



The site is situated at Furuset, in the east of Oslo, and part of Grorudalen.



Blue-green structure.
Existing and planned parks and streams which is to be unearthed.
The plan for Furuset aims at establishing a green link from south to north, dominated by vegetation and water, while an urban shared space street intersects in the east-west axis.

Furuset

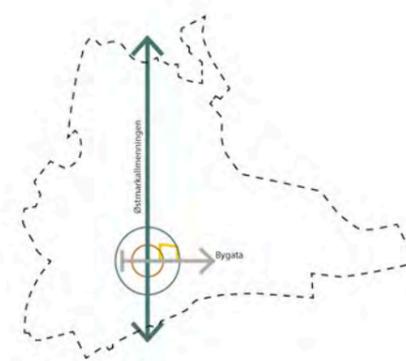
Sentrumskvartal med bydelshus, bibliotek, ungdomsklubb, servering, forretninger, kontorer og boliger.



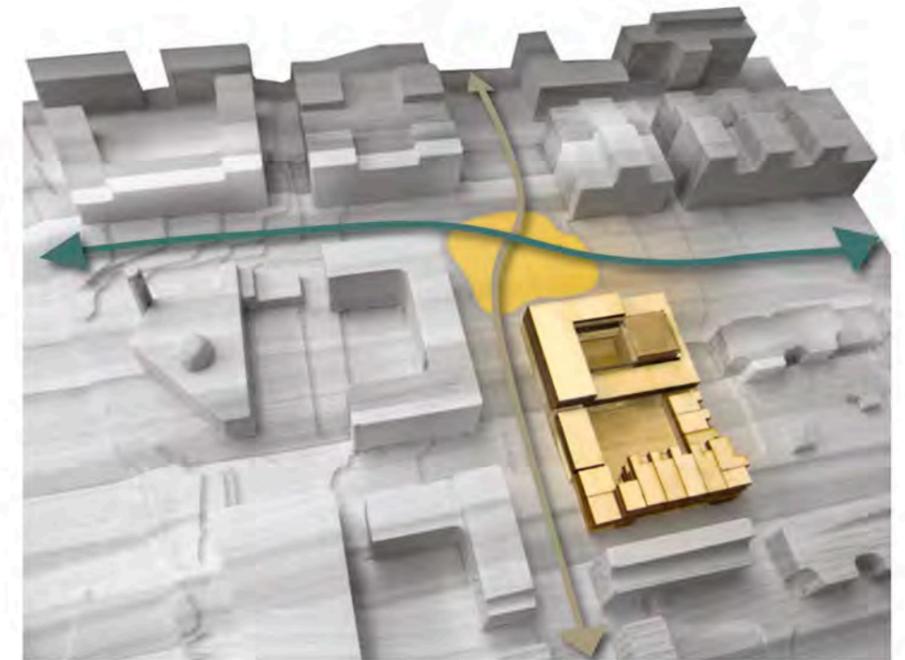
Current situation. Furuset is dominated by scattered housing complexes, schools and Furuset mall. E6 highway is a barrier to the south. Project site marked in yellow.

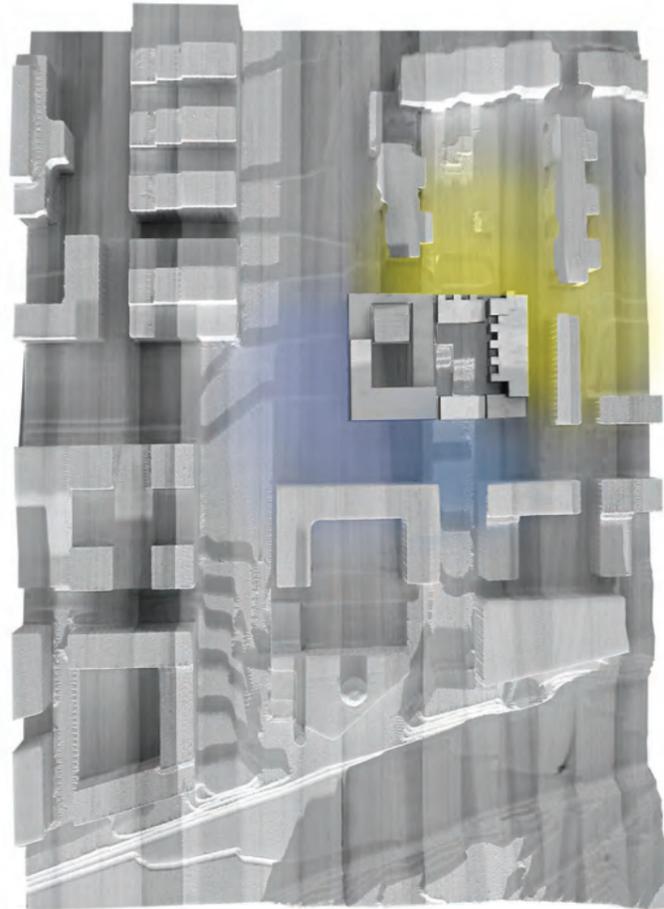


Future situation. Planned new housing, business and offices for Furuset, engulfing the existing housing lammelas in a tighter city block structure and diminishing the barrier of the highway with a concrete lid.

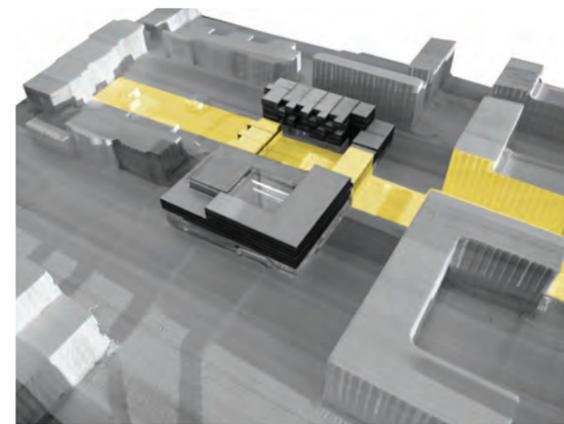


At the intersection of the urban street and the blue-green axis is Trygve Lies square. This square is the midpoint of the plan for Furuset, and acts as a mediator between different situations. Business, culture, nature and housing interfaces with this square. The project site is situated in this intersection.

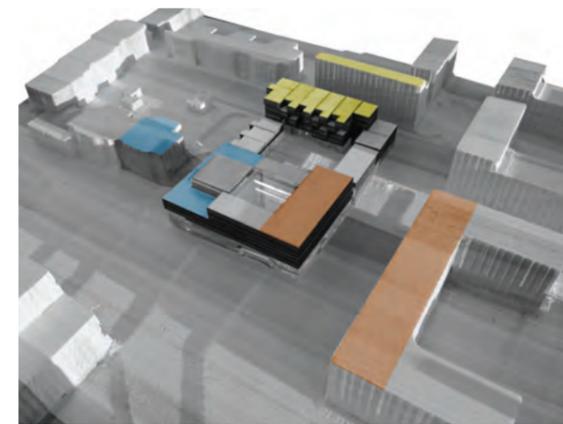




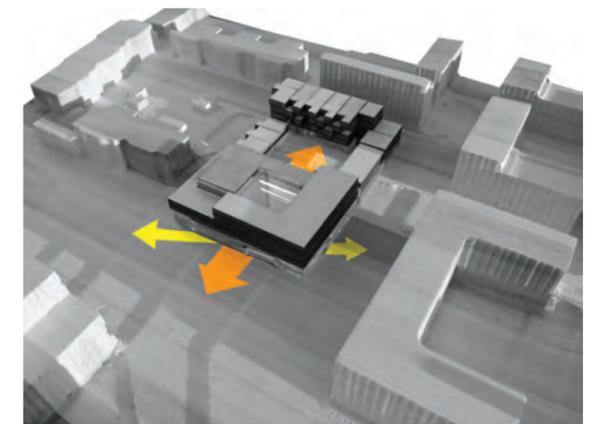
The buildings are situated on site according to their program, the main entrance of the residential part being in the residential area, the commercial programs facing the urban street, and the public functions opening up to the square.



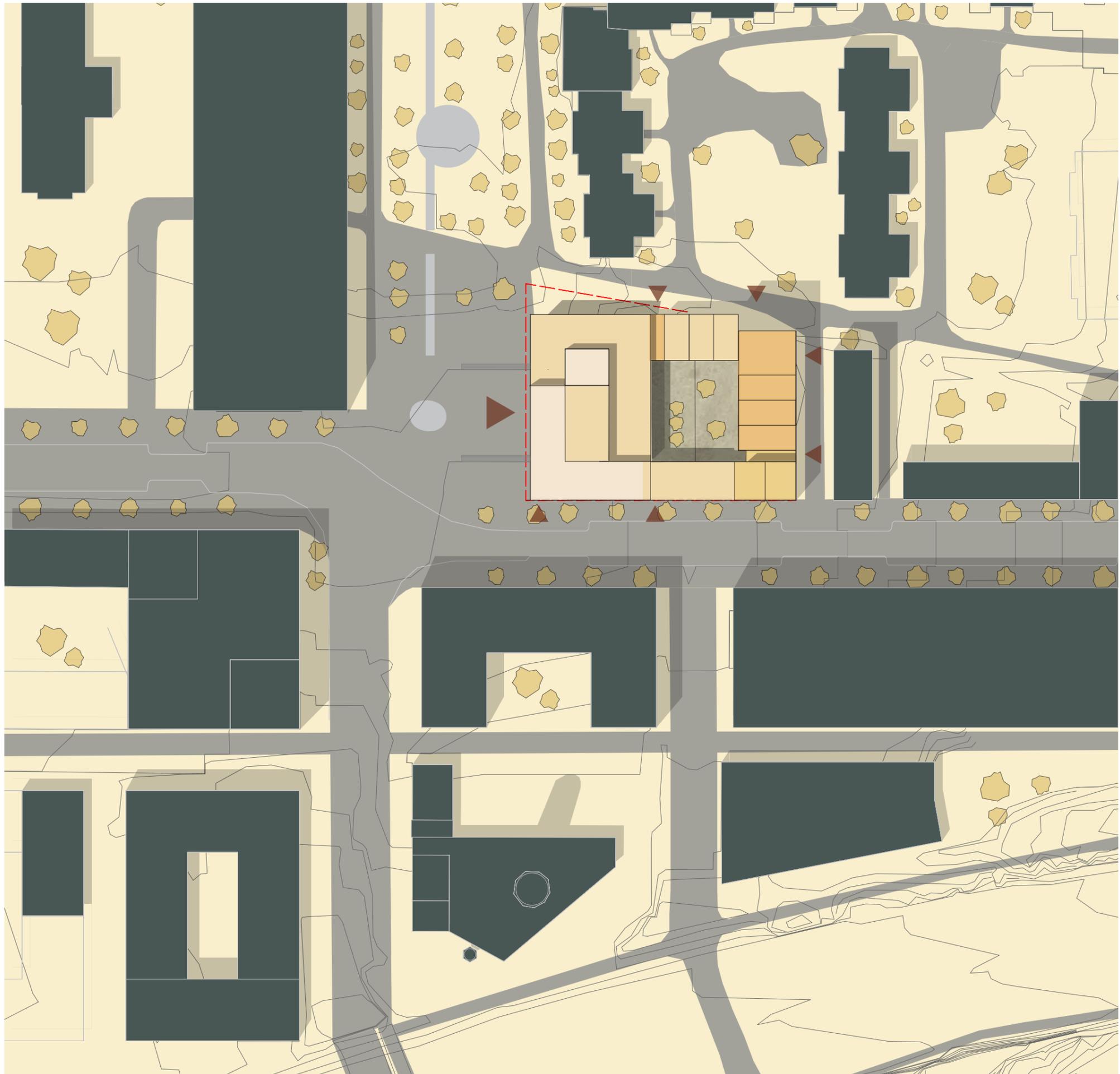
The building volumes are separated to underline the different functions and programs, with the apartment building to the west, the commercial building in the middle facing the urban street and the library adjacent Trygve Lies square.



