RESEARCH & DESIGN vol 03

/BUILDING

PROJECT BOOK

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03

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URBAN ARCHITECTURE

INTRODUCTION

Volume 03: BUILDING is the final chapter of the graduation thesis: it focuses on the interiors of the arts centre, exploring the finer details of the new proposal, both in terms of structure and construction, and in terms of building organisation and function.

We will look at how people will move through/use key spaces within the arts centre, and particular attention is given to the character, qualities and atmosphere of the different spaces, which are influenced heavily by materiality and tectonic design.

A thoughtful integration of building technology and environmental design is considered in the final part of the book.

CONTENTS

ORGANISATION AND ZONING

BUILDING ZONING

WORK | PUBLIC | LIVING | CIRCULATION

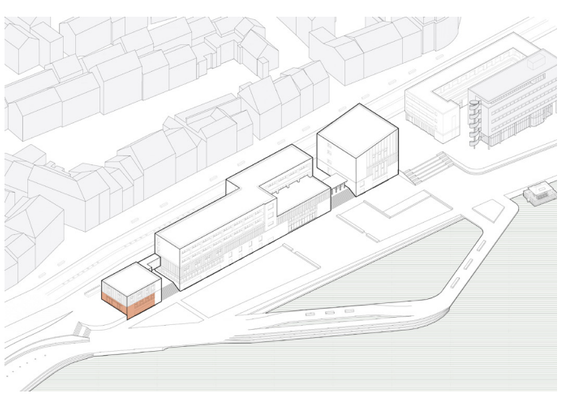
MOMENTS OF INTERSECTION

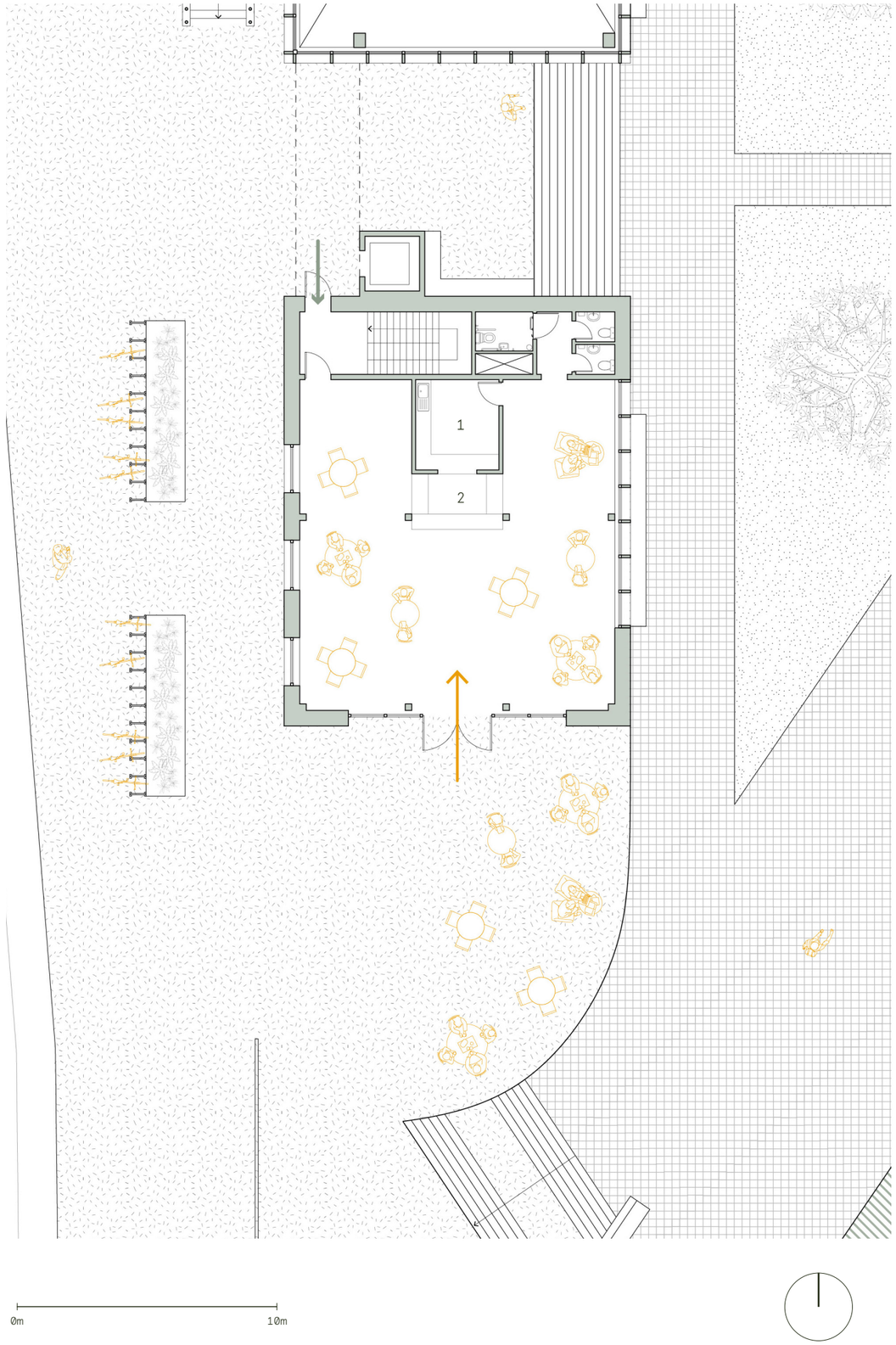
CAFE

In the design proposal, there are three key moments of intersection between the building and the public realm, in which interior spaces open up to the outdoors. This is key to inviting the public to engage with the arts centre and the activities inside.

The first of these moments is the cafe, which is strategically placed at the entry to the waterfront promenade and faces the city, acting as an invitation for a walk along the quay.

Seating spills out onto an outdoor terrace which overlooks the river. People can also order to takeaway and sit anywhere along the waterfront in the variety of new public seating provided.





kitchen / 1
service counter / 2

public entrance

private entrance

BUILDING | moments of intersection

open house | VOL 03

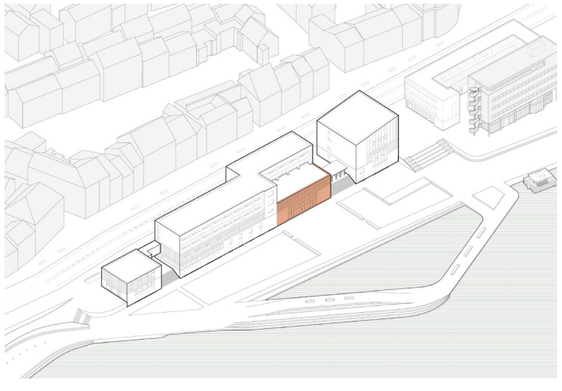
EXHIBITION HALL

The second moment is the exhibition hall, a large flexible space with a generous ceiling height of 8 metres. It will mainly be used to showcase rotating art collections, but can also accomodate a variety of other activities organised by the arts centre, for instance trade fairs and expos, lectures, public workshops, and networking events.

The hall can be accessed via the main entrance from the street side or alternatively from the waterfront promenade where it intersects with a large open square, allowing for activities to spill out into the public realm.

Its placement on the lower level of the waterfront means that the space will occassionally need to be cleared in the event of a flood which might occur every few years.

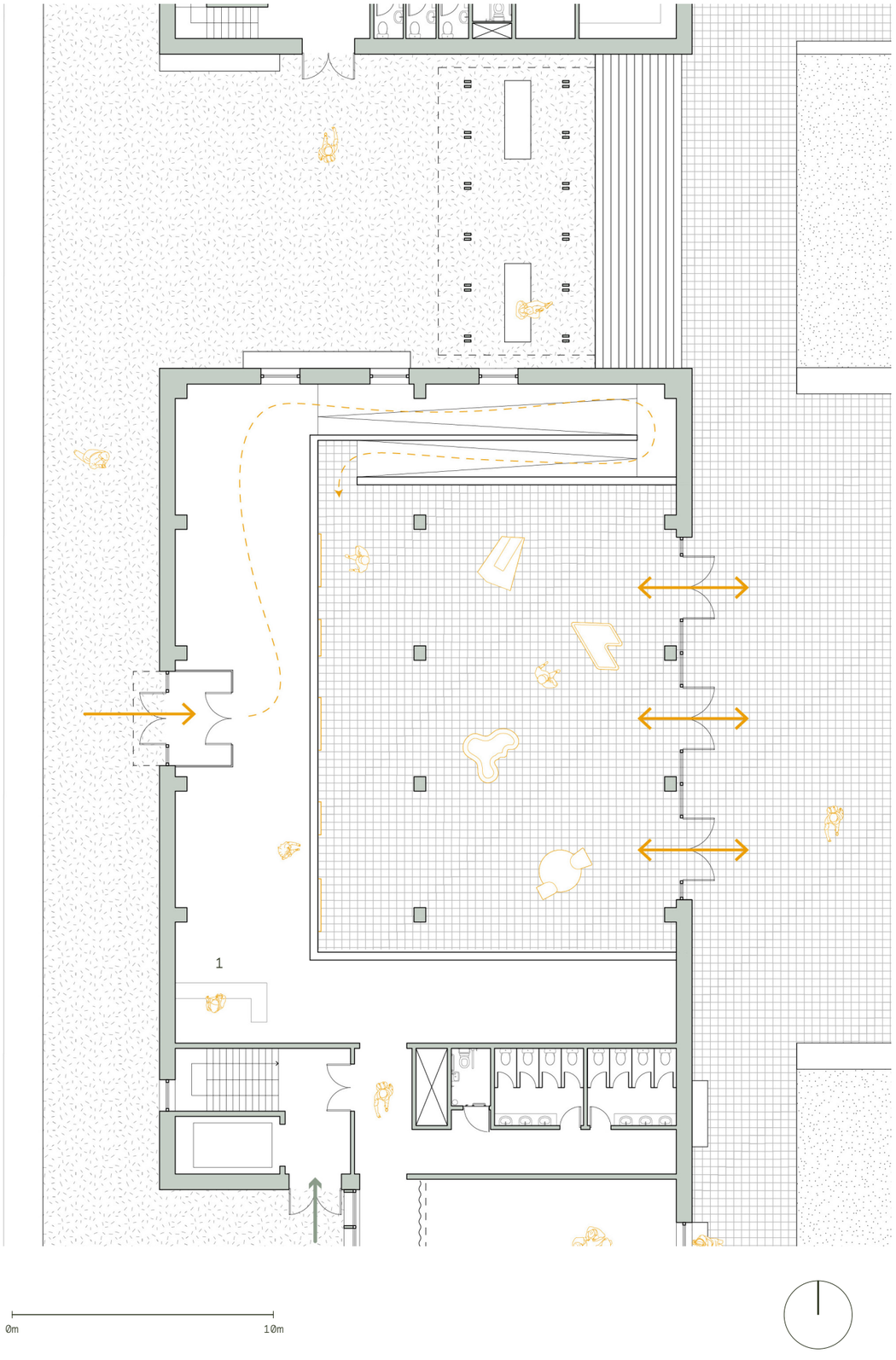
Solid concrete construction, forming a 3.1 meter high wall around the perimeter of the hall, ensures that the flood water will not reach any other part of the building.



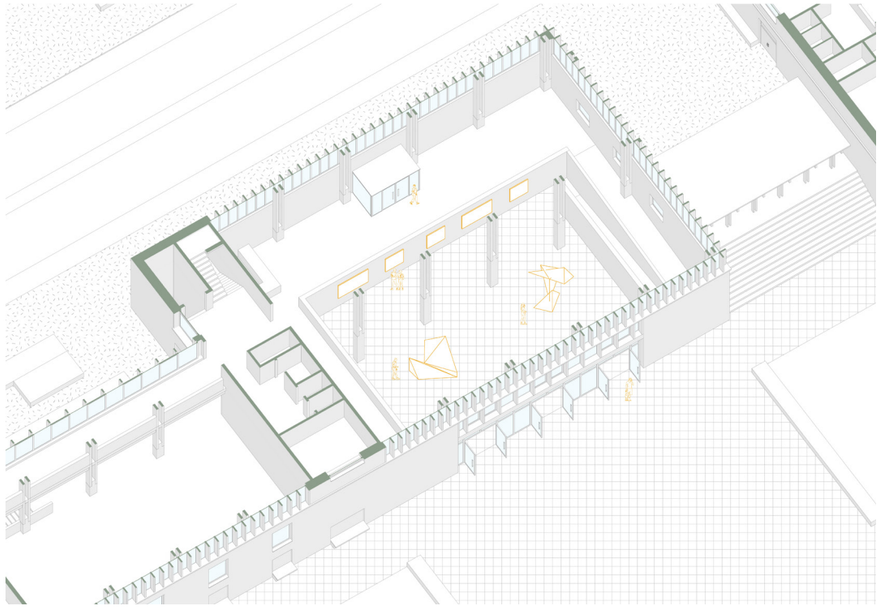
reception desk / 1

public entrance

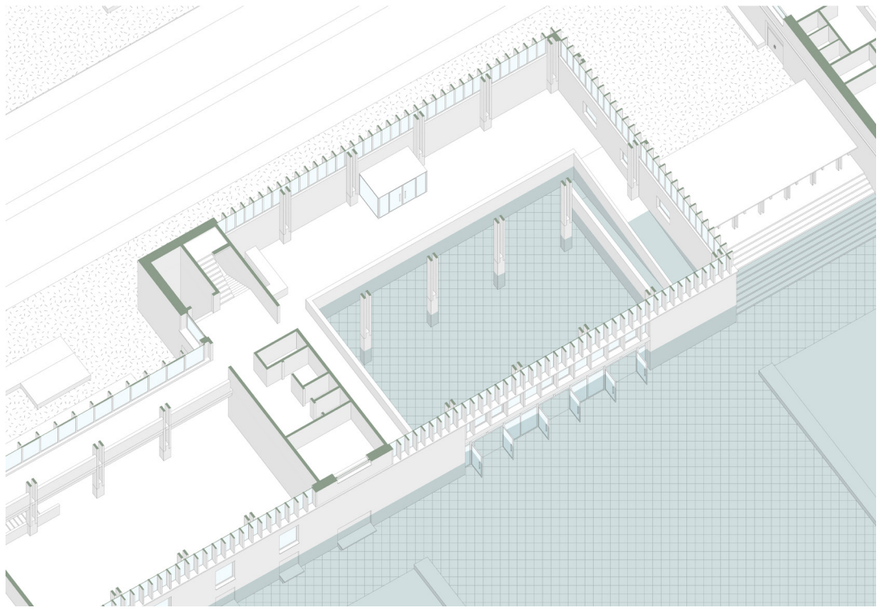
private entrance



FLOOD DIAGRAM



the exhibition hall under normal use



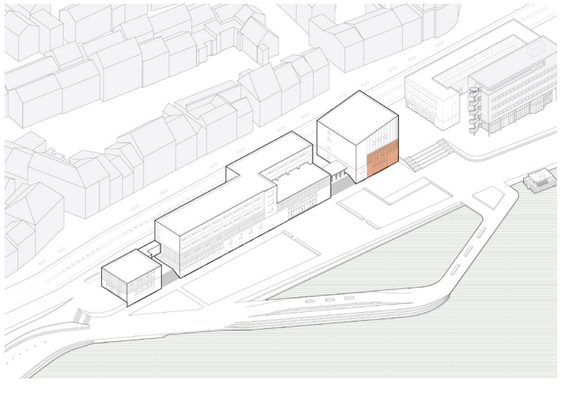
in the event of flooding, which may occur every few years

COMMUNITY HALL

The community hall is a large, open-plan, multifunctional space which opens out to another public square, this time on street level.

