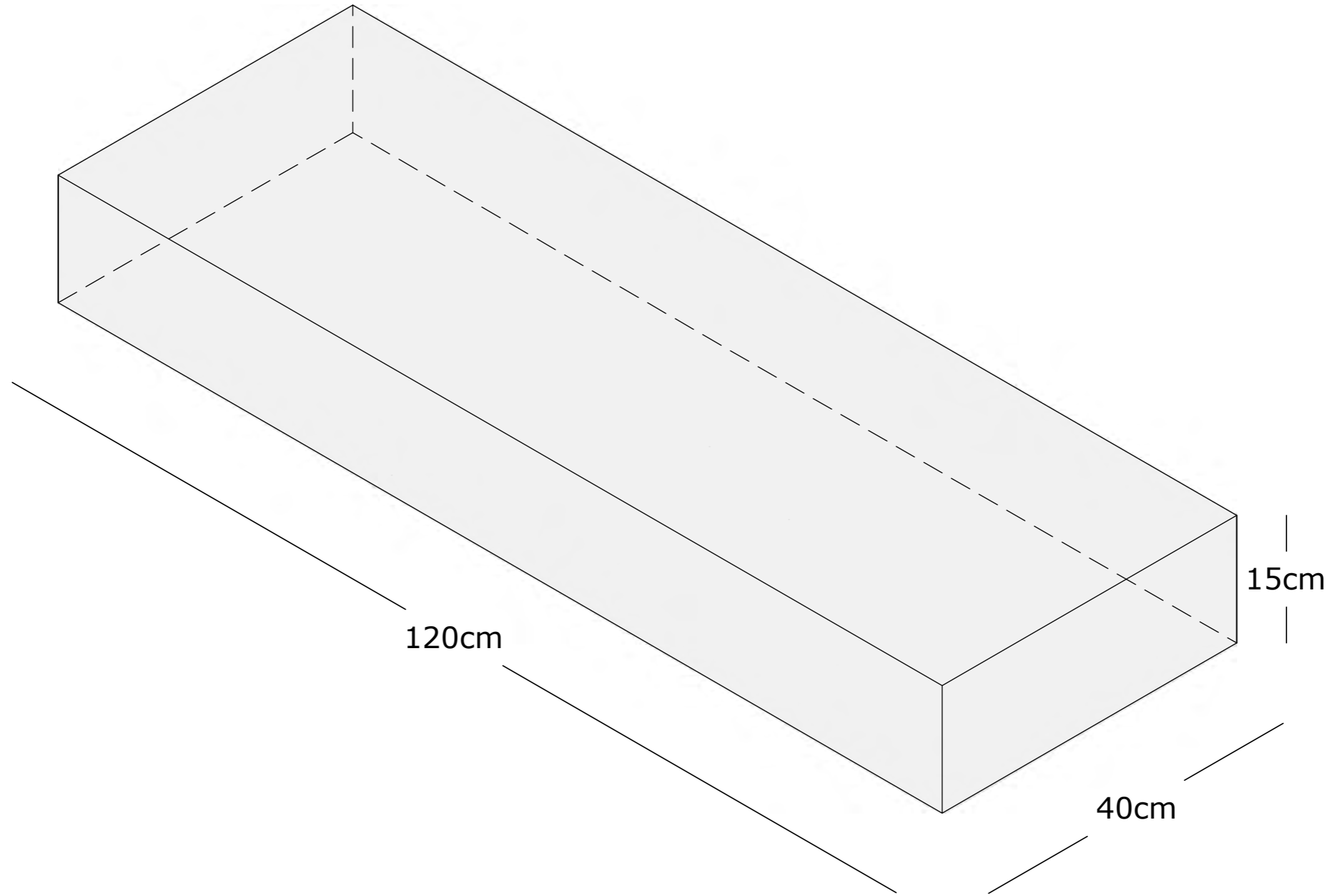
Assembly



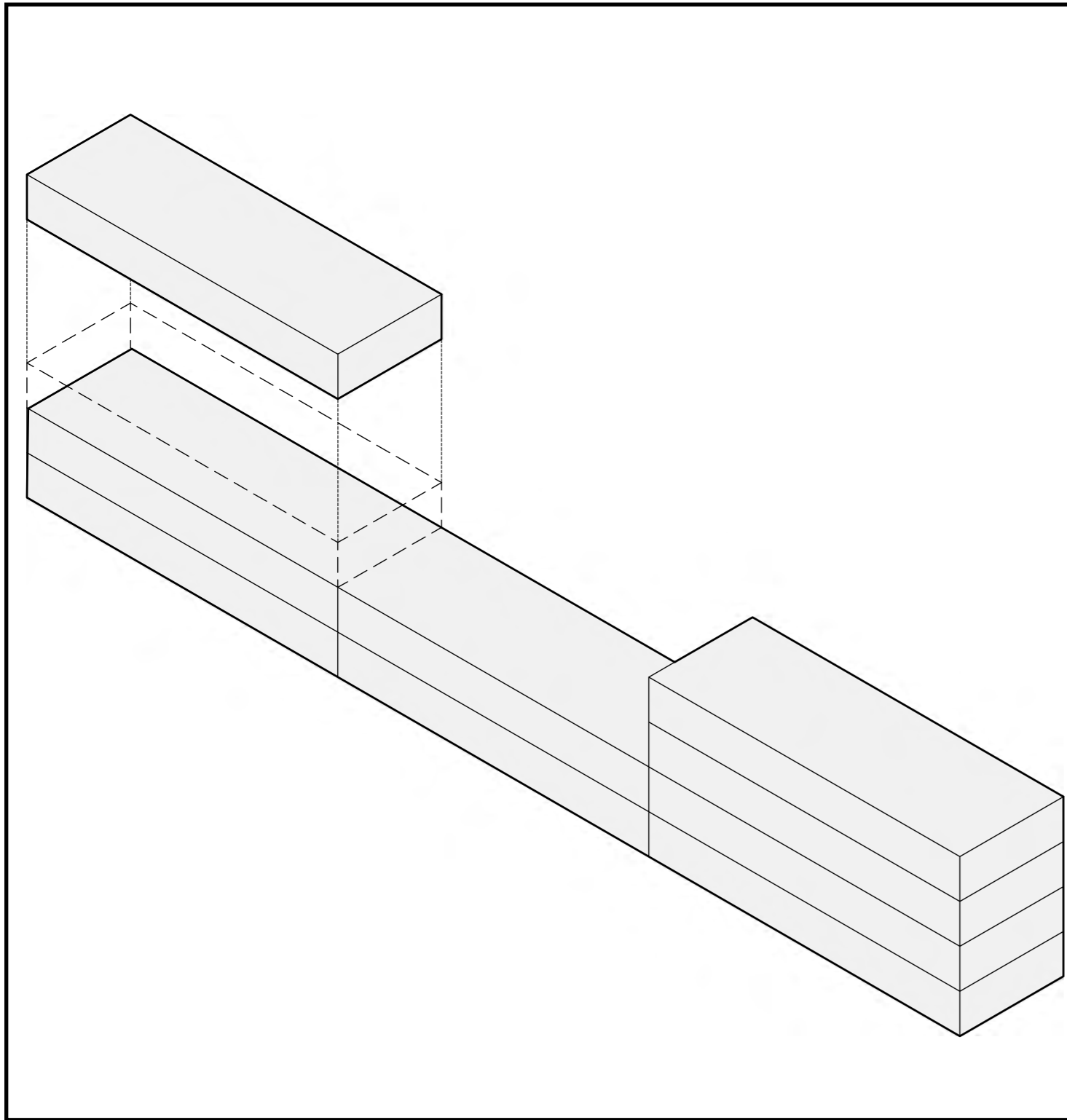