The roof height is adapted to the surrounding buildings, giving a tall city facade towards the urban street, and a softer lower facade towards the greenscape and the residential area.



The library melds with the public space. The library is on top of Trygve Lies square rather than to the side of it. The tile cover of the square flows into the building, removing the separation of inside and outside.



Trygve Lies square

Trygve Lies square is the main public space at Furuset. Currently this space is occupied by a large parking lot, and the area in general is dominated by cars and buses. The only current pedestrian sphere is right outside the Furuset Senter and in the periphery. With the new proposed plan for the area the cars will be pushed further south to a urban street.

The concrete covering unifies the square and the library interior. The fragmentation of the borders meld the hardscape with the vegetation, and the walkways with the park in the continuing greenscape stretching north to Verdensparken.

The public area outside the library is divided in three main zones by stairs that serve several functions.



1



The public space will have a surface water pool that is connected to the stream running through the area. Currently flowing through pipes underground, we want to bring the water to the surface via the pool and then again further north as a stream that people can walk by. When the pool fills up from rain water it will spill over into the stream.

2



The area in front of the library will be divided into three smaller spaces by the stairs that connects the library ground floor with the public space. The lower level will have a flexible active zone. The middle space is the entrance of the library and the top making up the corner of the square serves as a transition to the urban street with its café corner.

3



The stairs that pass through the glass facade of the library connects the open spaces in a near seamless transition, and along with the continuous concrete surface they serve to diffuse the line between library and public space, between inside and outside.

4



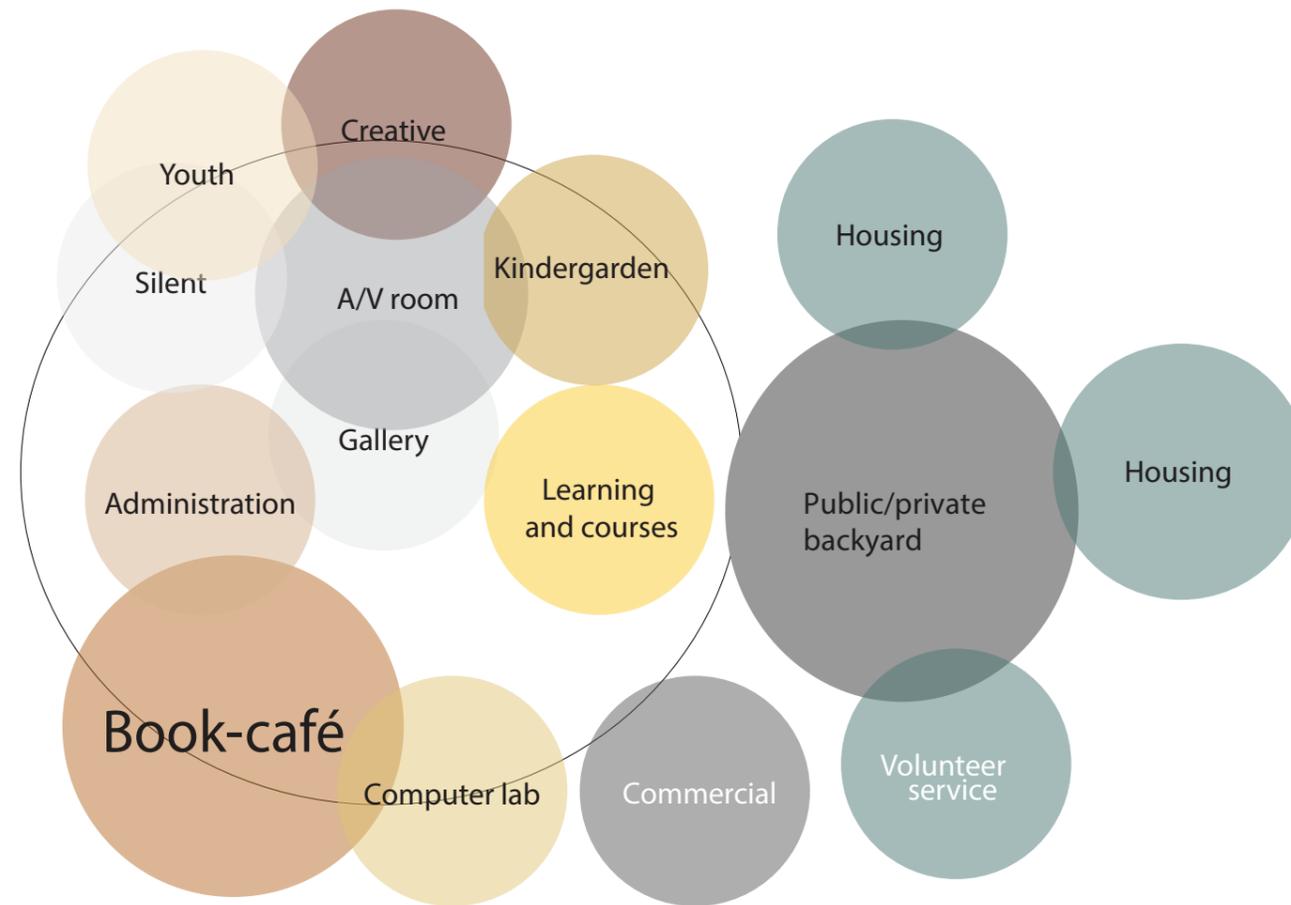
The main traffic of the area will be directed to the southern street of the square. Buses and cars will share this space with people, either walking or riding their bike. The curbs will be lowered and the street indicated by lighting fixtures, vegetation and changes in the surface texture.

5



The square surface is concrete tiles that will have fragmented openings in a randomized pattern, allowing vegetation to be a part of the urban setting.

Program



Cella	193m ²
Library total, ground floor	898m ²
Youth Department	164m ²
Main room	595m ²
Children's play area	139m ²
Cafe	160m ²
Workshop	63 m ²
Commercial	380m ²
Toilet	50 m ²
Housing	555m ²
Outdoor space	770m ²
(Library total 1535m ²)	

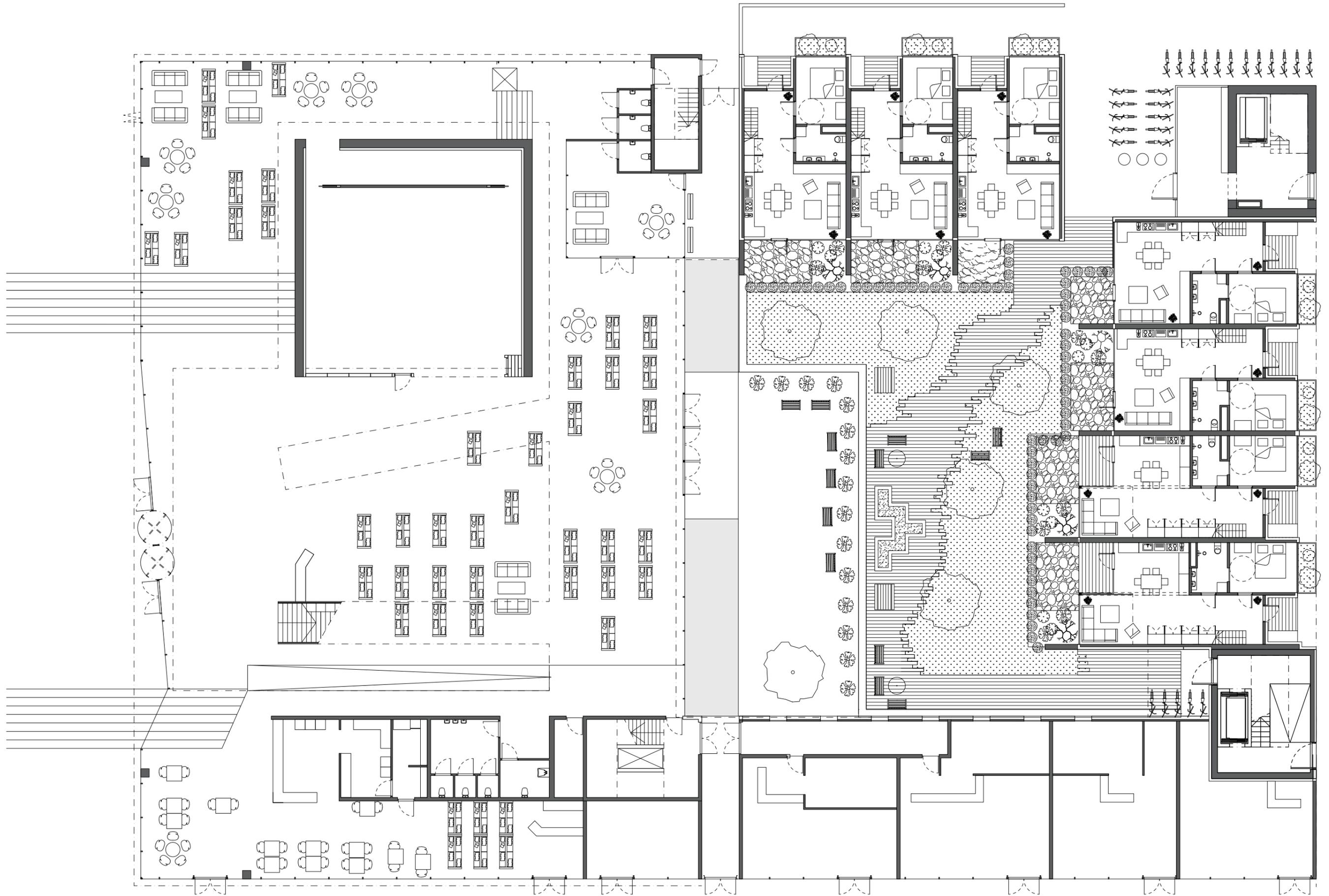


Cella	193m ²
Library Total	488m ²
Quite Zone	150m ²
Main rooms	338m ²
Course rooms	186m ²
Toilet	45 m ²
Computer Room	43 m ²
Office Space	180m ²
Housing	211m ²
(Library total 1249m ²)	



vv.	210m ²
Course rooms	178m ²
Toilet	36 m ²
Housing	711m ²
(Library total 795m ²)	
4th and 5th floor housing	570m ² each