When not scheduled for use by the arts centre itself, it can be hired for public use, for instance by clubs and societies, but also by individuals.

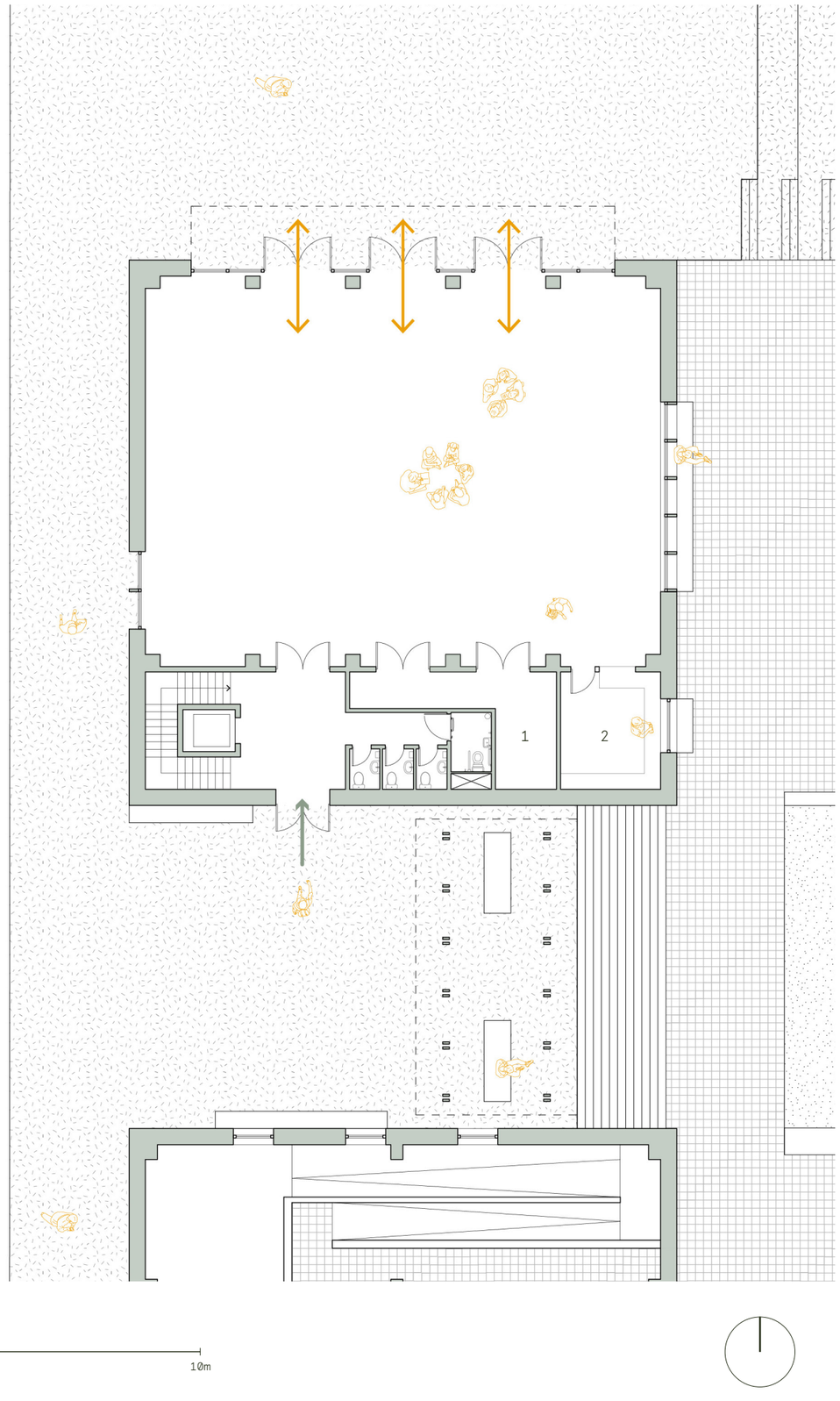
The space could be used for events, exhibitions, meetings, performances, parties, and much more,



storage / 1
kitchen / 2

public entrance

private entrance



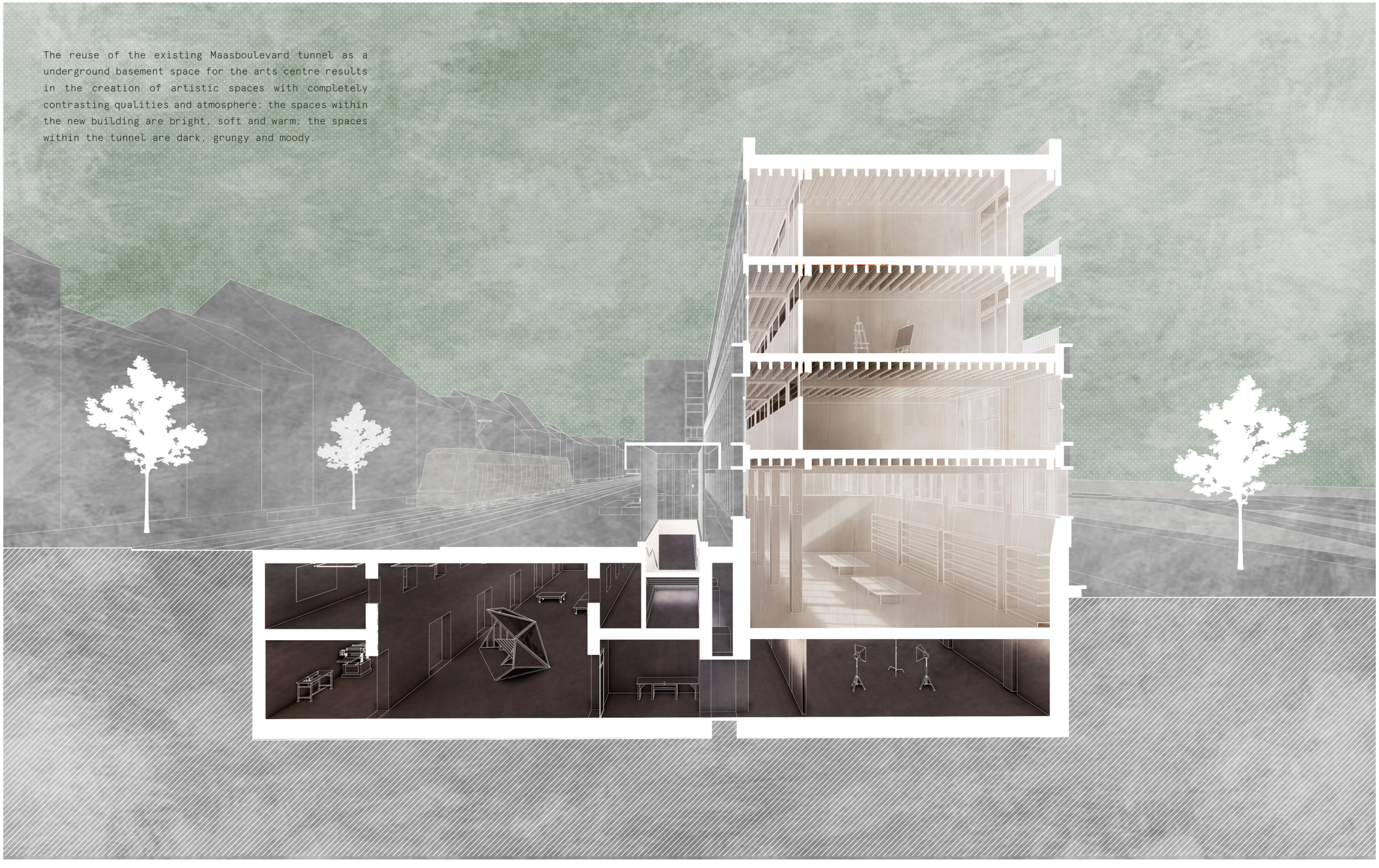
BUILDING | moments of intersection

open house | VOL 03

SPACES FOR CREATION

A BUILDING WITH TWO PERSONALITIES

The reuse of the existing Maasboulevard tunnel as a underground basement space for the arts centre results in the creation of artistic spaces with completely contrasting qualities and atmosphere: the spaces within the new building are bright, soft and warm; the spaces within the tunnel are dark, grungy and moody.



BASEMENT EXHIBITION SPACE

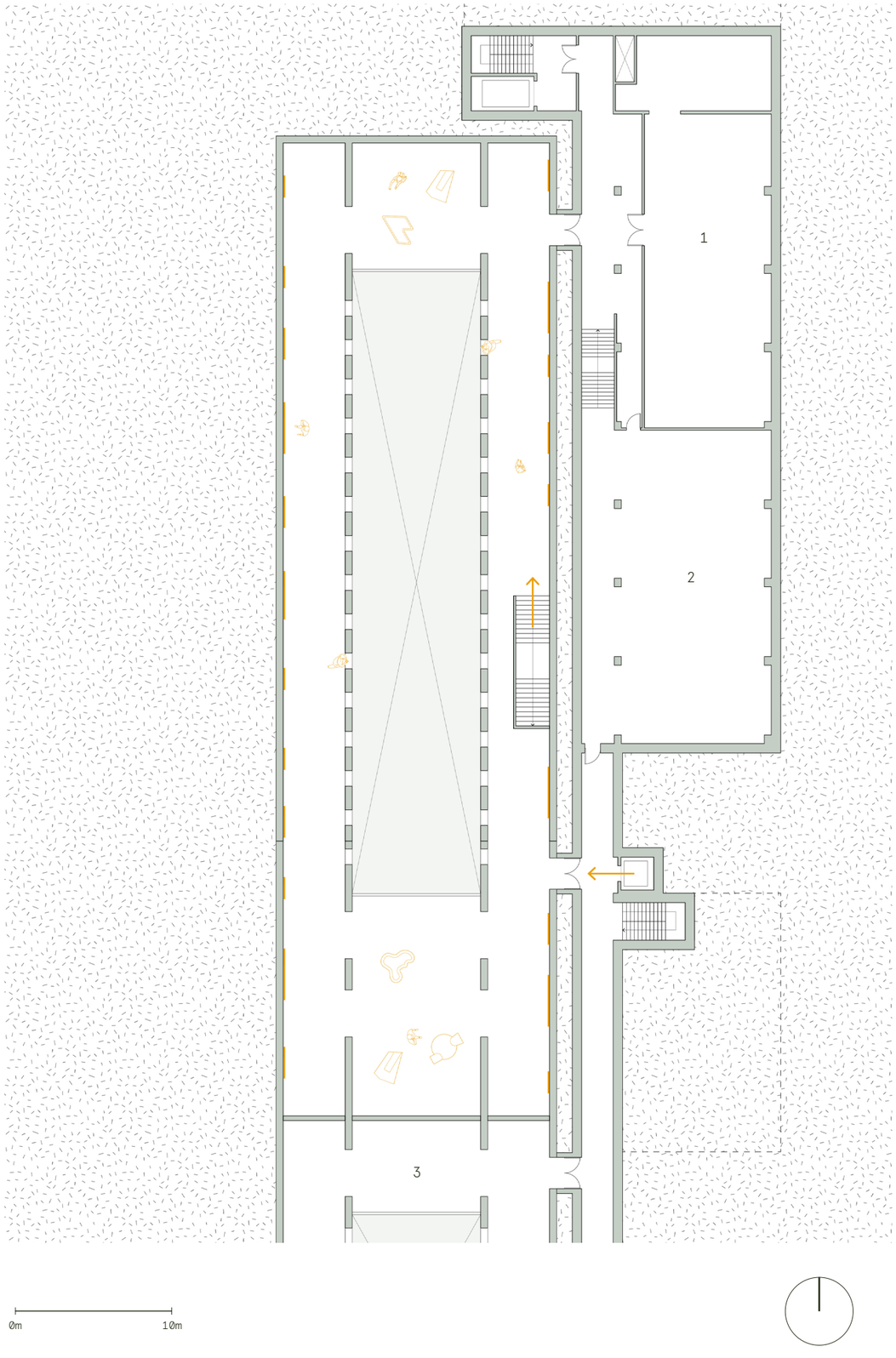
Upon entering the tunnel from the staircase or lift on the street, visitors arrive at a moody exhibition/ gallery space on a mezzanine level, which wraps around and overlooks an open plan workshop area for the resident artists on the floor below, allowing the public to get a glimpse of the artists at work.

