

portfolio ACEX16
Thea Forsell

il fiore

an exploration of forming sound
attributes as colourful art



il fiore

course

ACEX16 Bachelor Thesis Architecture
and Engineering

15hp

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mentors

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an exploration of forming sound
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project

This project explores the design of an outdoor music venue for orchestral and cultural performances. Located within an urban park, the proposal combines landscape, architecture, and acoustics to create a distinctive concert experience. The venue accommodates both seated and lawn audiences, while a sculpted landscape helps shield the site from surrounding traffic noise and integrates the performance spaces into the park environment.

concept

The concept reimagines the outdoor concert venue by enclosing the musicians within a sculptural form of colored glass. This creates a new relationship between performers and visitors, shifting the focus from direct visual contact to an experience shaped by sound, light, and movement within the landscape.

By blurring the boundary between architecture, art, and performance, the venue becomes a sculptural landscape that can be explored and experienced both during and beyond concerts.

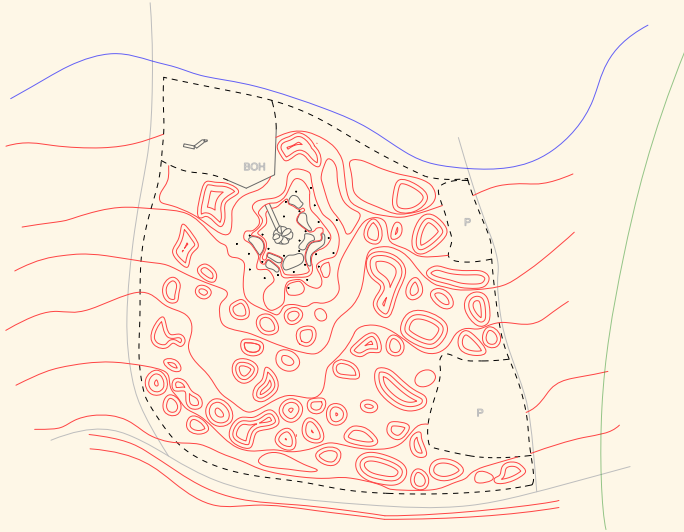
acoustic competition posters

concept

In the middle of Italy, amongst bushes and trees, we find ourselves walking through a sculpture park. Somewhere in the distance we hear the soft tones of an orchestral concert, intensifying as we follow the meandering slopes down towards the river. As we come around a hill, a large glass flower appears before us, seemingly the source of the music.

The concert hall is located in a bowl-shaped sculpture park, with the audience seated at different levels across a varied, sloping terrain. Roof-covered seating areas, with roofs made of glass to mirror the aesthetics of the stage, are mixed with informal lawn seating. By designing the omnidirectional loudspeakers as Roman pillars they relate to the Italian site as well as supply the audience with sound. These are strategically placed around the seating area, and smaller loudspeakers are hung from the ceiling of the covered areas. The loudspeakers are delayed 20-40 ms relative to the main loudspeakers at the stage to simulate distance perception and reflections from for example the glass ceiling. 3,000 audience members are accommodated in the roof-covered seating area, while the lawn accommodates an additional 10,000. The informal seating areas absorb sound, making it anechoic.

The surrounding park has a hilly, varied landscape with earth berms, tree buffers, and sculpturally designed Helmholtz resonators of different sizes that absorb and scatter traffic noise. Noise propagation is further reduced by the bowl-shaped terrain, which also protects the residential area from noise of performances. Apart from the stage and immediate surrounding area, the sculpture park is open to the public. If needed, a temporary fence may be raised to separate the audience area from the public park. Along the edges of the seating area, as well as by the car parks located at the outer bounds of the landscape, toilets and refreshment booths can be found.



site plan and sequence



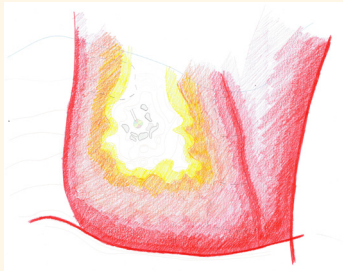
the flower stage

The stage is a freestanding, flower-like, sculptural structure with the audience almost completely surrounding it. The orchestra is encapsulated with multi-coloured glass panels in the form of flower petals, producing a closed environment for the musicians, free from outer noise, rain and direct sunlight.

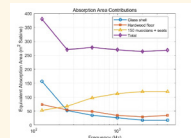
The enclosed stage functions as a rehearsal room and relies on room acoustics. The petals function as reflective panels and the orchestra absorbs sound, producing an environment in which the musicians can hear themselves clearly. A hardwood floor supports these acoustics with a low absorption coefficient in the frequency range of interest. In spite of the orchestra

being isolated, the audience can glimpse the musicians through the glass, and, most importantly, hear the music through the loudspeakers. This makes for a unique experience for the audience as well as the musicians.

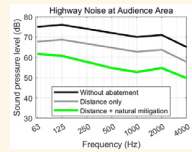
The glass petals are mounted to two attachments each, placed on rails, making them movable in two directions. For touring acts such as pop or rock concerts, where visibility of the musicians to the audience may be desirable, the front glass petals can be slid between the back petals creating an opening at the front. They can also be tilted open, using tilting mechanisms in the attachments, creating a striking visual effect of a blooming flower. When the petals are open the



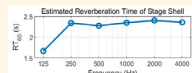
Map of traffic noise sound level, reduced by landscape



For frequencies around the 63 Hz to 125 Hz octave frequency band, the glass shell offers the biggest absorption area, while the musicians and their seats contribute more to frequency bands above 125 Hz.