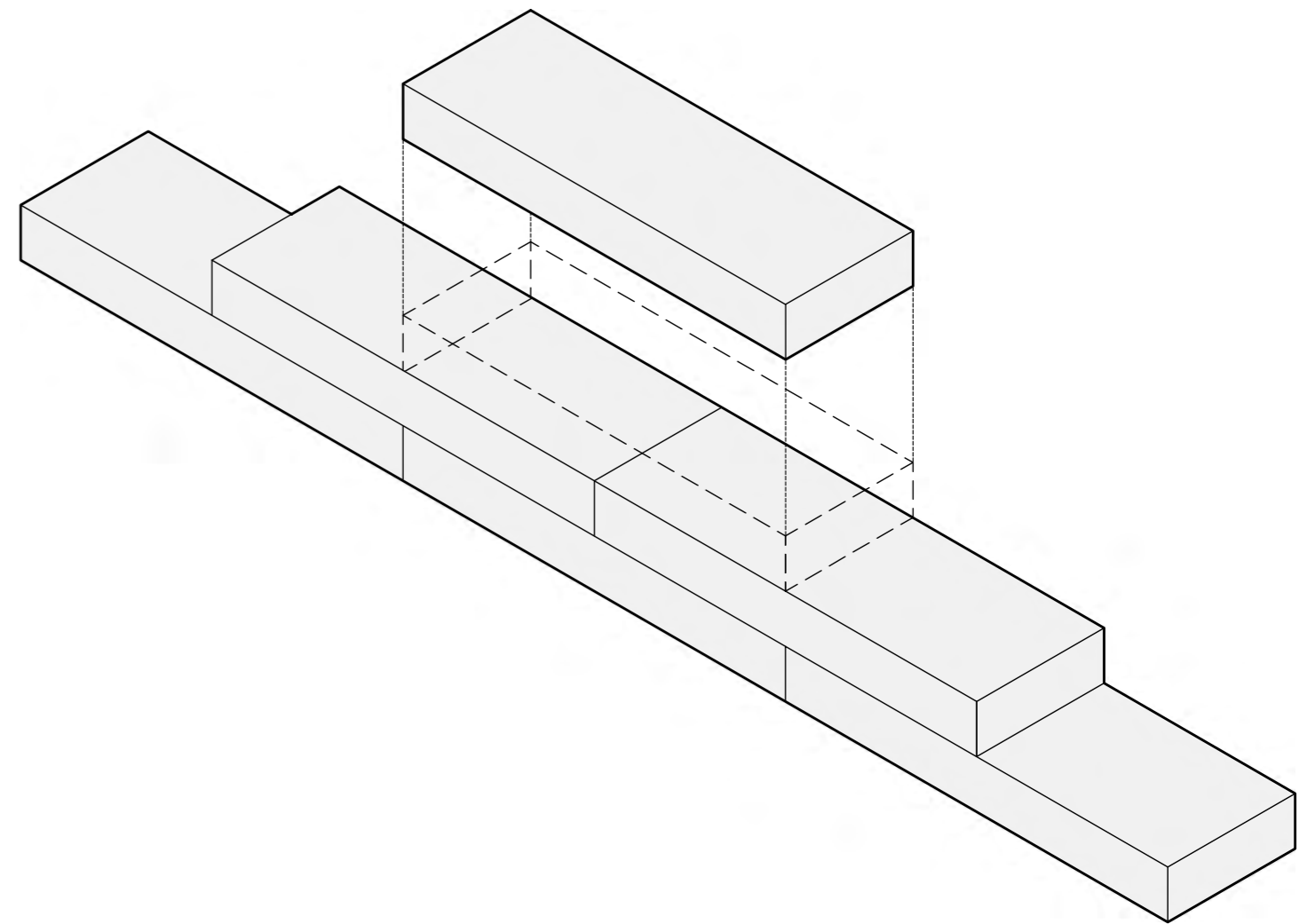
Technical Drawings



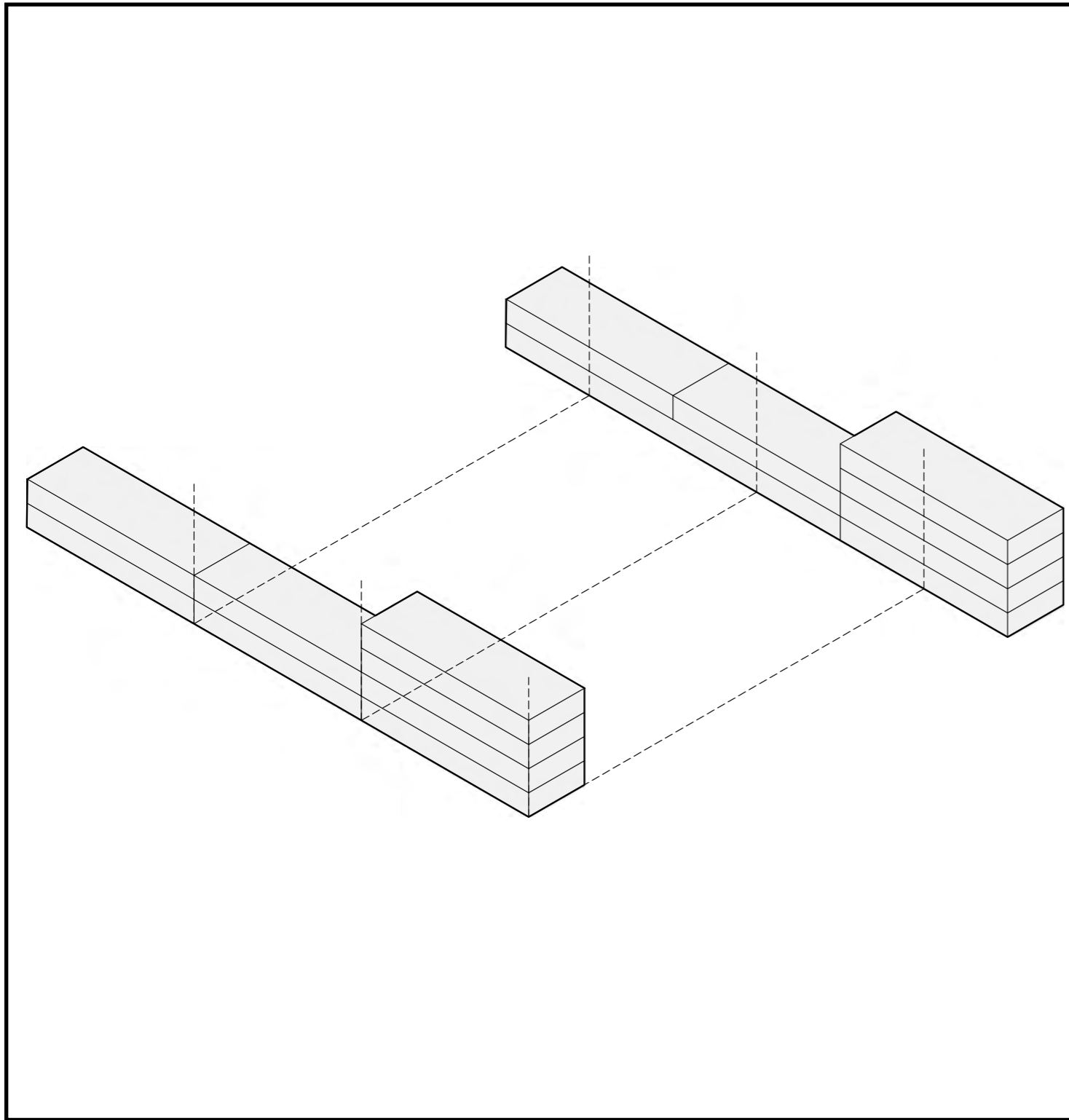