The benefit of exhibiting work in the tunnel as opposed to the main exhibition hall is that the lighting can be extensively controlled.

storage / 1
ceramics workshop / 2
theatre mezzanine / 3

public entrance

private entrance

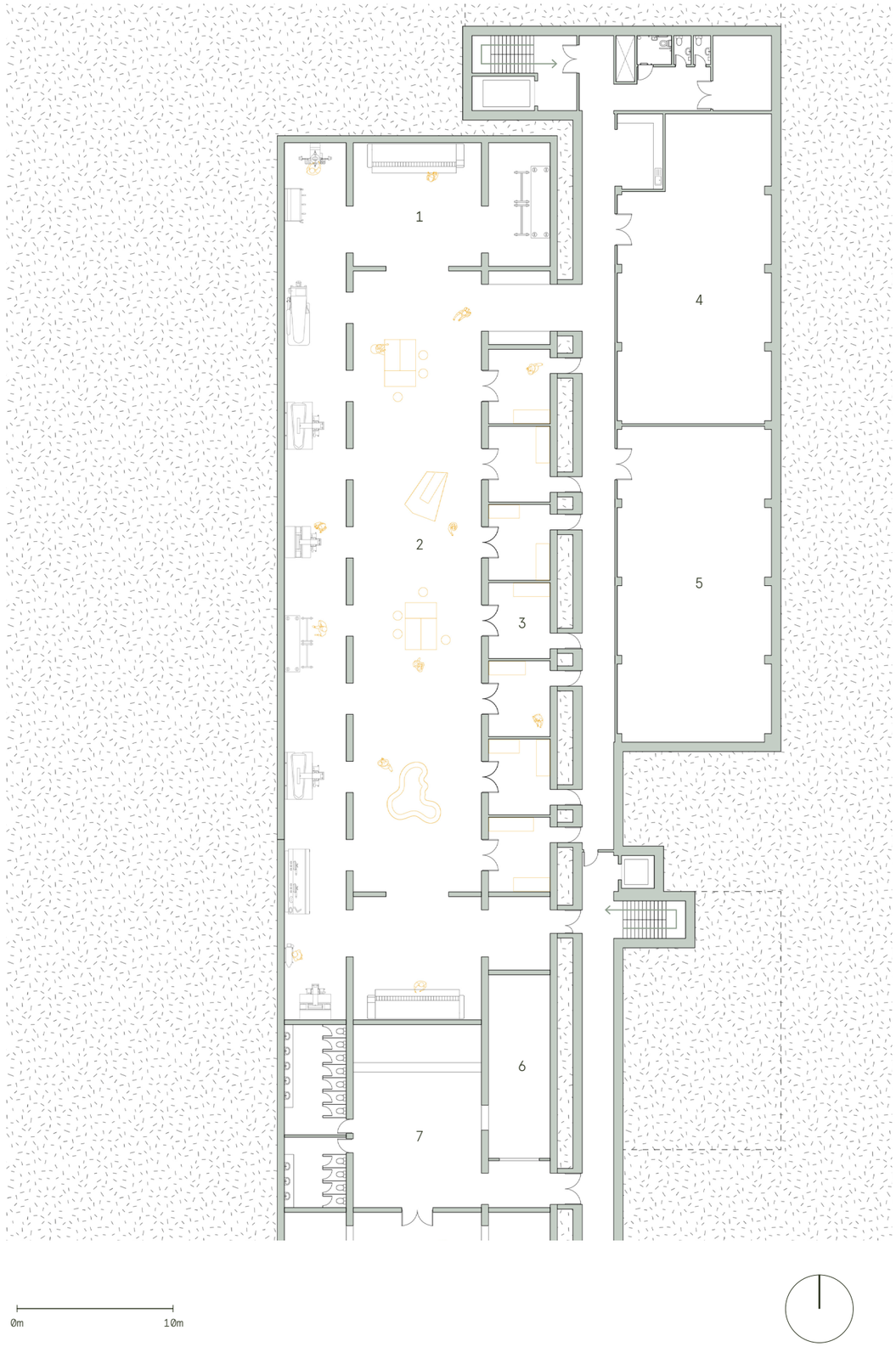


PROJECT SPACE AND ARTISTS STUDIOS

On the lower level of the tunnel, underneath the mezzanine, are a row of individual artists ateliers. These open to the communal, double height project space, used for big sculptures and installations that require a larger working area.

Supporting workshop facilities, such as woodworking machines, laser cutters and spray booths are located in the remaining spaces around the perimeter of the central project space.

The new building is constructed adjacent to the existing tunnel and the artists ateliers are connected to its basement by a series of corridors that bridge the gap between the two structures.



workshop area / 1
communal project space / 2
artist ateliers / 3
technical room / 4
photography studio / 5
cloakroom / 6
bar / 7

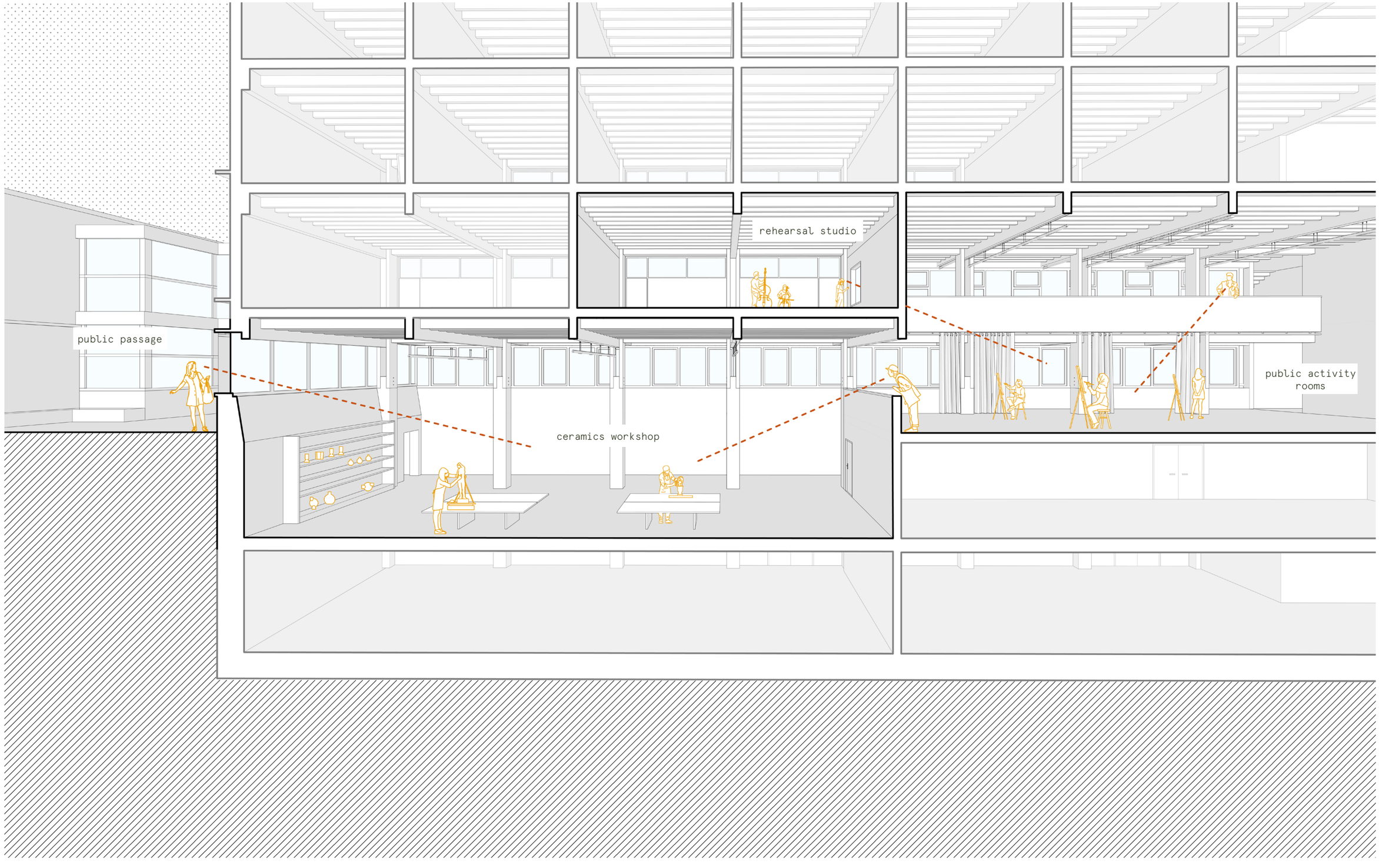
public entrance

private entrance

BUILDING | spaces for the arts

open house | VOL 03

VISUAL CONNECTIVITY ON THE GROUND FLOOR



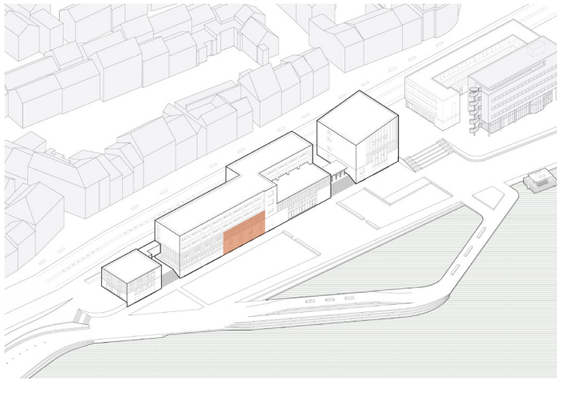
PUBLIC ACTIVITY ROOMS

The artists working in the building organise regular art classes and workshops for the public and these take place in dedicated activity rooms on the ground floor.

As classes are booked in advance, to access the activity rooms, visitors must by the main reception where they check in.

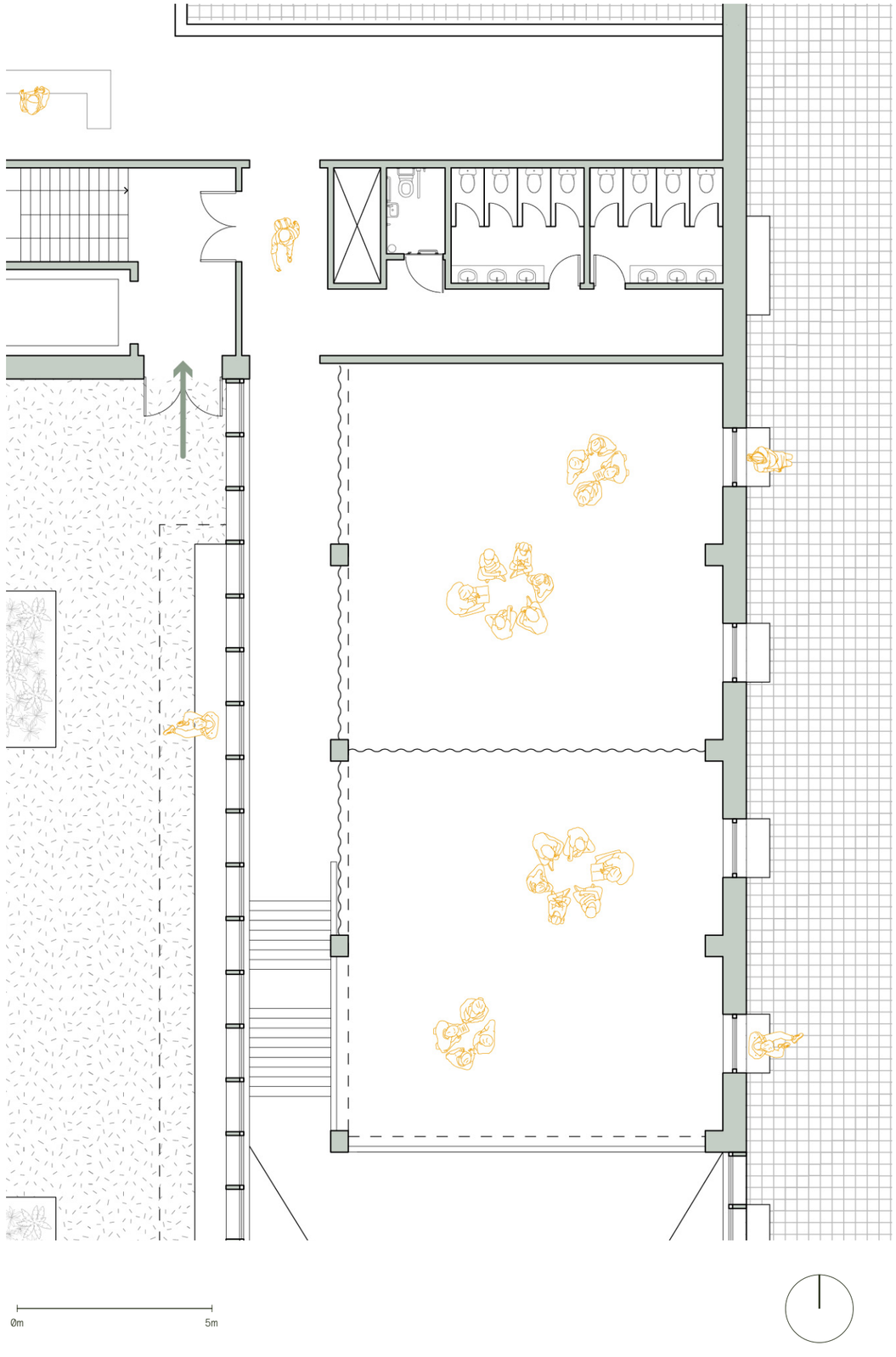
The space features picture windows, framing views of the river, and visual connections to several other spaces within the building are established.

A large curtain in the middle can be drawn closed to divide the area into two smaller rooms, making it possible for two classes to take place at once.



public entrance

private entrance



AN ADAPTABLE SPACE

Curtains Open

A large painting class takes place across the entire activity space

Curtains Closed

A small workshop for children takes place in the divided space

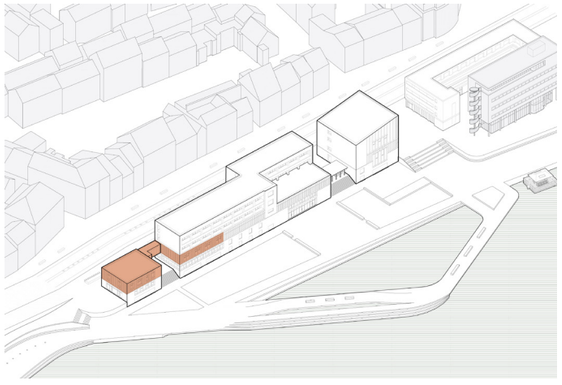
MUSIC PRACTICE FACILITIES

Rehearsal spaces for musical activities are located on the first floor:

Directly above the cafe, there are individual practice rooms, as well as a small professional recording studio, bookable by appointment. All rooms are acoustically treated to help isolate sound and prevent noise transmission outside of the room.

Larger group rehearsal studios are situated above the ceramics studio, accessed via a connecting bridge between the two blocks.

