

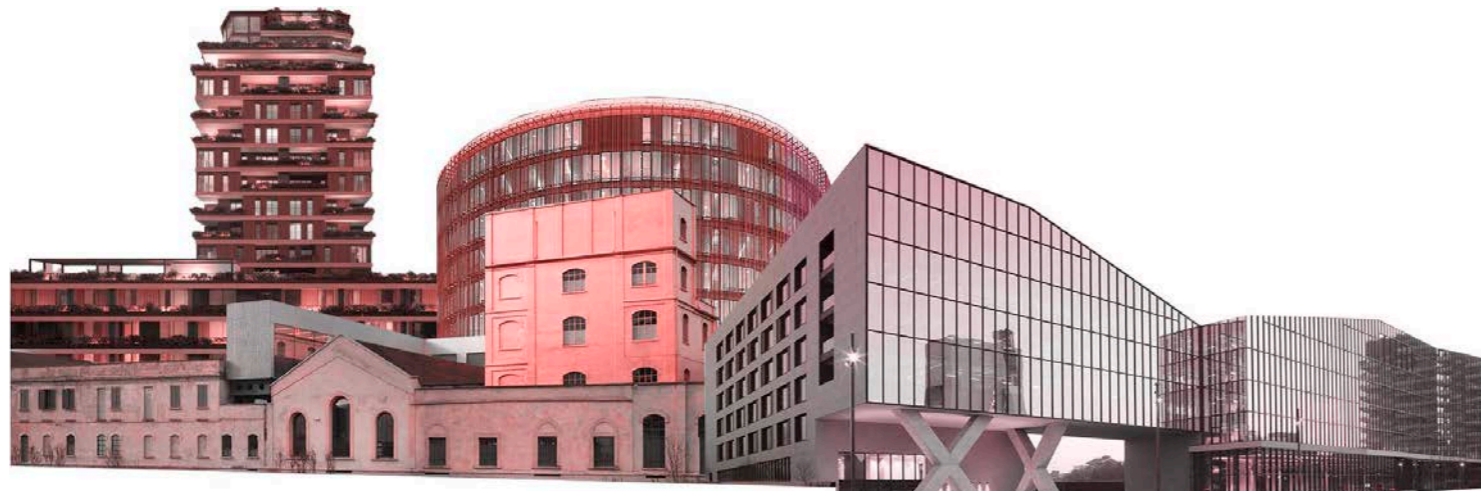


Vigentino Primary School + Community Hub

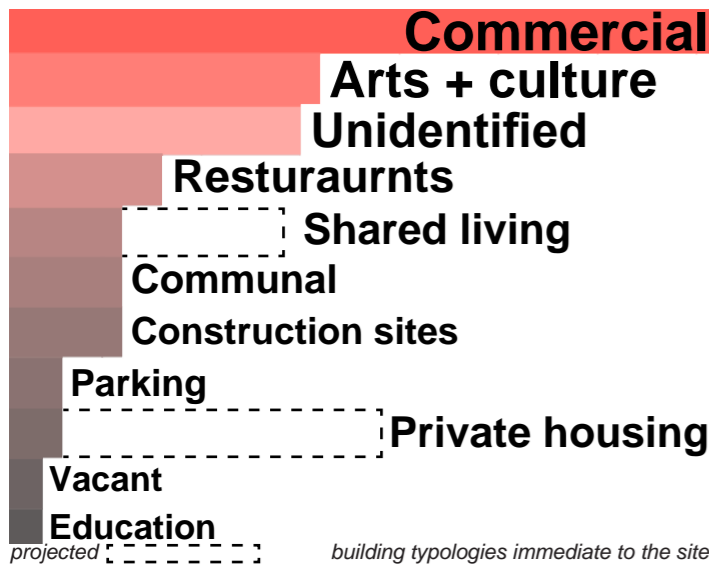
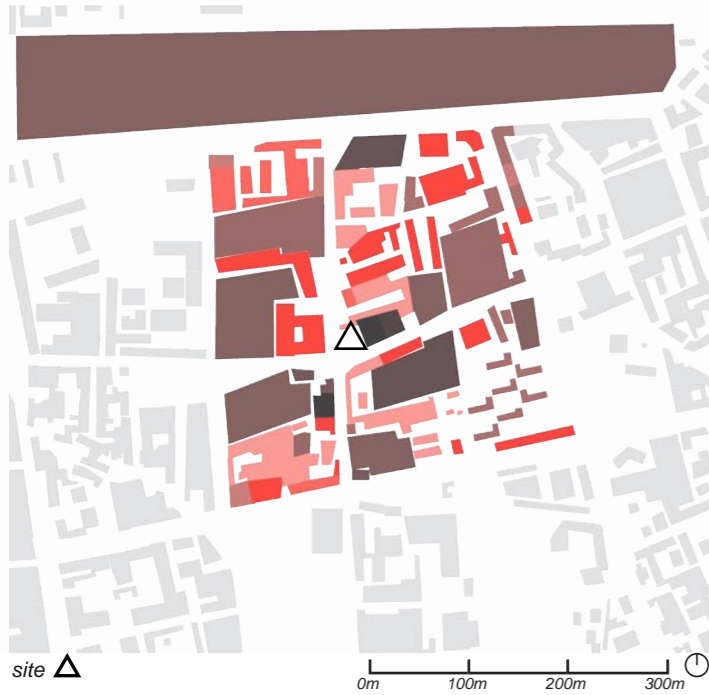
CARC6005
Project 06
Kris Preshant

This project is about about reinventing the school. Transforming an abandoned, lifeless site into the heart of the local community and a state of the art Primary school, functioning as an out of hours communal-hub bringing people from all walks of life together in a location that will cultivate their children's bright futures, through sustainable and modern architectural design.

Programme and typology

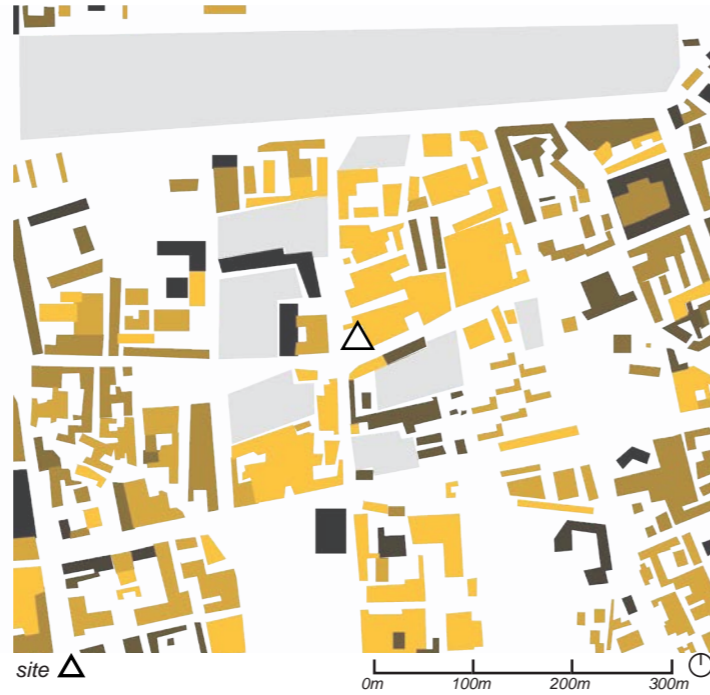


local buildings collage



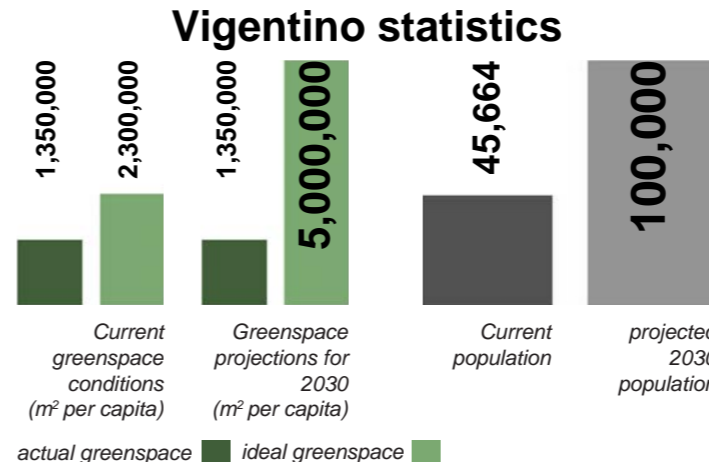
Site Summary

Building heights



Building heights in the immediate area (m)

Environmental conditions



- Air quality index: Moderate
- Car pollutant concentration x5.6 AQI guideline
- Air purifier required
- Face masks required outdoors
- Reduced window ventilation
- Reduced outdoor exercise

Negative impacts of current poor air quality in the area

Materiality



local buildings materiality study

The site is in Vigentino in Zone 5 of Milan, Italy. The immediate area has an extremely dominant proportion of commercial developments and relatively few residences, which is projected to be the inverse in the next decade due to Milan being the host city of the 2026 Olympics, which has had a very consistent trend of drastically increasing the population.

These projections also predict a great lack of greenspace for the new population density as well as an extreme lack of schools available in the area.

UK year group	2	3	4	5	6	7	8	9	10	11	12	13	
age (years old)	6	7	8	9	10	11	12	13	14	15	16	17	18
education cycle	First cycle of education						Second cycle of education						
components	Primary education (istruzione primaria)					Lower secondary education (istruzione secondaria di I grado)			The upper secondary school education (istruzione secondaria di II grado)				
									The regional vocational training system (IeFP)				
population range (%)	4.6		12					7.26					

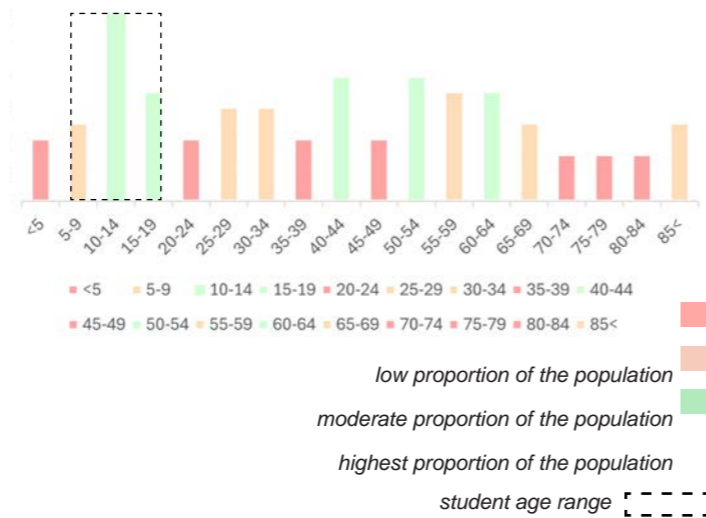
Italian education system structure



site mapping of local schools



Italian education system structure collage



Milan population statistics



Milan population statistics



british school



IISC school



german school



MILE school



japanese school



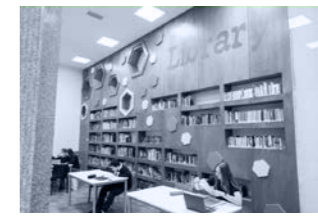
my english school



my way english school



SIS swiss international school



st louis school



st louis caviglia school



Education and schools

Projections



Predicted residency increase because of Olympics taking place in Milan 2026.

The age range of students comprise a significant proportion of the population but there are no schools near the area.

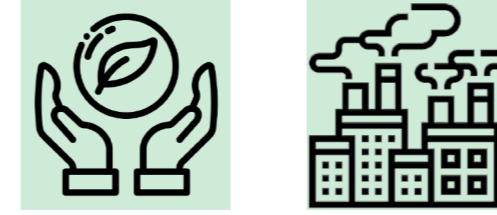
Education



Italy scored below the European national average in multiple subject areas

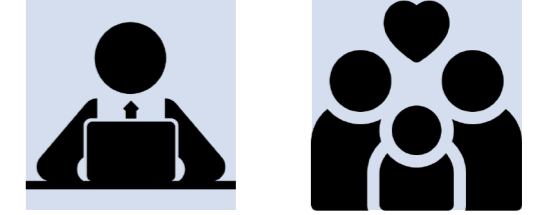
Designing a primary school that gets the students engaged and interested in their education from a young age is the most effective way to tackle this.

Sustainability



Sustainability is especially important for this site because of the significant air pollution in the area as well as Italy being the first country to mandate the study of sustainability and climate change.

Convenience



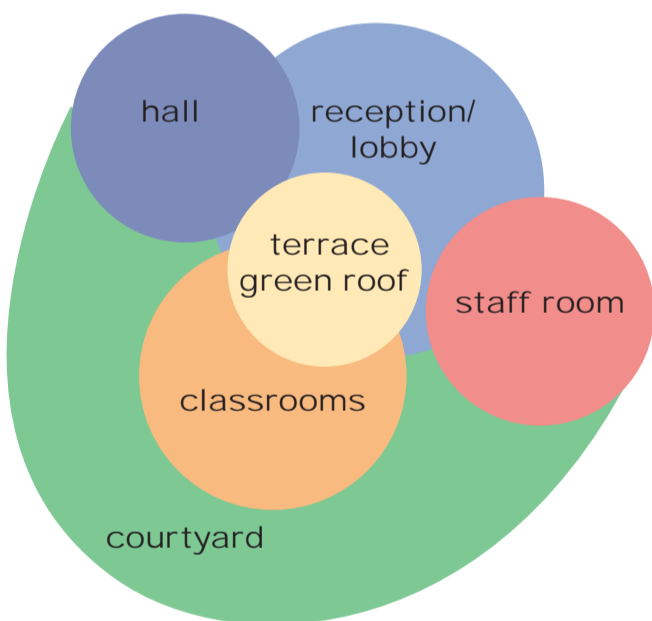
There's a vast majority of office and commercial spaces nearby so full-time parents working full time would really benefit from having a school nearby



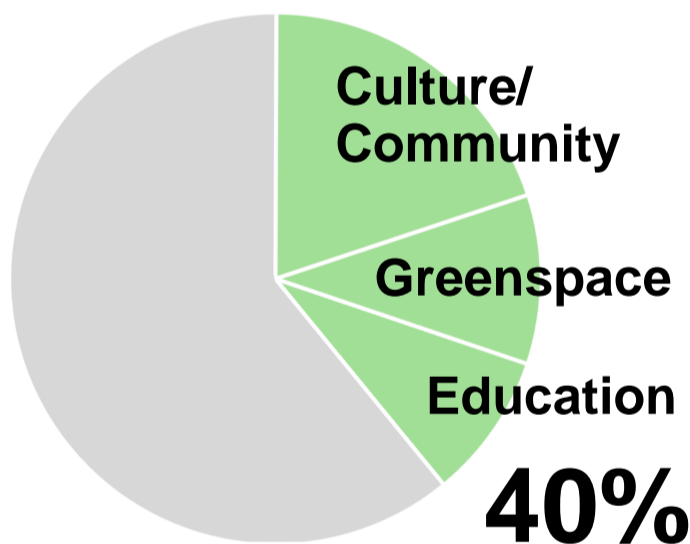
Brief Overview

Space/ Room	Minimum Area (m ²)	Users	# Users	Activities	Equipment
Classrooms	110	Teachers Students Teaching Assistants	1-2 60 2-4	learning/ teaching out of hours communal use	storage, chairs x60, desks x60, whiteboard, play equipment, fire-control equipment, first aid equipment
Courtyard	300	Parents Teachers Students Community Guests	All users	out of hours communal use playground/ leisure area	Play equipment
Terrace Green Roof	600			out of hours communal use playground/ leisure area gardening	Gardening equipment
Entrance lobby	150			Administration Parent-child drop off Play Circulation	Seating, fire-safety equipment, first-aid equipment
Sports/ Community Hall	200			Sports/ clubs Assemblies Community activity use Play area Circulation	Storage space, sports equipment, first-aid equipment, fire-control equipment
Changing rooms incl. toilets	100	All users		Changing... and toilet stuff	seating, storage, first-aid equipment, fire-safety equipment
Staff room	100	Teachers Teaching Assistants	All Teachers All TAs	Administration Break room Meetings/ consultations	seating, storage, first-aid equipment, fire-safety equipment, computers, printers, fridge, microwave, meeting table, desks
Nurses Office	30	Nurse	1	First-aid	Medical equipment, seating, desk, computer, storage, first-aid, fire-safety equipment
Toilets	30	All other users	-	going to the toilet and hopefully washing your hands after	first-aid equipment, toilets, sinks, disabled access equipment, air dryers, stalls
Reception		25 Staff	2-5	Administration	Computers, desks, printers, storage

Programme



Programme considerations



No parking needed to discourage air pollution near the children as cars are the main pollutant in Milan.