AMOUNT OF PIECES: 66



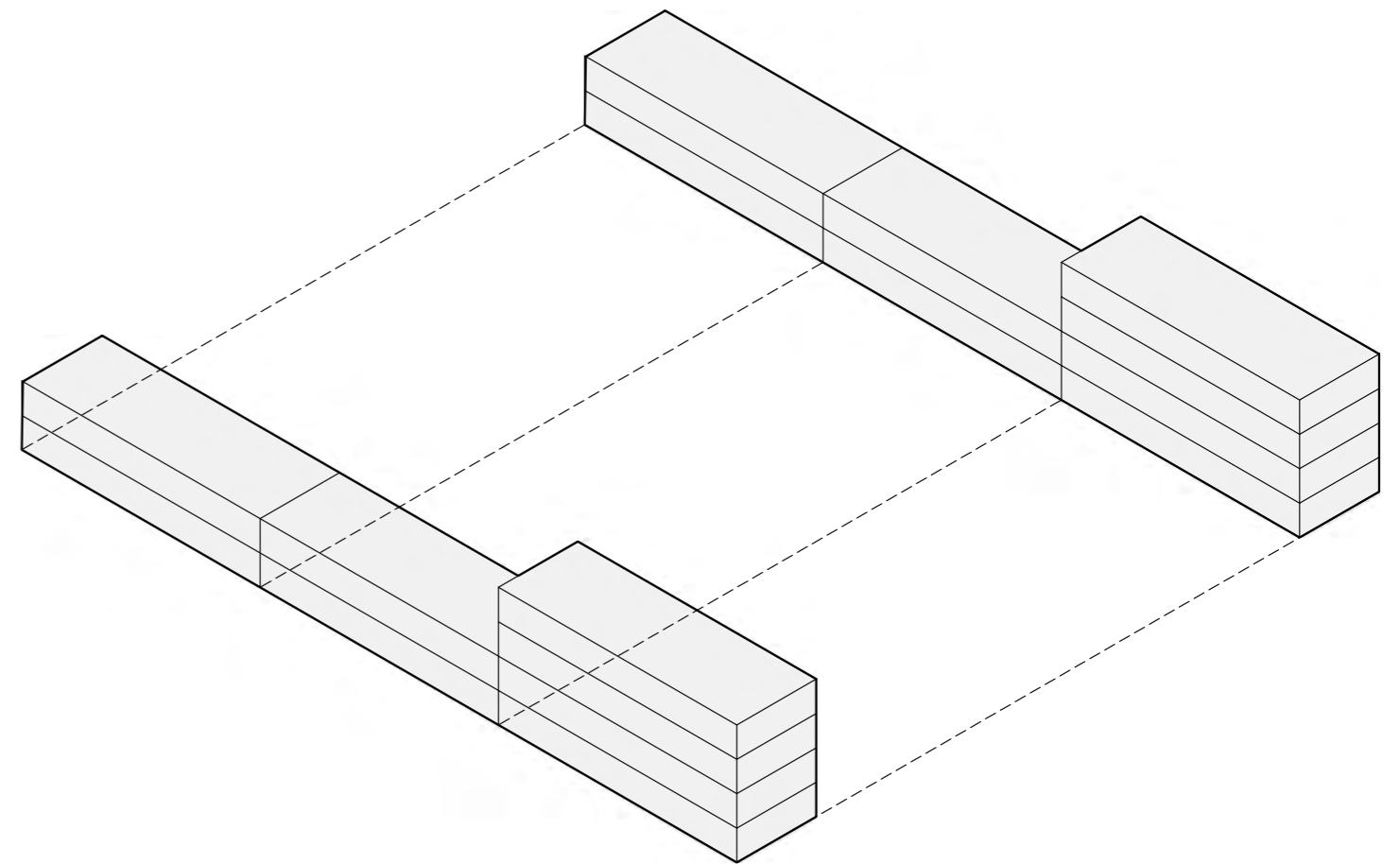
ALIGNED



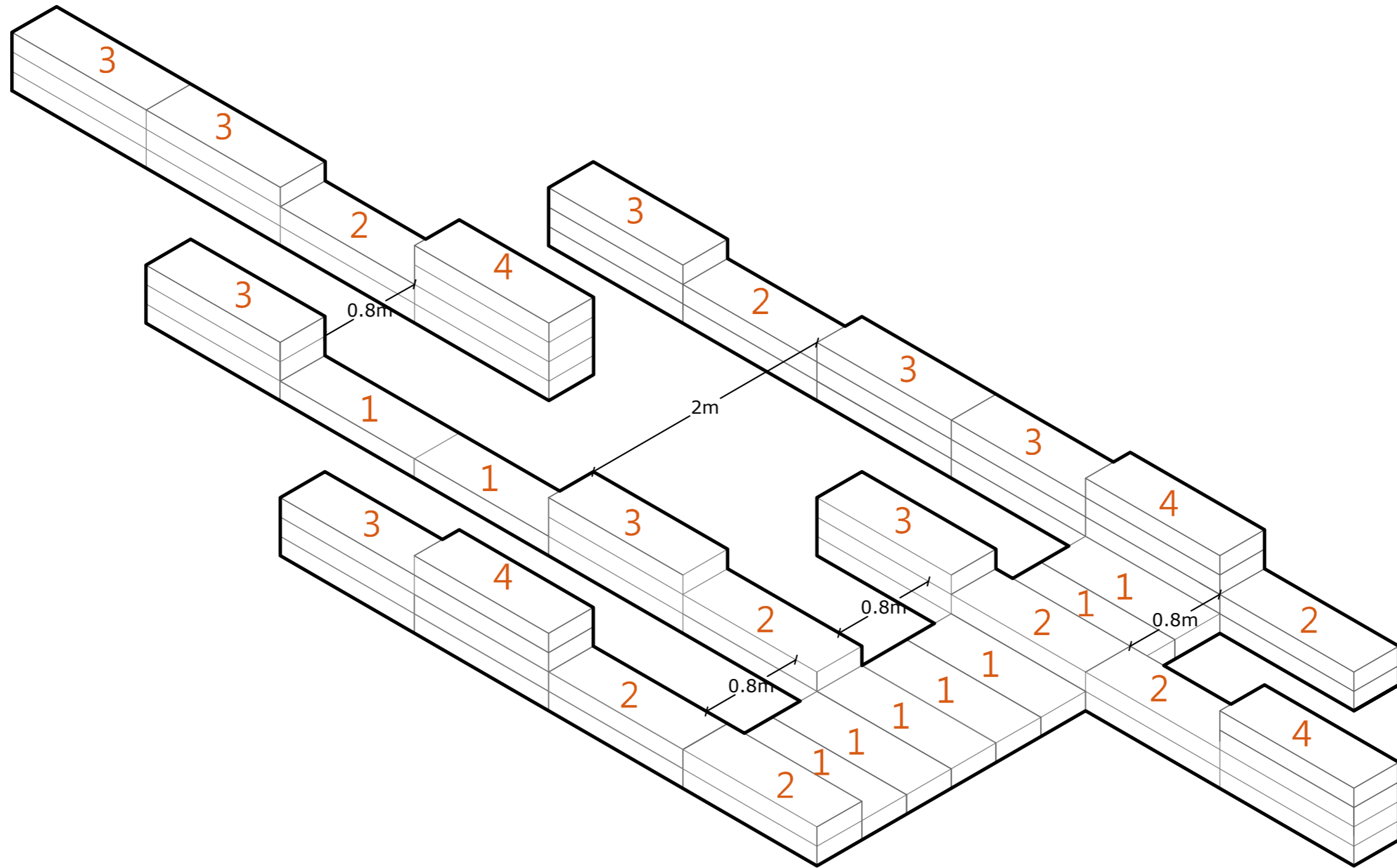