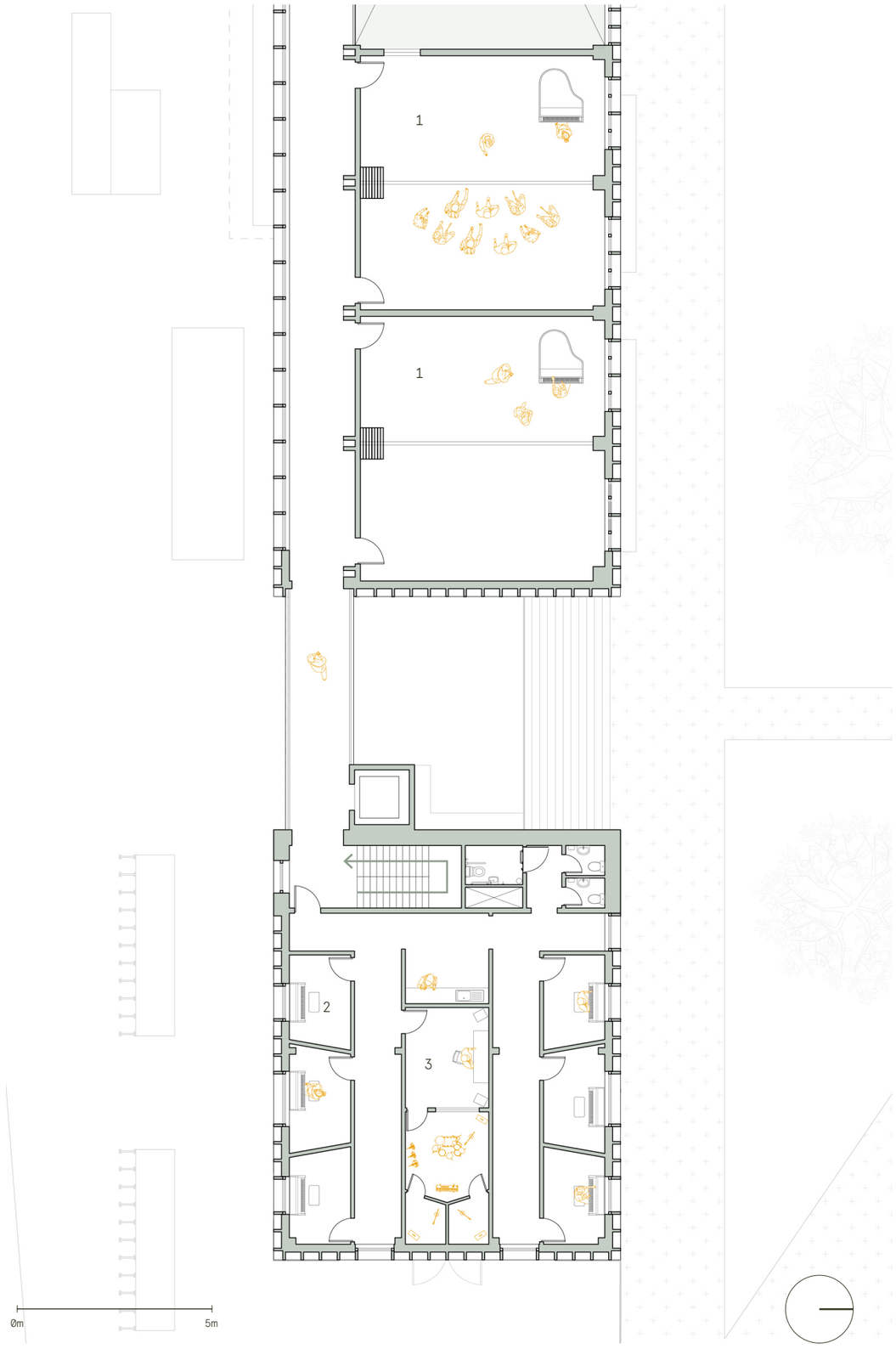
The music section has its own seperate, private entrance located in the interstitial passageway.



large rehearsal studios / 1
individual music practice rooms / 2
recording studio / 3

public entrance

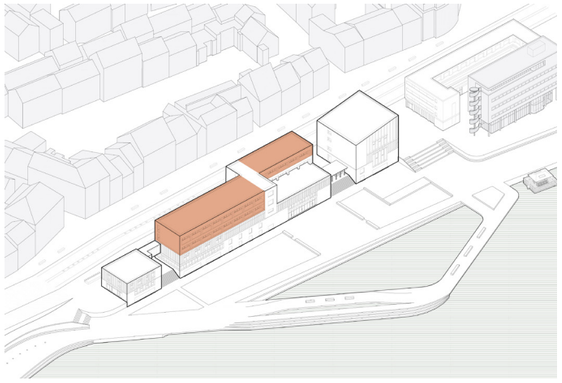
private entrance



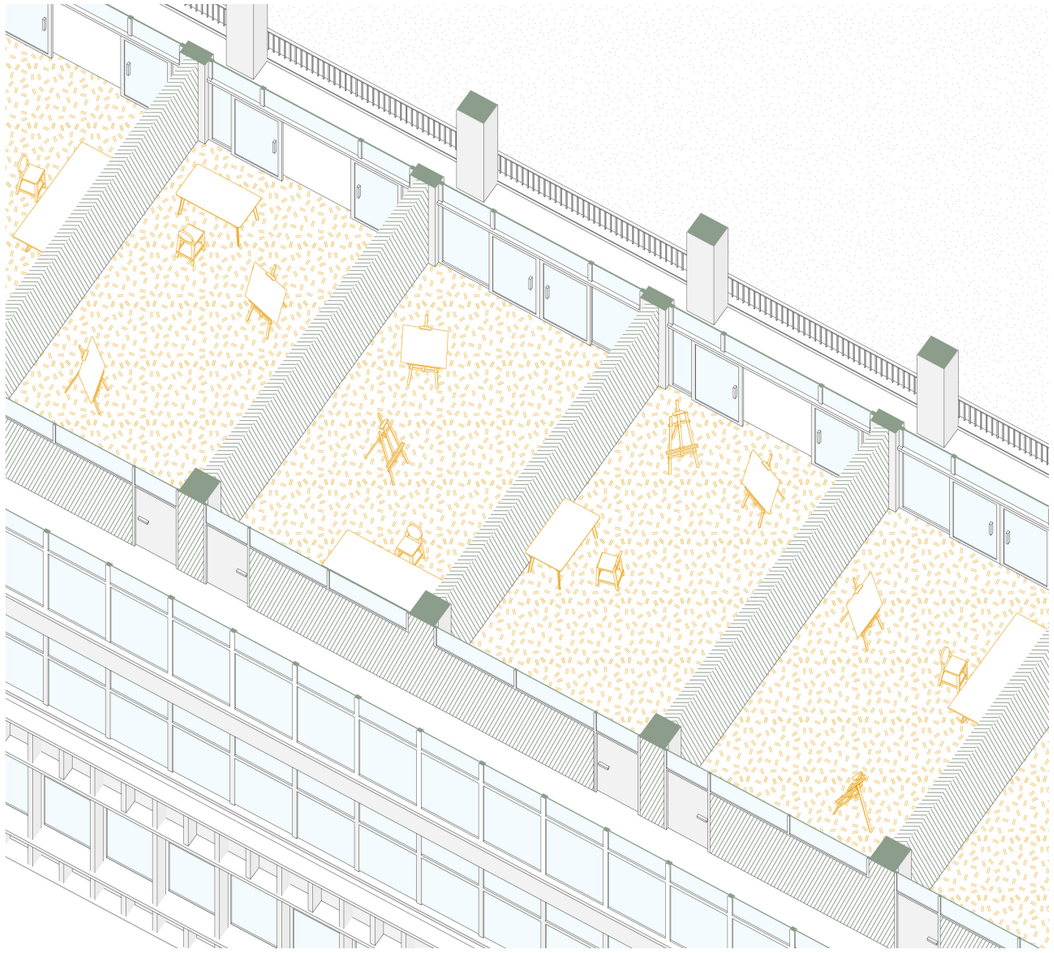
RIVERFRONT ARTISTS STUDIOS

19 of the 26 studios provided by the new arts centre are located on the upper floors of the largest block for greater privacy, and offer a completely different atmosphere to the basement atelier spaces.

These studios are orientated towards the river, featuring a beautiful view out over the water. There is access to an outdoor balcony area, and a quality of lightness and warmth is created by virtue of the exposed glulam structure and timber finishes.

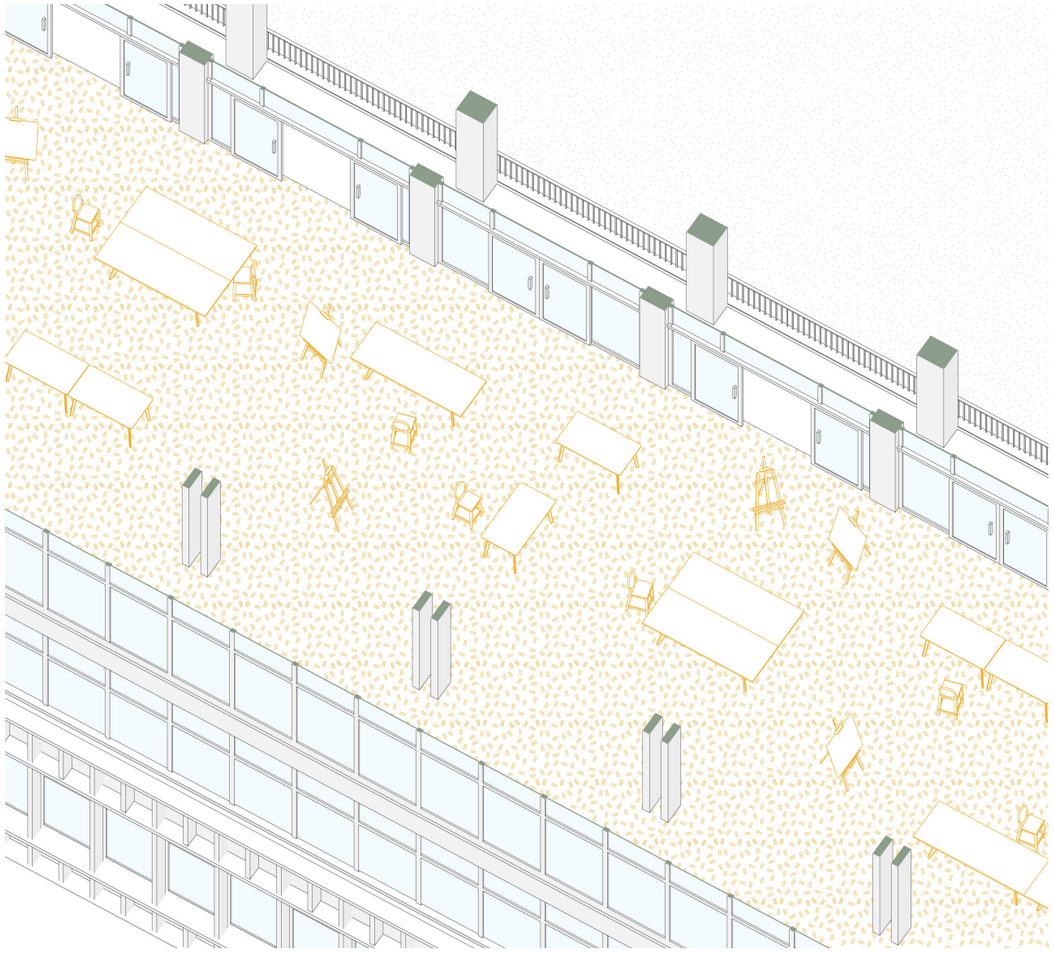


FLEXIBLE LAYOUT OPTIONS



Individual Studios

Since the building has a frame structure with columns and long span beams, the dividing partition walls between individual studios are not structural and can be placed anywhere

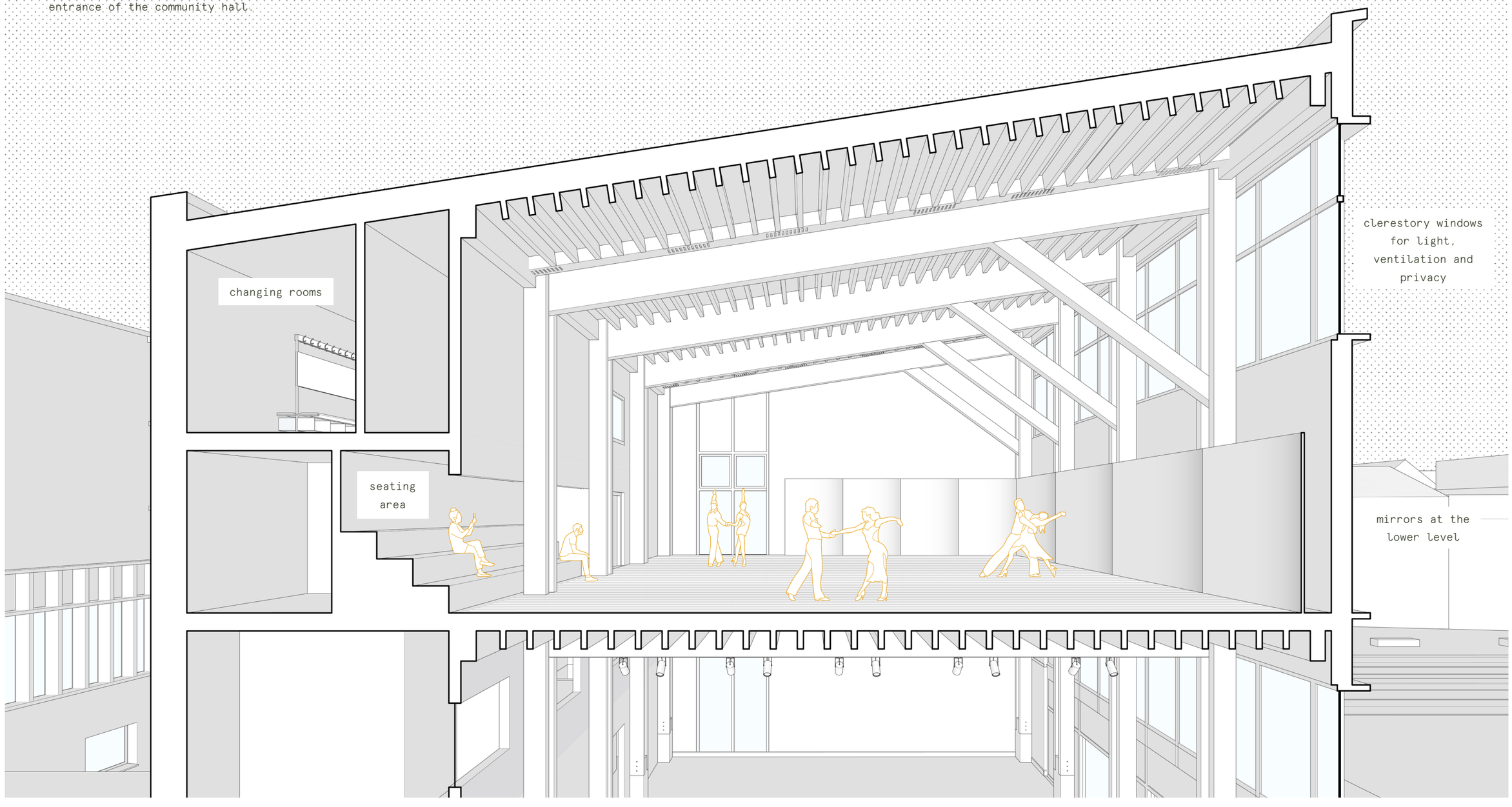


Shared Studios

the internal walls can even be removed altogether to create an open plan studio, used collectively, in a similar way to how the artists' spaces in the Landbouwbelang currently operate

DANCE STUDIO

Situated directly above the community hall is a dance studio with a pitched roof and generous ceiling height. The space is designed for activities relating to the performing arts, such as dance and theatre, and is accessible through a private entrance, seperate to the entrance of the community hall.