Designing the school with sustainability as a key component opens the opportunity to make the school a global symbol of sustainability, adding further validity to the programme.



School-time

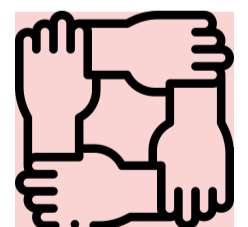
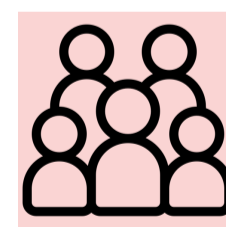
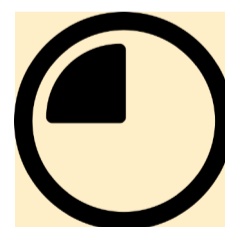
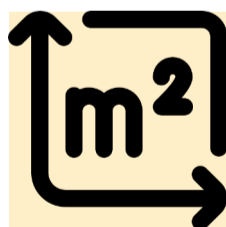


Communal use



Students make 25% of Milan's population.

The size of the site is appropriate for the number of students and spaces required for a primary school more than any other typology of school.



Community is one of the most influential factors in Quality of Life in Milan

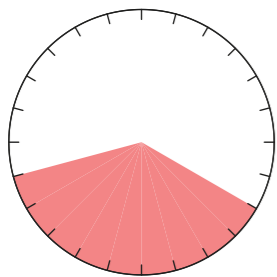
Communal aspect to utilise the building out of hours, transforming a regular primary school into a 24 hour use community hub.

Community, education and greenspace contribute to almost half of quality of life, meaning that the primary aspects of the programme: primary school, community hub and sustainable design is very likely to produce an outcome that greatly and positively impacts its inhabitants and the local community.

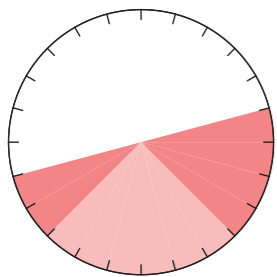
Brief Detail

00:00 01:00 02:00 03:00 04:00 05:00 06:00 07:00 08:00 09:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00

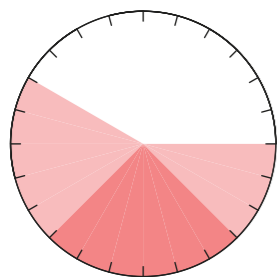
schooling



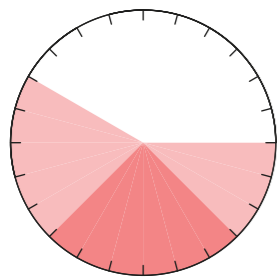
gardening



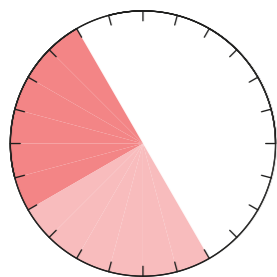
sports



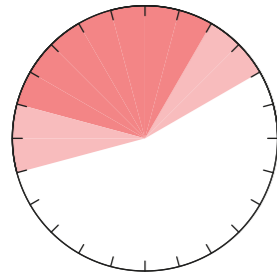
arts and exhibitions



social events and activity



night events



24 hour use programme

We live in a society dominated by time. It plays a part in everything we do. Just as people are controlled by time, so are the buildings we use. These buildings often times are very narrowly used. The proposed 24-hour programme will more than double the typical usage of the school.



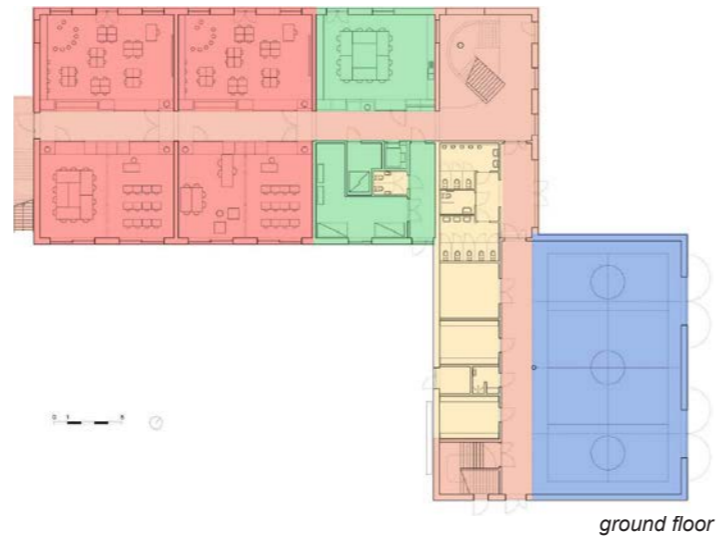
extension sports hall facade



lunch hall and sports hall



lunch hall and sports hall



ground floor



first floor

- classrooms
- movement + access
- toilets
- intermediate spaces
- sports hall

De Linde Elementary School

- Location: Belgium - Zarren
- Designer: FELT
- Project year: 2019
- New primary school in Zarren
- Both floors are connected by a central stair case
- On the ground floor a green sports hall closely links with an outdoor playing field and is look over by the lunch room,
- located on the first floor
- two wings connected by a central hall. This renders a clear and straightforward circulation scheme.

Key spaces:

- large playground
- central hall
- west wing; nine classrooms
- other wing houses the more public functions



courtyard view



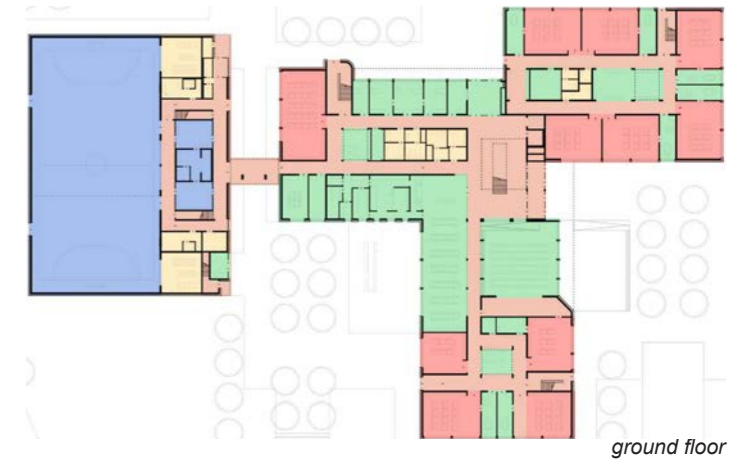
locker area



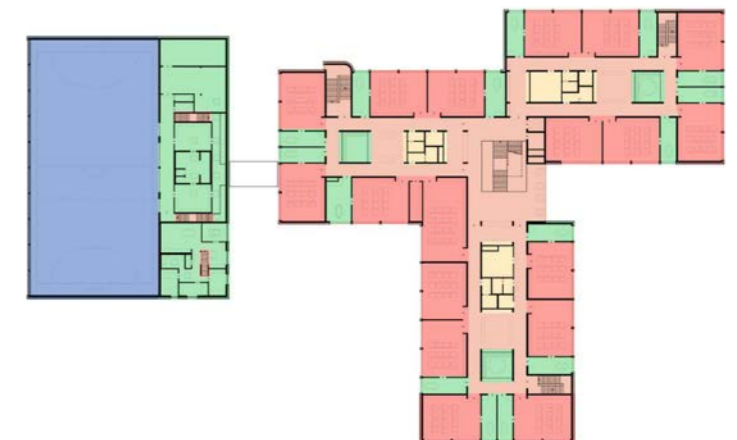
locker area



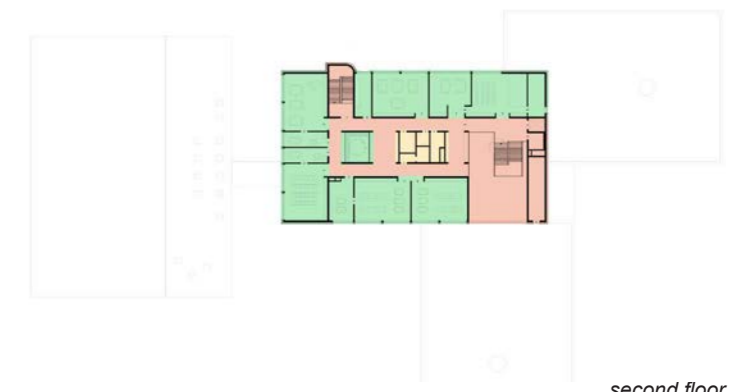
sports hall



ground floor



first floor



second floor

Emanuel-Schule Primary School

- Location: Germany - Cologne
- Designer: Drei Architekten
- Project year: 2023
- The school with five parallel classes in each year group and an adjacent sports hall.
- Can accommodate more than 500 pupils.
- It is the variety of different spaces ranging from small to large, quiet to lively that characterise its design.
- It offers spaces to study both individually or as a group, spaces for recreation, to retreat or for exchanging with other pupils and teachers.
- central hall with its open staircase
- multifunctional circulation areas

Precedents



playground view



entrance view



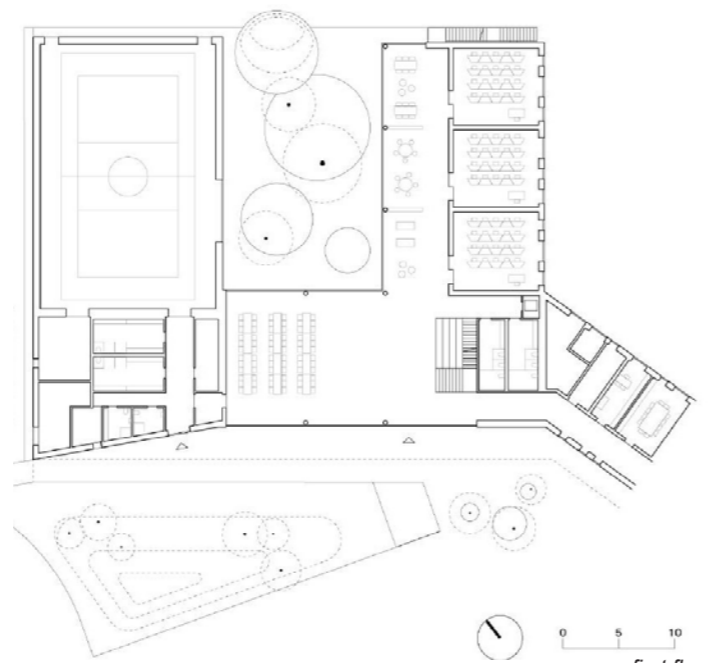
staircase close up



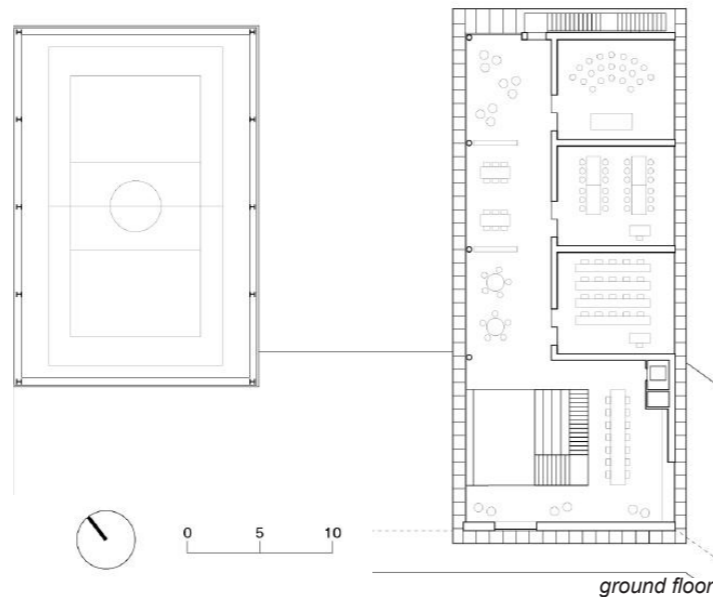
sports hall close up



sports hall view



first floor



ground floor

Marco Zito Middle School

- Location: Italy - Buttrio
- Designers: Marco Zitto and Artico Francassi
- Project year: 2021
- middle school hosts grades 11-13
- includes a sport hall.
- The double height atrium and the circulation system are intended as collective and active space where the students can interact and work everywhere in a flexible way.
- Classrooms and labs are directly connected with this system and allow innovative and dynamic learning strategies.
- The interior space extends fluidly to the outdoor landscape, the groundfloor is highly transparent and allows to perceive both spaces as a whole.