Ground Floor

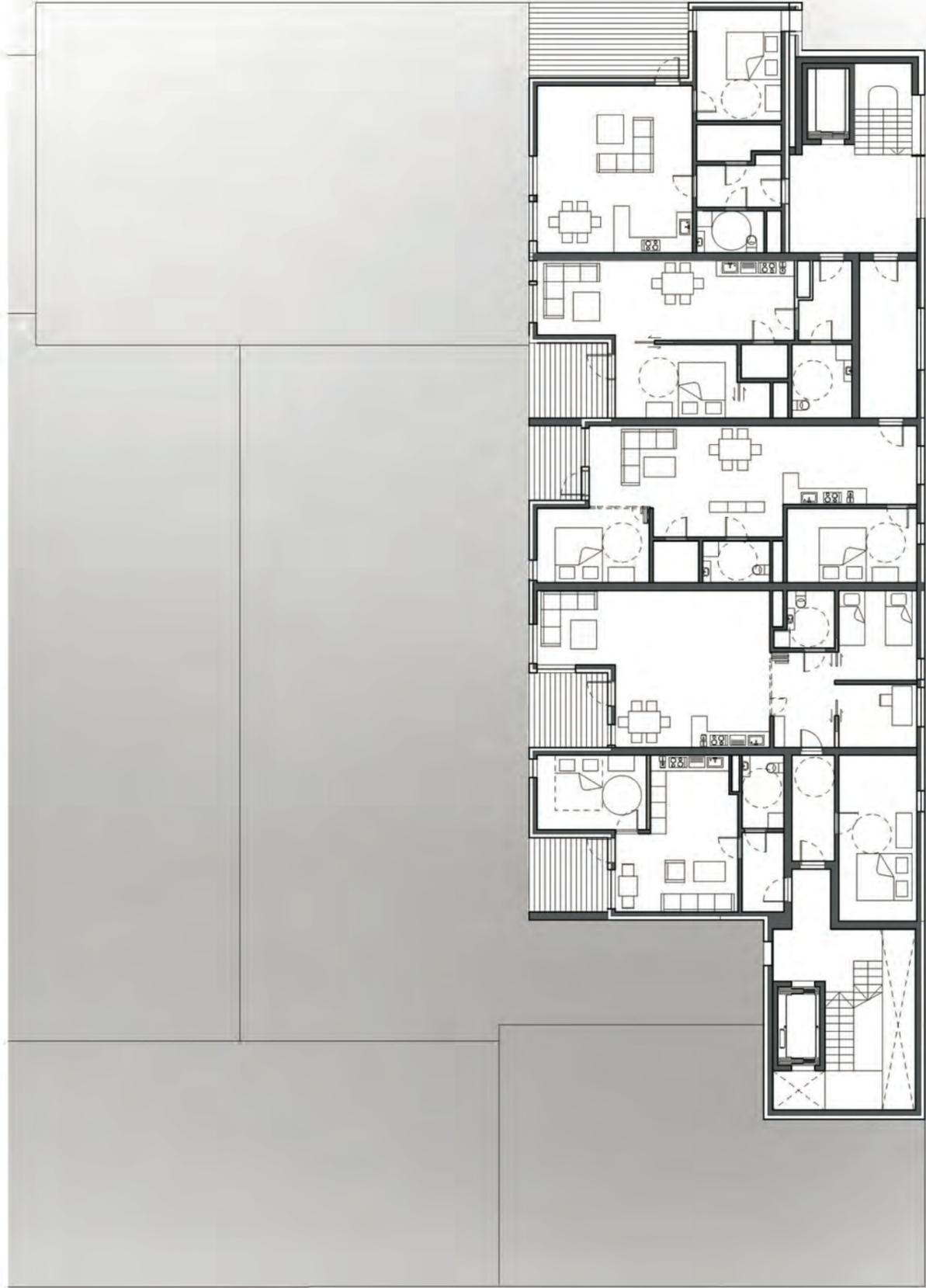
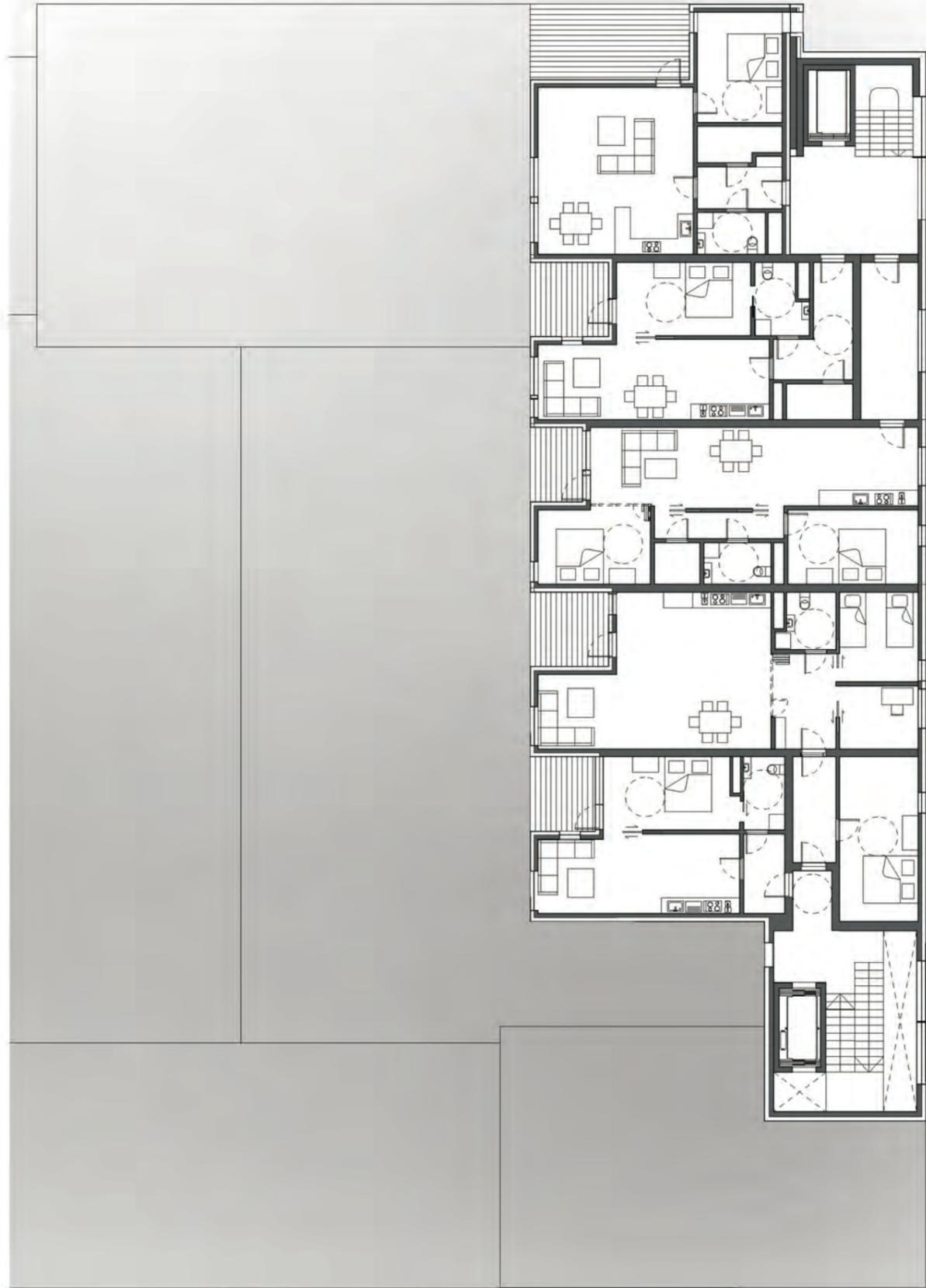


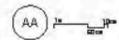
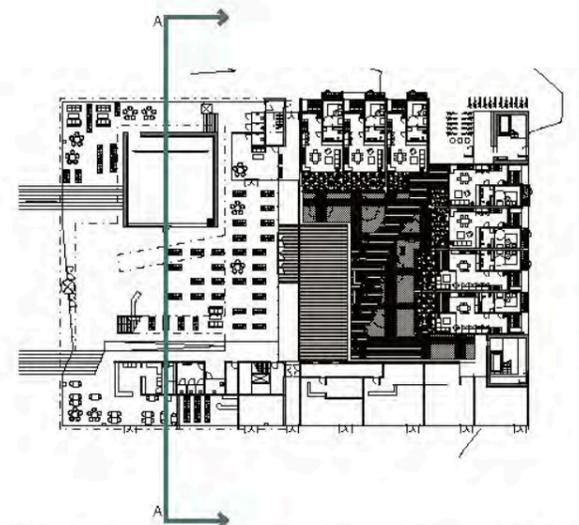
1st Floor