TECTONICS AND CLIMATE DESIGN

STRUCTURAL STRATEGY
PRIMARY STRUCTURE

CLT ribbed slab structural floor

upper floors

structural CLT floor slabs provide further stability for the glulam frame structure; the soffits will be exposed, giving spaces a quality of lightness and warmth

*

glulam frame structure

upper floors

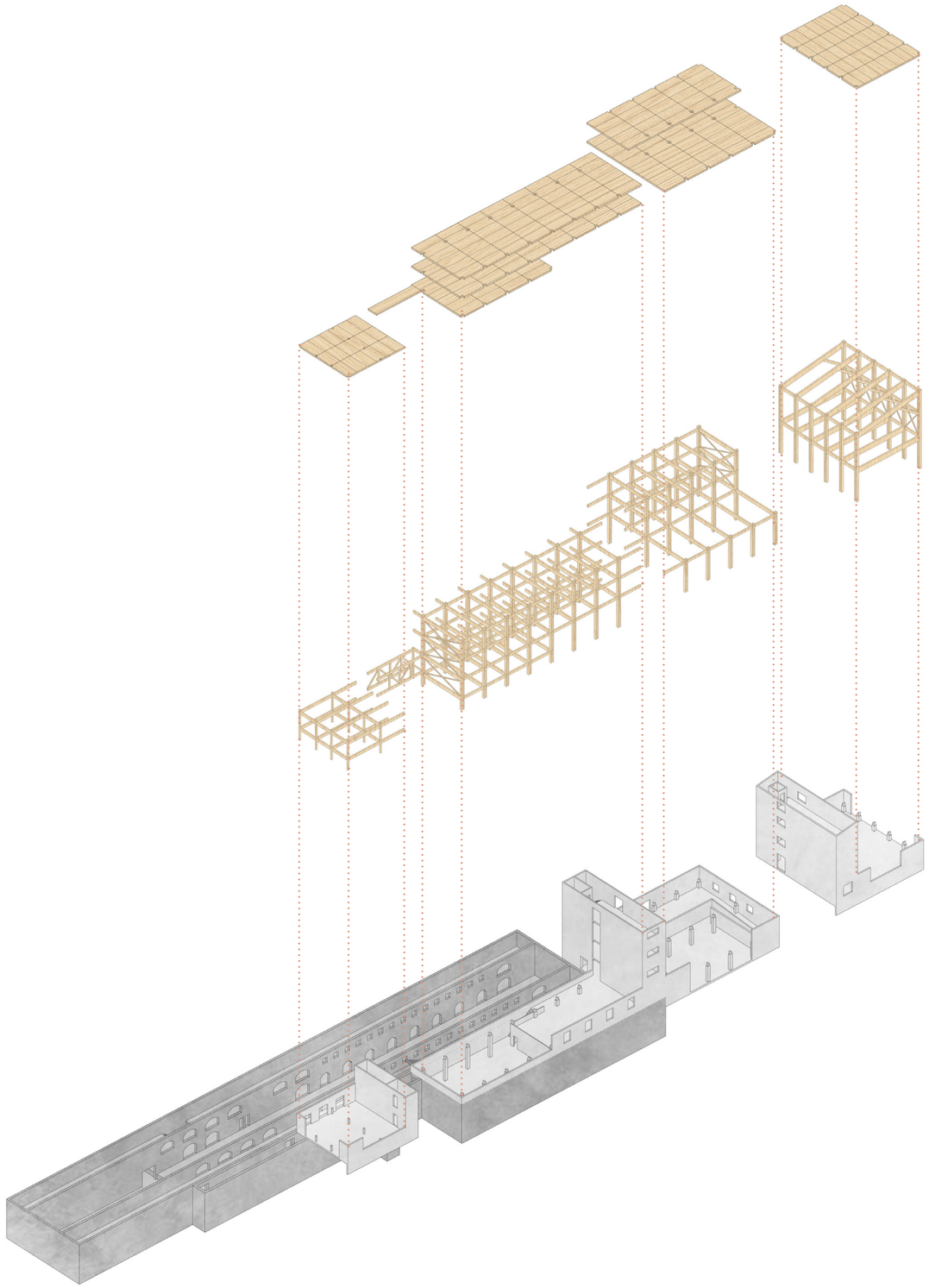
timber is chosen for its sustainability, and a glulam frame structure as opposed to a loadbearing CLT wall structure provides greater flexibility for the internal layouts

*

cast in-situ concrete base

basement + ground floor + structural cores

concrete was chosen for flood-resilience, and for durability of the more public spaces within the building



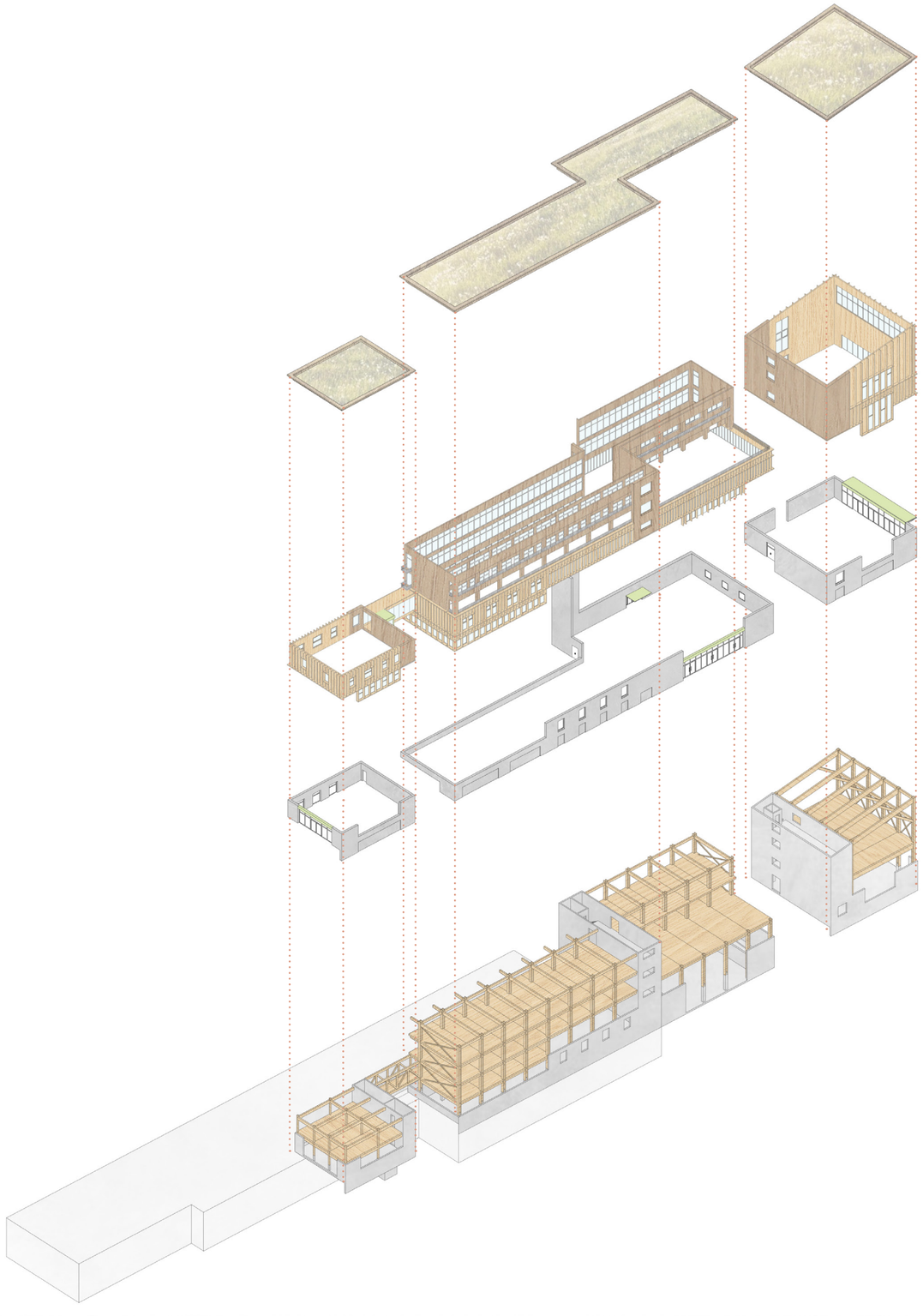
STRUCTURAL STRATEGY
EXTERNAL ENVELOPE

seedum roof

an extensive green roof benefits the climatic properties of the building and also helps to promote biodiversity in a dense urban environment

timber and concrete facade

the choice of materiality for the facades mirrors the materials used for the structure of the building: concrete on the ground floor and timber for the upper floors



FAÇADE DESIGN PRINCIPLE & MATERIAL PALETTE

bronze anodised aluminium

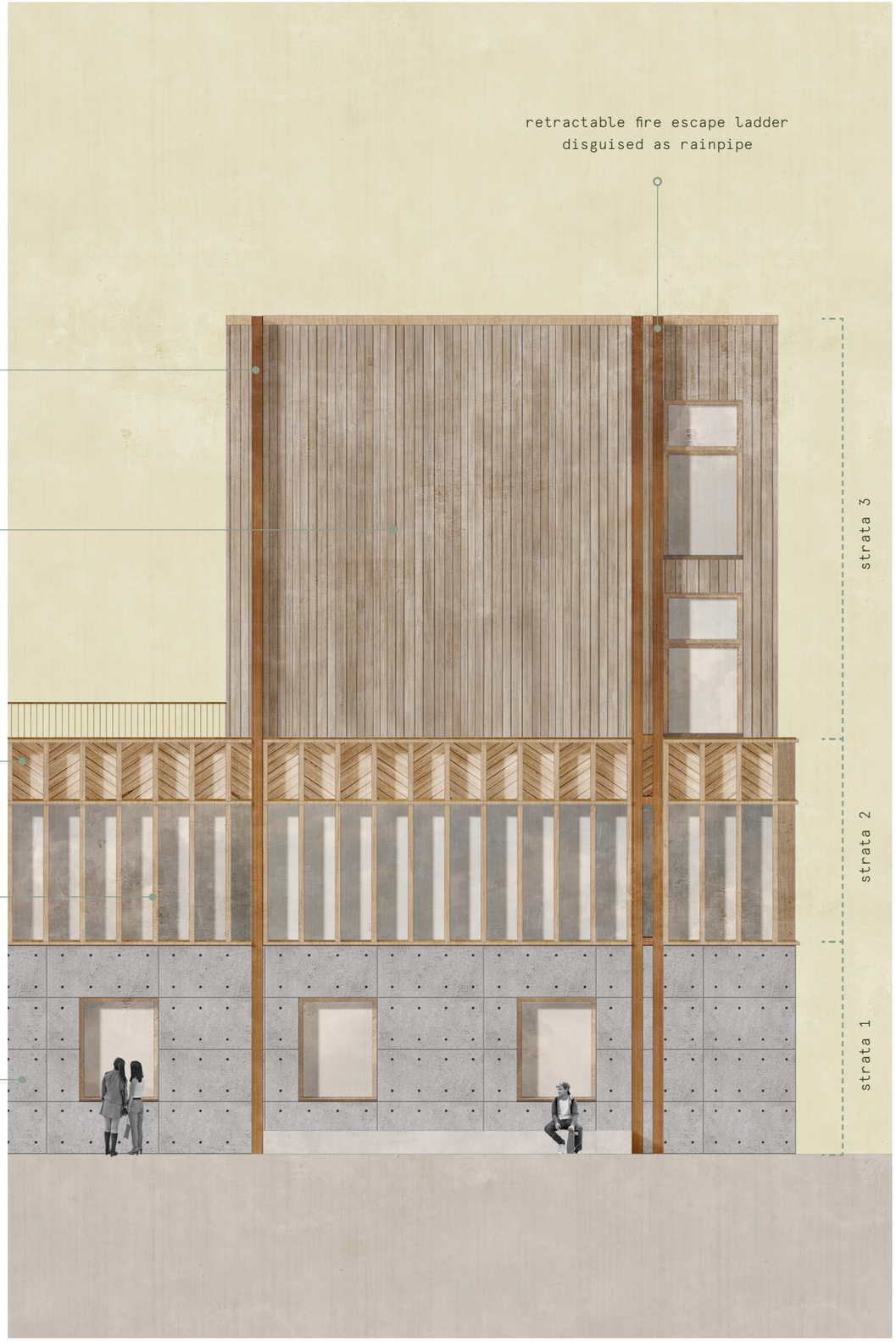
vertical timber cladding

herringbone timber cladding

timber fins

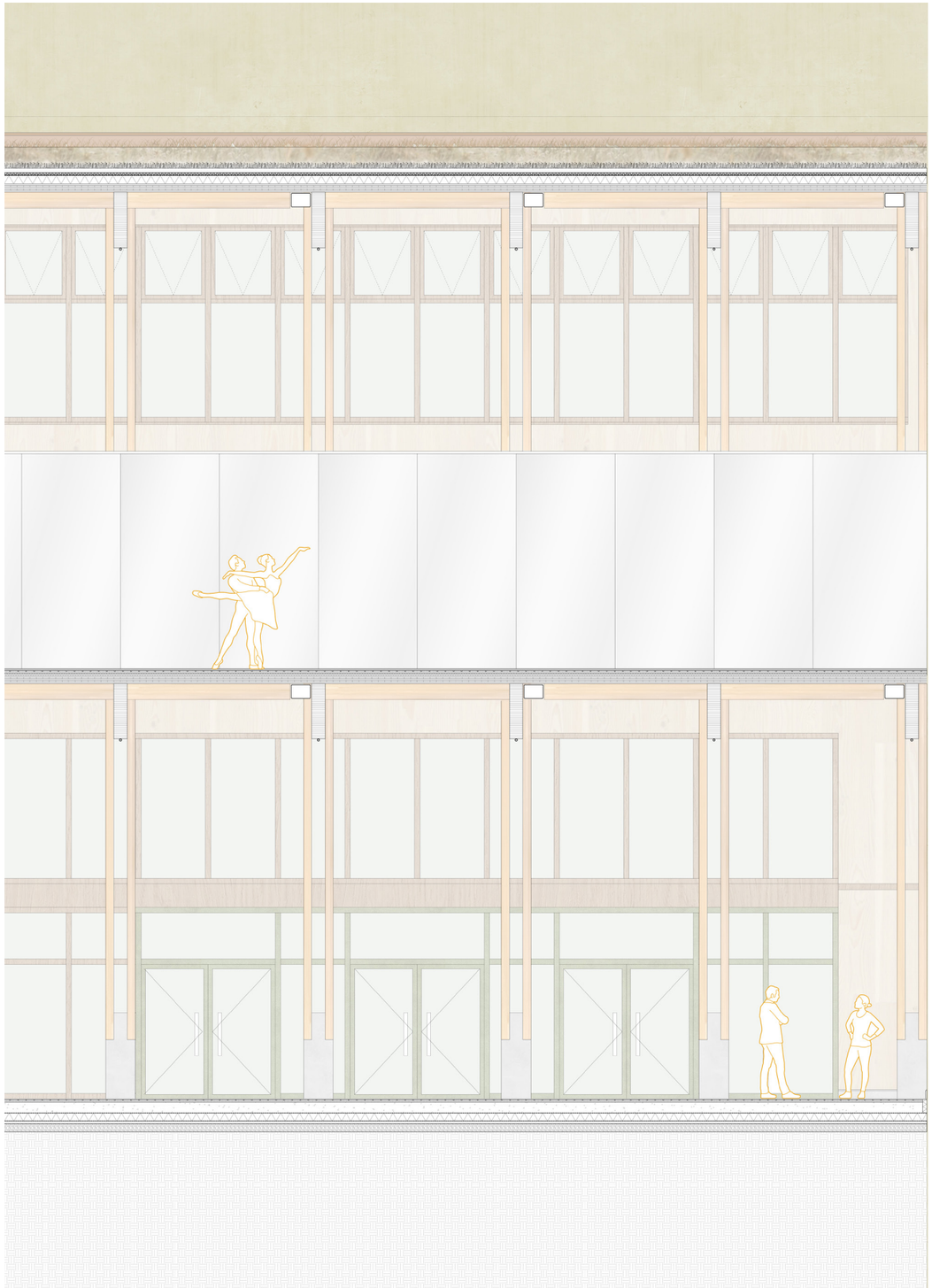
precast concrete panels

green anodised aluminium
(entrance detailing)