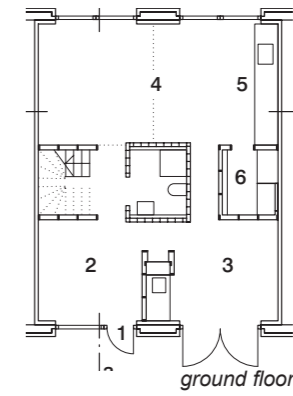
street view



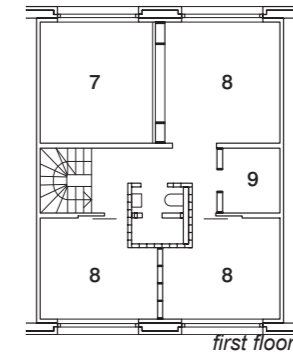
courtyard/ communal garden view



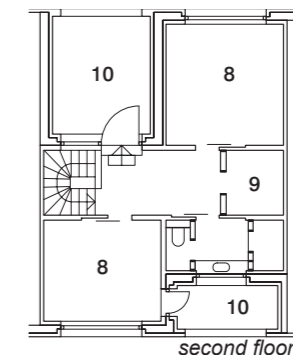
interior view



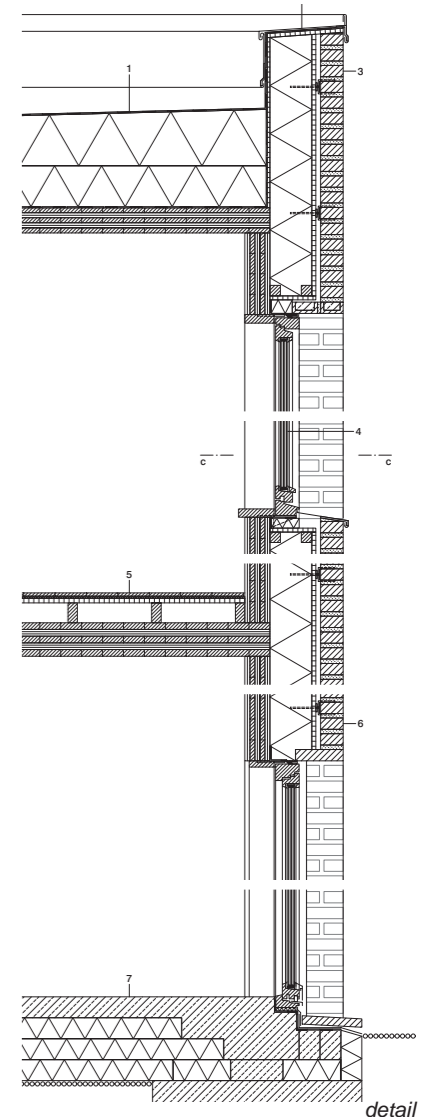
ground floor



first floor



second floor



detail

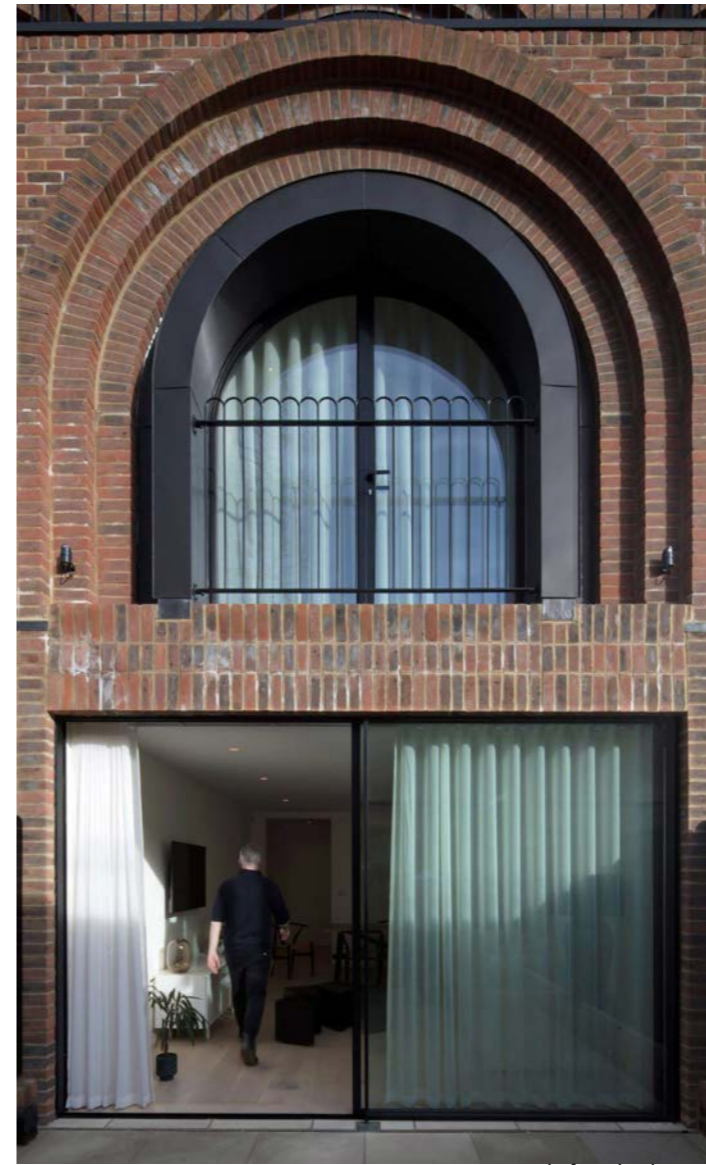
- classrooms
- movement + access
- toilets
- intermediate spaces
- sports hall

Townhouses in Malmö

- Location: Sweden - Malmö
- Designer: Förstberg Ling
- Project year: 2022
- residential complex in the Sorgenfri neighbourhood
- Brick and timber are the two main materials, masonry brick harmonises with the remaining historic brick buildings that define the character of the former industrial area.
- windowed facade displays clear organisation and conceals a cross laminated timber construction.
- L-shaped plan organised according to a clear grid.
- The inner structural shell consisting of cross laminated timber remains visible in the interiors. Its surfaces create a comfortable residential atmosphere.

Precedents

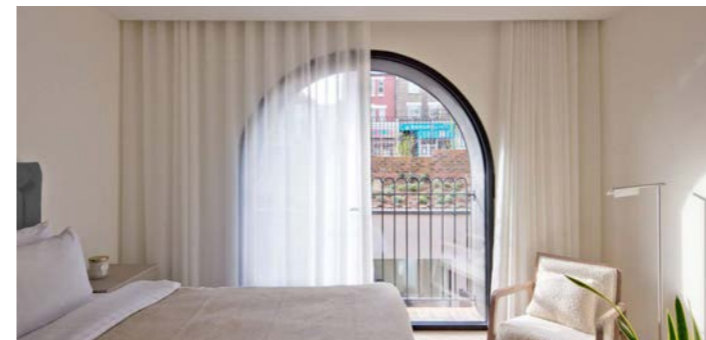
Local precedents



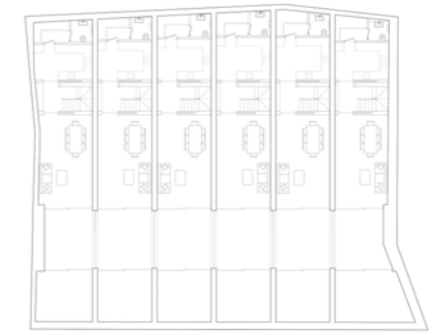
main facade close up



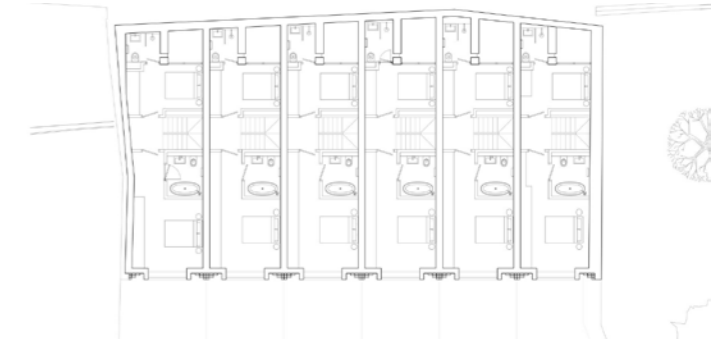
main facade



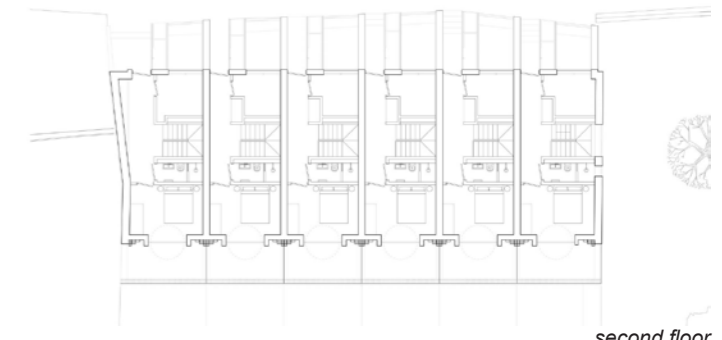
interior view



ground floor



first floor

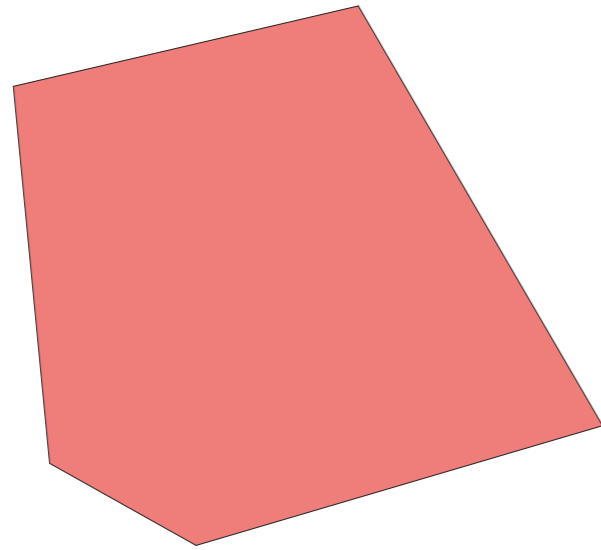


second floor

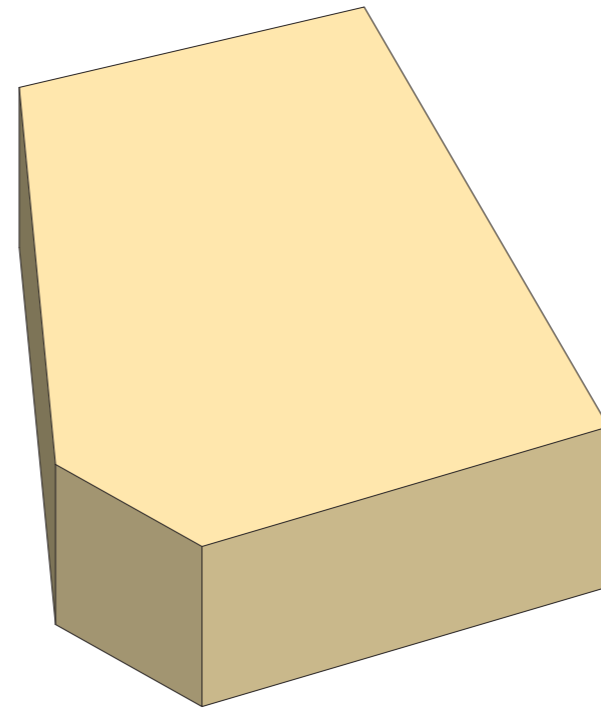
The Arches

- Location: North London conservation area
- Designer: DHaus
- Project year: 2023
- Replacing a derelict petrol station, the terrace is named after the monumental arches that form the facades of each partially sunken, three-level home.
- designed the row to echo its surroundings, which include Georgian-era housing named Grove Terrace and a row of Victorian railway arches.
- The arch is a recurring motif, so the studio decided to create a contemporary interpretation.
- "These buildings highlighted a strong mixture of rectangles and arches set within a brick canvas," they said.

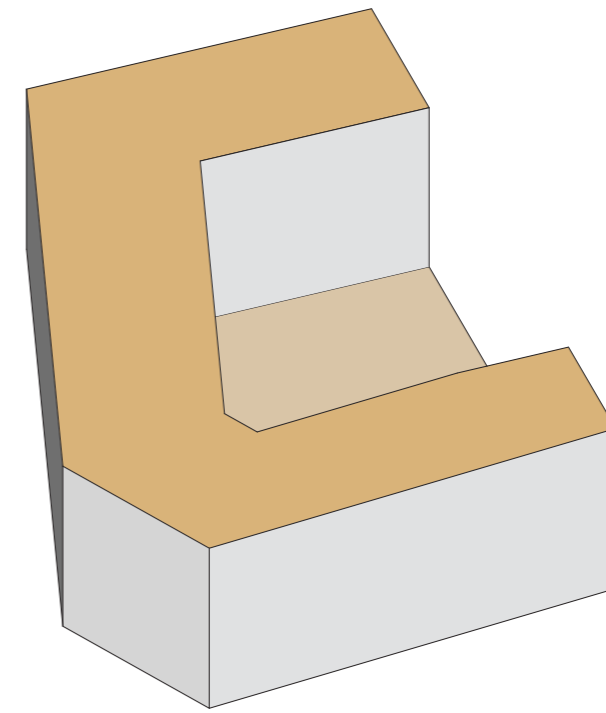
Precedents



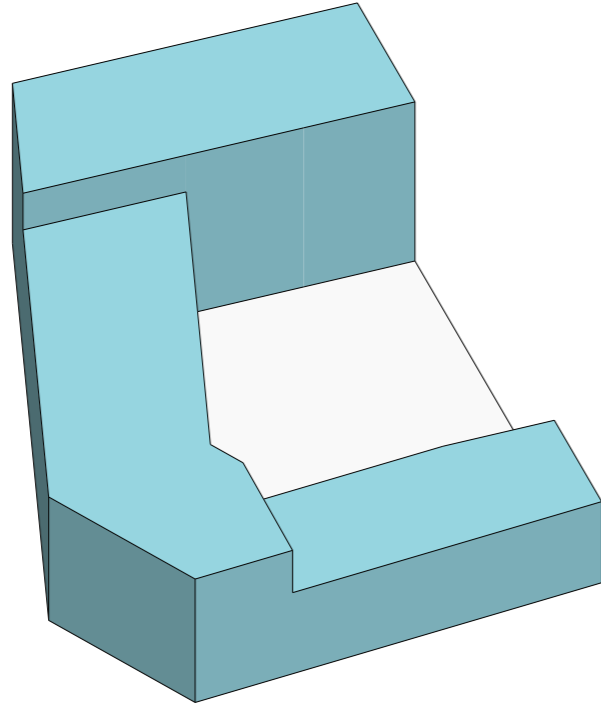
site boundary



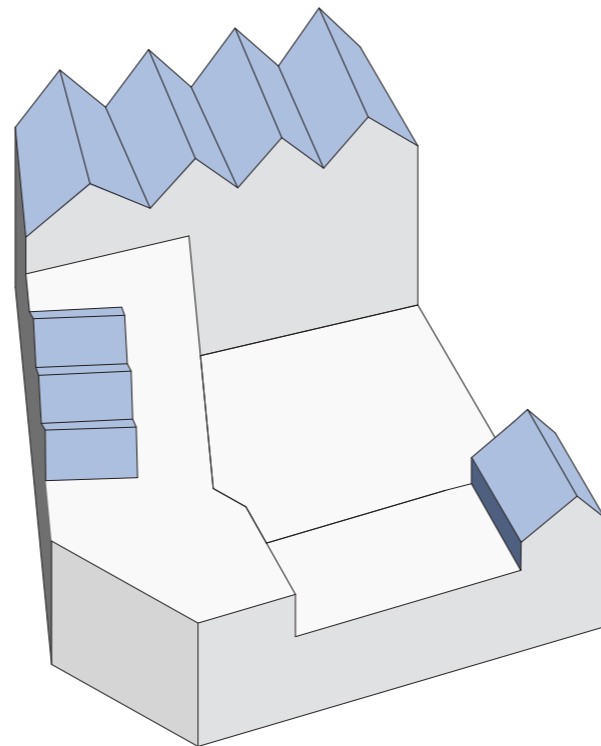
giving area volume appropriate to surroundings and programme