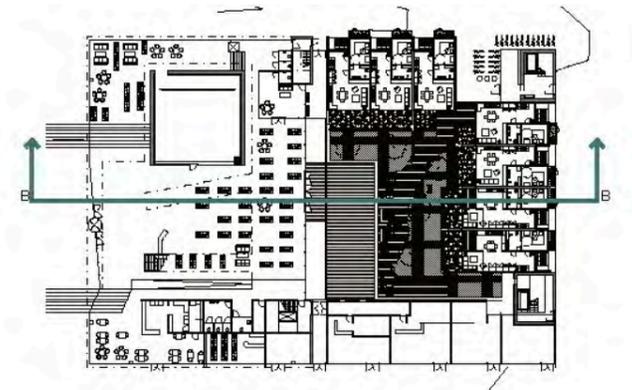


2nd Floor

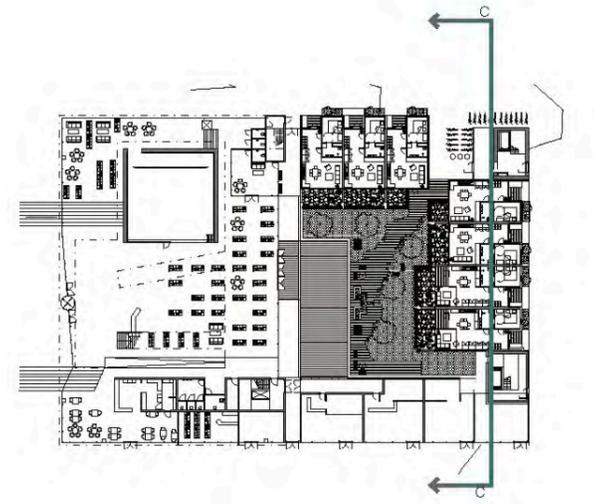






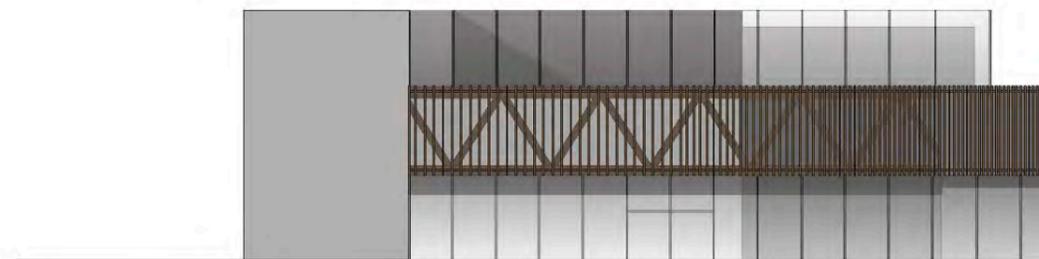


BB





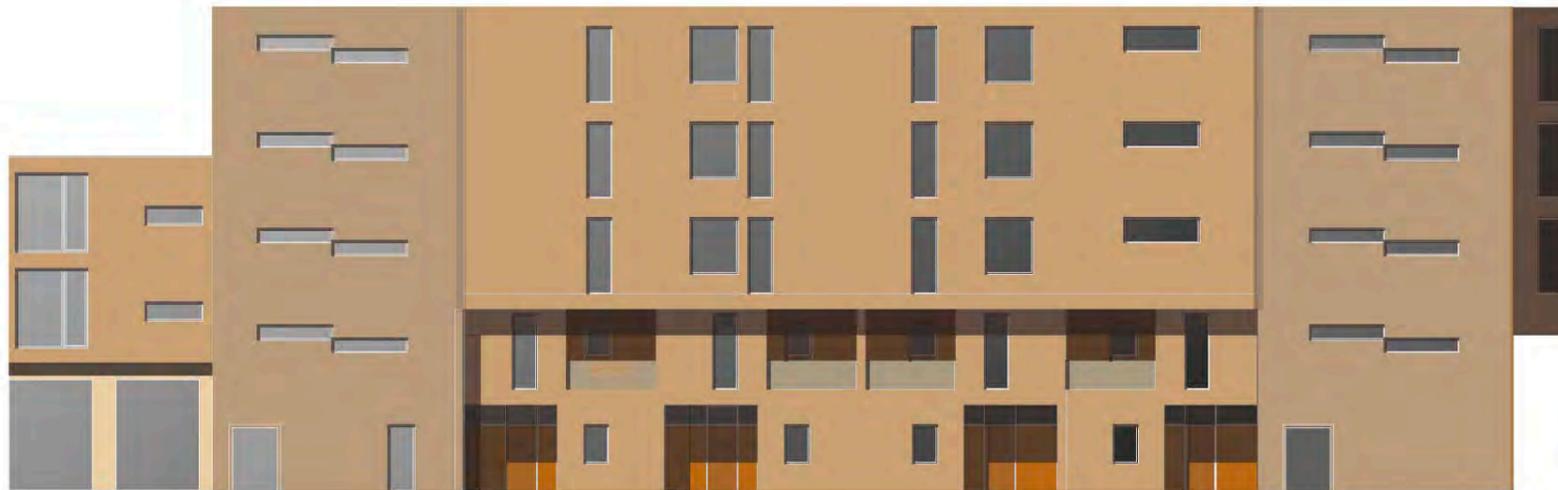
West facing facade Library



East facing facade Library



North facing facade Library



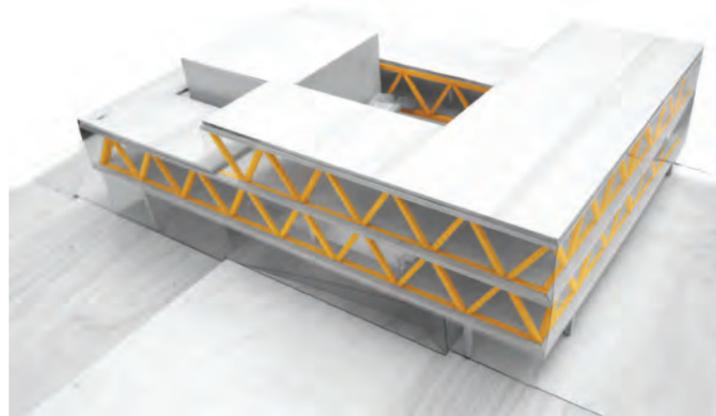
East facing facade Housing



West facing facade Housing



South facing facade



THE CELLA

serve several purposes. Firstly, it serves to structurally support the building by resisting horizontal loads.

The cella also house vertical circulation of water from the solar collectors on the roof for heating, and from the surface water pool in the back yard for cooling, while the outside contributes to the natural ventilation and disperses light in both the atrium area and along the openings compassing the cella.

The cella is constructed from low carbon recycled concrete 500mm thick. The concrete volume gives the cella a huge thermal capacity.

The noisy sections of the library are also contained within the cella, which provides effective sound insulation both for the AV gallery and the youth club. The multi functional AV gallery can be utilized as a workshop for scenography purposes. Sliding walls cover the wall facing the atrium, allowing the room to be opened completely.

While the trusses and service cores of the library are placed such that they invite adaptive reuse, the thick concrete of the cella ensures that even if the library at some point is put to other use, one part of it will still be a reminder that the building used to be a repository of knowledge.

THE TRUSSES are the most striking structural element of Furuset Library, composed of thick glulam beams and staves. The beams are uniform in size at 400 by 600 mm and the staves at 400 by 400 mm.

The trusses are continuous, from the service cores in the south, around the west façade, to the emergency stairs in the north, with the largest span measuring over 30 m.

The staves are spaced at 6m intervals, providing sufficient room between them to navigate freely, and sufficient strength to support the entire building on 4 columns and the two concrete cores.

The huge trusses are exposed throughout the building.

THE ATRIUM STAIRS running trough the open space handles the vertical movement of people within the building.

The constant motion of people through the stairs and the views from floor to floor, as well as the glow of light passing through the translucent roof and along the openings around the cella, creates a perceptual link between the floors, between the book café and the library, and also linking the administration to the other functions which might otherwise have felt isolated from one another.

The lower staircase offers a seating section, while the landing of the upper staircase offers a view over the main library area.

THE SKIN, or facade treatment is the same on all four exposed sides of the building, modulating light and views, creating a uniformity across each face of the second and third floor during the day. The expression is that of a body floating over the ground with Trygve Lies square continuing into the building.

The night exposes the buildings translucent qualities with the load bearing trusses framed by light from the inside, revealing the structural makeup.

The main facade is triple-glazed and functions as part of the building's climate control system. The lamellae are spaced with a rolling pattern, insuring light where it is needed, shade where it is needed, and views where it is wanted.

The ground floor facade is offset inwards by 500mm to cement the impression of transparency, and the main entrance has been given a slight angle to further invite the square into the building.

The materials which compose the skin are limited to glass, aluminium and wooden lamellae.

The roof is covered in sedum, reducing water runoff and increasing insulation.



SOCIALLY SUSTAINABLE housing with apartments of different typologies, allowing a diversity of residents in terms of age and life situation.

Located in a burgeoning urban environment with a demography consisting of different cultures and proximity to both the city and nature.

The apartments are centrally located to public transportation and also has close access to the cultural amenities that are available and later will become available in the future Furuset.

Financial and flexible flats, with a simple construction principle of slabs and bearing walls in solid wood that provides quick assembly and free plan apartments. The apartments also have qualities like sunlight, views and sheltered private outdoor space in addition to a common backyard garden.



The use of **LAMINATED WOOD** in a residential building involves a number of challenges in relation to traditional construction-methods like concrete or masonry.

Laminated wood has less weight and thus transmits noise easier than heavier materials.

This means that the requirements for soundproofing is an important factor in the construction and detailing. The structure of this building consists mainly of solid wood slabs that spans around 6 meters and is supported by solid wood walls. Horizontally braced by two stair and elevator cores in concrete. One core also takes up vertical load from the northernmost apartments with use of projecting consoles and glulam beams. This core and the apartments above also creates a frame around the entrance area where waste disposal and bicycle parking is established.

A common room with mail services adjacent to the core with a simple curtain wall acts as a light source at night and further identifies the main entrance to the building and backyard.



PRINCIPLES OF DISTRIBUTION AND FUNCTIONS

The building consists of five floors. The apartments on the ground floor are large two-story townhouses with a mezzanine and private garden area. Large window openings, taller story height and transmitting light ensures good daylight conditions for these lower units.