ELEVATION STUDY
COMMUNITY HALL AND DANCE STUDIO

INTERIOR VIEW



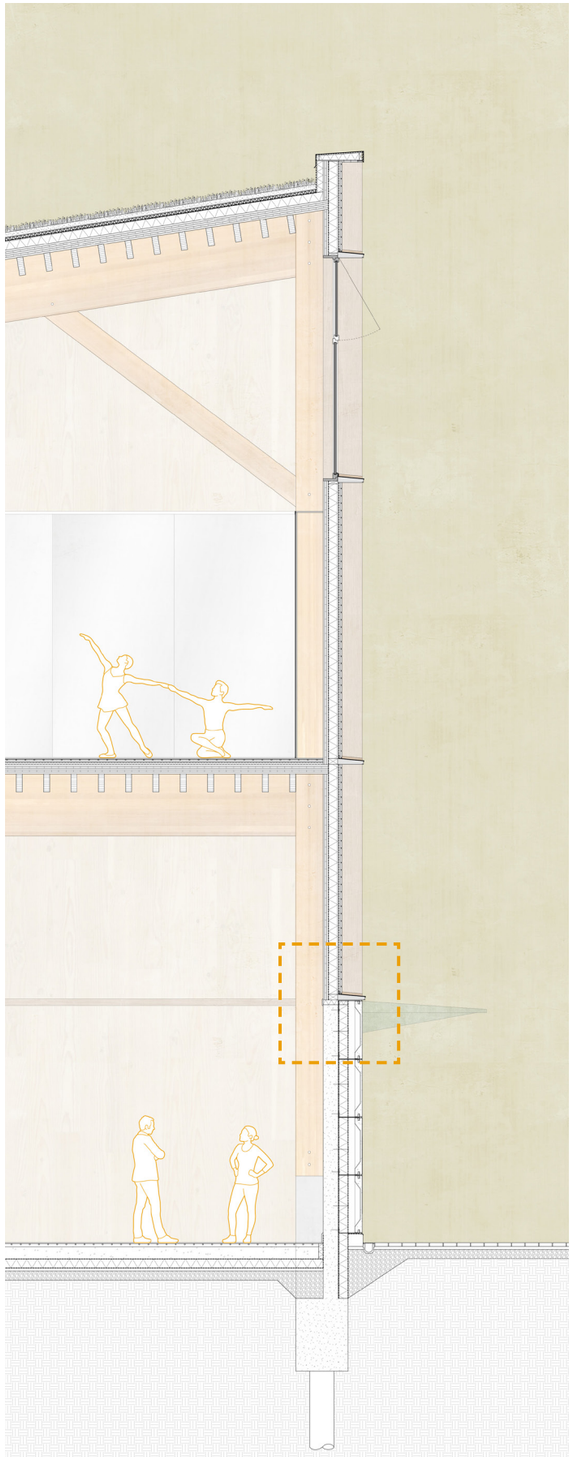
DETAIL 01
TIMBER AND CONCRETE FACADE TRANSITION

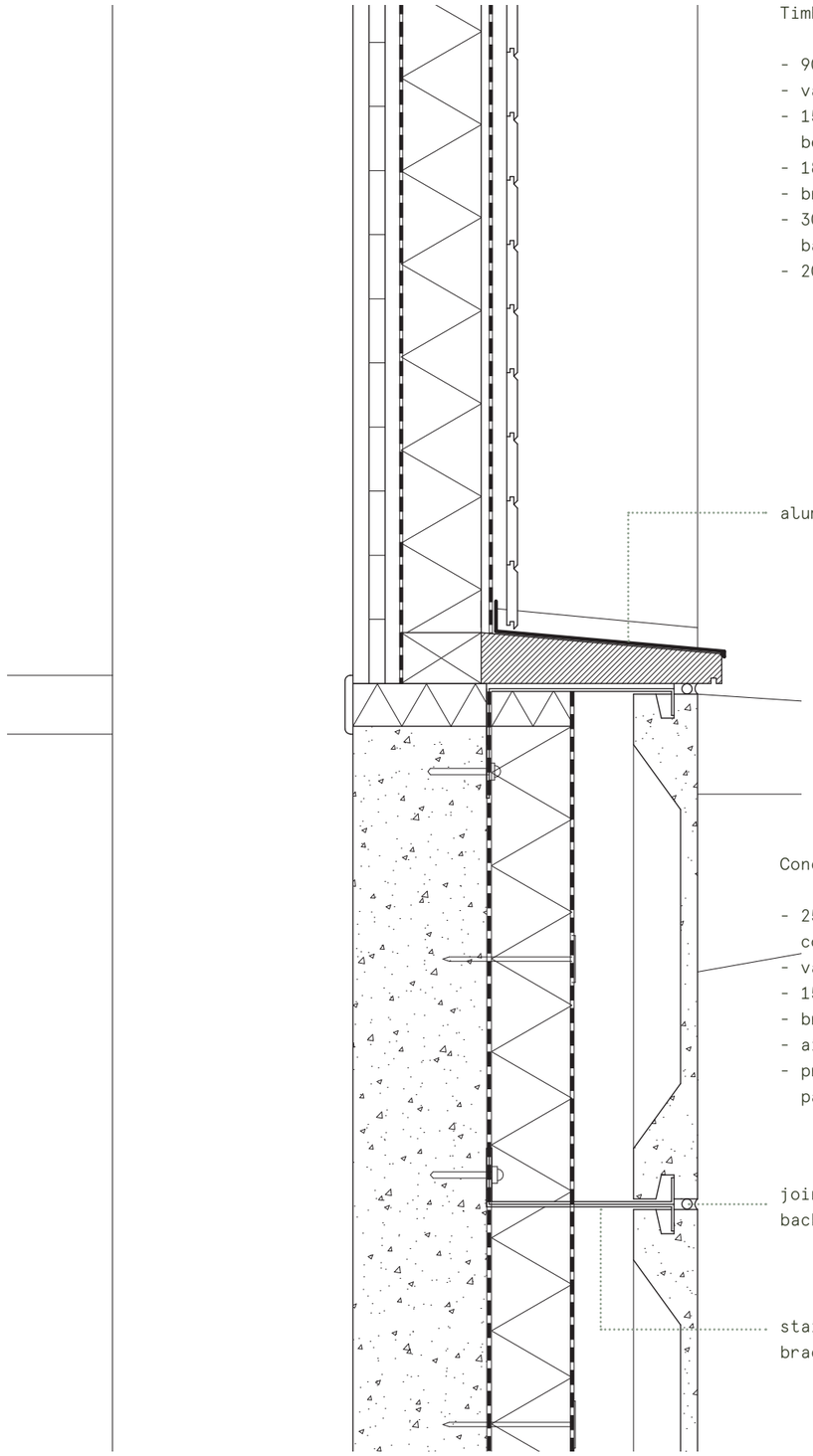
The façade design in fact mirrors the structural strategy of the building. The ground floor is clad with concrete panels and the upper floors are clad in timber.

The façade of the upper floors is given depth with the use of vertical fins, which extend out to fall in line with the thickness of the concrete wall.

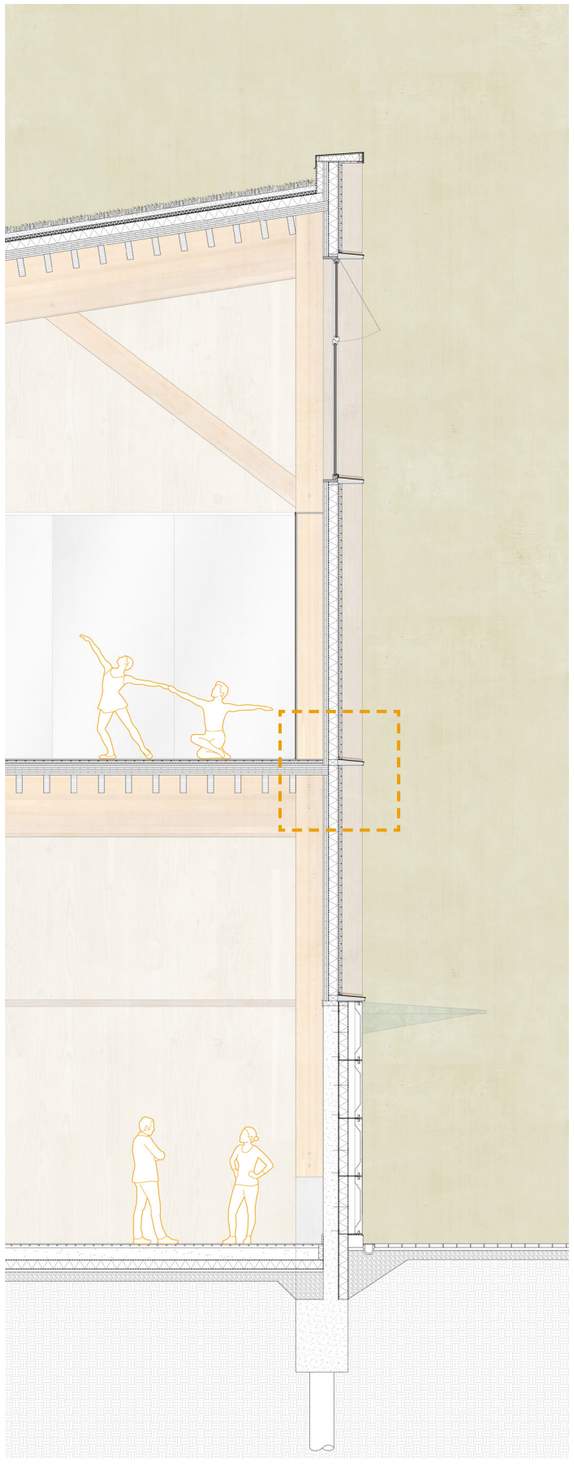
The timber cladding has a v-join tongue and groove profile which means that water runs easily off it, and the horizontal timber sills are topped with a aluminium flashing for protection.

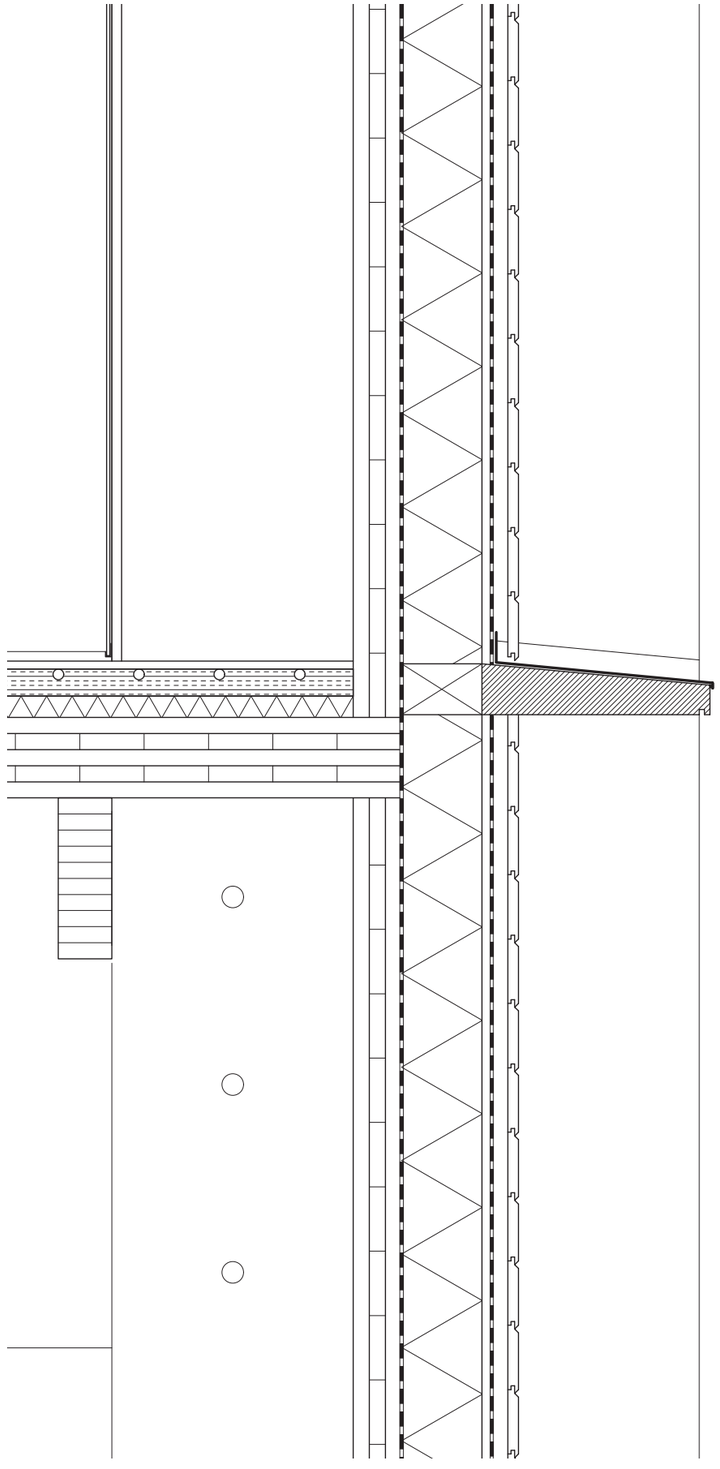
Exposed concrete on the interior of the ground floor also provides thermal mass that can help to regulate the internal thermal environment of the space.





