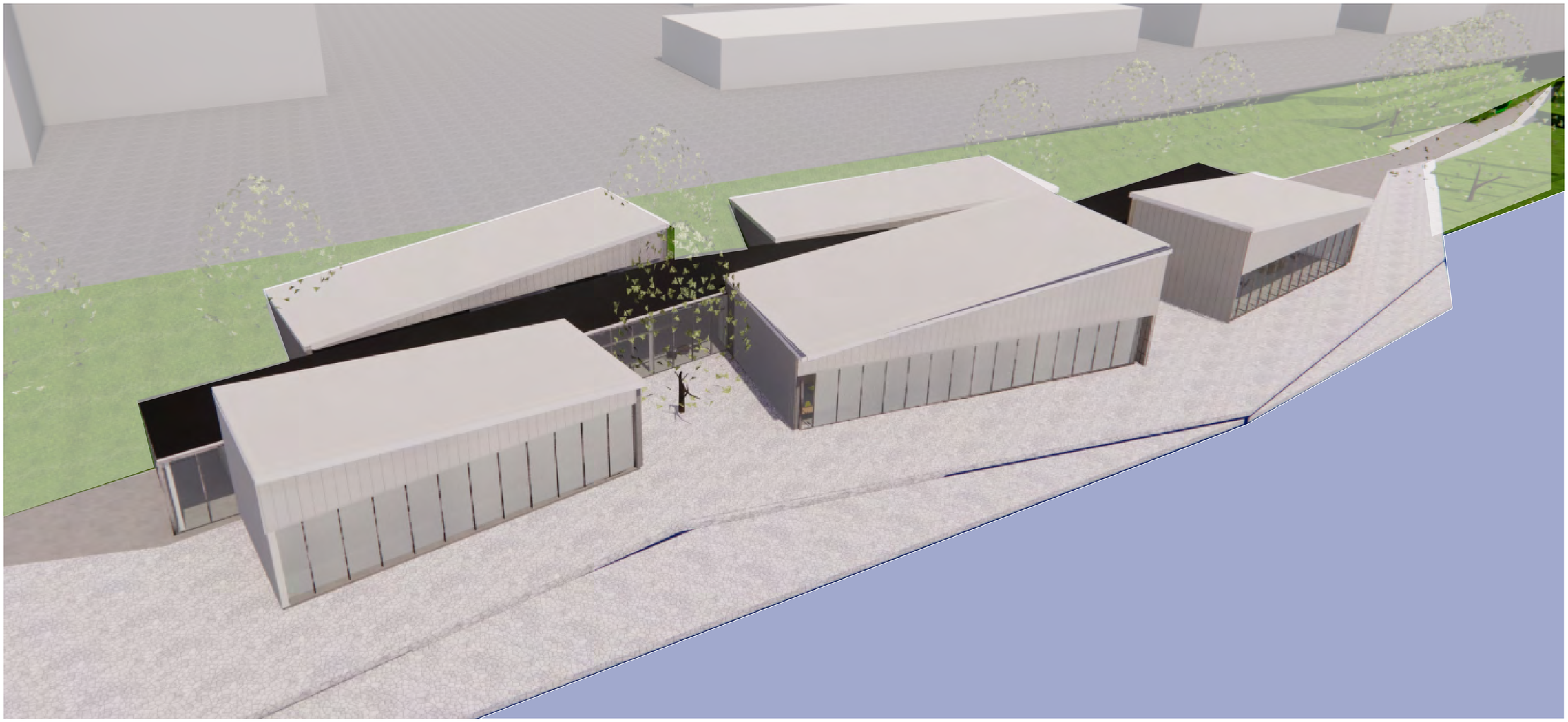
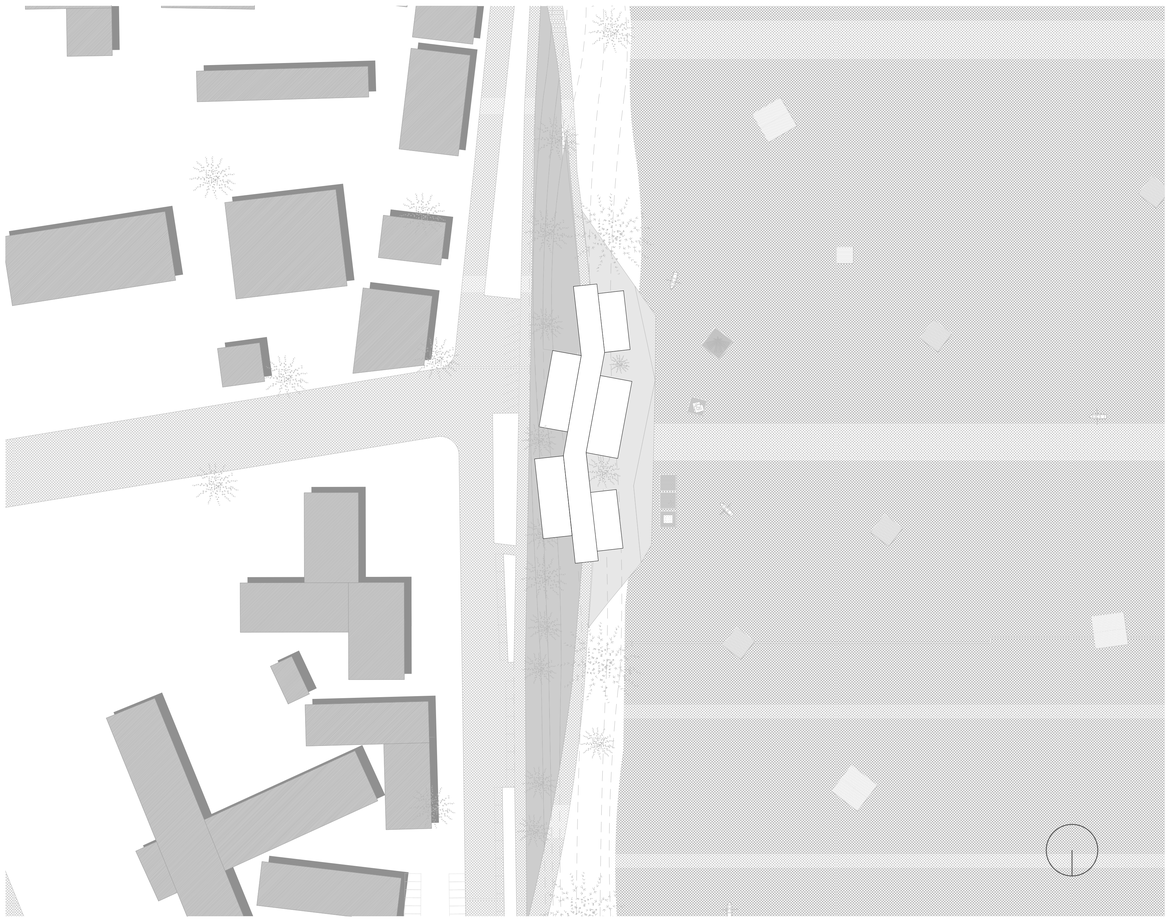
ARCHITECTURE BEYOND THE FORMAL

New revitilizing program of the great city development



Site plan 1:1000



Architecture Center in Kazan

Architecture Center "Beyond the formal" is a strategical project as an addition to the government city development plan for Kazan by 2035. Currently, it targets to develop the residential areas, transportation (new metro branch on the south of the lake Kaban), development of cultural environment (new National Theater on the south-east side of the lake Kaban), parks development (one of it- recently finished project of lake promenade). Lake plays a role in a city strategy since it is a center of the city, and needs an additional attention in development in order to reach the goals of the city development plan. Therefore, it focus to revive the most neglected part of the lake, and besides visual improvement of the area, enhance the potential of the precious land by inviting locals and tourists to visit it.