OFFSET

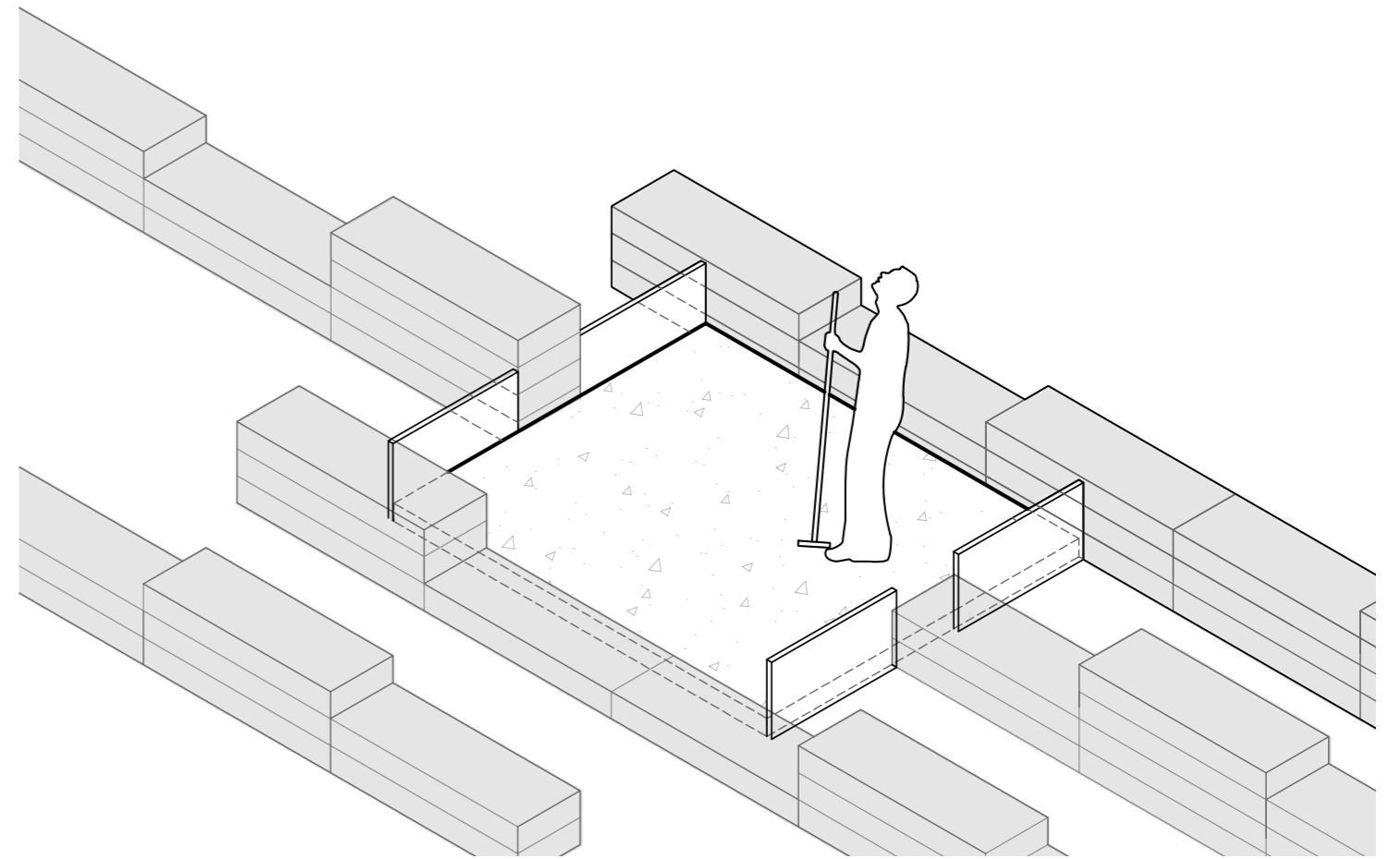
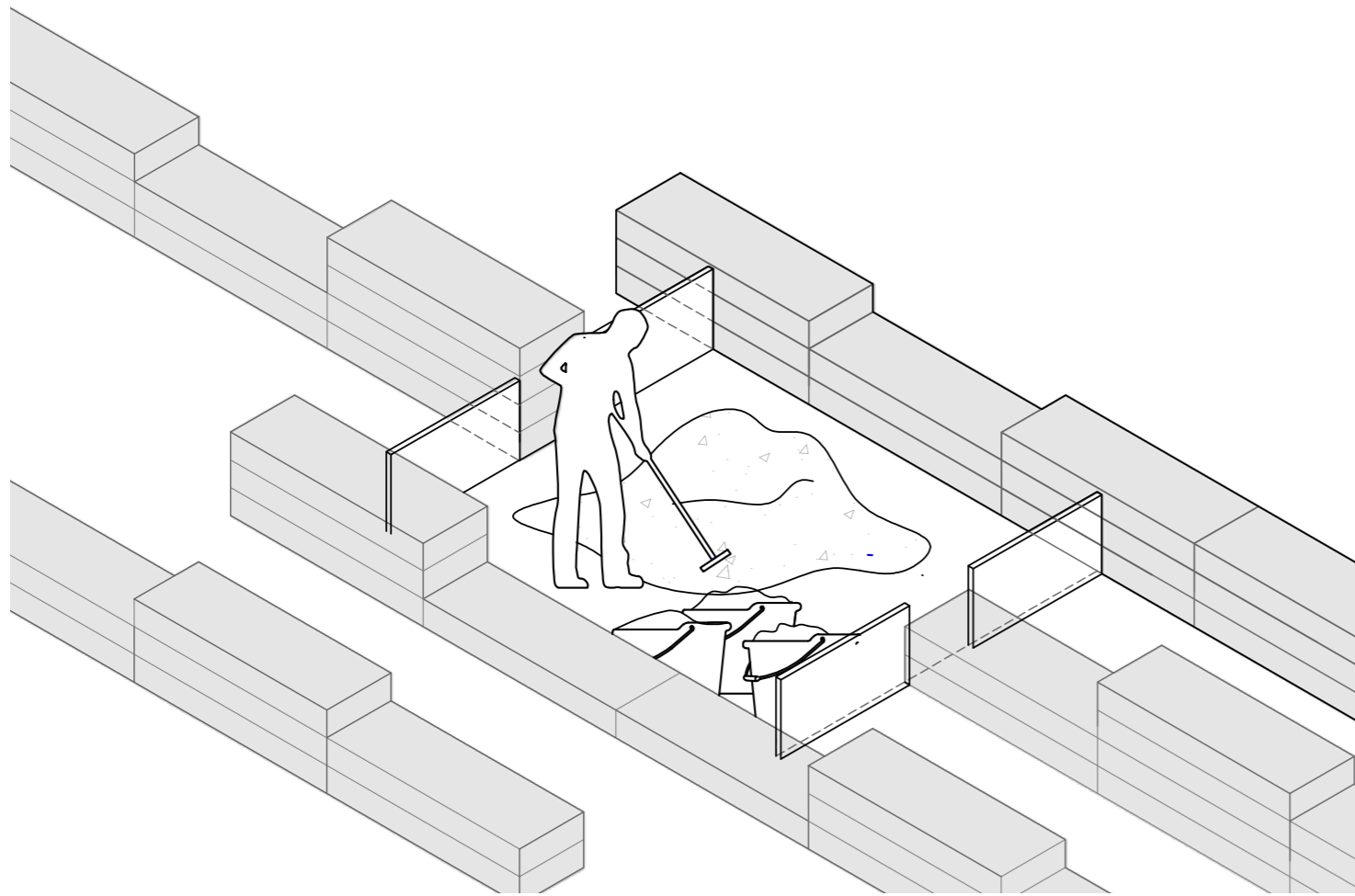