DETAIL 02
INTERMEDIATE FLOOR





Intermediate floor build up:

- Timber parquet flooring
- 60mm EPS insulation with underfloor heating
- 40mm impact sound insulation
- 150 mm ribbed CLT panel with 300mm glulam ribs

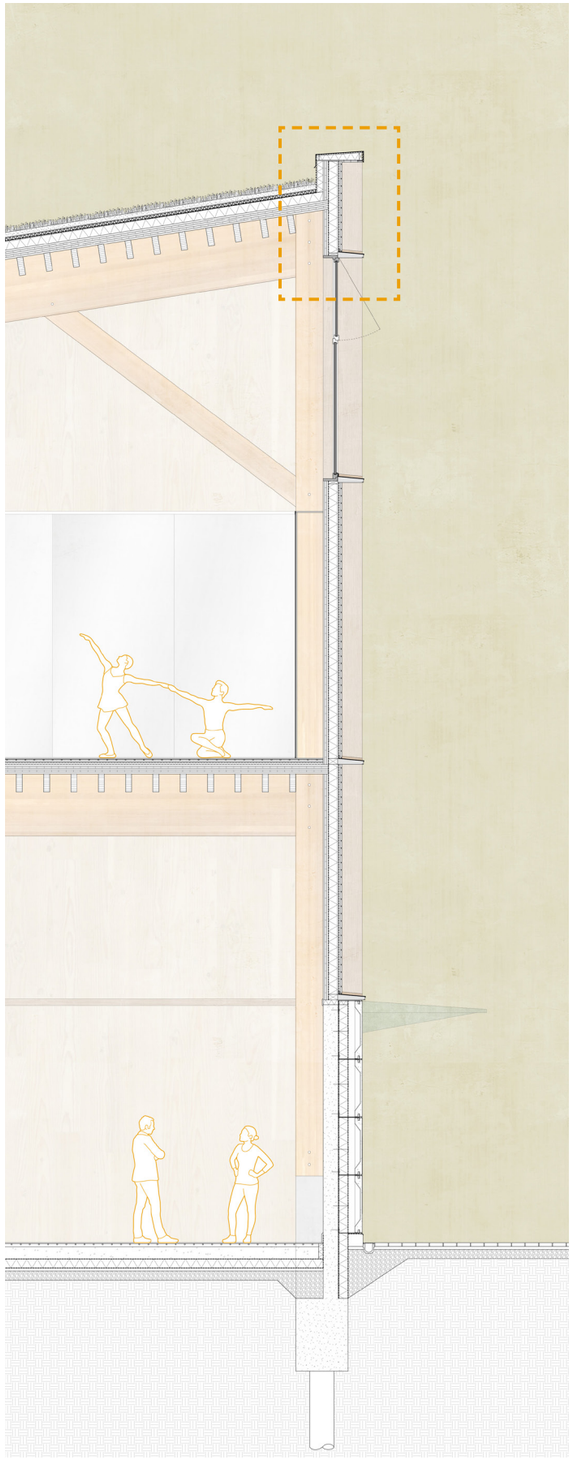
The detail of the intermediate floor build up shows that the building is heated through underfloor heating pipes which are laid on top of a layer of EPS insulation.

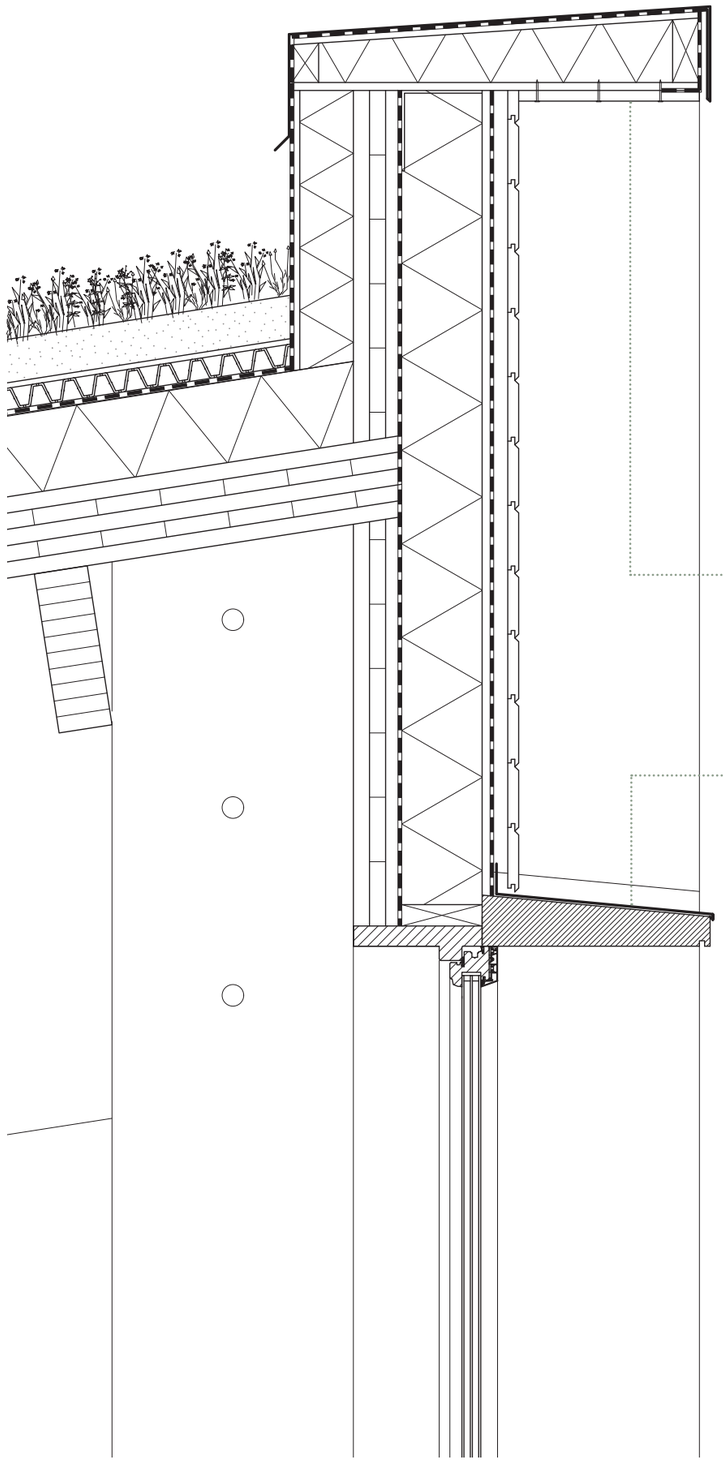
The structure of the floor consists of ribbed CLT panels, which can be more material efficient than regular CLT floor panels, since they use a relatively thin CLT slab, and stiffness is provided through glulam downstands at regular intervals.

The glulam ribs can be set back so that services can be neatly integrated within the overall depth of the slab.

The soffits of these panels will be exposed with the glulam ribs providing a nice visual aesthetic.

DETAIL 03
GREEN ROOF





Green roof build up:

- Planting
- 60mm substrate
- filter fabric
- drainage system
- root barrier
- waterproof membrane
- 150mm rigid insulation
- 150 mm ribbed CLT panel with 300mm glulam ribs

I am proposing that the buildings in my scheme will have green roofs. Green roofs have several nice benefits. These include:

- providing a degree of extra insulation

- improving the quality of the run off rainwater which can be collected and used for flushing toilets, for example

- substantially increasing the life of waterproofing membranes on the roof

- providing important microclimates for insects and birds

CLIMATE SECTION
SUMMER SCENARIO

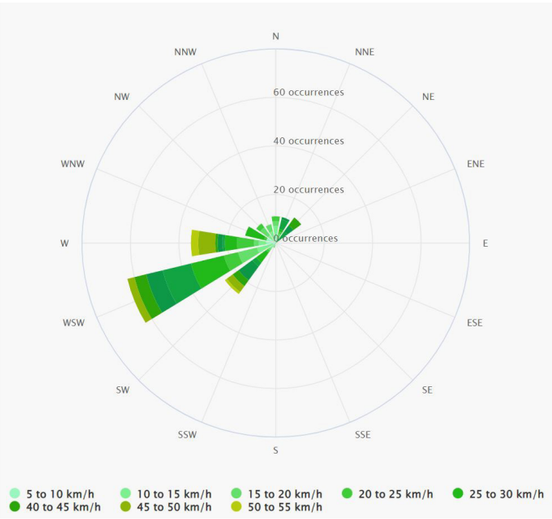
The wind rose for Maastricht shows that the prevailing wind direction is from the West, which means the building is perfectly orientated for natural cross ventilation.

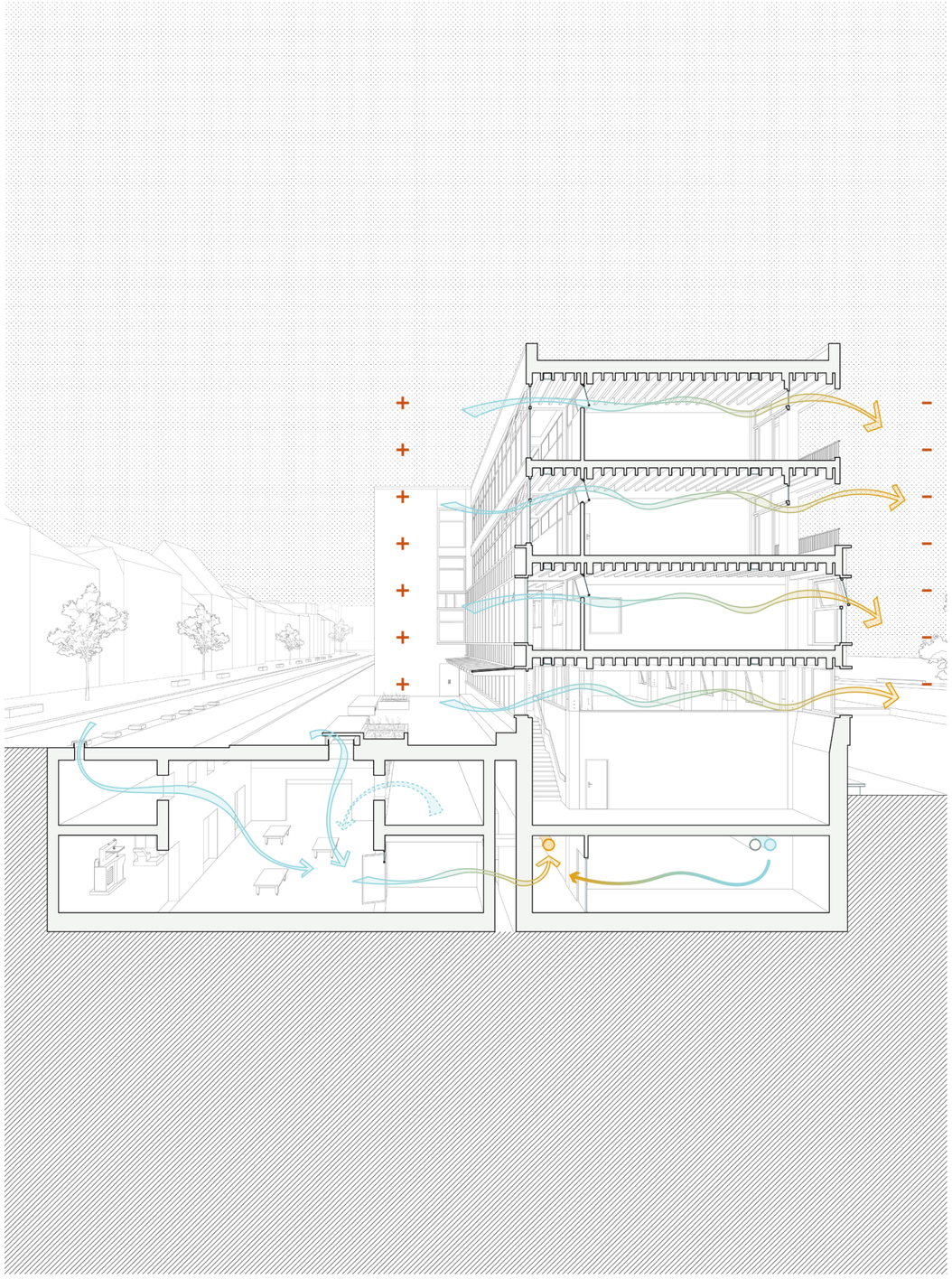
In the summer the upper floors which includes the artists studios, can be naturally ventilated, thanks to opening windows on opposite facades.

The ventilation strategy of the tunnel involves air inlet vents which are incorporated into elements within the public realm, such as benches and planters. Vents are also placed in the space between the two tram lanes.

Air is continuously exhausted from the tunnel, creating a negative pressure which means fresh air is drawn in from these inlets. The opening where the stairs go down into the tunnel, not visible in this section cut, is also a source for fresh air.