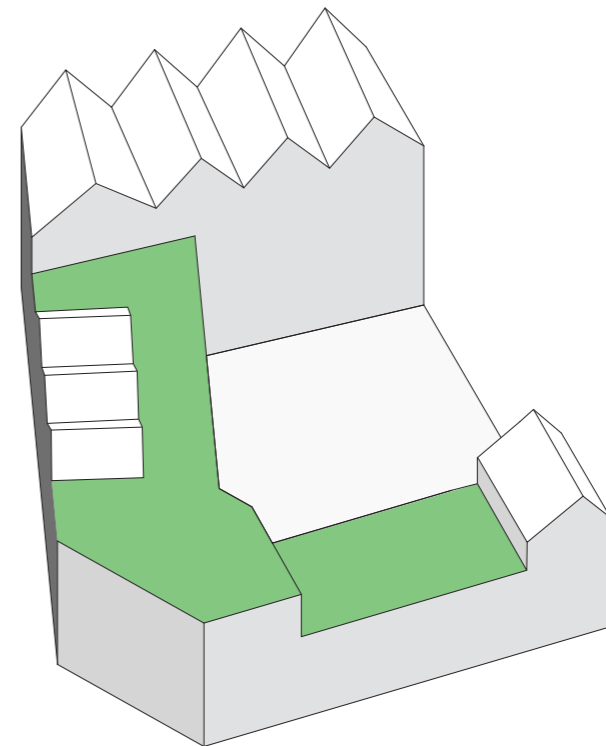
cutting out courtyard for play and communal space away from road and noise



level variation to improve form, daylight into courtyard and design appeal

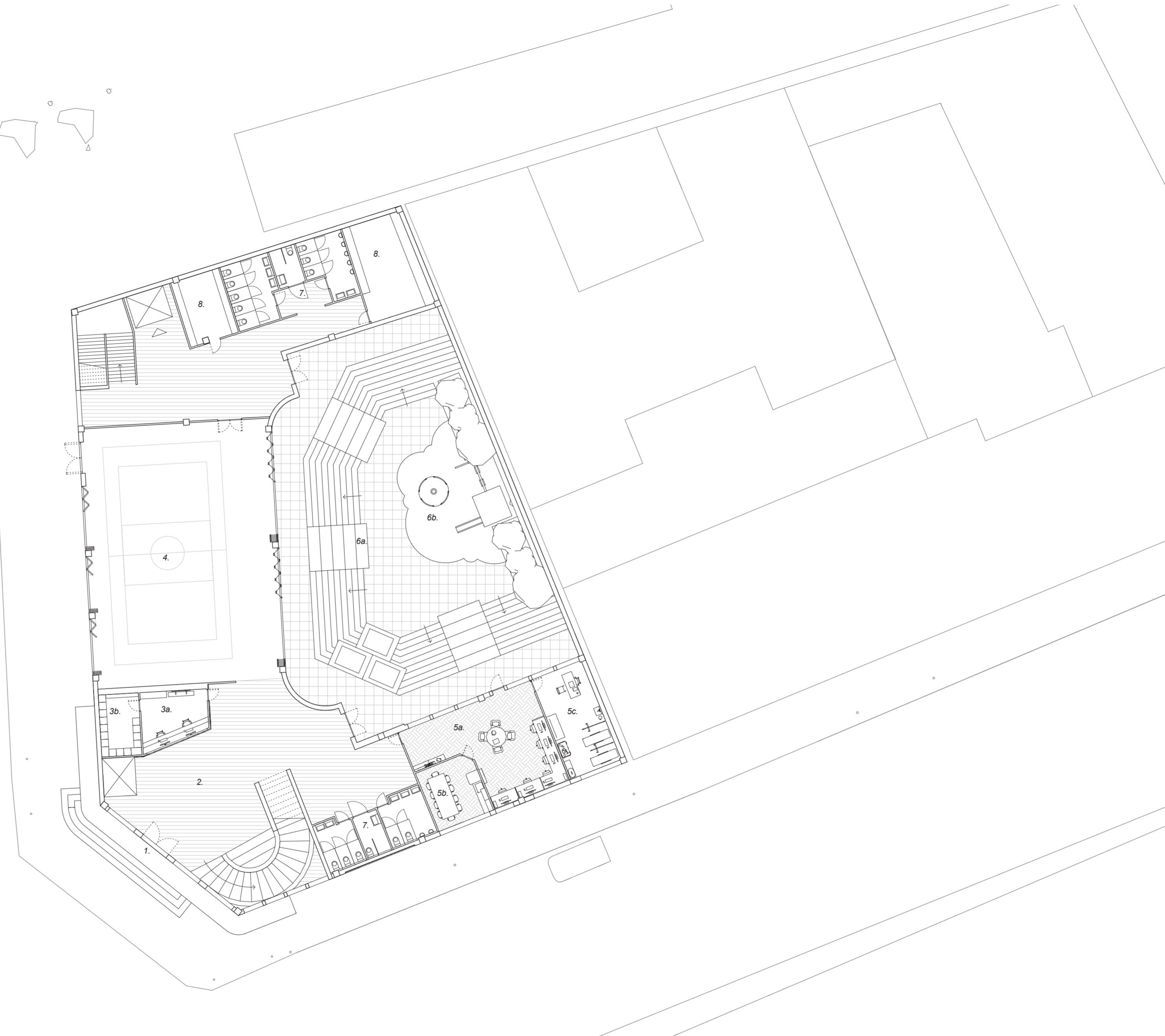
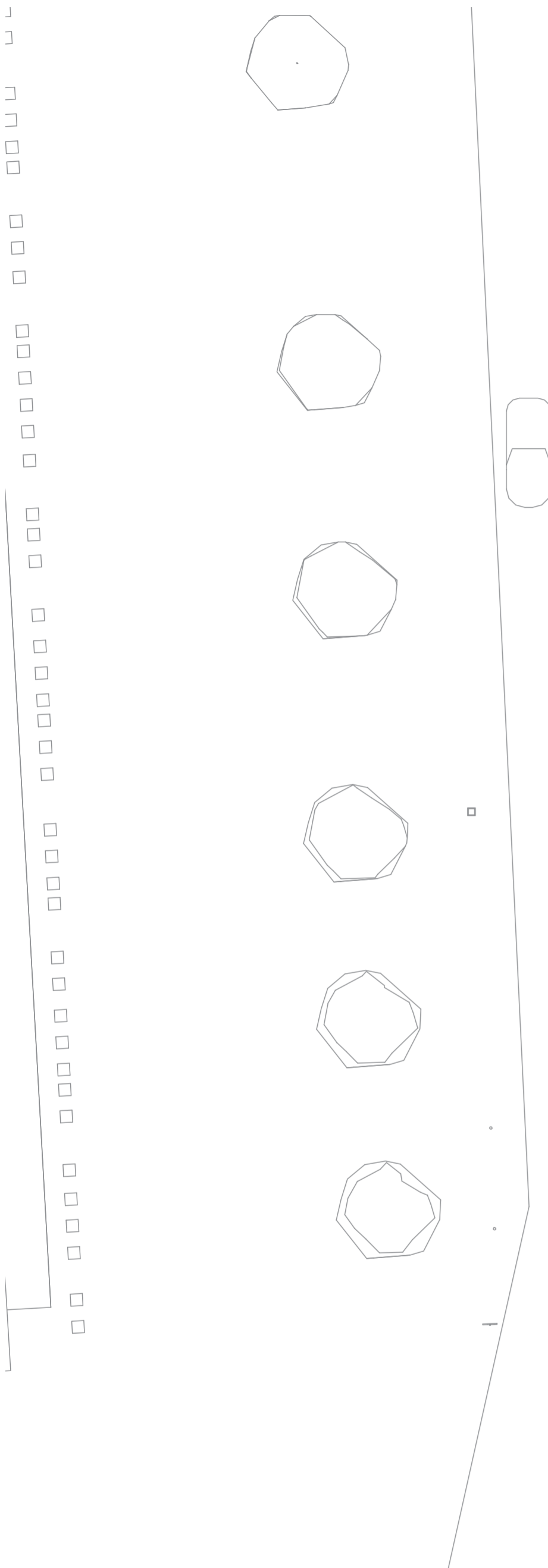


pitched roofs and skylight for form variation and appropriate angles for solar panels

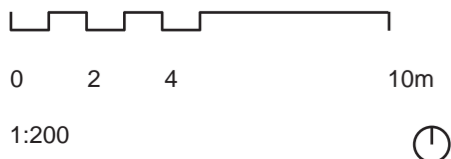


greenroof terrace to promote sustainability, greenspace and user wellbeing

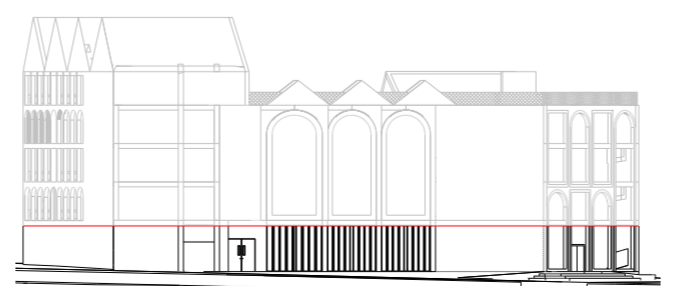
Massing Development



Ground Floor Plan



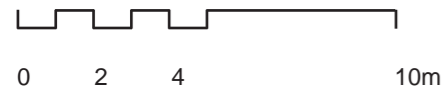
- key*
- | | |
|-----------------------|-------------------|
| 1. entrance | 5a. staff room |
| 2. foyer | 5b. meeting room |
| 3a. reception desk | 5c. nurses office |
| 3b. reception storage | 6a. courtyard |
| 4. main hall | 6b. playground |
| | 7. toilets |
| | 8. changing rooms |



- Big open entrance atrium with accented vibrant CLT staircase, decorated with multifunctional storage spaces for books etc to make more use of the space and create a very playful interactive environment as soon as you enter the building
- Reception and staff rooms are situated such that they're immediately accessible upon entry into the building for all users, students, staff and the wider community.
- Bifolding concertina doors that open to create direct circulation from the street, through the sports hall and into the courtyard to maximise the openness of the space and the desired communal atmosphere.



First Floor Plan

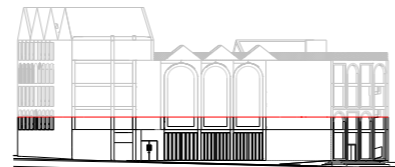


1:200

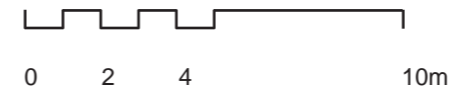


key

- | | | | |
|----|------------|-----|------------------|
| 1. | toilets | 5. | social area |
| 2. | foyer | 6. | courtyard |
| 3. | classrooms | 7a. | primary access |
| 4. | main hall | 7b. | secondary access |



Second Floor Plan



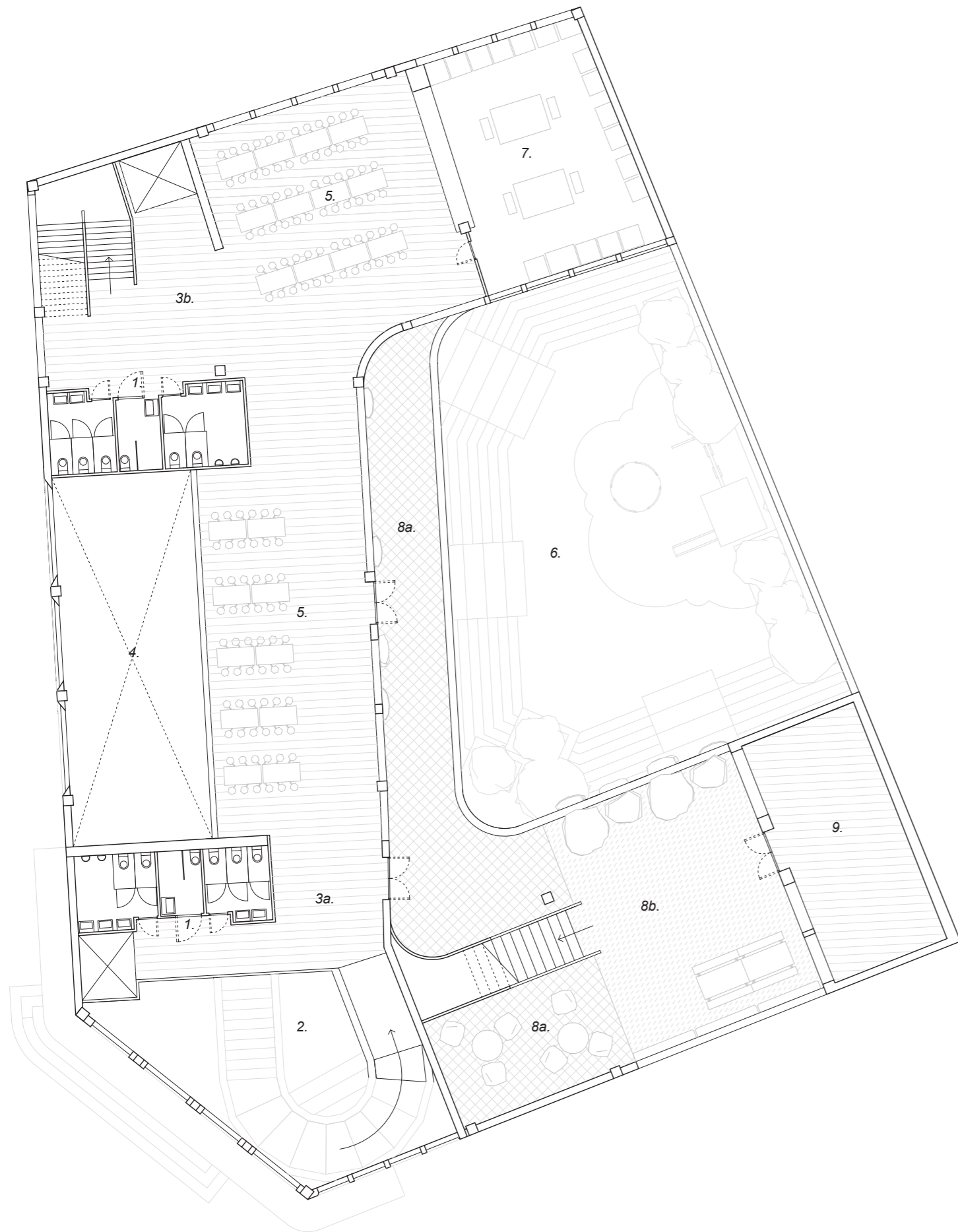
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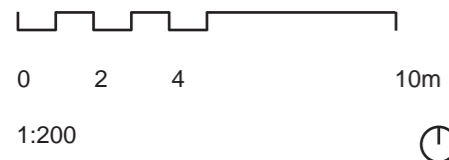
key