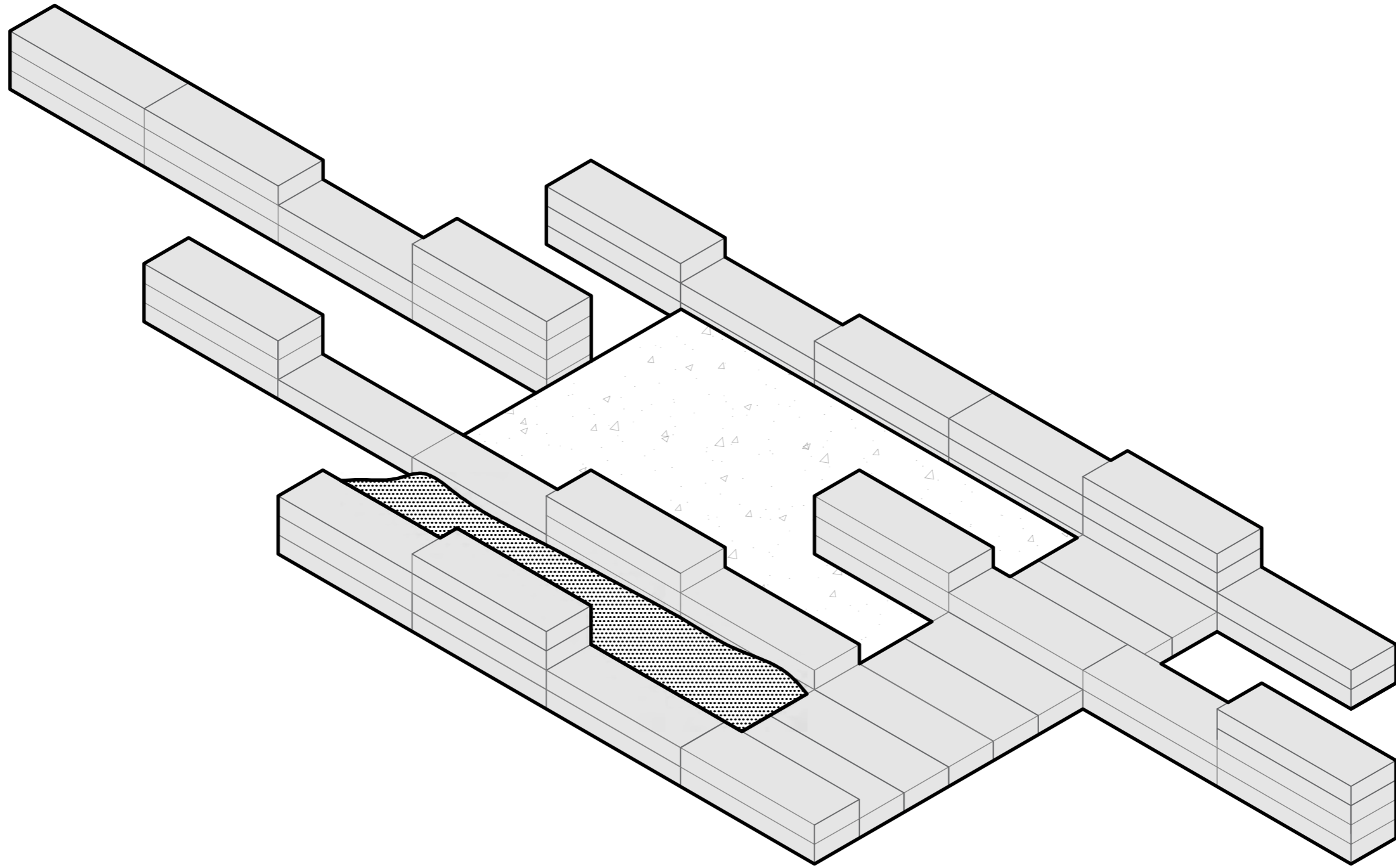
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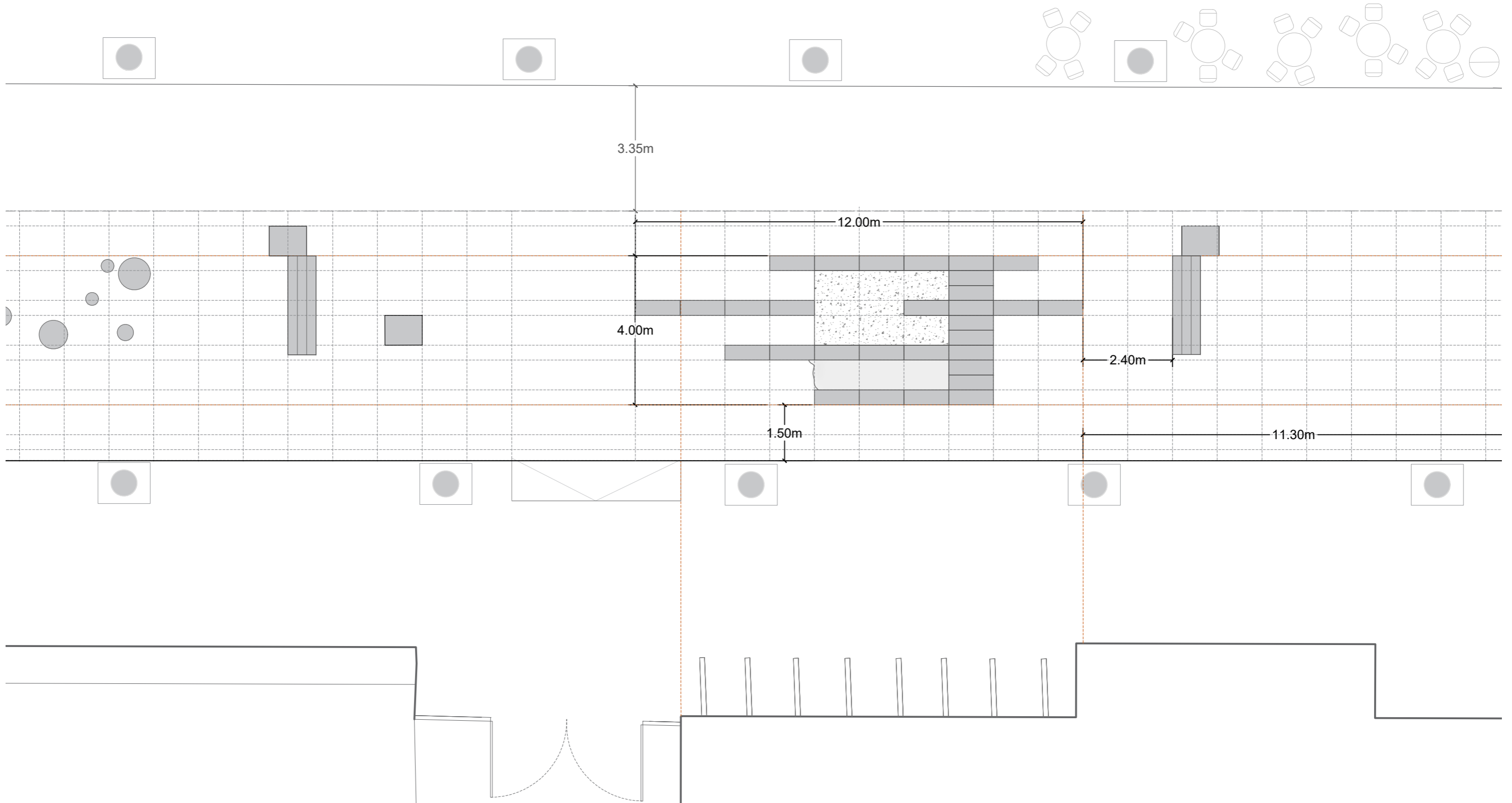