Kaban lake is surrounded by 3 well co-existing districts - Tatar district, Tatar sloboda), Russian district (Admiralteiskaya) and Historical district. The last one is the most developed, renovated, vivid and full of the events (north part of the lake), the side from the Russian district have been recently renovated by the promenade project of Turenscape company, which brought new live for the east part of the lake. Along the promenade, people use various facilities as sport equipments, barbecue etc. However, the West park of the lake is not planned to be under development, where in my opinion, it is important to take care of. After a careful research, my proposal offers to use the potential of the lake to its' possibilities, to bring the same success to the other side of the lake, therefore, the decision was to make the building as public-friendly as possible.

Architecture Center is fully dedicated to be open and attractive to public according to analysis of current architecture institutions of Kazan. While during a full-time operation it serves for architecture education, it is open for renting the space rooms and hosting any kind of public events including: conferences, exhibitions, theatrical acts, movie watching, workshops in arts etc. The spaces and the building is designed accordingly to withstand the diverse transformations. The structure, space separations, furniture were chosen with the goal to transform the space easily.

How city profits from the project

The main client of the project will be the Architecture Association of Kazan financed by government. The project is going to be part of the city's big investment to become the new architectural capital city of Kazan in 2026. Besides having the direct function of the building - teaching architecture, the building will regularly be used by the local citizens hosting multiple events for public, movie nights, sport classes, art workshops, conferences etc. So, this investment alongside other projects is a very important work for the government, to create a new cultural hub in the city center. The investment cost will be balanced by various incomes from ticket prices, donations and other rentals (auditorium, offices, and workshops and studios). Besides, the Center will play a major role during the Summer Architecture Festival - the Grand exhibition of architecture works and sculptures placed all around the lake area, so the city center could receive a new function. For locals - it is an event to learn about local architecture craft, for tourists - a new destination to come annually on summers.

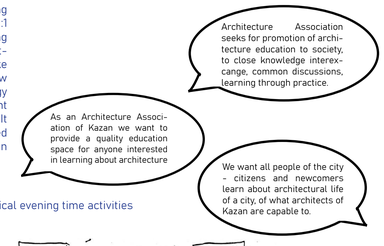
Users and structure organization

User can become anyone who is interested in architecture. It provides an inclusive opportunity to study architecture in extracurricular time in small groups. About 30 students per day would visit the building, while teachers would be the local architects who are passionate about the profession and would want to have a space to share the knowledge and built new projects. Primarily, during the autumn-winter time students in groups of 5 people will prepare works by methodology created by the specific teacher. Each year the works topics change. By the spring and summer time students must perform the final project in a 1:1 scale in a format of a sculpture which further is exhibited during 2 week festival. Students place their projects on a floating platform and let the sculpture float around the lake. Locals can take a boat which is a common service during the summer, and row towards any sculpture they are interested to see. This strategy plans to interest more people in the Architecture environment of the Architecture Center, promote creativity and art to public. It will also help to engage locals and tourists more to the neglected part of the lake, explore it, therefore, completing the city goal in revitalizing the lake and using its land to its' fullest potential.

Main values of the building project

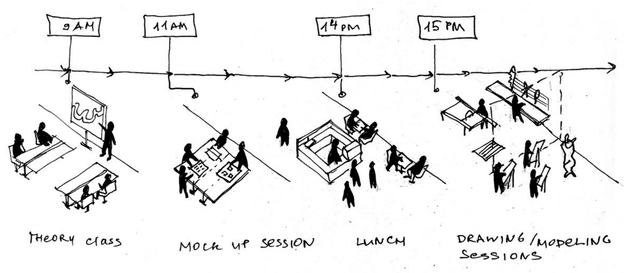
The content and spatial program of the Architecture Center is designed as a gradual opening in the transition from inside to outside – the exchange between public and internal plays an important role here. The connection to the public spaces is taken into account accordingly. In addition to the target audience that knows the place, "passenger customers" should also become aware of the Center. Accessibility should be as barrier-free as possible.
Visibility is specifically desired and is intended to invite people to become curious and to approach the center in a completely informal manner. The topics of sustainability, cultural and historical representation, architecture innovations and of a history of the place play a special role in the construction of the center.

Sustainability is presented by climate responsive design, using passive strategies such us consideration of orientation, wind direction, thermal mass, wind to wall ratio etc.
The cultural diversity is presented through multiple events dedicated to culture-related topics (projects exhibition of local artists and musicians in combination with architects, theatrical performances with use of architects' decorations etc).
Historical and cultural background is represented with inspiration from Tatar district space organization (facades look towards street, organization of natural atmosphere in the courtyard).
Architecture innovation is presented by exhibition of best student works, projects, sculptures, especially, during final summer exhibition - Summer Architecture Festival.

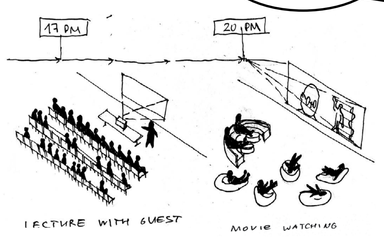


Schedule of the Architecture Center

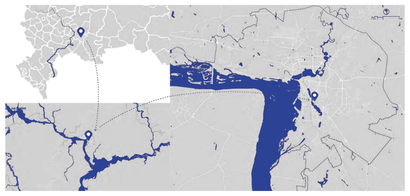
Typical daytime activities



Typical evening time activities



Contextual description of the Architecture Center



Position of city Kazan in Russia

Area: 425 sq. km.
Population: 1.1 million
Founded: 1005 year
Nationalities: Russians, Tatars
Languages: Russian, Tatar

Continental climate: summers up to +35, winters below -20,

Kazan description

Kazan is situated in the western part of Russia, 800 kilometers east of Moscow. Kazan, the capital city of the Republic of Tatarstan, is a vibrant and historic metropolis, it is named as the "third" capital of Russia after Moscow and St. Petersburg.

The city's geographical location has contributed to its historical significance as a trade and cultural hub. Situated at the crossroads of Eastern and Western civilizations, Kazan has embraced influences from both sides, a blend of Tatar and Russian cultures, traditions, and architecture.

The landscape of the city is formed by diverse plains and forests. Additionally, it is surrounded by the Volga River, one of the longest rivers in Europe.In the heart of the city are positioned the net of three "Kaban" lakes connected between each other and the river Volga.

Historical background of city built around water bodies

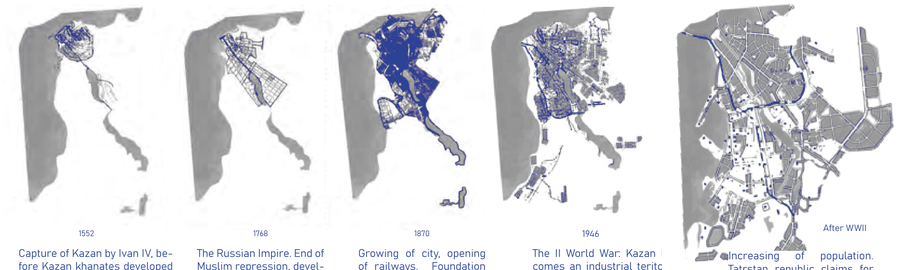
The waters of the lakes and the ecosystems surrounding them have been a real treasure of the city since its foundation. Kaban Lakes is the largest lake system in Tatarstan in terms of water area (193 hectares). It stretches through the central part of the city by a chain of ducts with a total length of almost 10 km. The whole hollow of the Kaban Lake system with its channels is essentially a unique natural object.