- | | | | |
|----|------------|-----|------------------|
| 1. | toilets | 5. | social area |
| 2. | foyer | 6. | courtyard |
| 3. | classrooms | 7a. | primary access |
| 4. | main hall | 7b. | secondary access |

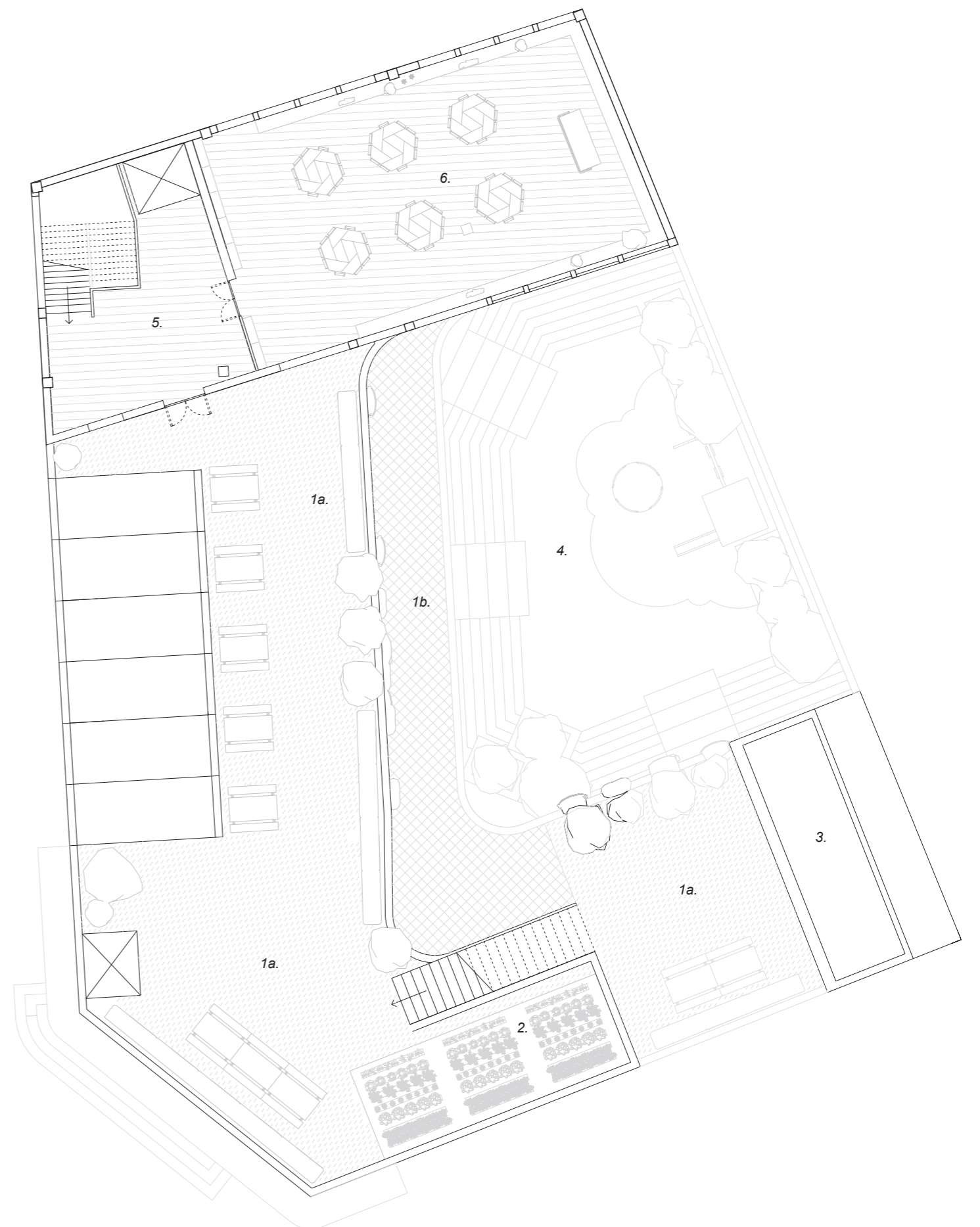
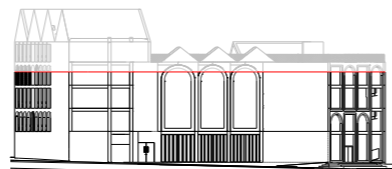




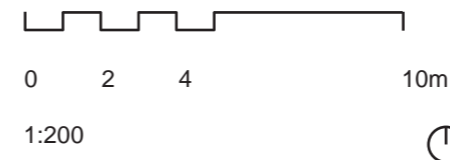
Third Floor Plan



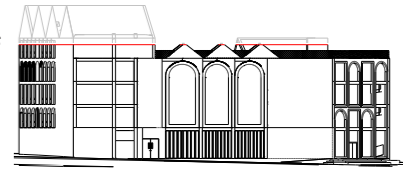
- | | | | |
|------------|------------------|-----|-------------------|
| <i>key</i> | | | |
| 1. | toilets | 6. | courtyard |
| 2. | foyer | 7. | kitchen |
| 3a. | primary access | 8a. | terrace balcony |
| 4. | secondary access | 8b. | terrace greenroof |
| 5. | lunch hall | 9. | greenroof shed |



Fourth Floor Plan



- | | | | |
|------------|-------------------|----|------------------|
| <i>key</i> | | | |
| 1a. | terrace greenroof | 4. | courtyard |
| 1b. | terrace balcony | 5. | secondary access |
| 2. | vegetable garden | 6. | classroom |
| 3. | greenroof shed | | |





West Elevation



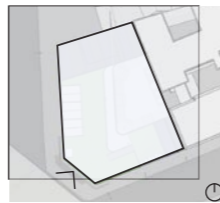
0 2 4 10m

1:200



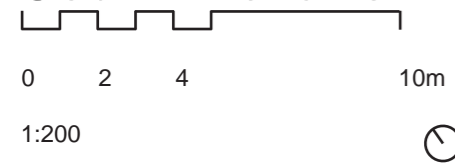
key

- 1. main entrance
- 2. main hall access
- 3. fire exit
- 4. green roof terrace
- 5. secondary access
- 6. staff room
- 7. classrooms

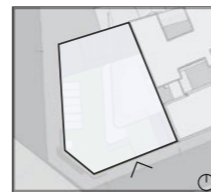




South Elevation

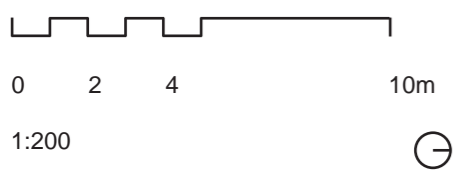


- key
- 1. main entrance
 - 2. green roof terrace
 - 3. staff room
 - 4. classrooms





Section A



- key*
- | | | | |
|----|---------------------------|----|-----------------------|
| 1. | <i>main entrance</i> | 6. | <i>lunch hall</i> |
| 2. | <i>sports hall</i> | 7. | <i>seating area</i> |
| 3. | <i>green roof terrace</i> | 8. | <i>changing rooms</i> |
| 4. | <i>classrooms</i> | 9. | <i>courtyard</i> |
| 5. | <i>canteen/ kitchen</i> | | |

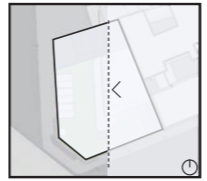


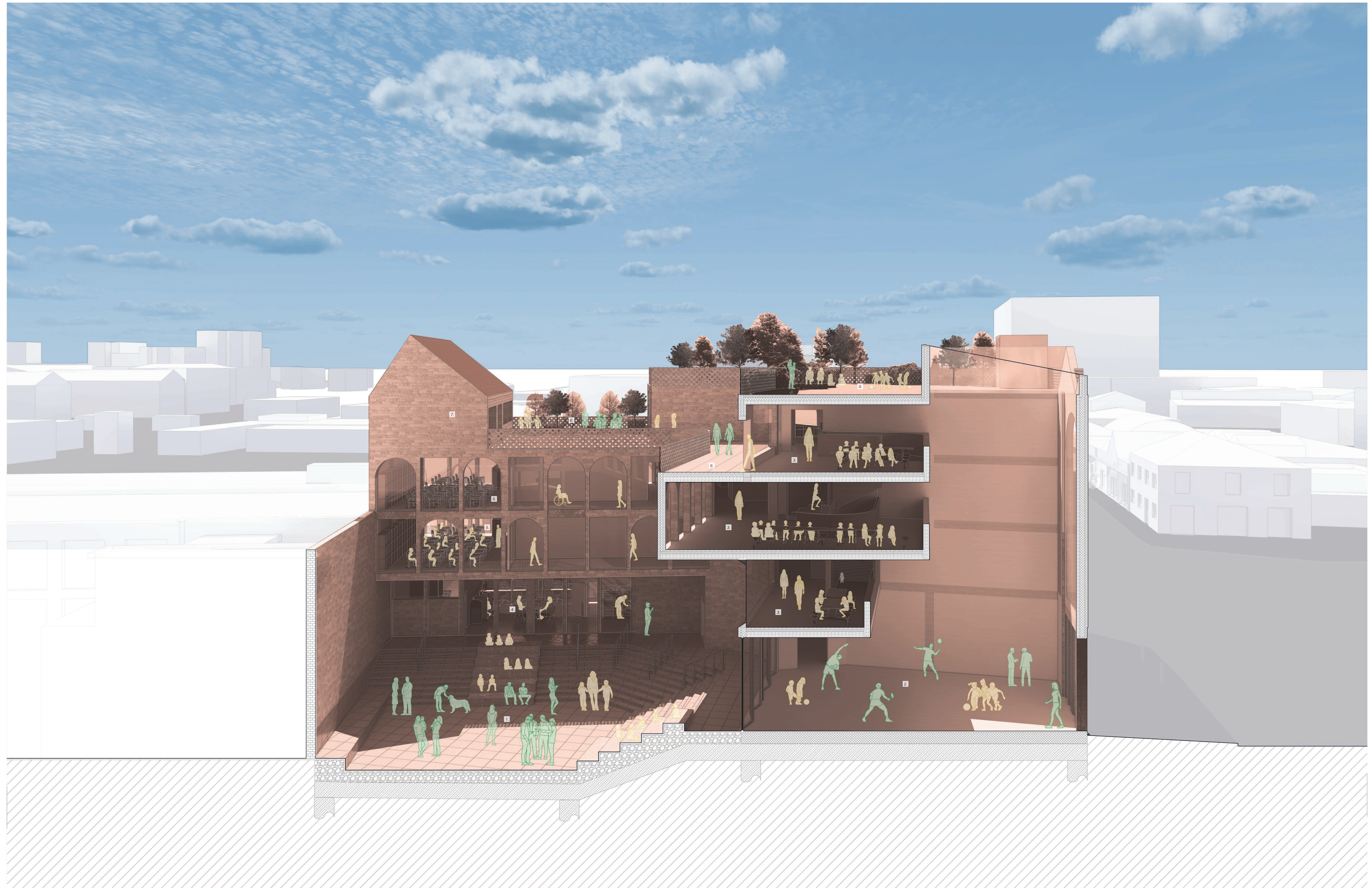


Section B

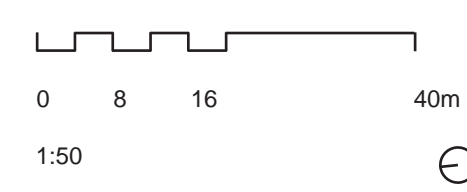


- key*
- | | | | |
|----|---------------------------|----|-----------------------|
| 1. | <i>main entrance</i> | 6. | <i>lunch hall</i> |
| 2. | <i>sports hall</i> | 7. | <i>seating area</i> |
| 3. | <i>green roof terrace</i> | 8. | <i>changing rooms</i> |
| 4. | <i>classrooms</i> | 9. | <i>courtyard</i> |
| 5. | <i>canteen/ kitchen</i> | | |

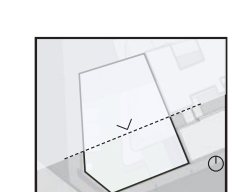




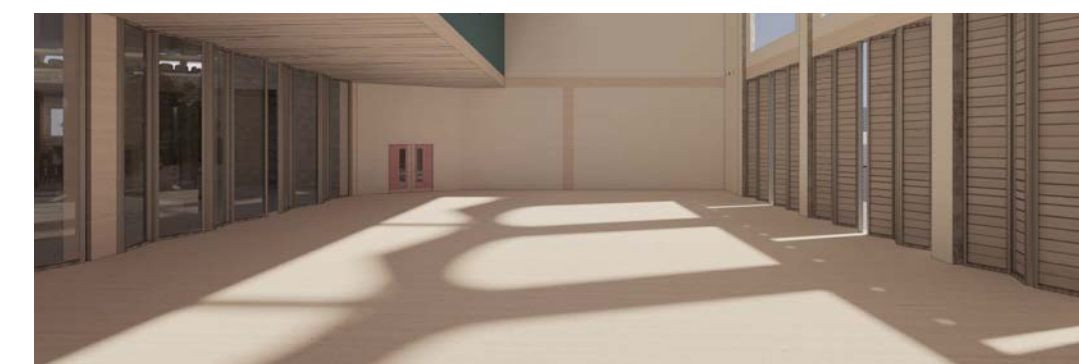
Section C



- key**
- 1 courtyard
 - 2 multifunction hall
 - 3 dining hall = social space
 - 4 staff room
 - 5 classrooms
 - 6 terrace green roof
 - 7 green roof shed