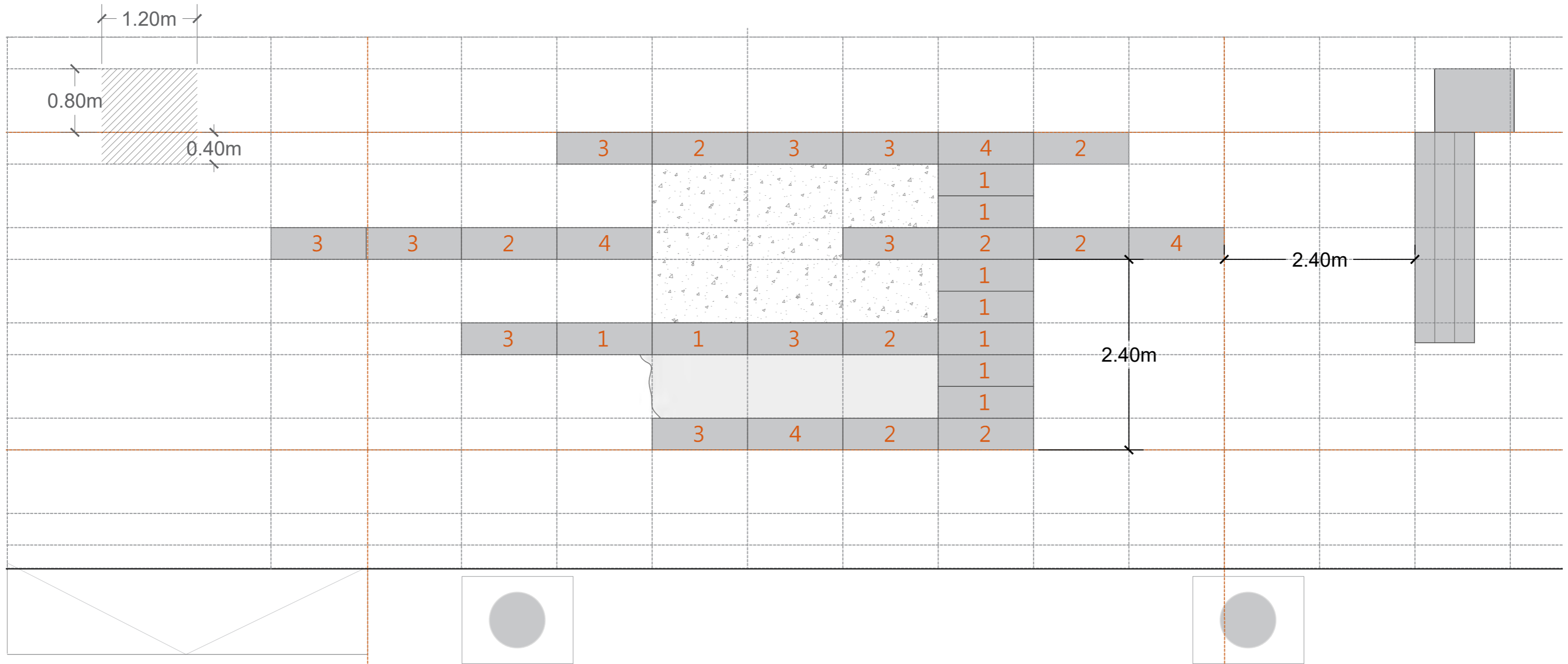
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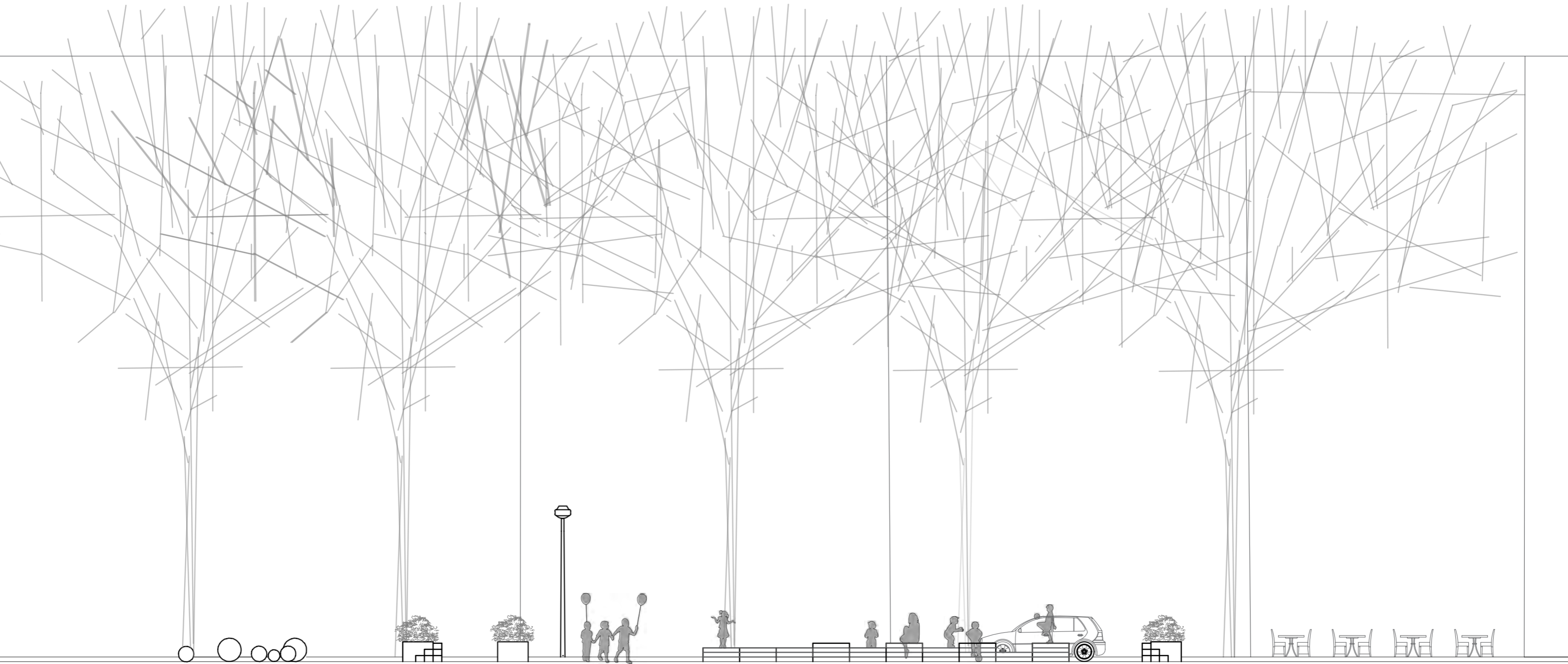