The system of three lakes and two canals connecting them is a natural area through which one can track the history of Kazan's expansion. Starting from base of Kazan to expansion around lakes of multiple districts, 1 – Central historical, 2- Tatar sloboda from the left of the lake (inhabited by Tatar people after Ivan IV conquered Kazan and evicted them), 3 - Admiralteiskaya sloboda (district of primary Russian inhabitants).

Tatar sloboda

Tatar Sloboda emerged as a distinct district in Kazan through a historical process that unfolded over several centuries. The origins of Tatar Sloboda can be traced back to the medieval period, when Kazan was a diverse city with a thriving economy and a significant Tatar population.

During this time, Kazan served as a key center for trade and cultural exchange between different ethnic groups. The Tatars, a Tur-



1552
Capture of Kazan by Ivan IV, before Kazan khanates developed a fortified city (Kremlin) of area by Volzsk Bulgars in 1005.

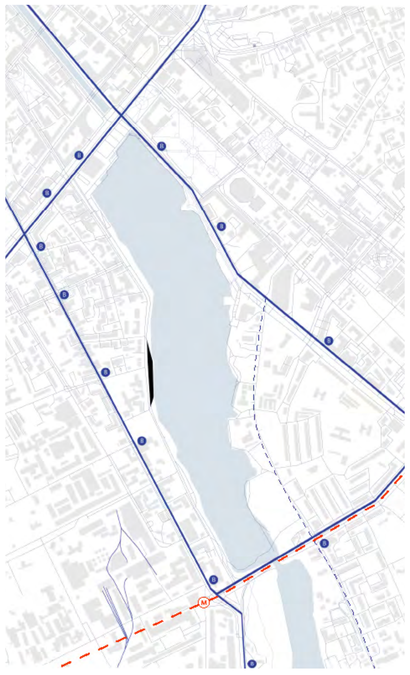
1768
The Russian Impire. End of Muslim repression, development of Tatar districts.

1870
Growing of city, opening of railways. Foundation of one of the first federal

1946
The II World War: Kazan comes an industrial teritc of a military front of factor The USSR: Religion is forbidden, partial destroying of mosques.

After WWII
Increasing of population. Tatrstan republic claims for independence from Russia. Time of harmonic co-ex-

Transportation and road map

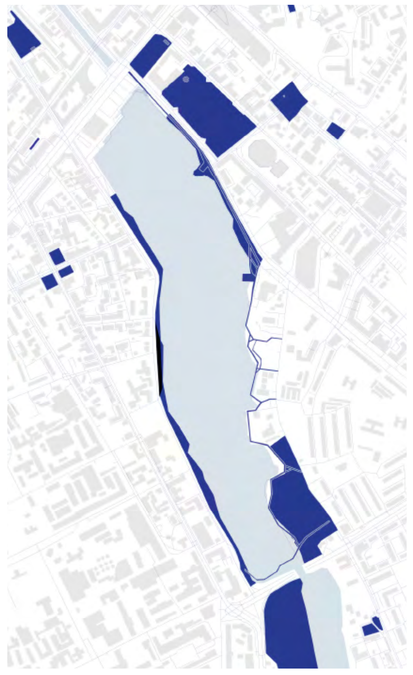


Bus stations | Planned new metro line and station by 2035

Building context

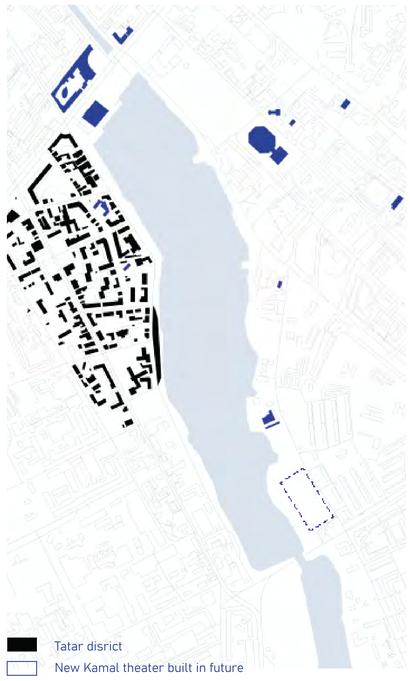
Building shape | Site plot

Ecological context



Parks and green areas | Site plot | New promenade

Significant building indication



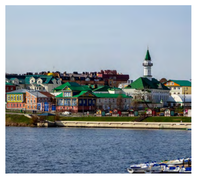
Tatar disrict
New Kamal theater built in future
Buildings of sport, educational, cultural, religious significance

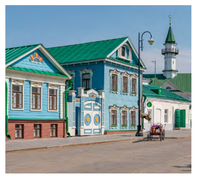
Functional zoning

Historical | Residencial | Commercial | Industrial

Tatar sloboda and its influence on design

Through a deep research of the Tatar building culture, I found out following principles: 1. Tatar people had migrating feature, for summers they left Tatar sloboda (concept of flexibility). 2. Tatar houses windows were faced streets, and courtyards were dedicated to connect with nature.





Architecture education in Kazan

Kazan future architects can start their formal education starting from 6 years old in architecture school Dashka. Students visit it as an extracurricular education after governmental schools and education lasts for 10 years. Further, Kazan State University offers a 5-year bachelor education.

Within it, the Tiarch studio of best selected students trains daily future architects for extra evening hours in model making, hand drawing and competition design. Students prove to win international competitions and attain job offers in well-recognized offices as OMA, Zaha Hadid, etc. Education is offered to maximum to 30 people per year.

Other institutions as Smena museum, Shtab coworking art office and National Library offer monthly events, exhibitions and lectures dedicated to architecture topics. The problem found that architecture education in Kazan is very closed and events are not popular within locals and non-architects.

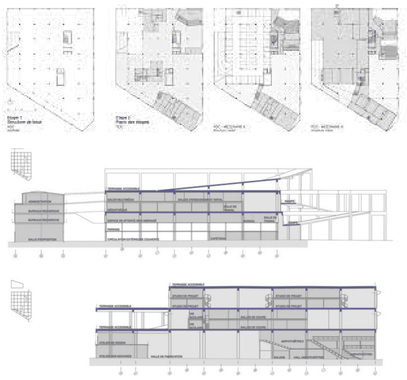
Refrence projects connected to Architecture Education

Nantes School of Architecture, France

Architects: Lacaton & Vassal
Area: 15150 m² Year: 2009

Important output: The program are ample, double-height volumes with non-attributed functions.

On the initiative of the students, teachers or visitors, these spaces become the locus of possible appropriations, events and programming. At any one moment the adaptation of the school to new interventions and its reconversion are possible.



Austin Center for Architecture Murrey Legge, the US

Size: 14,000 sf programing
Year Completed: 2018

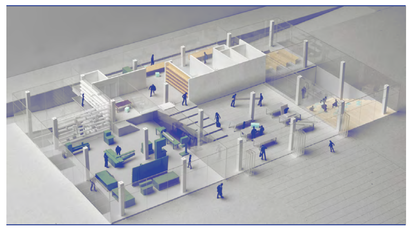
Output: the project program was planned within the context of needs for the next 10-15 years.

The guide separates the program into five elements—each a different aspect of the Center's mission and needs. Each of space has opprotunity to transform and change. The sapces are public-oriented, tranformative into diverse way presented on the projects descrptive webiste.

Gerrit Rietveld Academy and Sandberg Institute

Area: 6850 m² Year: 2019

Output: The building is a social hub that quite naturally accommodates and spatially connects education, encounter, relaxation and collectivism and in which changing perspectives inform the educational environment. It is an interactive and dynamic setting for making and experimenting; a building that generates ideas, thoughts and works. It is openable building, communicating with exterior.