- lots of trees to promote wellbeing and fresh air amidst the poor air quality in the area
- playground and play equipment for the students
- recycled tiles to reduce the building carbon footprint
- stone seating
- staggered building heights give optimal sunlight to the space
- surrounded by glass giving a big transparent, open and welcoming atmosphere



- high up windows to ensure privacy from the street
- large window size to ensure optimal daylight entering the space
- falling concrete walls that create direct movement from the street to the courtyard emphasising and maximising the openness of the spaces and the desired communal atmosphere



- higher floor and large open windows to create amazing views while in the space
- open plan for optimal circulation
- immediate access to the terrace
- high sunlight entry into the space



- high up windows to ensure enough privacy
- sufficient daylight
- has courses and meeting space
- carpet tiled flooring



- large open plan
- each classroom accommodates at least 60 children
- excellent views into the courtyard
- ample amounts of storage space
- adjustable configuration tables, can be arranged in many different ways

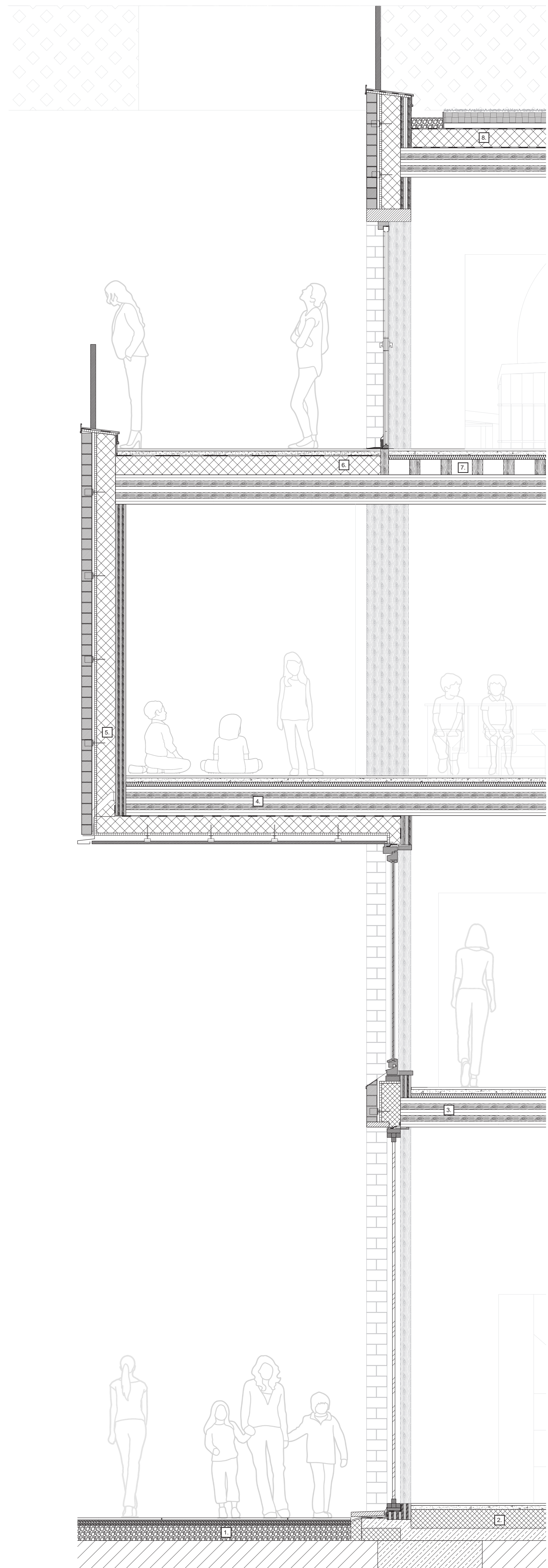


- 4 storeys high
- large amount of greenery and trees
- benches and seating to enjoy the area and the communal element of programme
- carbon sequestering, very environmentally friendly
- large amount of green space promotes user wellbeing
- open floor plan to allow the children a space to run and play freely

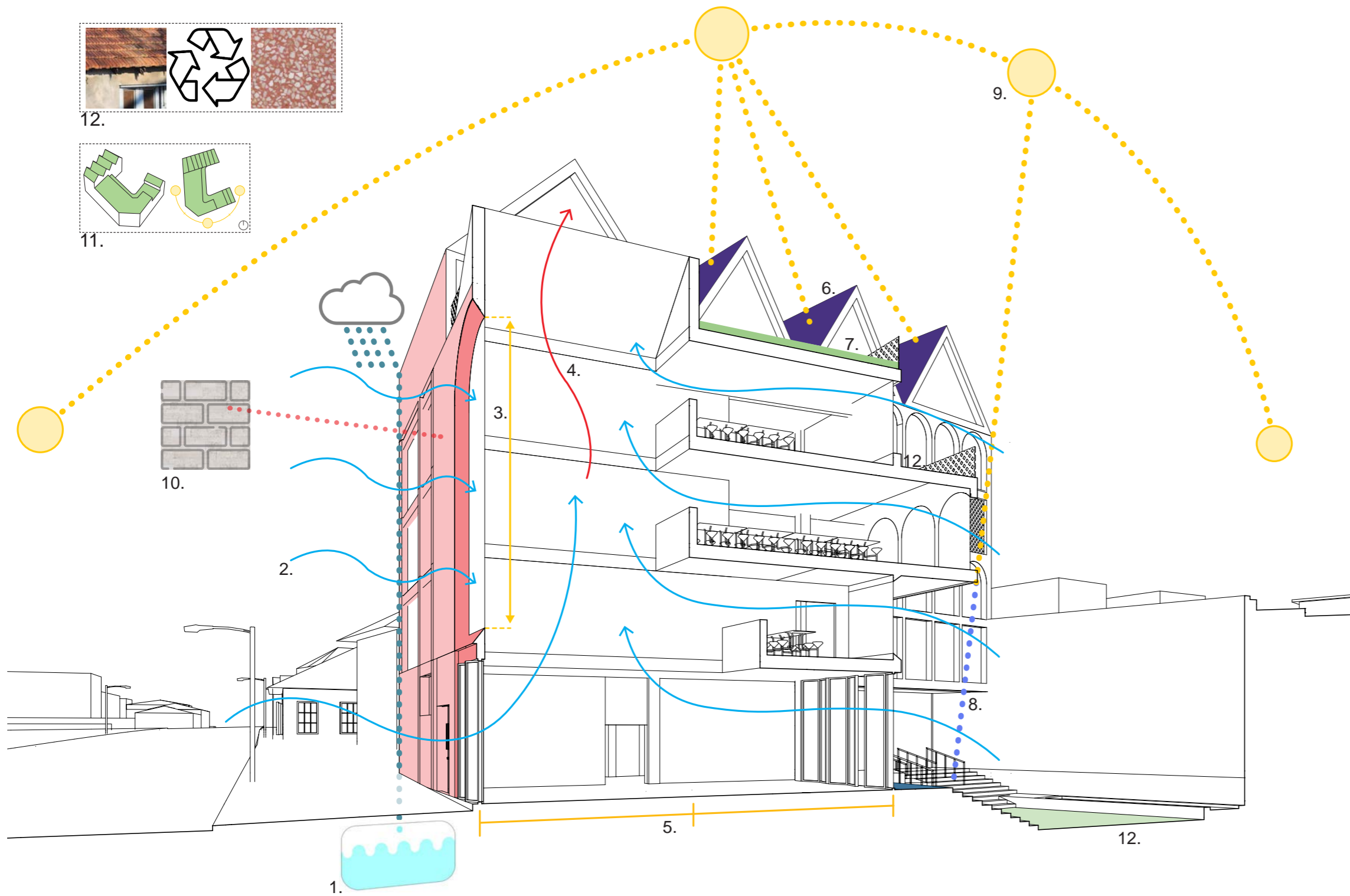


1:20 Bay Study

- | | | | |
|--|---|---|---|
| <p>2. internal floor build-up</p> <ul style="list-style-type: none"> • 20mm floor finish oak flooring • 40mm screed • 200mm rigid insulation • 700mm concrete | <p>1. external floor build-up</p> <ul style="list-style-type: none"> • 20mm, recycled terrazzo tile flooring • 40mm gravel • 100mm hardcore | <p>3. 1st floor build-up</p> <ul style="list-style-type: none"> • 20mm floor finish, oak flooring • 40mm screed • 40mm acoustic insulation • 380mm c/c structure | <p>4. 2nd floor build-up</p> <ul style="list-style-type: none"> • 20mm floor finish, oak flooring • 40mm screed • 40mm acoustic insulation • 380mm c/c floor plate • 2mm water insulation • 180mm rigid insulation • 40mm cantilever cladding |
|--|---|---|---|



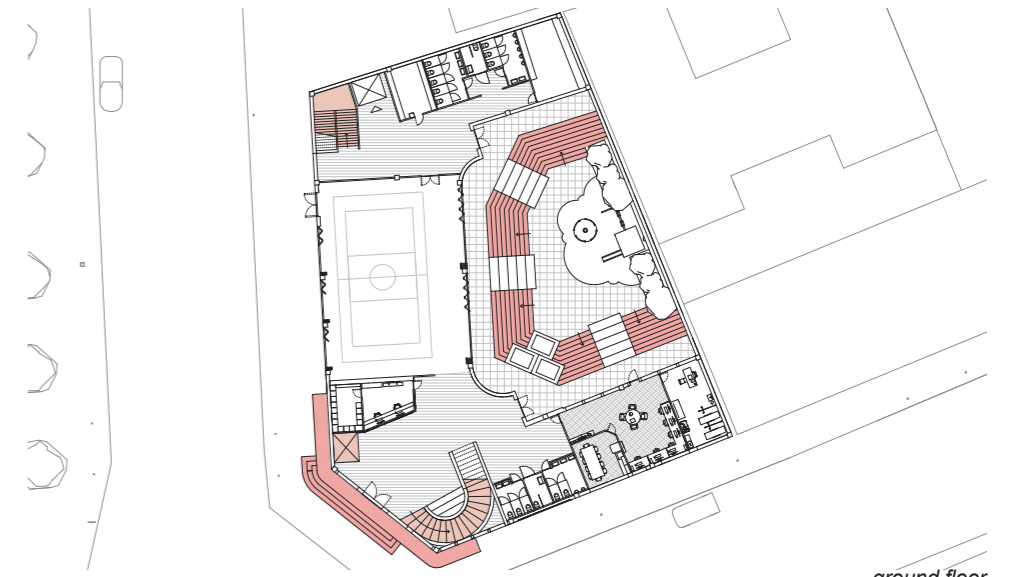
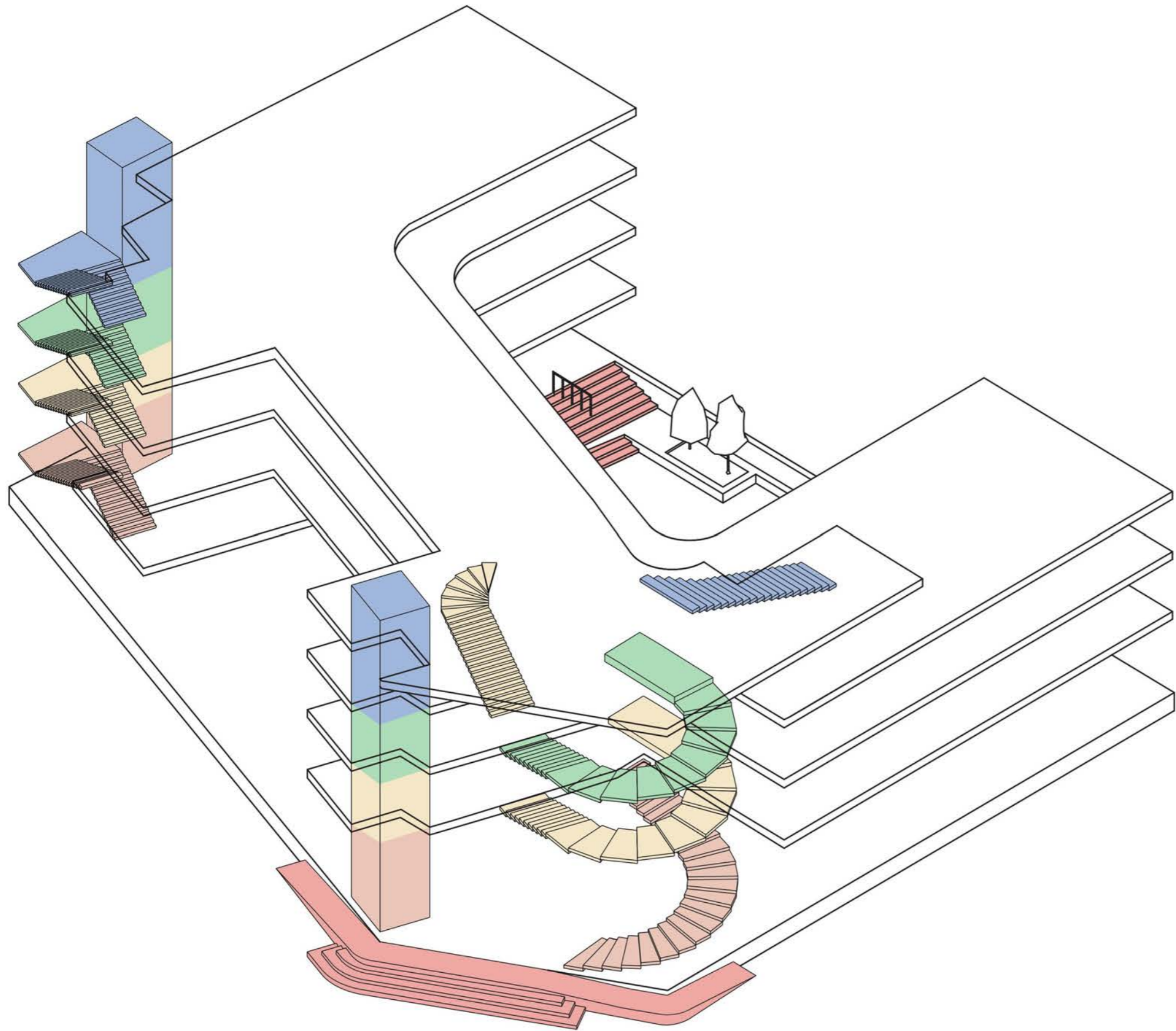
- | | | | |
|---|---|---|---|
| <p>5. external wall build-up</p> <ul style="list-style-type: none"> • 100mm c/c structure • 180mm rigid insulation • 100mm stone brick cladding | <p>6. terrace floor build-up</p> <ul style="list-style-type: none"> • 20mm terrazzo tile flooring • 40mm screed • 180mm rigid insulation • 380mm c/c floor plate | <p>7. 3rd floor internal build-up</p> <ul style="list-style-type: none"> • 20mm floor finish, oak flooring • 40mm screed • 40mm acoustic insulation • 140mmx70mm glulam beams • 380mm c/c floor plate | <p>8. terrace green roof build-up</p> <ul style="list-style-type: none"> • grass/ greenery • 200mm soil • 200mm gravel • waterproofing membrane • 100mm drainage layer • 180mm rigid insulation • 380mm c/c floor plate |
|---|---|---|---|



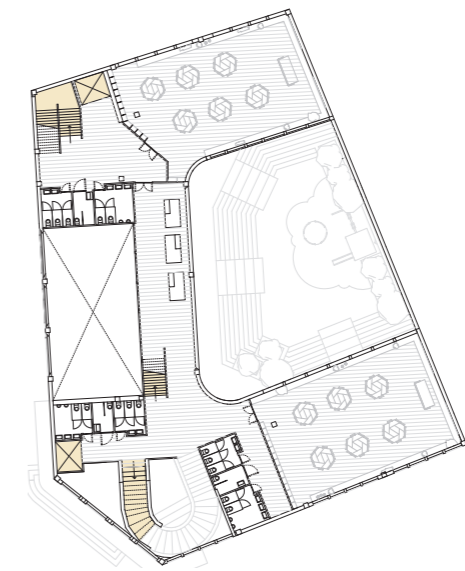
Key:

1. Rainwater harvesting and grey water recycling.
2. Wind direction aligned with windows for optimal airflow and ventilation.
3. Optimised daylight factor with large full height windows.
4. Stack and cross ventilation for optimised internal temperature.
5. Optimising Daylight factor by having all interior floorspace less than 7m away from windows.
6. Solar panels for renewable electricity and heating.
7. Green roof promotes biodiversity as well as habitat, water retention and user wellbeing.
8. Cantilever creates solar shading to prevent overheating.
9. Building aligned with Sun path for optimal lighting.
10. Thermal Mass controlling internal temperature with stone cladding
11. Optimised Form factor design for reduced heat loss and energy consumption
12. Recycled tiles using aggregate from pre-existing structures for decreased carbon footprint.