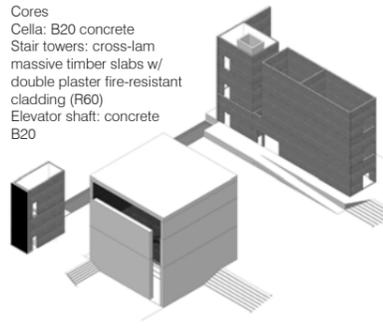
Further up the stories the structure change into one-plan apartments with varying size, where the guiding principle is transmitting light through the unit or sunny conditions in the main areas of the flat. All have private west-facing sheltered outdoor spaces that provide sun and views to Trygve Lie square and the new library.

The apartment structure creates a varied aesthetic facade with different use of wood and glass in lamellae, walls and windows.

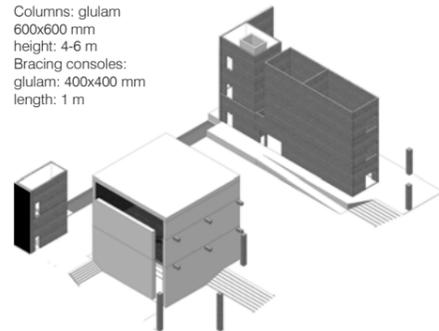
The backyard is richly planted and a water channel collects rain water from the environment and sedum roofing of the building, creating a relaxing oasis for the residents.

LIBRARY

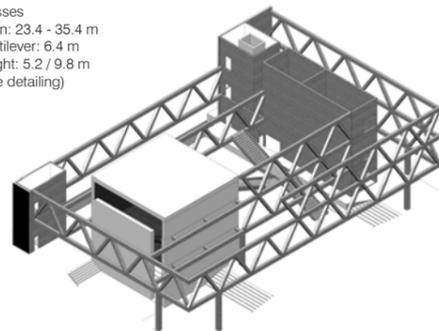
Cores
 Cella: B20 concrete
 Stair towers: cross-lam massive timber slabs w/ double plaster fire-resistant cladding (R60)
 Elevator shaft: concrete B20



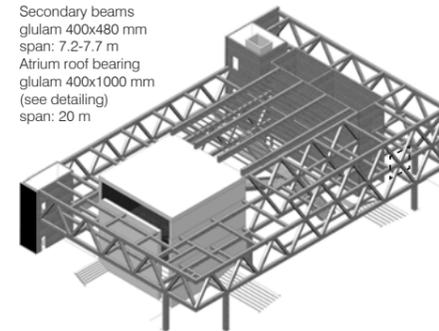
Columns: glulam
 600x600 mm
 height: 4-6 m
 Bracing consoles: glulam: 400x400 mm
 length: 1 m



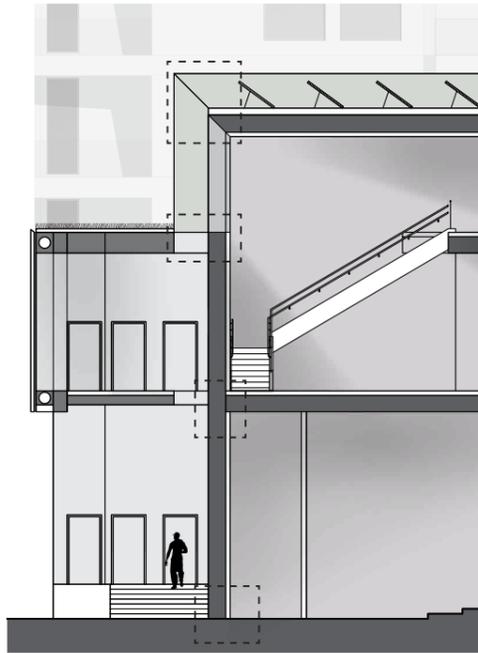
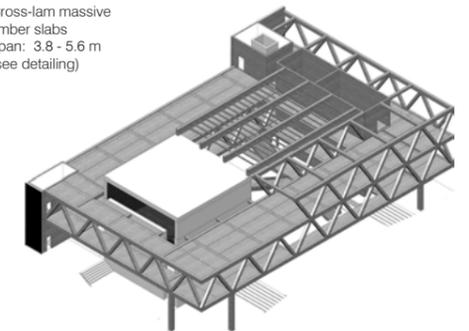
Trusses
 span: 23.4 - 35.4 m
 cantilever: 6.4 m
 height: 5.2 / 9.8 m
 (see detailing)



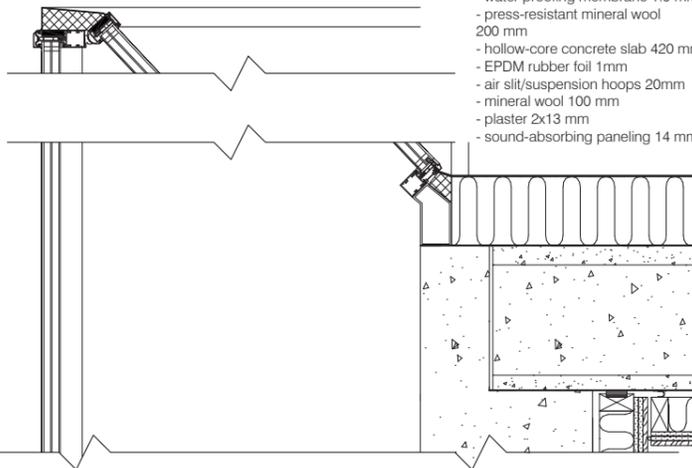
Secondary beams
 glulam 400x480 mm
 span: 7.2-7.7 m
 Atrium roof bearing glulam 400x1000 mm
 (see detailing)
 span: 20 m



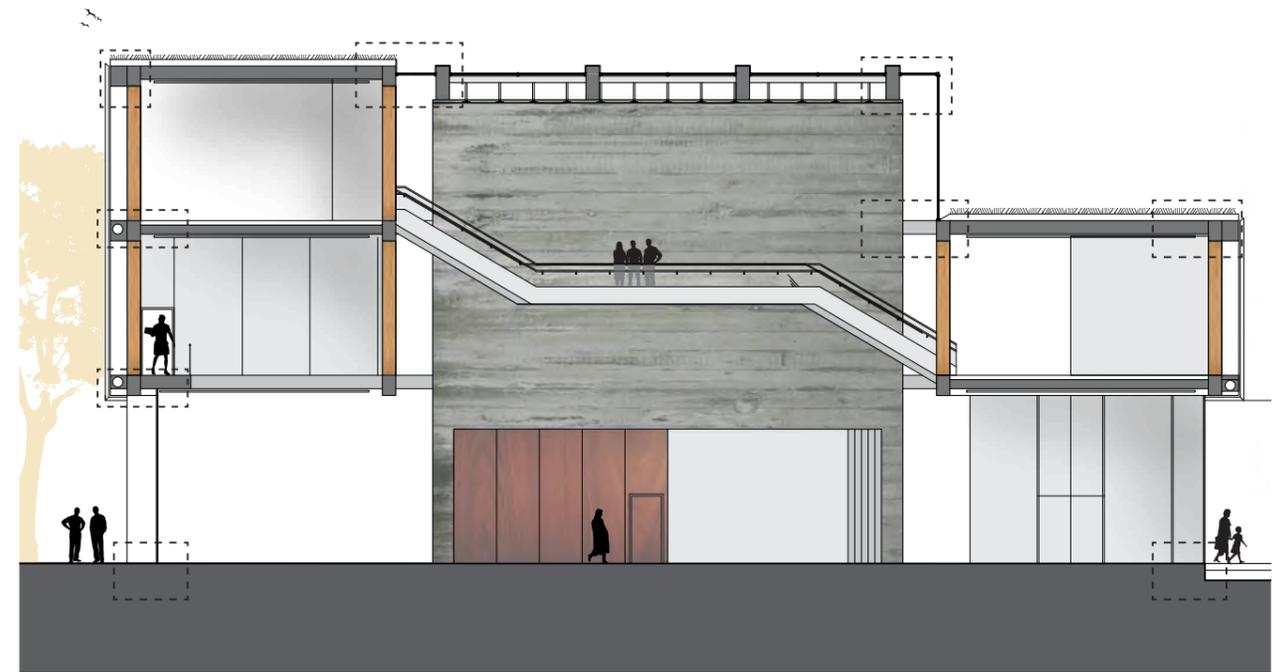
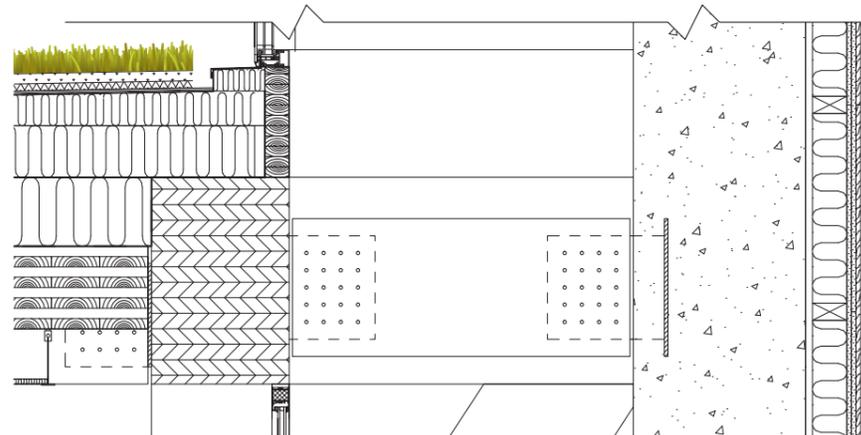
Cross-lam massive timber slabs
 span: 3.8 - 5.6 m
 (see detailing)



GLASS ROOF/FACADE SYSTEM:
 - 3-layer insulating system 54 mm
 - plastic coating
 - 6/4mm panel thickness
 - double argon gas layer, 2x20 mm
 - Aluminum framework
 - PVC thermal bridge breakers
 - structural profiles: 25-140 mm
 - heat flux: 0,8 W/m²K