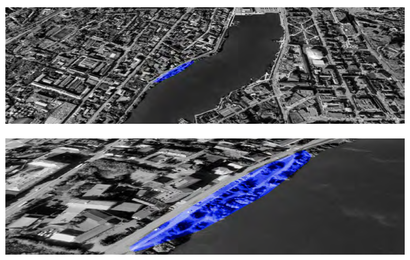
Site definition

Site coverage: 5700 m2

Terrain of site: site with a height difference of 5 m. Above the site is a vehicle and pedestrian road while the road leading towards water is a promenade. The promenade road is passing through the site from north to south, while 5m hill of 25 degree slope is from the west. The east of the site opens towards the gorgeous vast views.

Soil water table: Currently, the Kaban lakes belong to partially regulated water bodies, its level regime is mainly maintained at around 51.5 m of absolute height. Excess water is pumped out by pumping stations to the river.

Insolation: South side is situated along street Shagabutdina Mardzhani.



Site choice reasons

1. All the parts of the lake are developed except the West side. With the successful intervention of the Promenade project I wish to close the unfinished loop of the promenade in order to create a coherent function along the lake.
2. Neglegted and underdeveloped parts of the lake will transform the lake to its most of potential.
3. Kaban lake is a platform for multiple event on the north historical part of the lake, it already a loved space by locals not only to escape hustle and bustle of the city, but as well to entertain and learn, therefore, it assures that the land will be used and visited.
4. Architetcure education in the city is closed to public with information, positioning it in the city center and on the Lake will help to promote art and architecture knowledge.

Promenade

Turenscape + MAP
Landscape design finished in 2018

A project that develops all 3 lakes of Kaban with social, ecological, landscape development strategies.

Potentials and negative features of the site

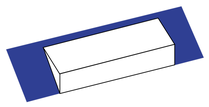
1. Greenery: Due to high amount of greenery on the site (green ratio: 70%), trees can be used as a shading system of the building. Its' position is situated from the west of the building.
2. Sun position: West and south side are requiring shading in order to protect a building from overheating in the summer. West part is protected with shading from the trees
3. Wind exposure: average wind velocity is 13km/h with wind rose movements from south to north. The natural ventilation of this direction would be beneficial to use.
4. Hill: Penetrating the building within the part of the hill would create a thermal mass to the building, as 'coat' it will protect the part of the building from the heat escape.
5. Lake: During the summer, it refreshes the air and release a cool breeze that decrease the temperature of the indoor and outdoor air, as well as the temperature of the structure.
6. Climate: Categoty of the cool climates. It requires a great amount heating and cooling systems.

Passive strategies.

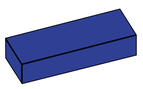
1. Thermal mass: Thermal mass is the ability of a material to absorb and store heat energy (as Thermal Sponge). A lot of heat energy is required to change the temperature of high density materials like concrete, which is therefore said to have high thermal mass.
Due to its density, concrete has the capacity to absorb and store large quantities of heat, contributing to a high-performance building envelope. Its thermal mass allows concrete to react very slowly to changes in outside temperature to reduce peak heating and cooling loads and delay the time at which these loads occur. The resulting savings can be significant—up to 25% of heating and cooling costs.
2. WtW ratio. Allows to save up to 30% of heating demand.
3. Orientation: Facades of oriented to north is best to close with walls without any windows. Allows to decrease heating demandabout 30%.
4. Natural ventialation: using the opprtunity to avoid mechanical ventilation can decrease about 20% of ventilation demand.
5. Project target – A+ classification.

Strategies used in design

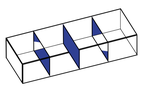
For RC boxes:



Penetrating hill creates earth coupling and increase thermall mass



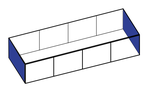
Using RC walls and structure increase thermal mass



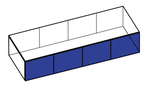
RC interior walls increase thermall mass

For lightweigt boxes:

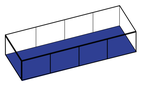
RC walls on the sides

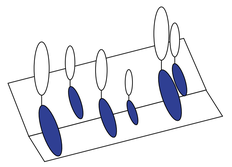


Triple glased facade

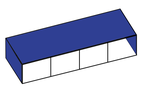


RC slab foundation

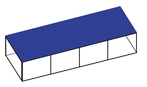




Trees as shading

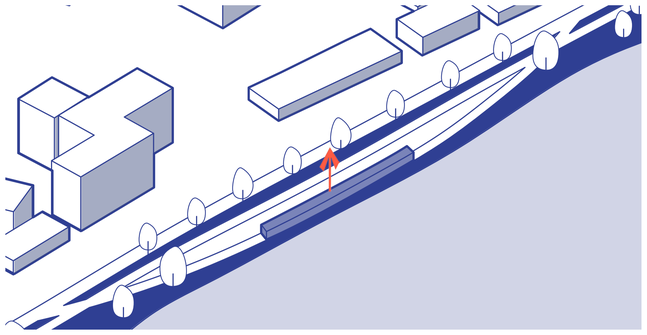


Sufficient thermal insulation

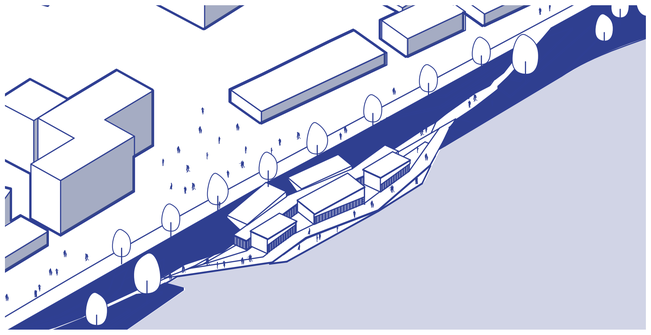


RC roof increase thermal mass

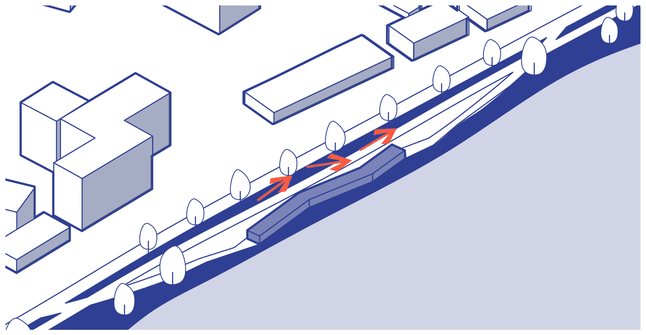
Building mass formation



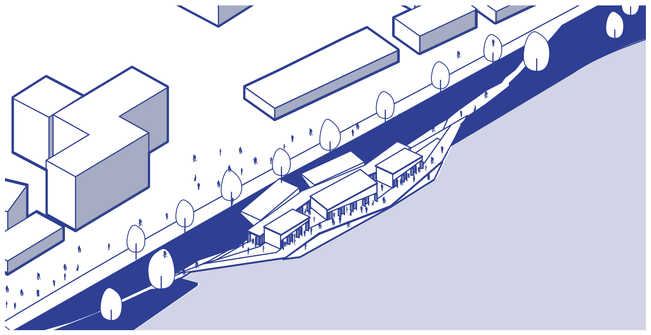
Promenade is a main element to include in the building



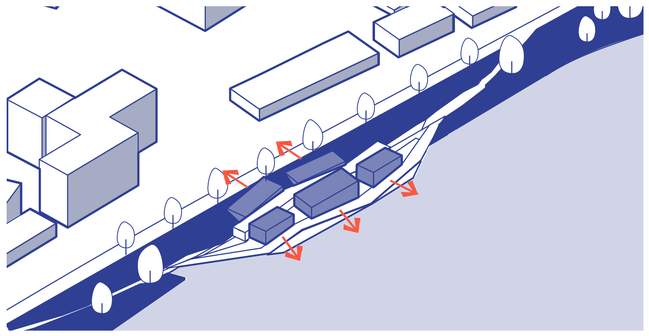
Building is organically placed without interfering of the movement.