Environmental Strategy



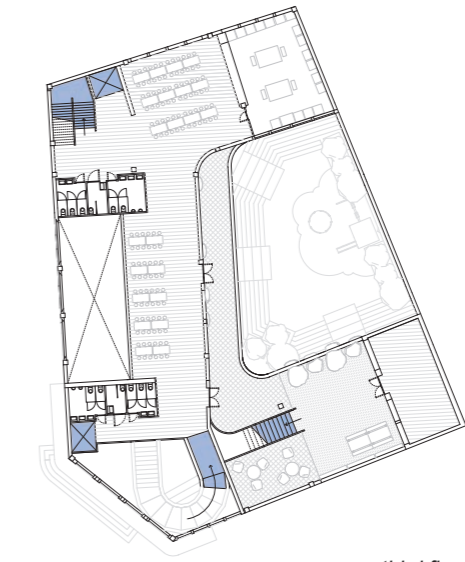
ground floor



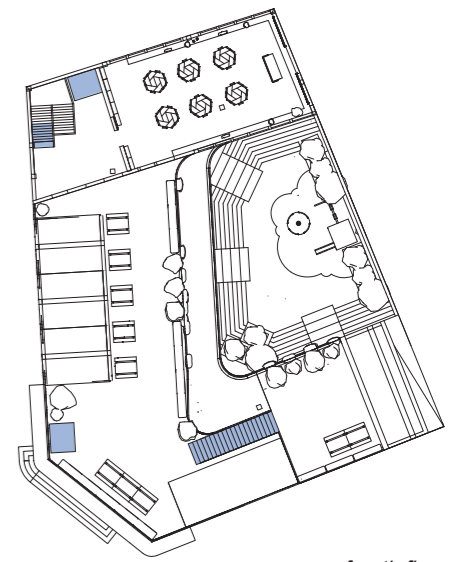
first floor



second floor

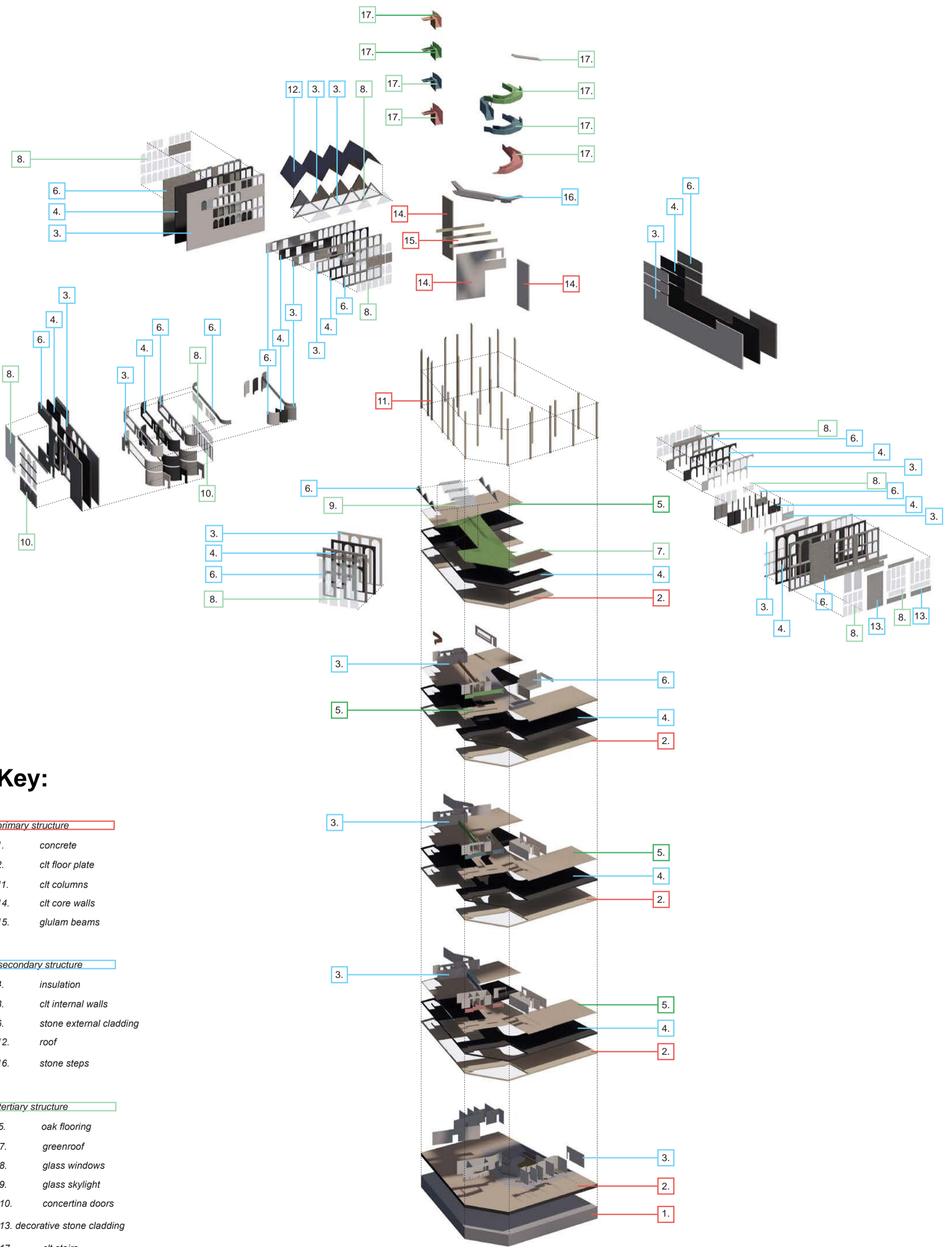


third floor



fourth floor

Accessibility Strategy



Key:

primary structure

- 1. concrete
- 2. clt floor plate
- 11. clt columns
- 14. clt core walls
- 15. glulam beams

secondary structure

- 4. insulation
- 3. clt internal walls
- 6. stone external cladding
- 12. roof
- 16. stone steps

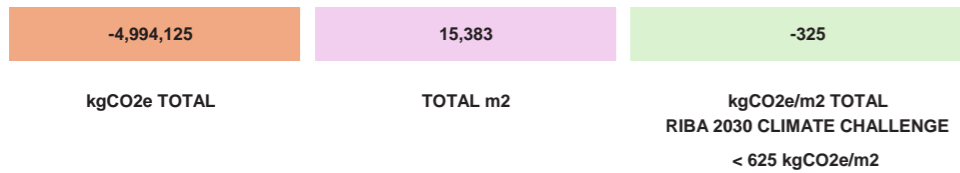
tertiary structure

- 5. oak flooring
- 7. greenroof
- 8. glass windows
- 9. glass skylight
- 10. concertina doors
- 13. decorative stone cladding
- 17. clt stairs

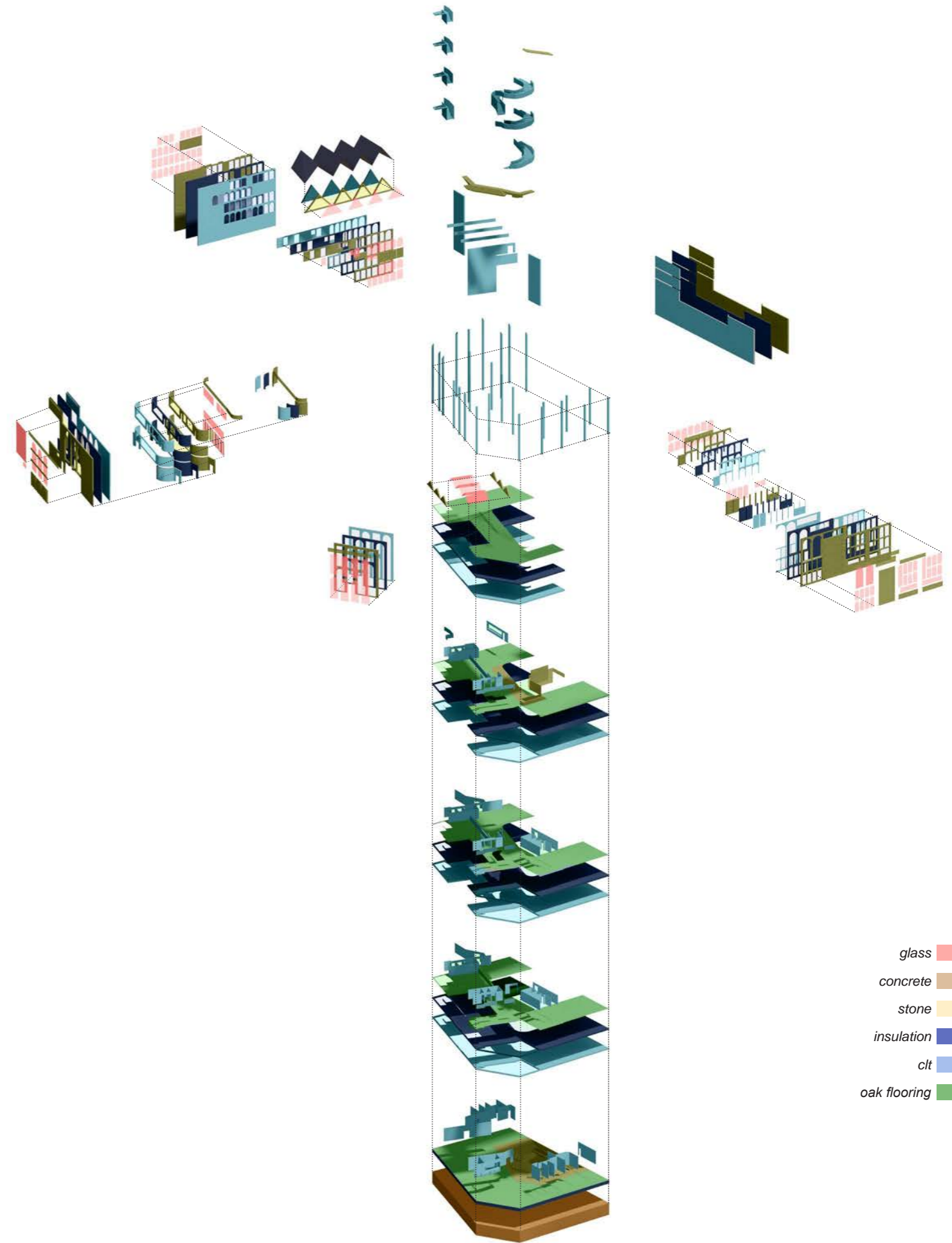
Structural Strategy

Embodied Carbon Calculation (Global Standard EN15978) (Stages A1-A5)