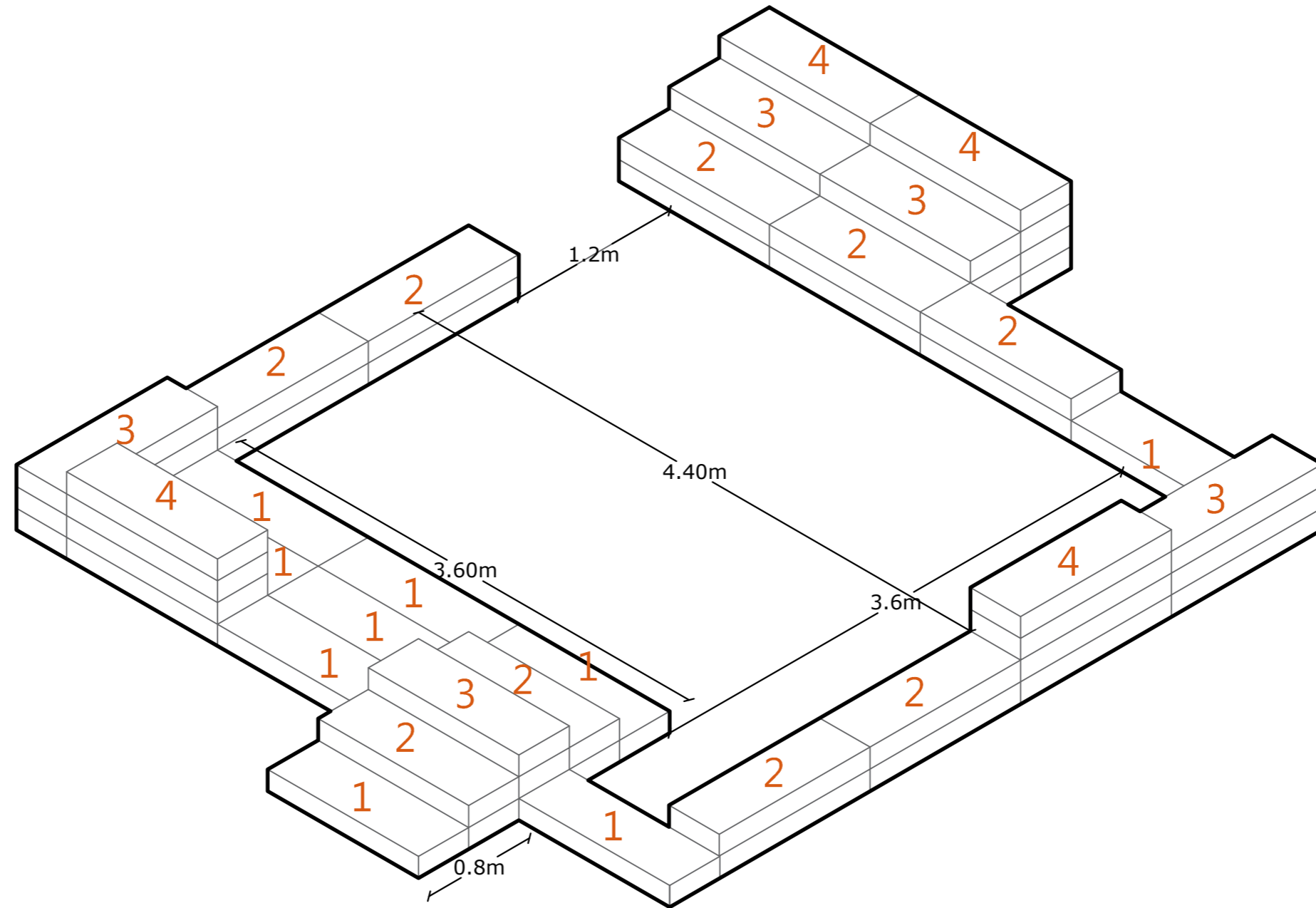


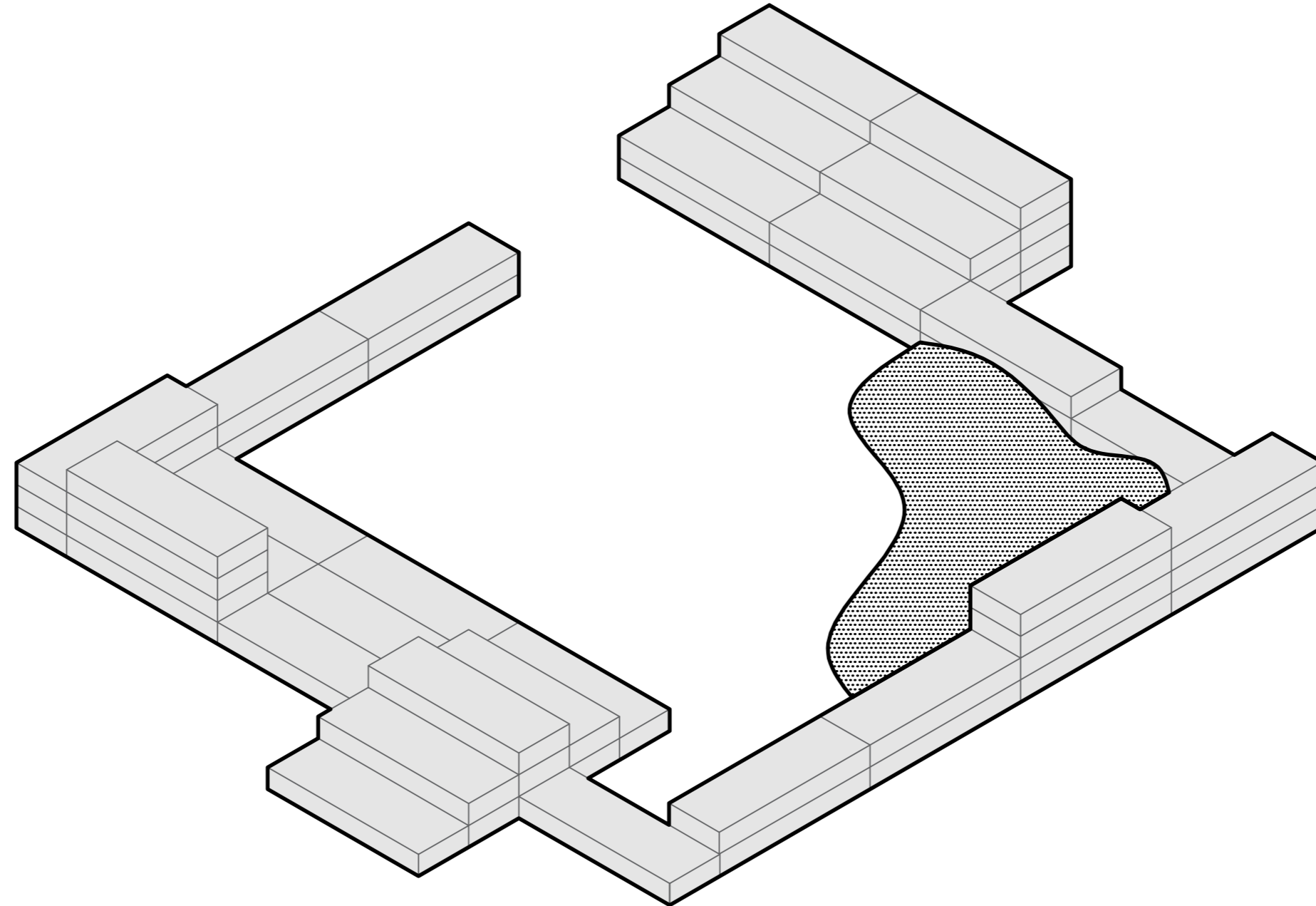
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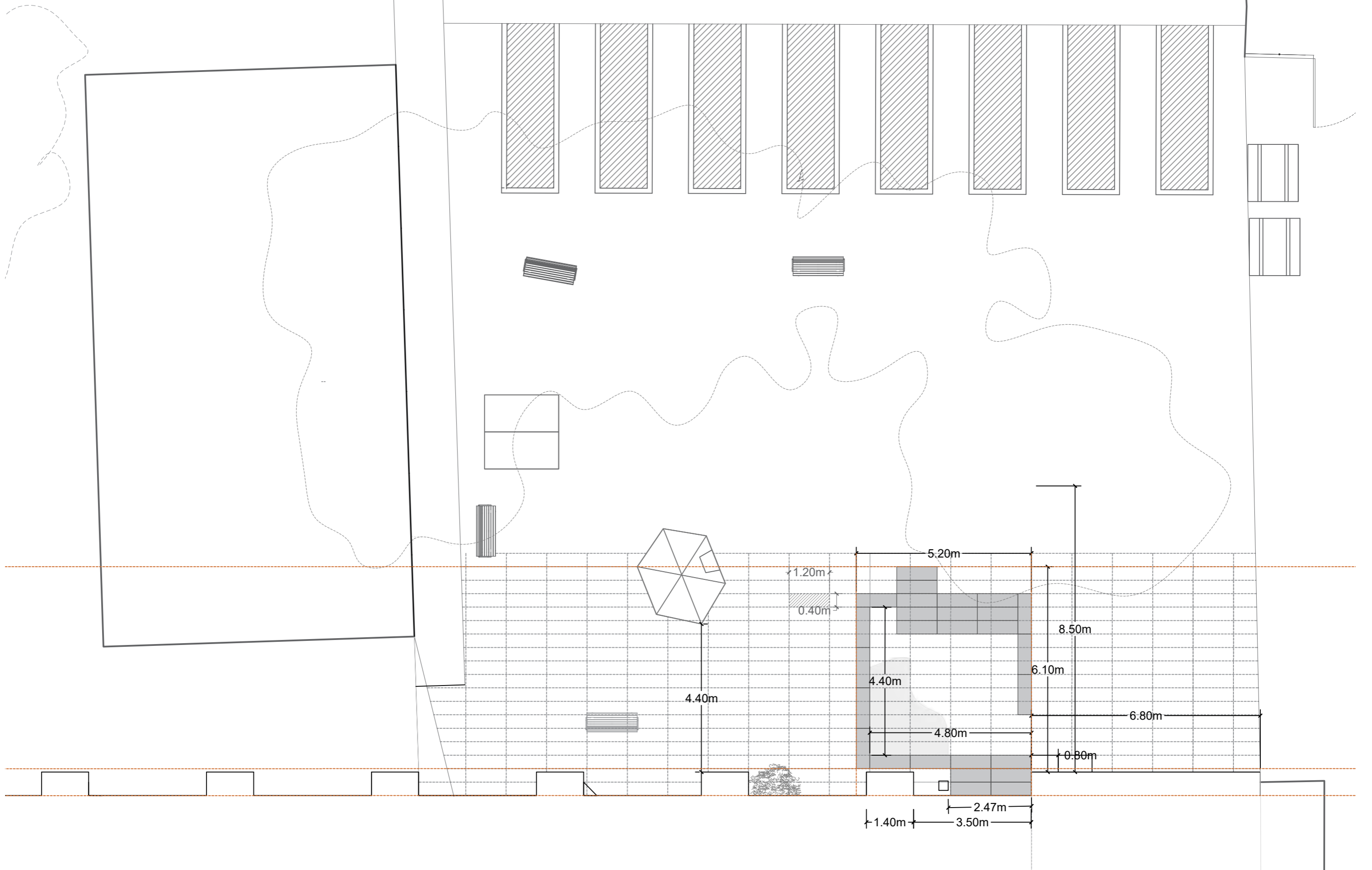
number of blocks