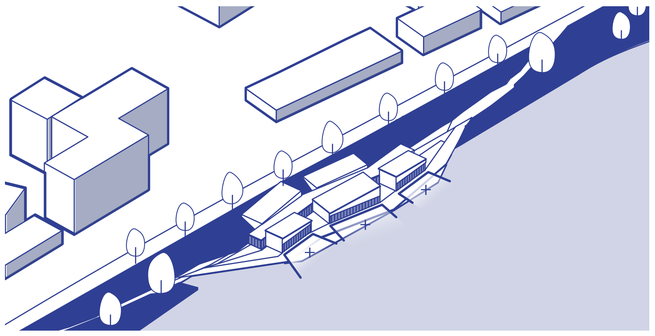
Promenade modification in order to bring new functional possibilities



Building is open to public and continues to work as part of the park



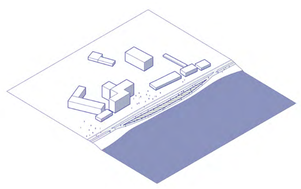
Extention of promenade with new spaces along it



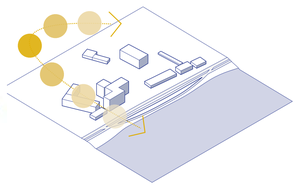
Giving the view access to the public from the inside

Site representation

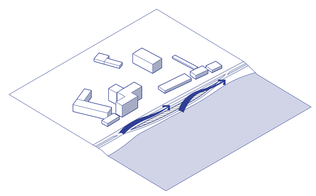
Social context



Sun path

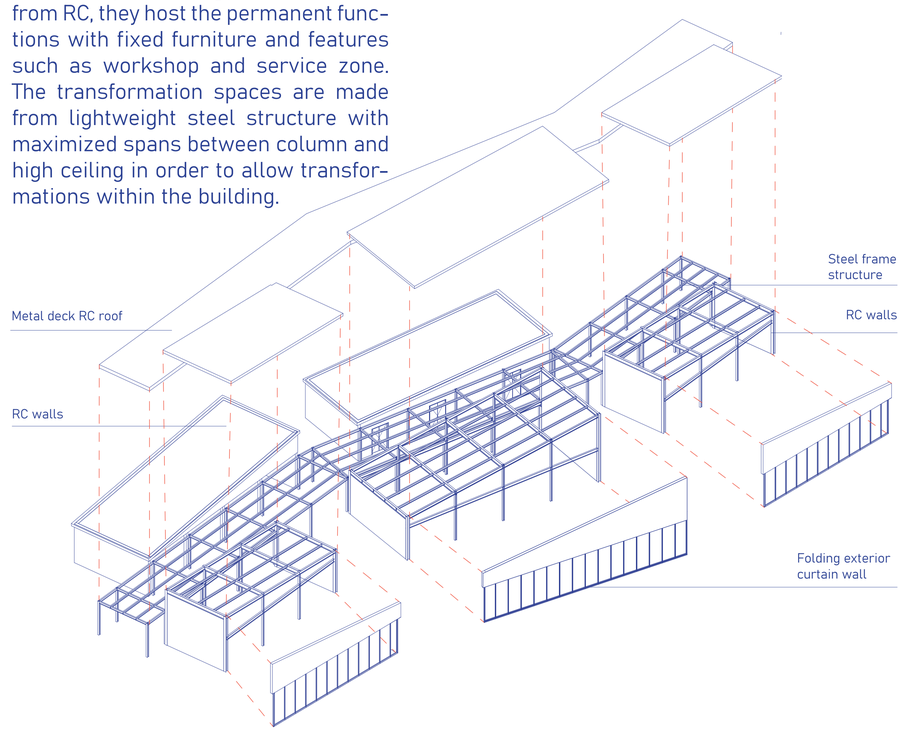


Wind direction



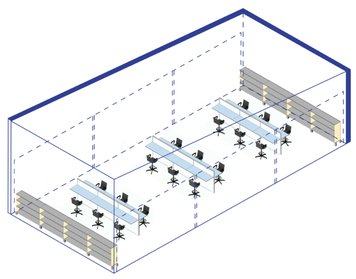
Structural design concept

The boxes penetrating the hill are made from RC, they host the permanent functions with fixed furniture and features such as workshop and service zone. The transformation spaces are made from lightweight steel structure with maximized spans between column and high ceiling in order to allow transformations within the building.

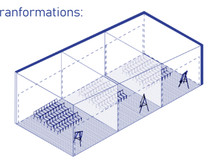


Space design

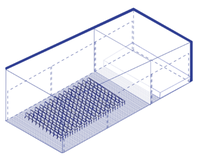
Classroom



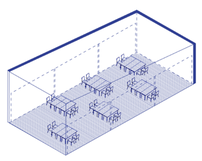
Tranformations:



Conference rooms

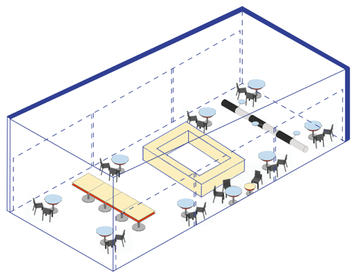


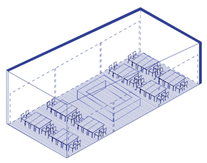
Theater/ Auditorium



Model mock up class

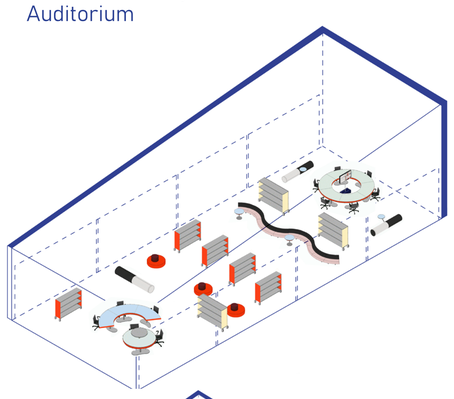
Cafe

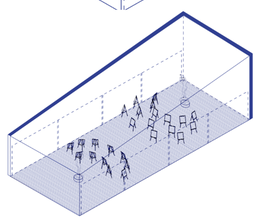




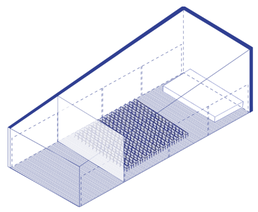
Private event

Communal study area/ Auditorium

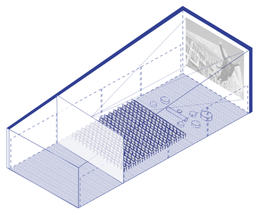




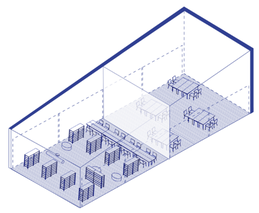
Drawing class



Auditoria for conferences and storage for equipment and left furniture



Cinema watching and storage for equipment and left furniture

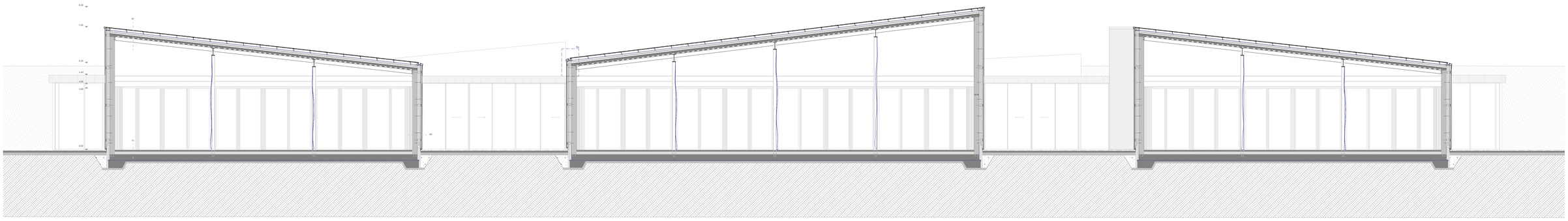


Private workshop and rest of the study area

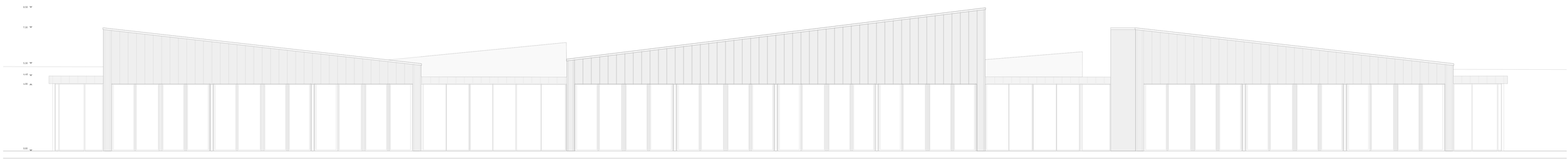
Function design concept


Cold etrance
20 m2
polished concrete
Cafeteria
150 m2
polished concrete
29 m²
Study room
140 m2
polished concrete
Classrooms
150 m2
polished concrete
Lobby
530 m2
polished concrete
Cold etrance
20 m2
polished concrete
D5
D6