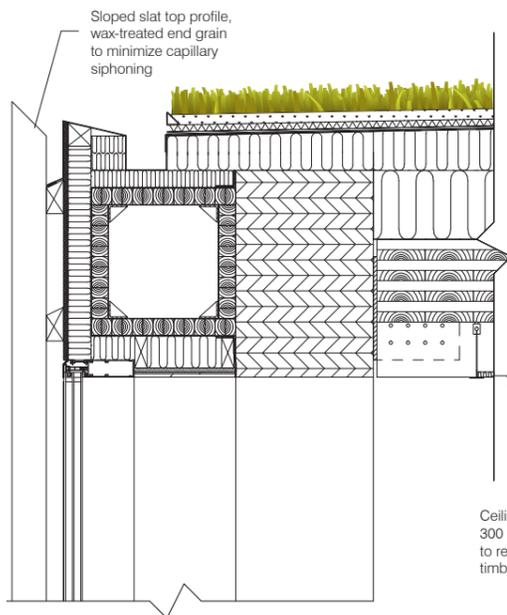


CELLA ROOF
 - shingle roof cover roll 3 mm
 - water-proofing membrane 1.5 mm
 - press-resistant mineral wool 200 mm
 - hollow-core concrete slab 420 mm
 - EPDM rubber foil 1mm
 - air slit/suspension hoops 20mm
 - mineral wool 100 mm
 - plaster 2x13 mm
 - sound-absorbing paneling 14 mm



ROOF COVER AND STRUCTURAL COMPOSITION

- sedum growth layer 30 mm 0,65-0,8 kN/m²
- drainage layer 20 mm
- root block 1mm
- waterproofing Membrane 1.5 mm
- press-resistant mineral wool 300-450 mm
- vapor barrier
- cross-laminated massive timber 240 mm
- air slit for ass. fixtures 145 mm
- sound-absorbing ceiling tiles 15 mm

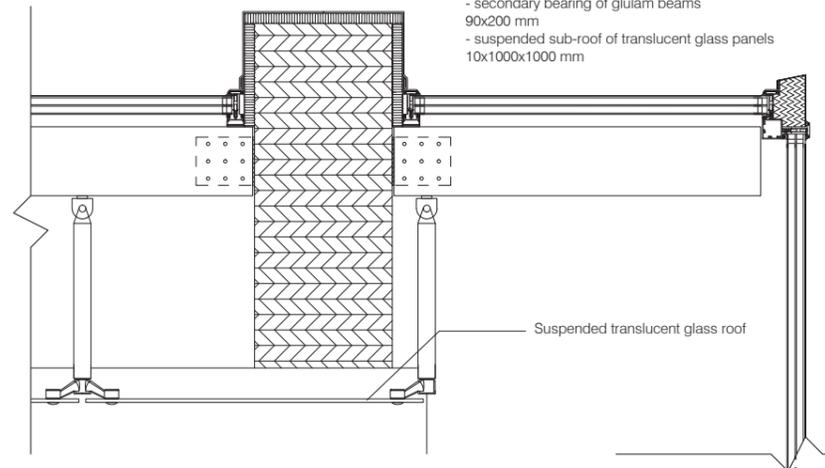


Sloped slat top profile, wax-treated end grain to minimize capillary siphoning

Ceiling tiles retracted 300 mm on each side to reveal the massive timber slabs

CELLA WALL

- situ-cast low-carbon concrete B20 M60 500 mm
- air slit 20 mm
- mineral wool 100 mm
- plaster 2x13 mm
- sound-absorbant paneling 14 mm



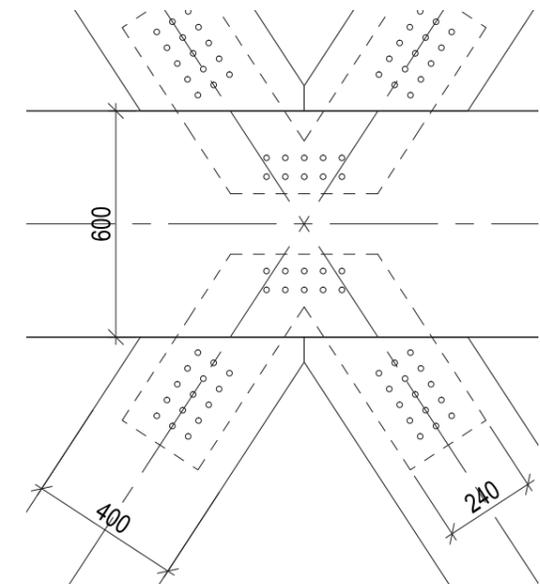
GLASS ROOF, ATRIUM

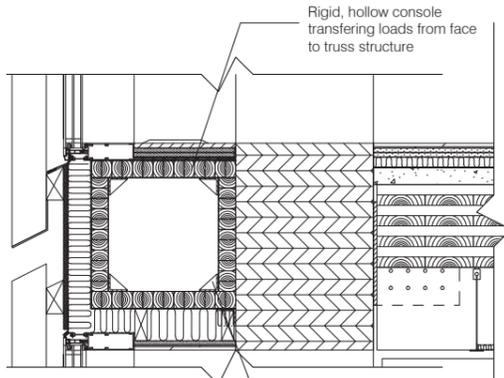
- aluminum cover fittings 1 mm
- press-resistant mineral wool 30 mm
- main bearing glulam beam 400x1000 mm
- 3-layer insulating system 54 mm
- secondary bearing of glulam beams 90x200 mm
- suspended sub-roof of translucent glass panels 10x1000x1000 mm

Suspended translucent glass roof

PRIMARY BEARING TRUSSES

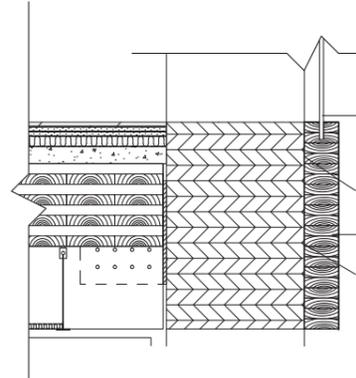
- pine glulam truss beams
- Chords: 400x600 mm
- Stringers: 400x400 mm
- steel joints:
- Slotted steel joining plates 10 mm
- steel locking pins Ø15
- covering wooden dowels for visual and thermal screening





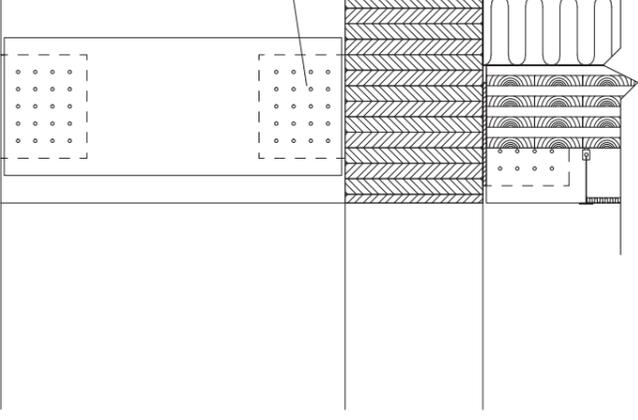
FLOOR-FACADE SEGMENT
 - sun-shading slats, heartwood of spruce treated with iron sulfate for smooth gray patina 48x98 mm,
 - lathing 36 mm
 - wind barrier plate 12mm
 - press-resistant mineral wool 50 mm
 - vapor barrier
 - hollow console 420x390 mm
 - 90x420/330 mm pine glulam

Steel angles bracing the console

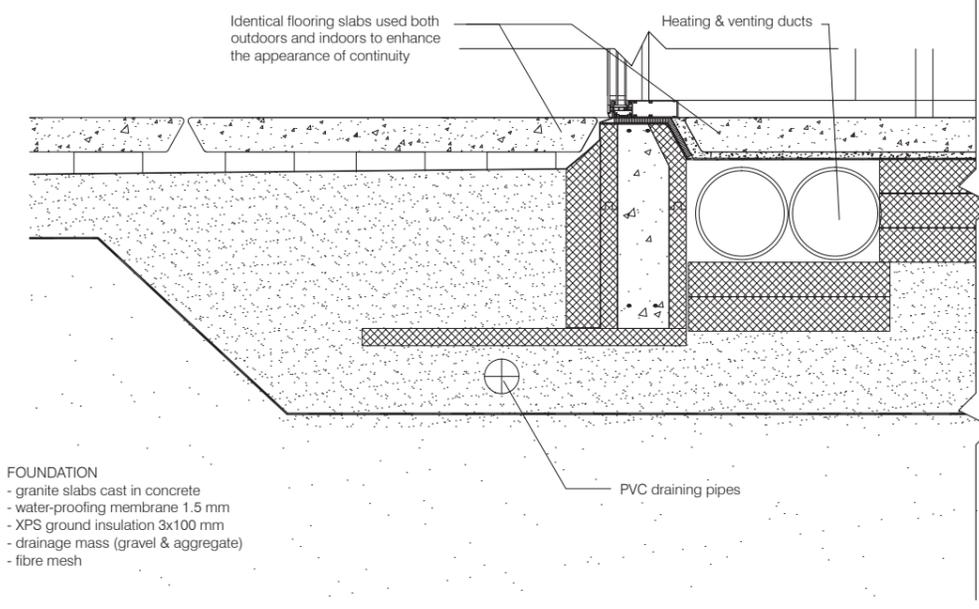
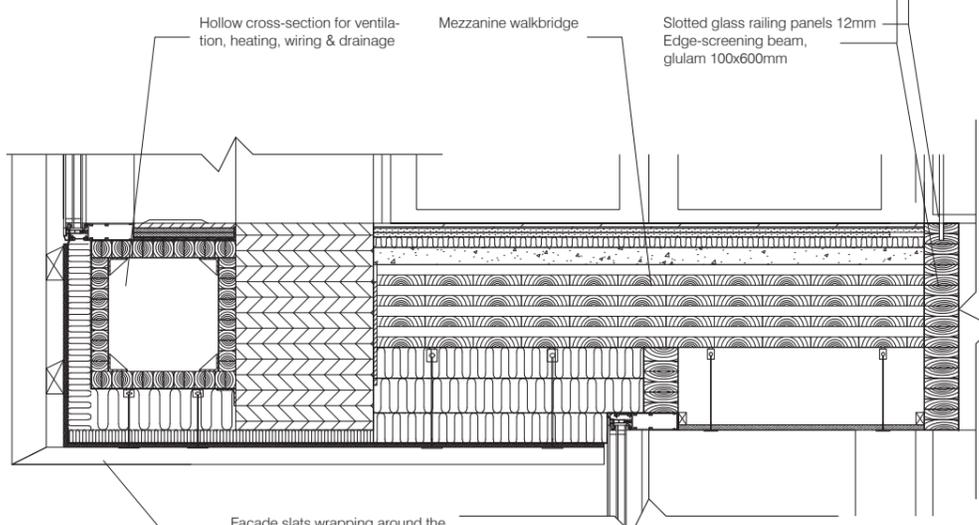
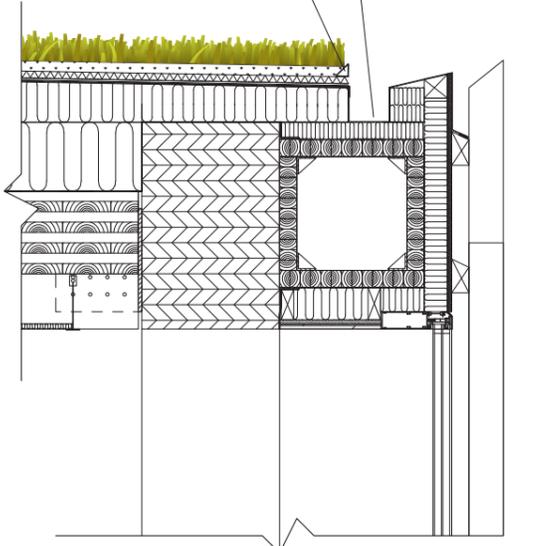