Wind rose - Maastricht

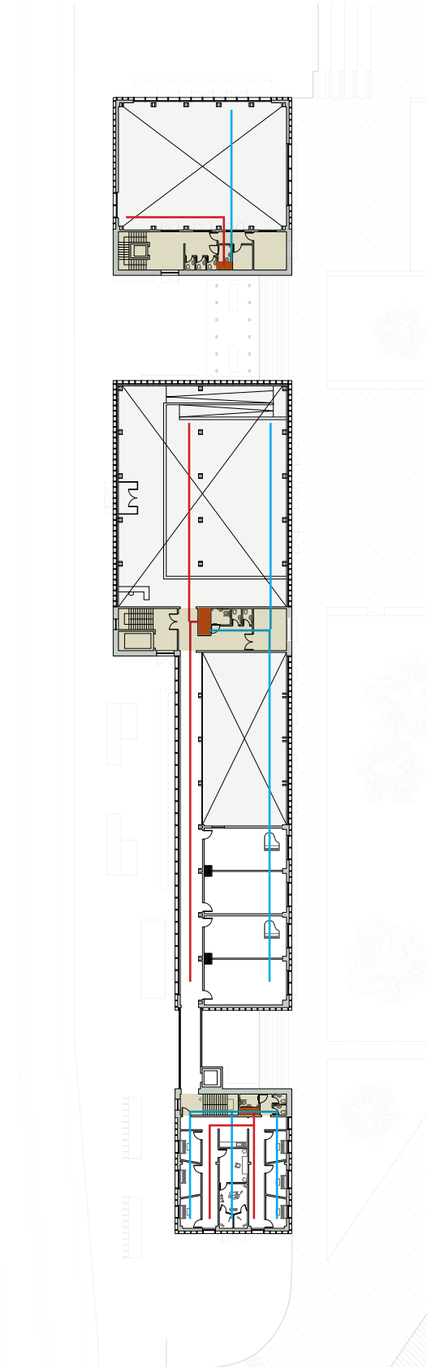




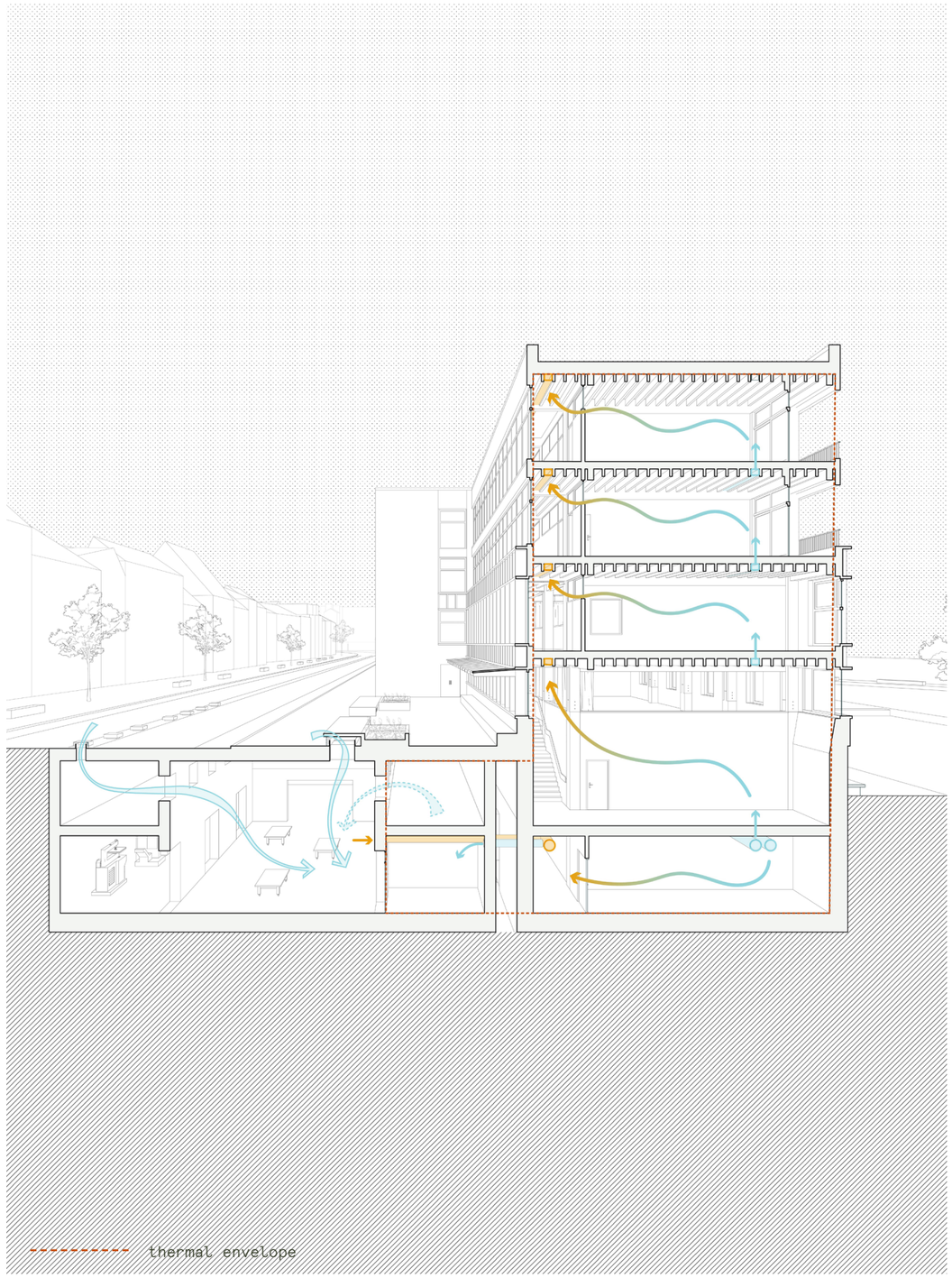
CLIMATE SECTION
WINTER SCENARIO

In the winter, when it is not very nice to keep windows open, the building turns to mechanical ventilation. A MVHR system involving heat recovery is utilised.

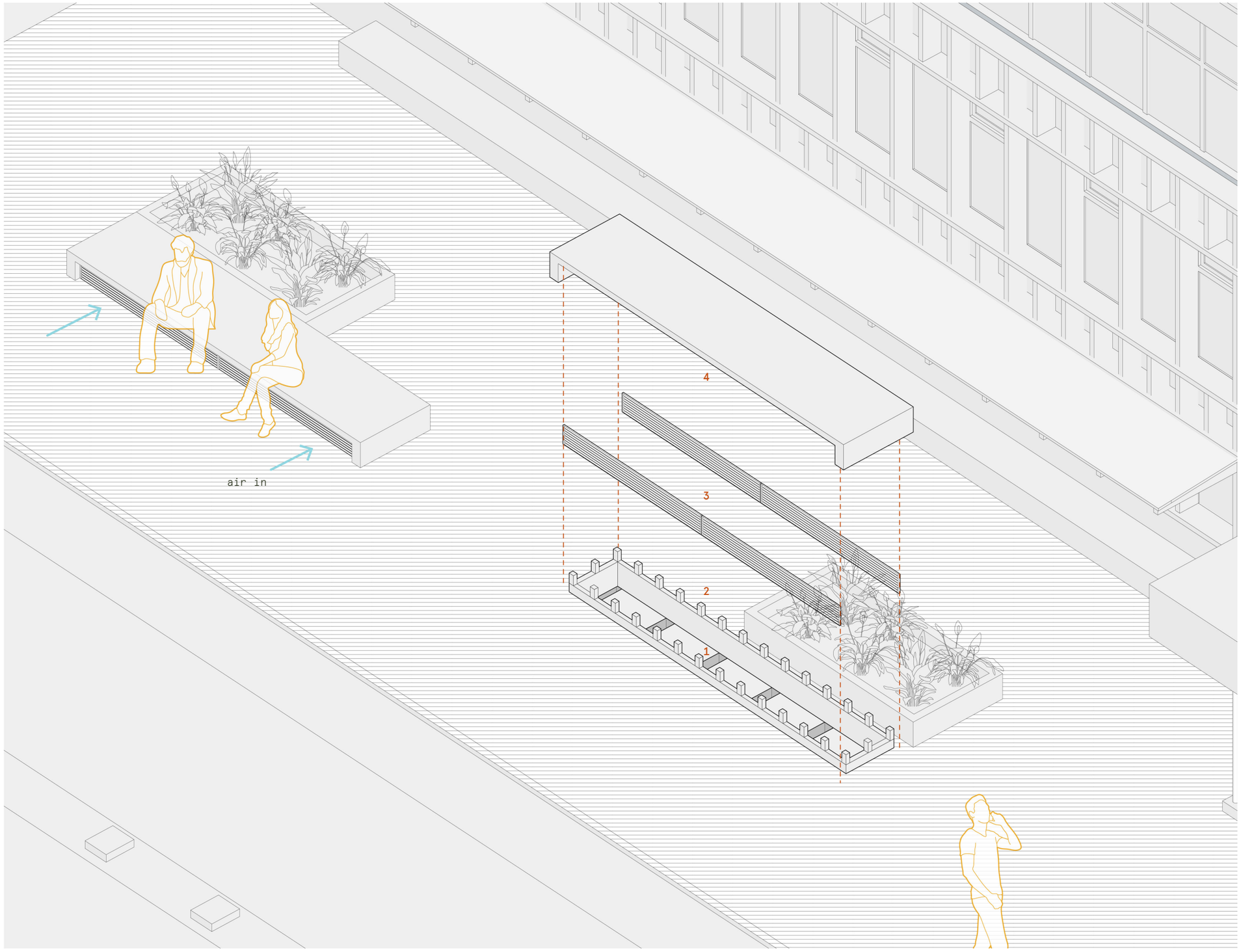
Fresh air enters occupied rooms at a low level from floor vents and stale air is exhausted from the circulation spaces.



ducting in plan



BASEMENT VENT DESIGN



1 / Ventilation holes in precast concrete slabs of the tunnel roof

2 / Perforated concrete plinth

3 / Metal grille

4 / Concrete bench resting on structural plinth

The public benches of the tram stop area are one of the landscape elements that conceal vents for the tunnel.

The design consists of a concrete top that stands on a perforated concrete base structure. Metal grilles prevent water and debris from entering the vent.

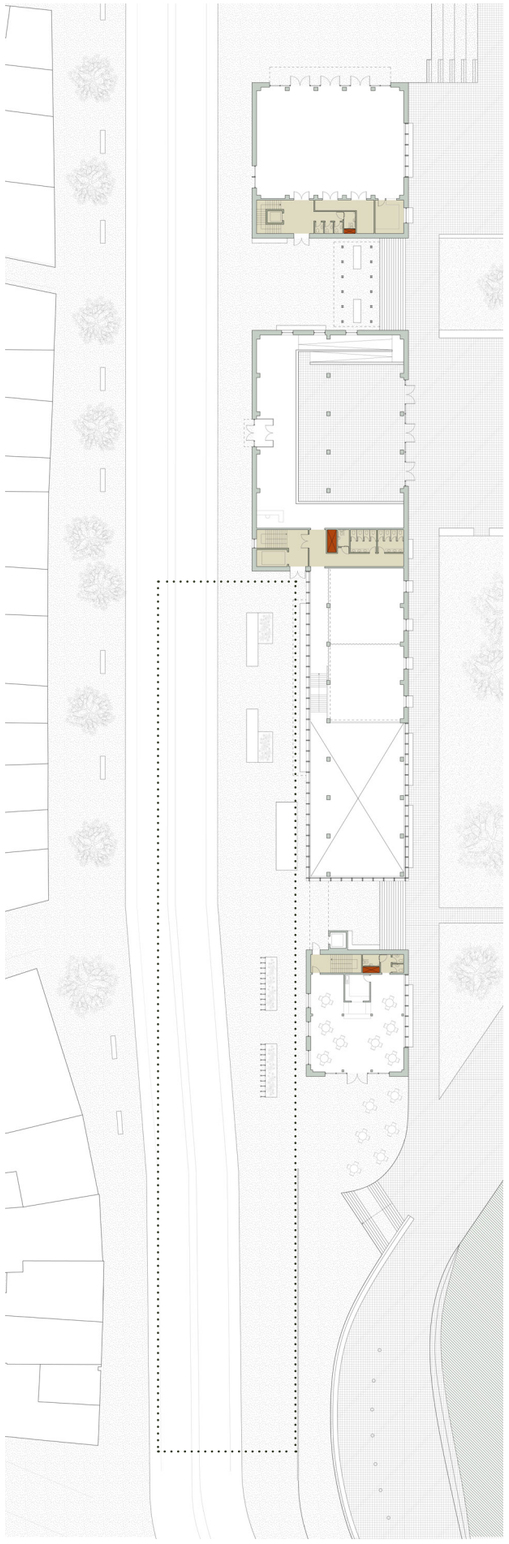
BUILDING SERVICES

The building is organised around 3 main ciruclation cores in which the WCs and vertical service risers are located.

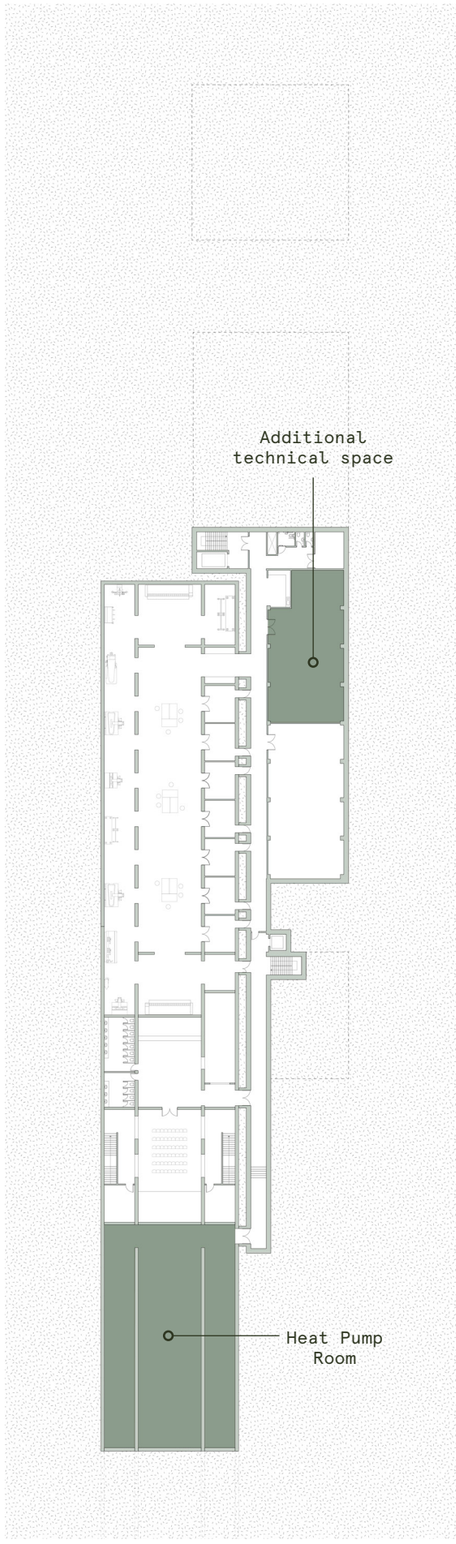
The river Maas is an extremely valuable local resource and energy from the water can be utilised to heat the building. River source heat pumps are an emerging technology, but they are proving to work really well in district heating systems. There are some successful precedents in the UK, such as Queen's Quay in Scotland.

The technical space that will house the large machinery that is required for this is situated in the within the tunnel on the -2 level.

twin river source heat pumps at Queen's Quay, Clydebank, Scotland



Cores and Service Risers / Ground Floor Plan



Technical Space / -2 Basement level

REFLECTION

There are many things that I have learned as a part of the Urban Architecture studio. The studio's attitude of 'gleaning' from the existing, making use of its resources and potentials, has taught me to evaluate the existing urban context in a way that I never have before.

I was working with an empty, unbuilt site, so at first glance, I thought I was working with a blank slate. Slowly, I began to realise there was much to gain from the surrounding context: I had to consider how my building proposal would interact with the existing Jo Coenen office building to the North of the site; how it would relate to the residential buildings along the Maasboulevard; and eventually I would decide to repurpose the existing Maasboulevard traffic tunnel, incorporating a part of it into my design.

No project ever starts from scratch, there is always something to build upon. The themes of gleaning and reuse are very relevant in the wider architectural profession, as we should be encouraged to make the most out of existing resources for the sake of the environment, and also for placemaking and building character.

I learned to zoom out of my design every now and again, always relating the design back to the context of the city and not focusing solely on the building and the details without the bigger picture in mind. What role does the building play in the city, and how does it shape the lives of the people of Maastricht?

In a world with increasingly deepening inequalities, the need for an examination of spatial justice is paramount. Capitalist attitudes have resulted in architecture becoming increasingly commodified and aestheticized and this sometimes carries through to architectural education, where students become preoccupied with image and form. I hope that with my graduation work I have managed to bring the focus back onto the lived experience of architecture; it's social and political dimensions.

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