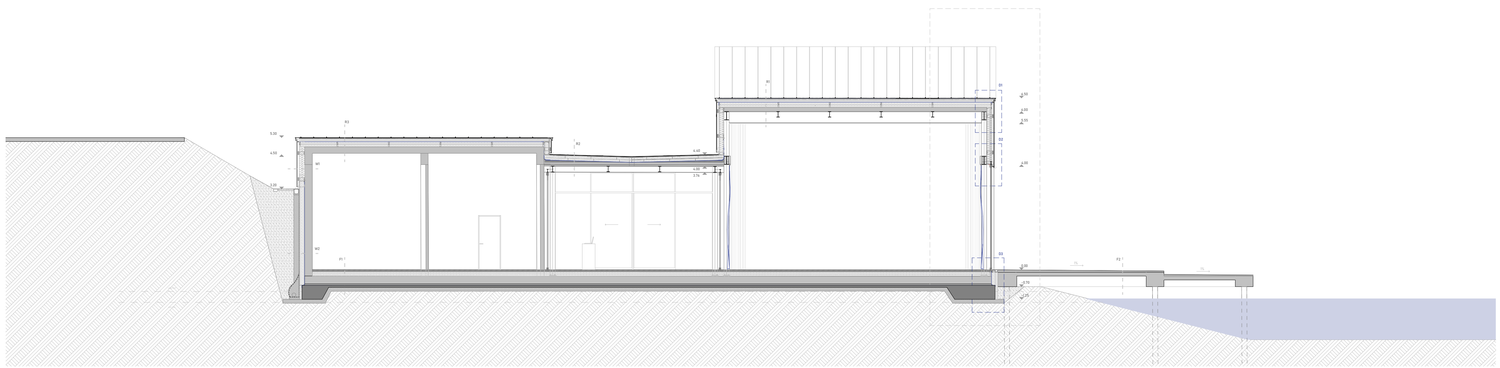
Longitudinal section 1:100



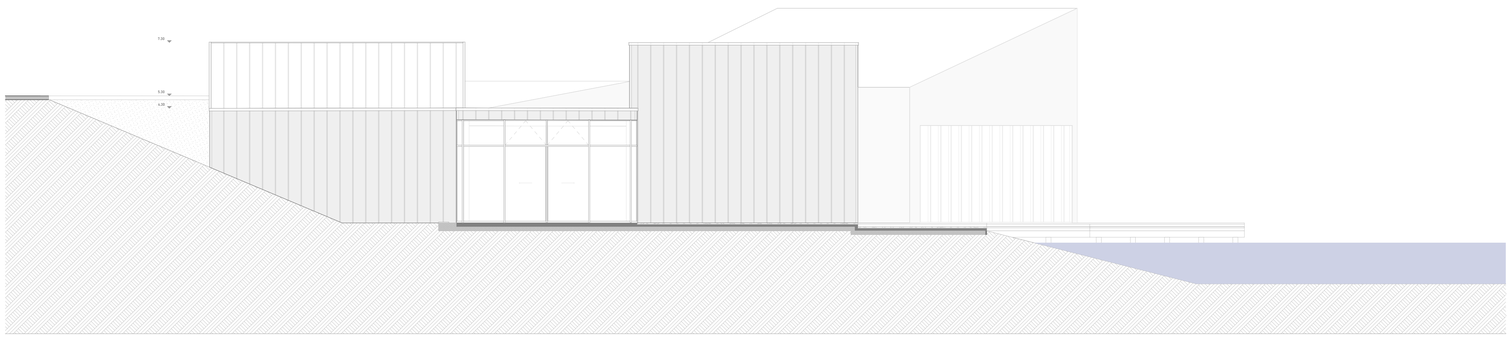
Longitudinal facade 1:100



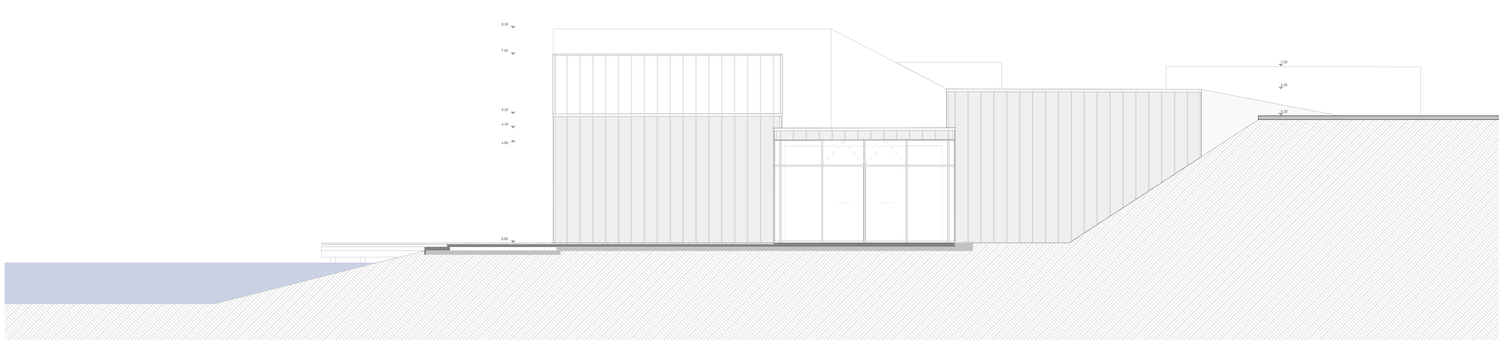
Cross section 1:100



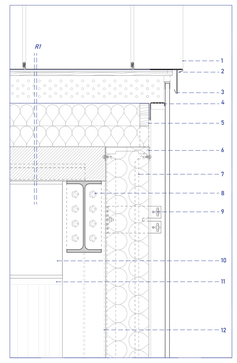
North facade 1:100

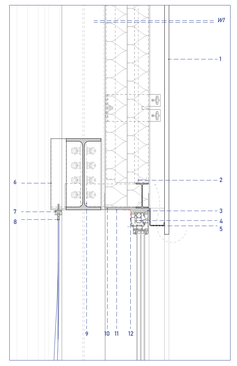


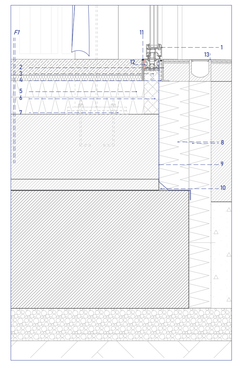
South facade 1:100



Details 1:10







D1

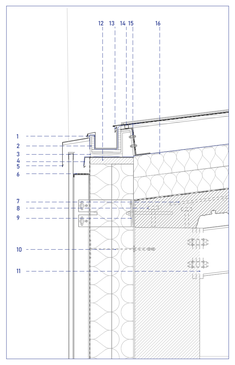
1 - Titanium zink metal sheet roofing
2 - Dripping noze from galvanized steel
3 - Dripping noze from galvanized steel, fixed to OSB board
4 - Galvanized steel net
5 - Timber joist between mineral wool thermal insulation 10x5 cm
6 - Top aluminium frame of the thermal insulation
7 - Veritcal liner tray
8 - End plate connection of multispan beams IPE330 to columns HEA 200
9 - Vertical aluminum bracket fastened mechanically to the wall, product Danpal, policarbanate facade system
10 - Cross mater beam IPE 450
11 - Railing of the acoustic textile curtain
12 - Policarbonate facade wall 500 mm width and 12mm thickness, product Danpal, facade system with internal sealing and connection

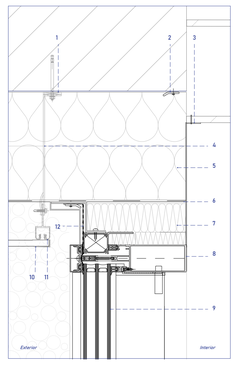
D2

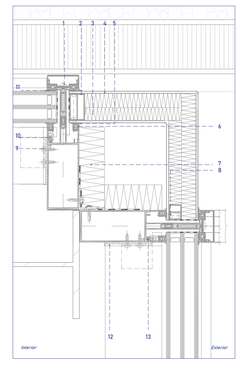
1 - Policarbonate facade wall 500 mm width and 12mm thickness, product Danpal, facade system with internal sealing and connection
2 - Vertical aluminum bracket fastened mechanically to the wall, product Danpal, policarbanate facade system
3 - 1 cm construction gap with timer spacers, gaps filled with mineral wool
4 - Railing connection of folding door, product NanaWalls Cero III sl70
5 - Galvanized steel net from insects connected to folding door aluminium frame with L-shaped steel profile (piecies distributed each 1 m)
6 - Aluminium box hiding the curtain system
7 - Aluminium rail of the curtians to steel
L+-shaped purlin connected to IPE beam.
8 - Metal rings holding heavy acoustic curtains, product: ECHOTON
9 - Fin plate pin type connection
10 - Foam filling
11 - Railing of the acoustic textile curtain
12 - Vapour barrier bituminous foil

D3

1 - Bottom detail of the folding door, product NanaWalls Cero III sl70 connected to railing.
2 - L-shaped galvanized steel profile.
3 - Folding door connection to PURENIT block 20x7cm.
4 - XPS insulation gap filling, covered with long lasting flexible silicone and PE foam string (supporting)
5 - 2 layers by 10cm EPS thermal insulation
6 - PURENIT block 20x7cm.
7 - Connection of column HEA200 to foundation with base plate, leveling mortar layer 1cm and anchors connected with nuts.
8 - XPS thermal insulation
9 - 4 mm SBS modified bituminous sheet waterproofing with 1 rtg cold bituminous grounding
10 - Cement mortar corner
11 - 1 cm PE foam with long lasting flexible silicone and PE foam string (supporting).
12 - Vapour barrier bituminous foil
13 - Water channel product







D4

1 - Waterproofing layer folded to fascia of the timber boarding and covered by galvanized coated steel gutter
2 - Galvanized steel gutter backet
3 - Timber spacers placed each 2 m providing air gap for the roof ventilation
4 - 1,2 mm Dripping noze from galvanized steel covered with WP bituminous mebrane, fixed to timber board
5 - 1,2 mm Dripping noze, galvanized steel
6 - Galvanized steel net
7 - Reinforcement of compound slab from RC and metal deck
8 - Steel studs fixing metal deck
9 - Vertical aluminum bracket fastened mechanically to the wall, product Danpal, policarbanate facade system
10 - Mechanical fastener of the 2 layer mineral wool thermal insulation with foam infill
11 - Fin plate connection of girgers IPE 220 to columns with steel bolts

D5

1 - Timber Spacer
2 - Bituminous waterptoofing fixation
3 - 2 mm metal sheet covering facade system
4 - Vertical aluminum bracket fastened mechanically to the wall, product Danpal, policarbanate facade system
5 - 2 layered by 10 cm niberal wool thermal insulation fixed to RC wall mechanically.
6 - Fiberglass mesh surface treatment of thermal insulation
7 - Mineral wool filling.
8 - Mullion 130mm, product: ETEM
9 - Triple glazed curtain wall system
10 - End connecter of policarbonate facade system, product: Danpal
11 - Profile connectorof policarbonate facade system, product: Danpal
12 - Butyl seal (reccomended by product)

D6

1 - Tapping screw
2 - Thermal insulation spacer
3 - Hard insulation 40mm
4 - Etalbond
5 - Wheathersill tape (vapour barrier)
6 - Silicone gasket
7 - Hard insulation 40mm
8, 9, 10 - Tapping screws
11 - Air and watertight foil, vapour permeable
12 - Flange connected to mullion
13 - Silicone

R1 - Roof layer (ventilated)

3 mm	Titanium zink metal sheet roofing
1 layer	Fibreglass fleece separation layer loose laid, adjoining overlap each 50 mm
15 mm	OSB boarding
130mm	Z-type galvanized steel profile perforated purlins "Z-ECO" 2mm thickness and air gap
1,2mm	Vapour permeable roofing membrane
20 cm	Mineral wool thermal insulation between timber joists each 2m
1 layer	3,0 mm modified bitumen vapour barrier membrane, fully bonded
18 cm	Compound slab from RC cover of 13cm and metal deck profile from galvanized steel of 50mm depth, deck is sprayed with intumescent fireprotective coating.

R2 - Roof layer (flat)

1 layer	UV protection
4 mm	1 layer modified bitumen waterproofing membrane (polyester fibre reinforced), Fully bonded by torch applied welding
4 mm	1 layer modified bitumen waterproofing membrane (glass fibre reinforced), fully bonded
1 layer	cold bitumen patching compound (about 300 g/m2)
20 cm	2 layers mineral wool thermal insulation fastened mechanically
1 layer	3,0 mm modified bitumen vapour barrier membrane, fully bonded
4- cm	concrete inclination layer (substructure), expansion joints at every 50m2
17cm	metal deck slab with RC cover

R3- Roof layer (ventilated)

3 mm	Titanium zink metal sheet roofing
1 layer	Fibreglass fleece separation layer loose laid, adjoining overlap each 50 mm
15 mm	OSB boarding
130mm	Z-type galvanized steel profile perforated purlins "Z-ECO" 2mm thickness and air gap
1,2mm	Vapour permeable roofing membrane
20 cm	Mineral wool thermal insulation between timber joists each 2m
1 layer	3,0 mm modified bitumen vapour barrier membrane, fully bonded
25 cm	RC slab

W1 - Wall layers

12 mm	Policarbonate sheet profile 500mm width connected to hidden profiles, product Danpal
65 mm	Air gap and policarbonate connecter U-profile
20 cm	2 layers of mineral wool thermal insulation with glass fibre veil coating and fixed with plastic anchors
30 cm	RC filling wall between steel columns for a better thermall mass of the building