INTERIOR FLOOR STRUCTURE
 - hardwood flooring 14 mm
 - flooring plaster 2x13 mm
 - acoustic underlay 30 mm
 - concrete floor screed 50 mm
 - cross-laminated massive timber 240 mm
 - open space for lighting and el. fixtures
 - sound-absorbing ceiling tiles 15 mm

LATERAL BRACING OF TRUSSES TO CELLA
 - Pine glulam beam 400 mm
 - Slotted steel joining plates 10 mm
 - steel locking pins Ø15
 - covering wooden dowels for visual and thermal screening

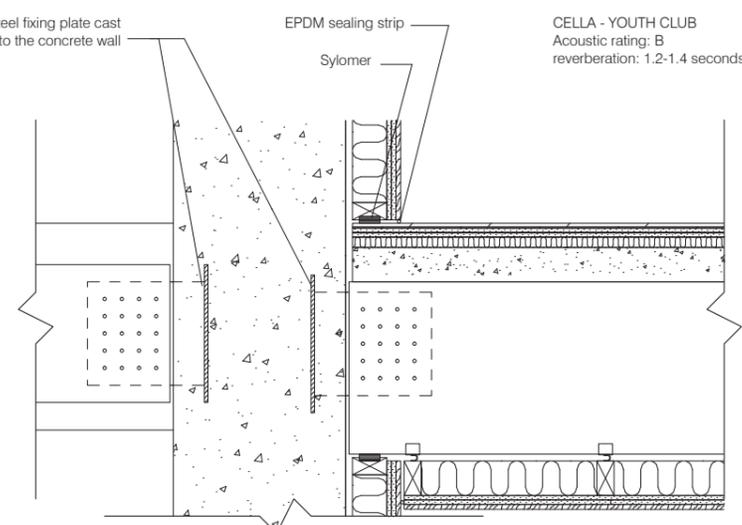


Growth layer retainer, aluminum profile, bolted to draining layer
 Drains, aluminum cover fittings 1 mm



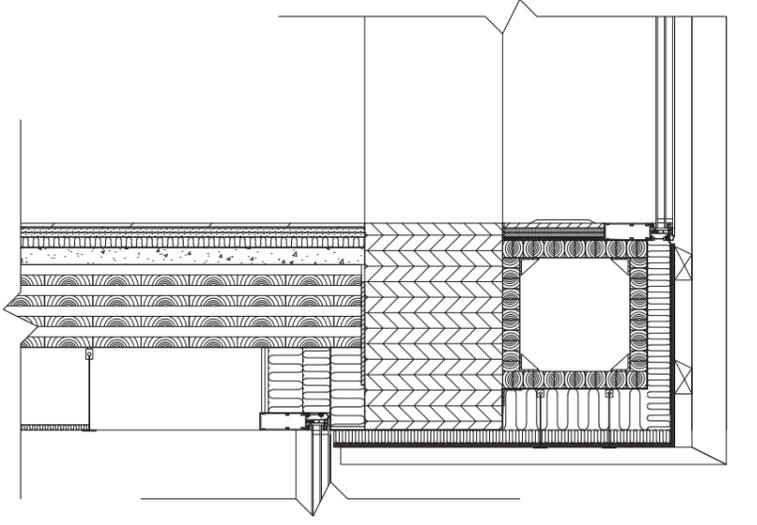
FOUNDATION
 - granite slabs cast in concrete
 - water-proofing membrane 1.5 mm
 - XPS ground insulation 3x100 mm
 - drainage mass (gravel & aggregate)
 - fibre mesh

PVC draining pipes

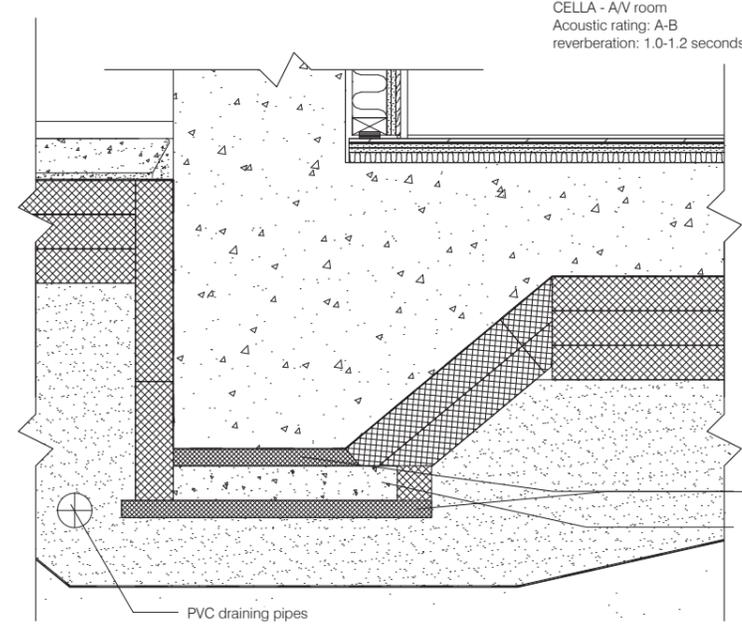


CELLA - YOUTH CLUB
 Acoustic rating: B
 reverberation: 1.2-1.4 seconds

INTERIOR FLOOR, CELLA
 - hardwood flooring 14 mm
 - flooring plaster 2x13 mm
 - acoustic underlay 30 mm
 - hybrid rib slab 600 mm
 - concrete floor screed 100 mm
 - glulam beam 500 mm
 - span: 12.7 meters
 - air slit 20 mm
 - alu suspension hoops
 - mineral wool 100 mm
 - plaster 2x13mm
 - sound-absorbant paneling 14 mm



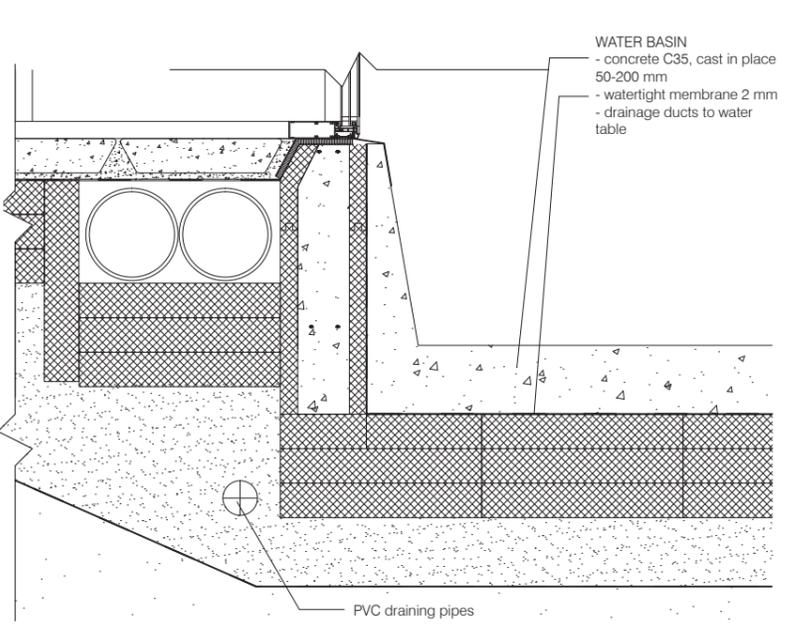
CELLA - AV room
 Acoustic rating: A-B
 reverberation: 1.0-1.2 seconds



CELLA GROUND FLOOR
 - hardwood flooring 14 mm
 - flooring plaster 2x13 mm
 - acoustic underlay 30 mm
 - situ-cast low-carbon concrete B20 M60 330 mm
 - water-proofing membrane 1.5 mm
 - XPS ground insulation 3x100 mm

WALL FOUNDATION
 - press-resistant insulating plates 2x50mm
 - auxiliary load-absorbing slab, concrete B30 100 mm