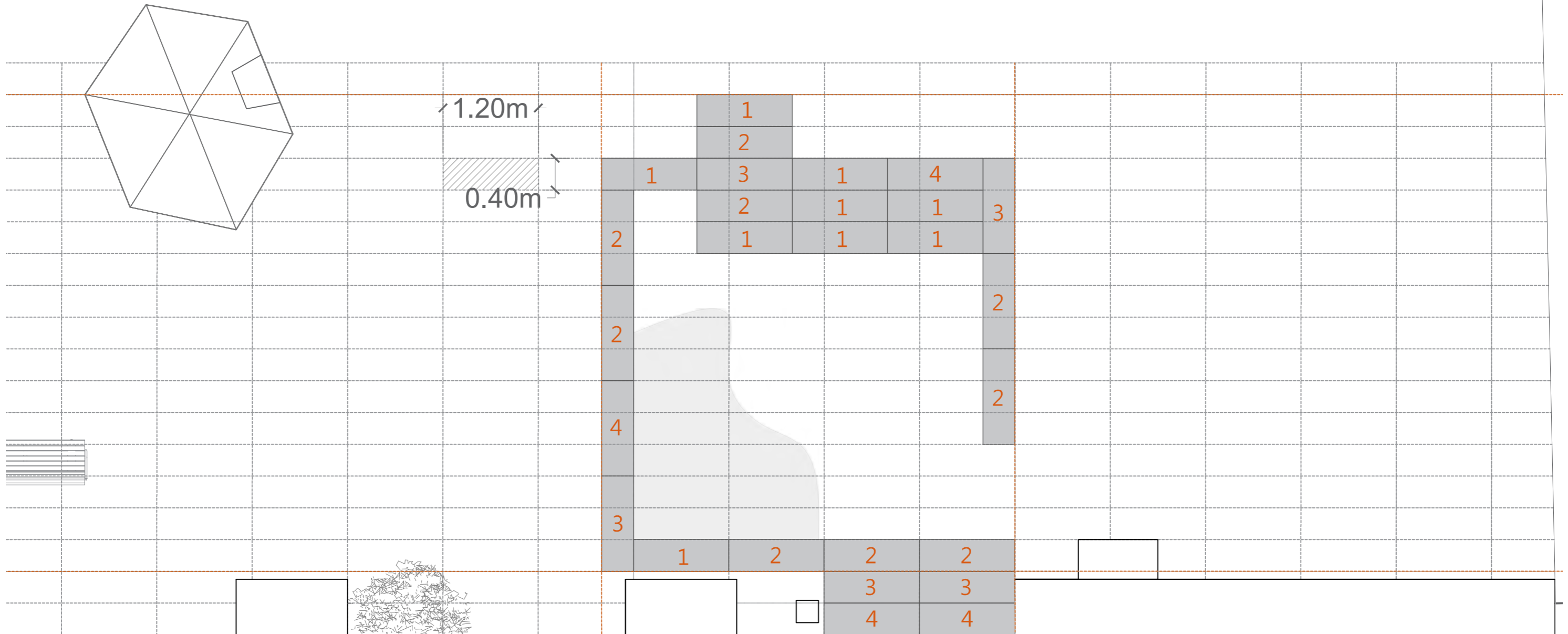
grid











Num

number of blocks

grid





RAW was designed and fabricated by a team of researchers, professors, alumni and students of Elisava Barcelona School of Design and Engineering (UVic-UCC)

Elisava Research:

Roger Paez (PI/project manager), Jordi Queralt (design coord)

Elisava Alumni-Design:

Liana Kalaitzoglou

Elisava Students-Assembly:

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CoDesign:

Antoni Brusi School 6th grade students

Collaborators:

CARNET, Ajuntament de Barcelona, Escola Antoni Brusi, GLS Prefabricats

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