W2 - Wall layers

	soil backfill
1 lyr	dimpled plastic sheet protection
1 lyr	4 mm SBS modified bituminous sheet waterproofing
1 lyr	cold bituminous grounding
30 cm	RC wall

F1 - Floor layers

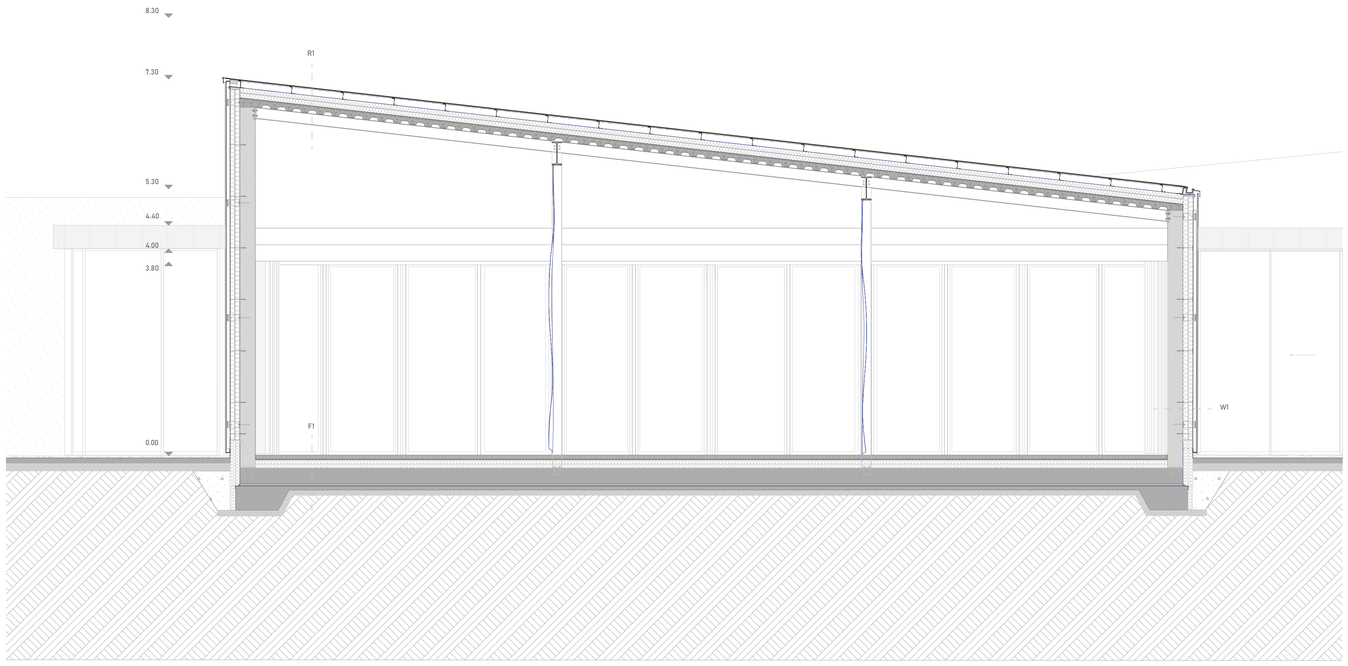
75 mm	Polished concrete
1 rtg	PE foil
25 mm	Mineral wool floating floor
50 mm	2 layers of EPS foam thermal insulation
30 cm	RC slab foundation
5 cm	Concrete protection layer of wp
1 lr	Bituminous dpc waterproofing
15cm	gravel bed soil

F2 - Floor layers

50 mm	Stone cladding
10 mm	Mortar
~4 cm	Incliining screed
15 cm	RC screed

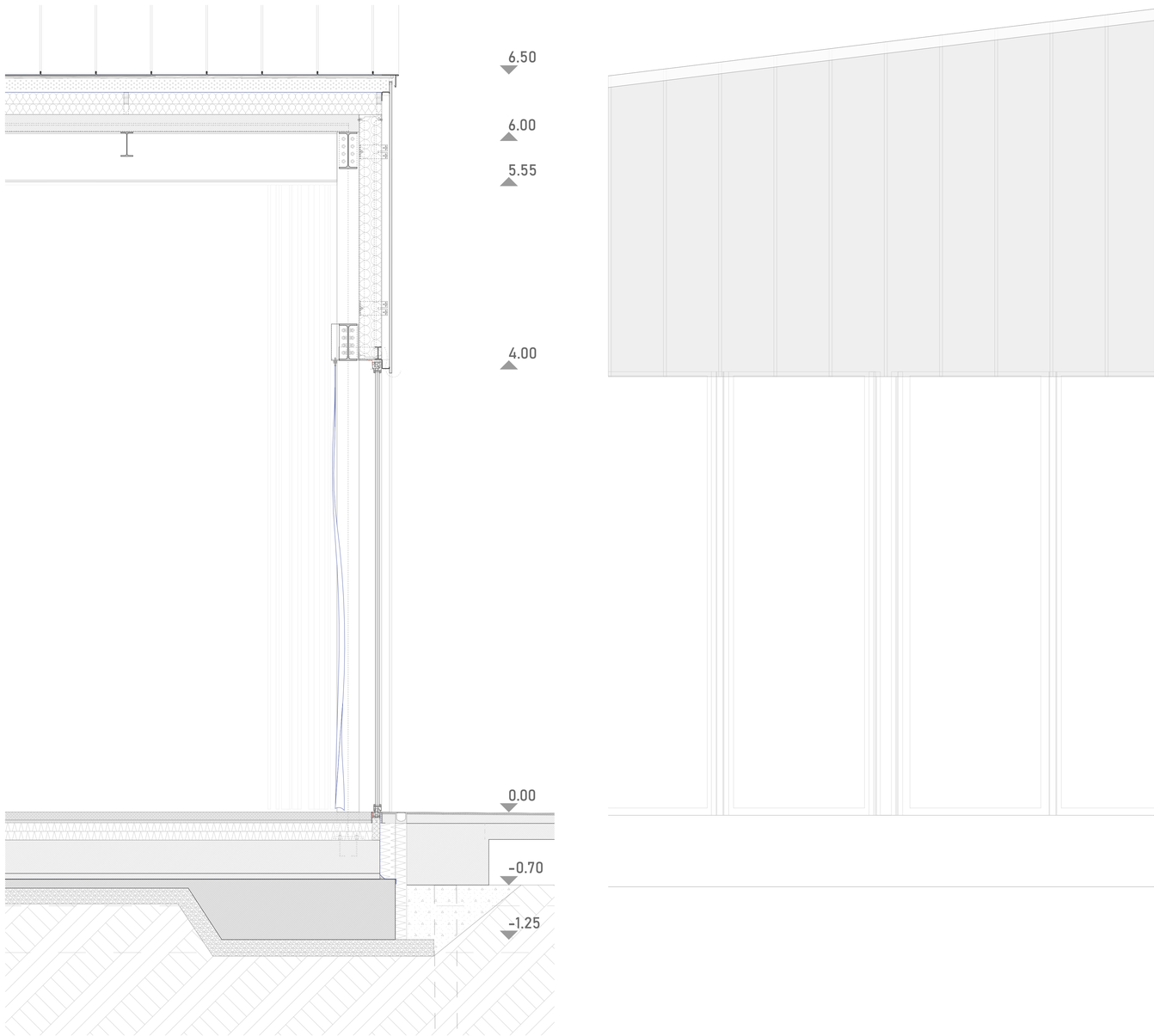
Section and facade 1:50

Lobby space



Section and facade 1:50

Classroom space



Section and facade 1:20

Study room/ auditorium