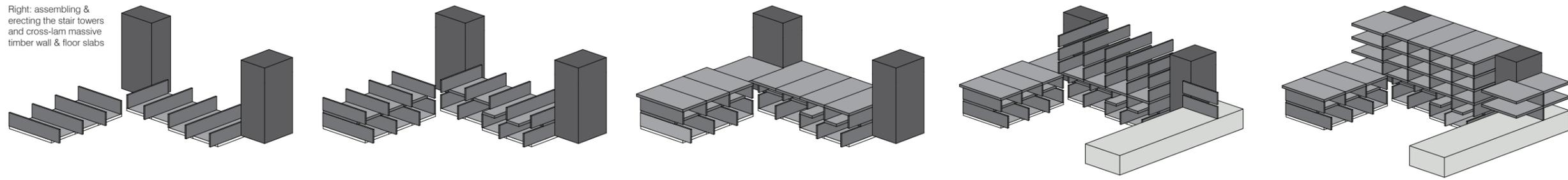
PVC draining pipes



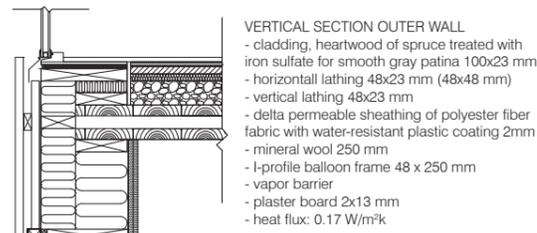
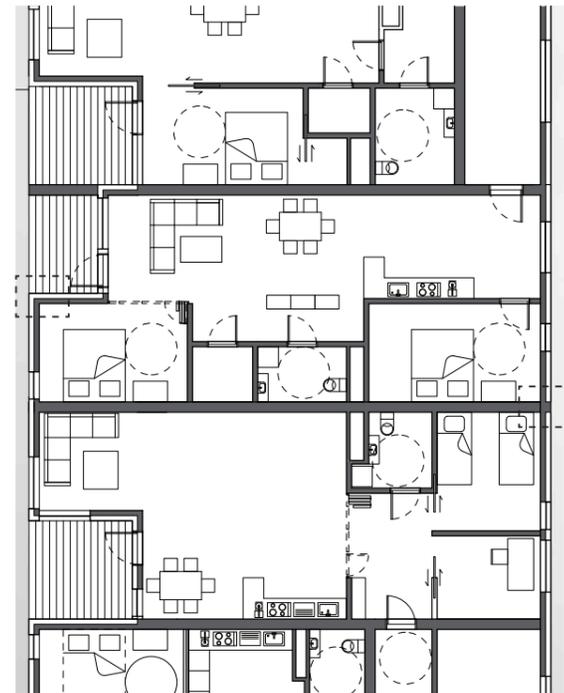
WATER BASIN
 - concrete C35, cast in place 50-200 mm
 - watertight membrane 2 mm
 - drainage ducts to water table

PVC draining pipes

Right: assembling & erecting the stair towers and cross-lam massive timber wall & floor slabs



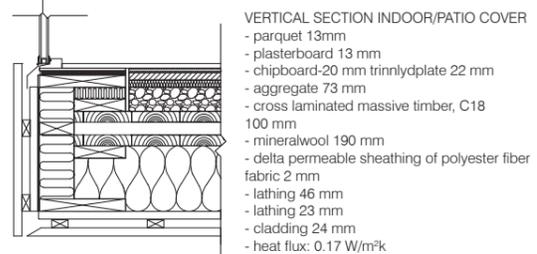
HOUSING



- VERTICAL SECTION OUTER WALL**
- cladding, heartwood of spruce treated with iron sulfate for smooth gray patina 100x23 mm
 - horizontal lathing 48x23 mm (48x48 mm)
 - vertical lathing 48x23 mm
 - delta permeable sheathing of polyester fiber fabric with water-resistant plastic coating 2mm
 - mineral wool 250 mm
 - I-profile balloon frame 48 x 250 mm
 - vapor barrier
 - plaster board 2x13 mm
 - heat flux: 0,17 W/m²k

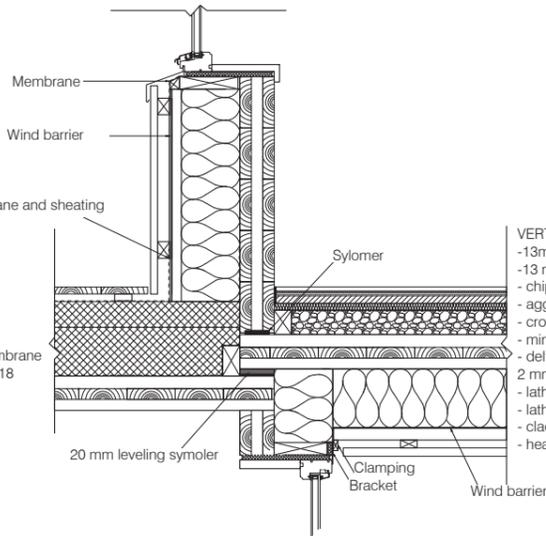
- VERTICAL SECTION OUTER WALL TO OUT DOOR SPACE**
- cladding 20 mm
 - lathing 46 mm
 - Moisture braking permeable sheathing 2 mm
 - board 5 mm
 - lathing 28 mm
 - mineral wool 170 mm
 - cross laminated massive timber 100 mm
 - heat flux: 0,17 W/m²k

- HORISZONTAL SECTION, OUTER WALL**
- cladding, heartwood of spruce treated with iron sulfate for smooth gray patina. 100x23mm.
 - horizontal lathing 48x23mm (48x48mm)
 - vertical lathing 48x23 mm
 - delta permeable sheathing of polyester fiber fabric with water-resistant plastic coating 2 mm
 - mineral wool 250 mm
 - I-profile balloon frame 48 x 250 mm
 - vapor barrier
 - 13+13mm plaster board
 - heat flux: 0,17 W/m²k

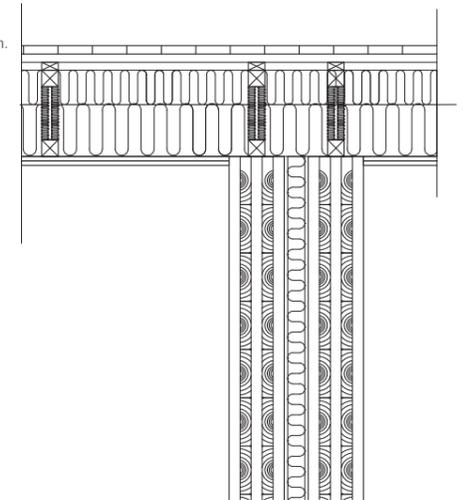


- VERTICAL SECTION INDOOR/PATIO COVER**
- parquet 13mm
 - plasterboard 13 mm
 - chipboard-20 mm trinnlydplate 22 mm
 - aggregate 73 mm
 - cross laminated massive timber, C18 100 mm
 - mineralwool 190 mm
 - delta permeable sheathing of polyester fiber fabric 2 mm
 - lathing 46 mm
 - lathing 23 mm
 - cladding 24 mm
 - heat flux: 0,17 W/m²k

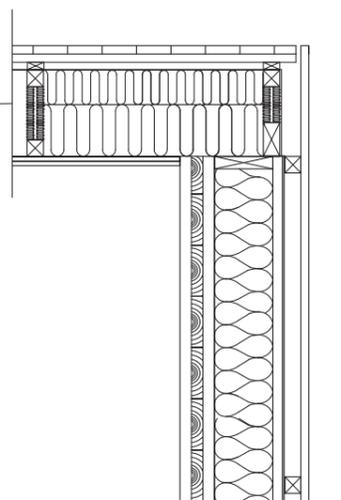
- VERTICAL SECTION PATIO FLOOR**
- wood cladding 20 mm
 - joist 20mm
 - durable membrane 2mm
 - press-resistant insulation 215 mm
 - moisture-breaking permeable membrane
 - cross-laminated massive timber, c18 100 mm



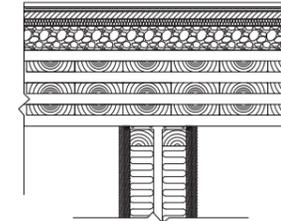
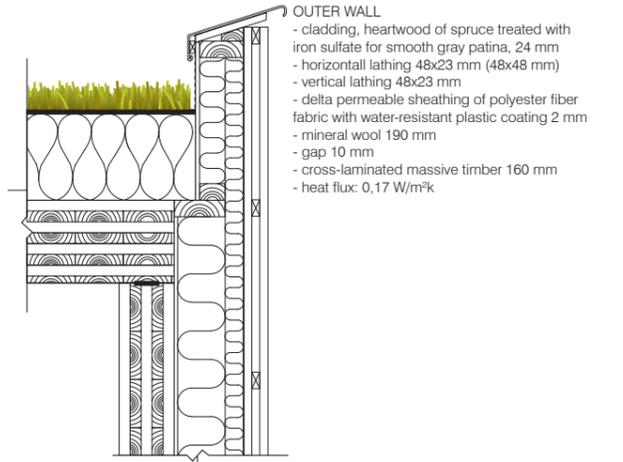
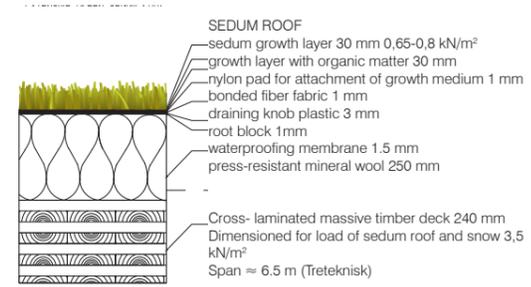
- VERTICAL SECTION INDOOR/PATIO COVER**
- 13mm parquet
 - 13 mm plasterboard
 - chipboard-20 mm sound 22 mm
 - aggregate 73 mm
 - cross laminated massive timber, C18 100 mm
 - mineral wool 190 mm
 - delta permeable sheathing of polyester fiber fabric 2 mm
 - lathing 46 mm
 - lathing 23 mm
 - cladding 24 mm
 - heat flux: 0,17 W/m²k



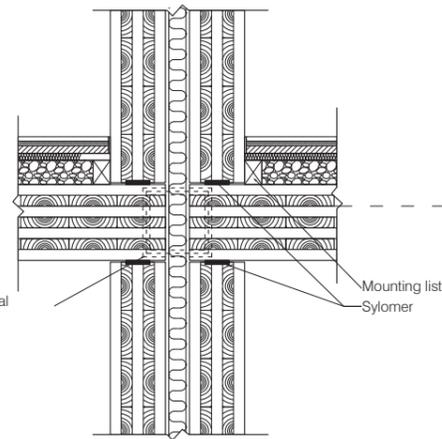
- SOUND WALL R60**
- cross laminated massive timber 160 mm
 - air slit 10 mm
 - mineral wool 50 mm
 - air slit 10 mm
 - cross laminated massive timber 160 mm



- EXTERIOR WALL TOWARDS OTUDOOR SPACE**
- cladding 20 mm
 - lathing 46 mm
 - moisture braking permeable sheathing 2 mm
 - board 5 mm
 - lathing 28 mm
 - mineral wool 170 mm
 - cross laminated massive timber 100 mm
 - heat flux: 0,17W/m²k



Structural steel for horizontal
buttrressing C/C 1200mm



Cross laminated massive timber 160 mm
Void 10 mm
Membrane 2 mm