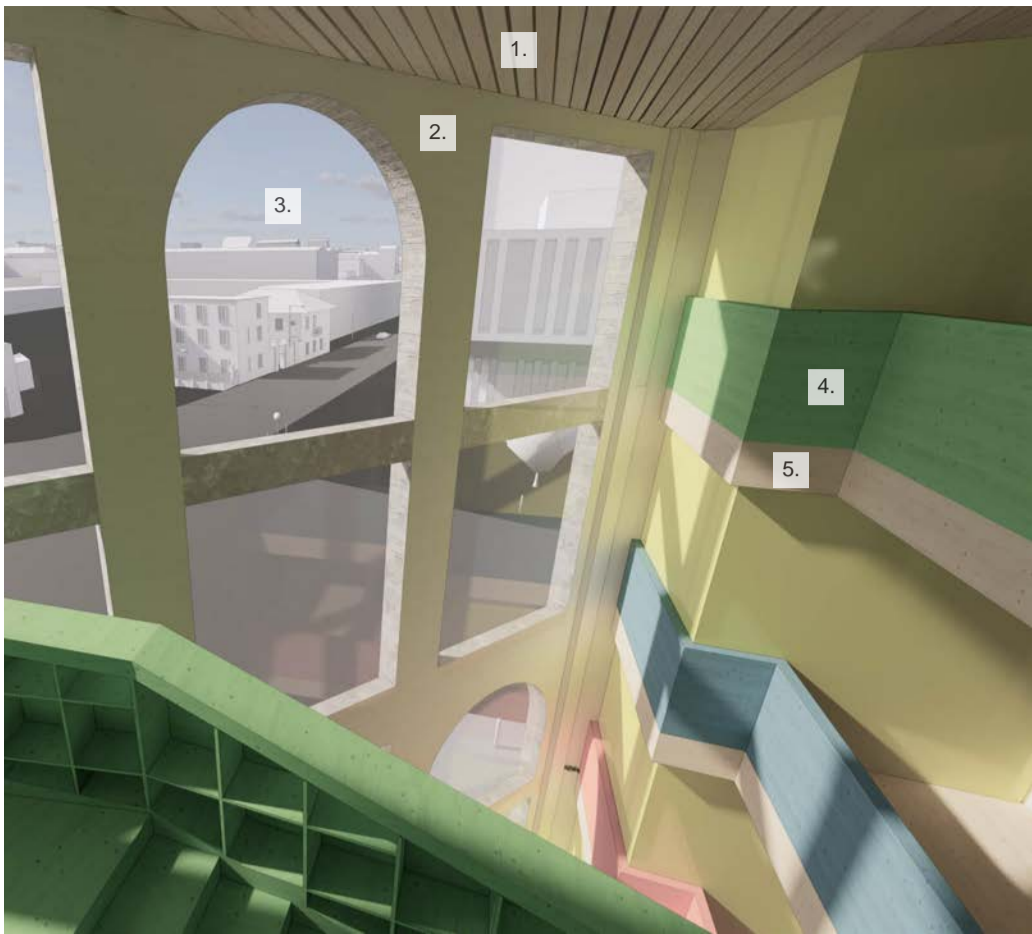
Material description	Density	Embodied carbon A+C KgCO2e/m3	Volume of material Used m3	TOTAL Embodied Carbon Materials
Aluminium (polyester powder coated)	2700	36484	0	0
Aluminium (virgin)	2700	31540	0	0
Aluminium (general)	2700	22814	0	0
Brass	8700	22306	0	0
Galvanised structural steel	7850	17276	0	0
Aluminium (bar and rod)	2700	16636	0	0
Glass fibre Reinforced plastic (GFRP)	1500	14315	0	0
Glass fibre	2500	13327	0	0
Hot rolled structural steel	7850	11176	0	0
Intumescent paint for steel	50	5653	0	0
PVC	1380	2814	0	0
Flat glass	2500	2823	15.54805962	43894
Clay Bricks	2400	1271	0	0
Viroc® Cement Bonded Particle Board	1350	948	0	0
Granite/Basalt/Marble	2600	541	0	0
Concrete 40 Mpa (unreinforced)	2400	495	1045.586146	517668
Concrete Blocks 7.3MPa	2050	372	0	0
Bitumen Elastomer	1000	343	0	0
Light concrete (autoclaved aerated)	1000	338	0	0
Plasterboard	720	298	0	0
Limestone	2500	176	0	0
Natural Stone	2500	176	100.8865817	17717
Sandstone	2400	171	0	0
Icyene (polyurethane)	30	142	0	0
Vapour barrier (polyethylene)	900	128	0	0
Fiber Felt	25	118	0	0
Rockwool	45	35	0	0
Thermacork Insulation	115	-133	3784.342085	-502945
Sustainably sourced MDF	700	-299	0	0
Laminated Bamboo	750	-349	0	0
Sustainably sourced plywood	620	-377	0	0
Sustainably sourced CLT (spruce)	470	-484	10379.01281	-5025129
Sustainably sourced pine	420	-489	0	0
Sustainably sourced Douglas Fir	530	-549	0	0
Sustainably sourced Oak	770	-702	57.962844	-45331



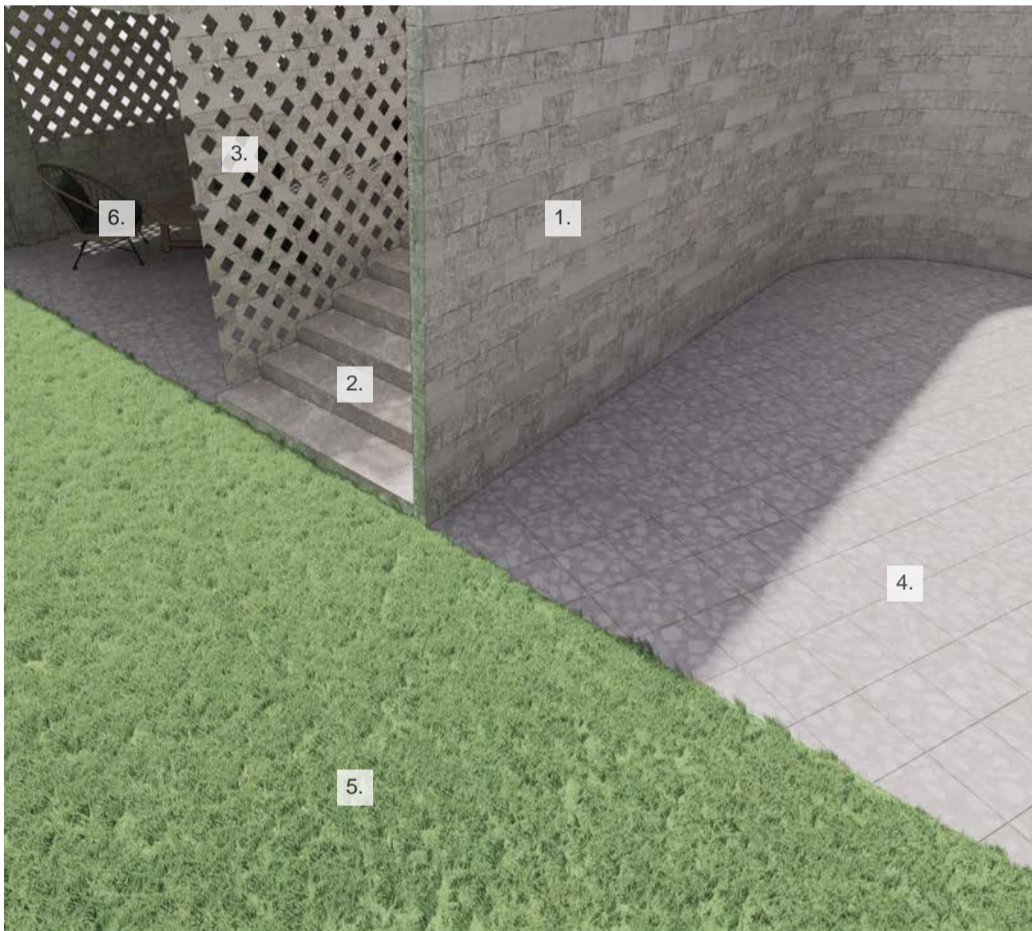
The design approach not only exceeds the required embodied carbon in the RIBA Climate Challenge, but sequesters carbon with the environmentally friendly and sustainable material palette



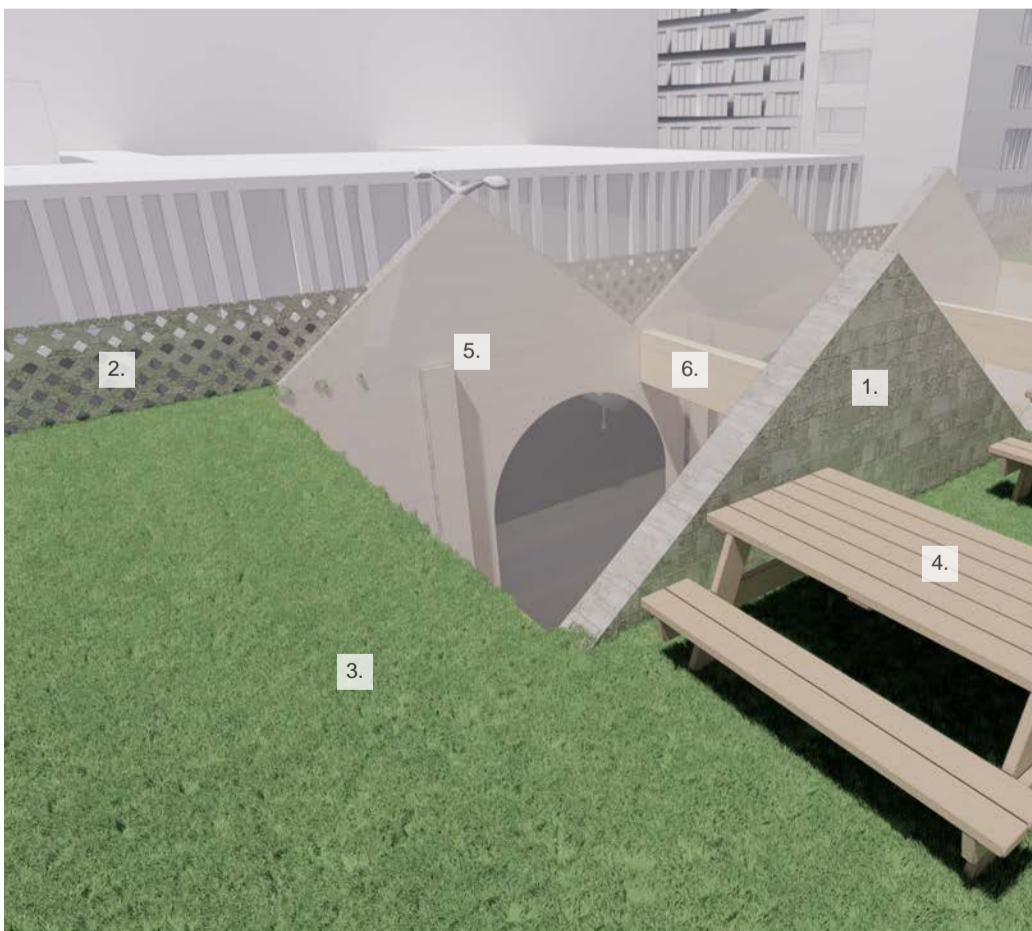
Embodied Carbon Calculation



1. slat timber ceiling
2. white bleached clt interior cladding
3. large open glass windows
4. bleach vibrant coloured clt
5. clt flooring 380mm



1. stone external wall
2. stone staircase to upper roof garden
3. decorative stone external wall cladding
4. recycled terrazzo tiles
5. grass/ green roof
6. timber based seating/ furniture



1. stone external wall
2. decorative stone external wall cladding
3. grass/ green roof
4. timber based seating/ furniture
5. glass skylight
6. glulam beam

Material Strategy



Aerial View



Internal View: Sports hall

- *high up windows to ensure privacy from the street*
- *large window size to ensure optimal daylight entering the space*
- *folding concertina walls that create direct movement from the street to the courtyard emphasising and maximising the openness of the spaces and the desired communal atmosphere*



- open and inviting plan, with reception desk immediate upon entry, vibrant spiral staircase to pique the interest of the students and engage them with the architecture
- multi-functional elements; seating besides the staircase and shelves running the span of the staircase as ballustrades
- lots of windows to let in sufficient natural light

Internal View: Foyer



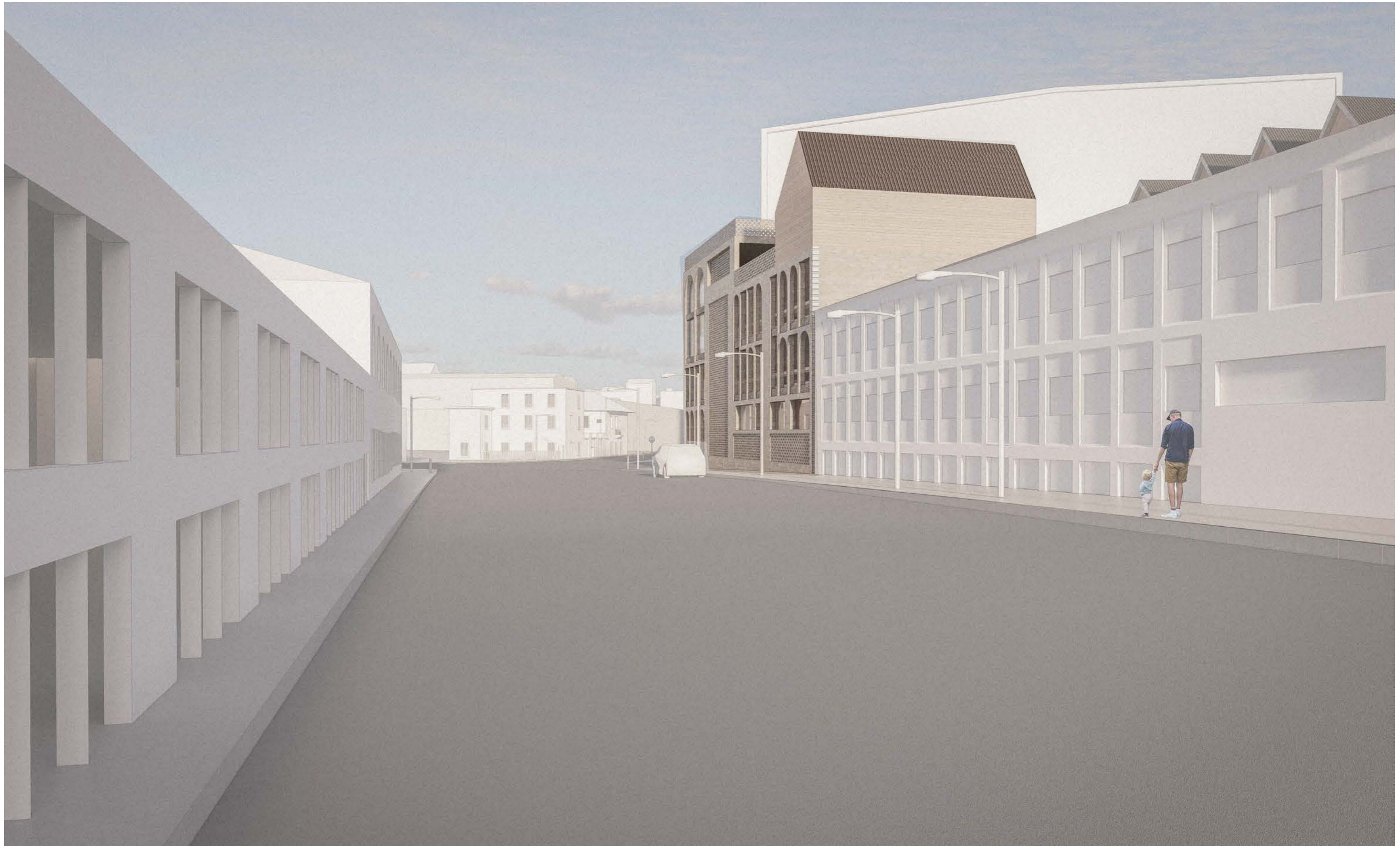
- *large open plan*
- *each classroom accomodates at least 60 children*
- *excellent views into the courtyard*
- *ample amounts of storage space*
- *adjustable configuration tables, can be arranged in many different ways*

Internal View: Classroom



Internal View: Staff room

- *high up windows to ensure enough privacy*
- *sufficient daylight*
- *has nurses and meeting space*
- *carpet tiled flooring*



External View: Street



- lots of trees to promote wellbeing and fresh air amidst the poor air quality in the area
- playground and play equipment for the students
- recycled tiles to reduce the buildings carbon footprint
- stone seating
- staggered building heights give optimal sunlight to the space
- surrounded by glass giving a big transparent, open and welcoming atmosphere

External View: Courtyard



- 4 storeys high
- large amount of greenery and trees
- benches and seating to enjoy the area and the communal element of programme
- carbon sequestering, very environmentally friendly
- large amount of greenspace promotes user wellbeing
- open floor plan to allow the children a space to run and play freely.

External View: Terrace roof garden



Model