The reduction of highway noise at the audience area and stage is based on distance. Simply placing the venue further away from the highway already provides a significant reduction in noise levels before applying any additional mitigation measures.



This is the upper limit of the reverberation time in the simulation, leading to the highest possible values. In reality, the surface of the glass petals has overlaps, attachments and other details and not a perfect circular bend, which reduces the actual reverberation time.

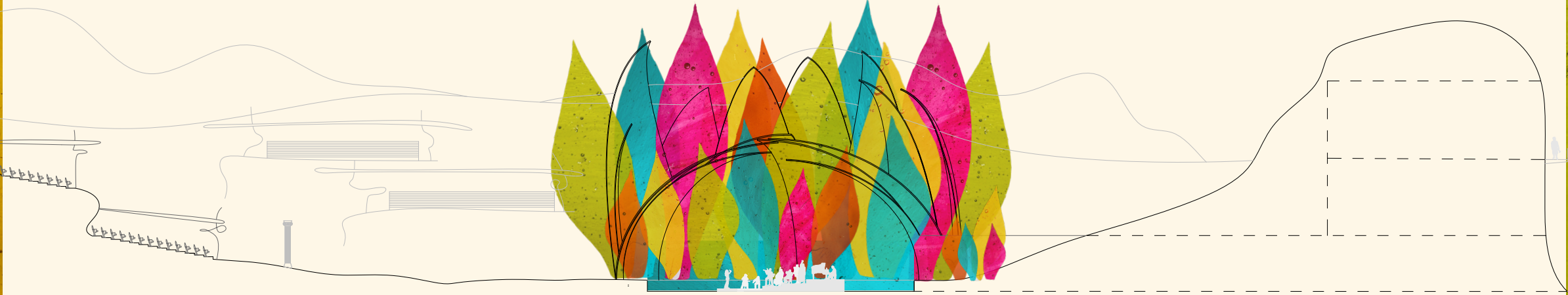
acoustic target values

Internal Noise	Sound Pressure Level L_{max} (dB)	Reverberation Time RT_{60} (s)	Clarity C_{80} (%)	Sound Strength G (dB)
Stage	85 to 90 dB A	0.8 to 1.2 s	+3 to +6 dB	+3 to +6 dB
Covered Audience	80 to 88 dB A	1.2 to 1.6 s	0 to +3 dB	+4 to +6 dB
Lawn Audience	75 to 85 dB A	-	-	-
Front of House	90 dB A	-	-	-

Back of House	Sound Pressure Level L_{max} (dB)	Sound Pressure Level L_{max} (dB)	Weighted Sound Reduction Index R_w in Walls (dB)
Rehearsal Rooms and Soloist's Dressing Rooms	80 to 90 dB A	30 to 35 dB A	50 to 55 dB
Other Dressing Rooms	-	35 to 40 dB A	45 to 50 dB
Green Room	-	35 to 40 dB A	-

back of house

The back of house is embedded within a hill, open in a direction facing away from the stage and thus not visible to the audience. The soil covering the back of house acts as insulation between stage and back of house, allowing for concurrent activities between the stage and back of house practice rooms. From the loading dock, the main storage area and stage entrance are easily accessible and on the same level. On the ground floor, there is also a staff entrance, orchestra locker rooms, toilets for the performers, as well as a grand staircase leading up to the green room. In addition to the green room, the first floor also accommodates changing rooms that also function as practice rooms, one star dressing room housing a piano, and additional storage. The walls between loud rooms, such as practice rooms, have a high sound reduction index, minimising sound interference. The second floor accommodates a mechanical equipment room, storage, offices, and a separate practice room. Rooms intended for prolonged occupancy are oriented towards the windows facing the river for the performers and staff to enjoy. Rooms intended for short-term use, such as storage or changing rooms, face the hillside.



acoustic competition texts

concept

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the flower stage

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design process

The design process was driven by physical exploration through models, sketches, and sectional studies.

Initial investigations focused on the site's acoustic conditions and how sound moves through the landscape.

Working with clay models allowed ideas to be tested and refined through continuous iteration, making it possible to quickly evaluate different spatial and acoustic strategies throughout the project.

iterations

The project evolved through the exploration of three conceptual landscape typologies: the crater/amphitheatre, the tower/desert, and the park/green landscape. Each concept investigated different relationships between sound, topography, and audience experience. The final proposal emerged from combining the strongest qualities of each approach into a unified design where landscape becomes both an acoustic and spatial framework for the venue.

architectural qualities

The proposal seeks to create an immersive experience where music, landscape, and architecture are closely connected. A sculpted terrain guides visitors through the site and frames the performance space, while the stage enclosure creates a distinctive visual identity. The project balances functional requirements with a strong experiential character, transforming a technical acoustic challenge into an architectural opportunity.

sustainability strategies

Sustainability was approached through landscape interventions and resource efficiency. Existing soil was reused to shape a series of hills that function as natural noise barriers, reducing the need for additional acoustic infrastructure. By embedding the back-of-house facilities within the terrain, the design minimizes visual impact while preserving large areas of the site as accessible public parkland.

my reflection

The project reinforced the value of iterative design and physical model-making as tools for architectural exploration. By continuously testing ideas through models, drawings, and discussion, the design evolved from abstract concepts into a coherent proposal. The process highlighted the importance of balancing intuitive experimentation with technical reasoning to create architecture that is both expressive and functional.

leadership and project role

my future

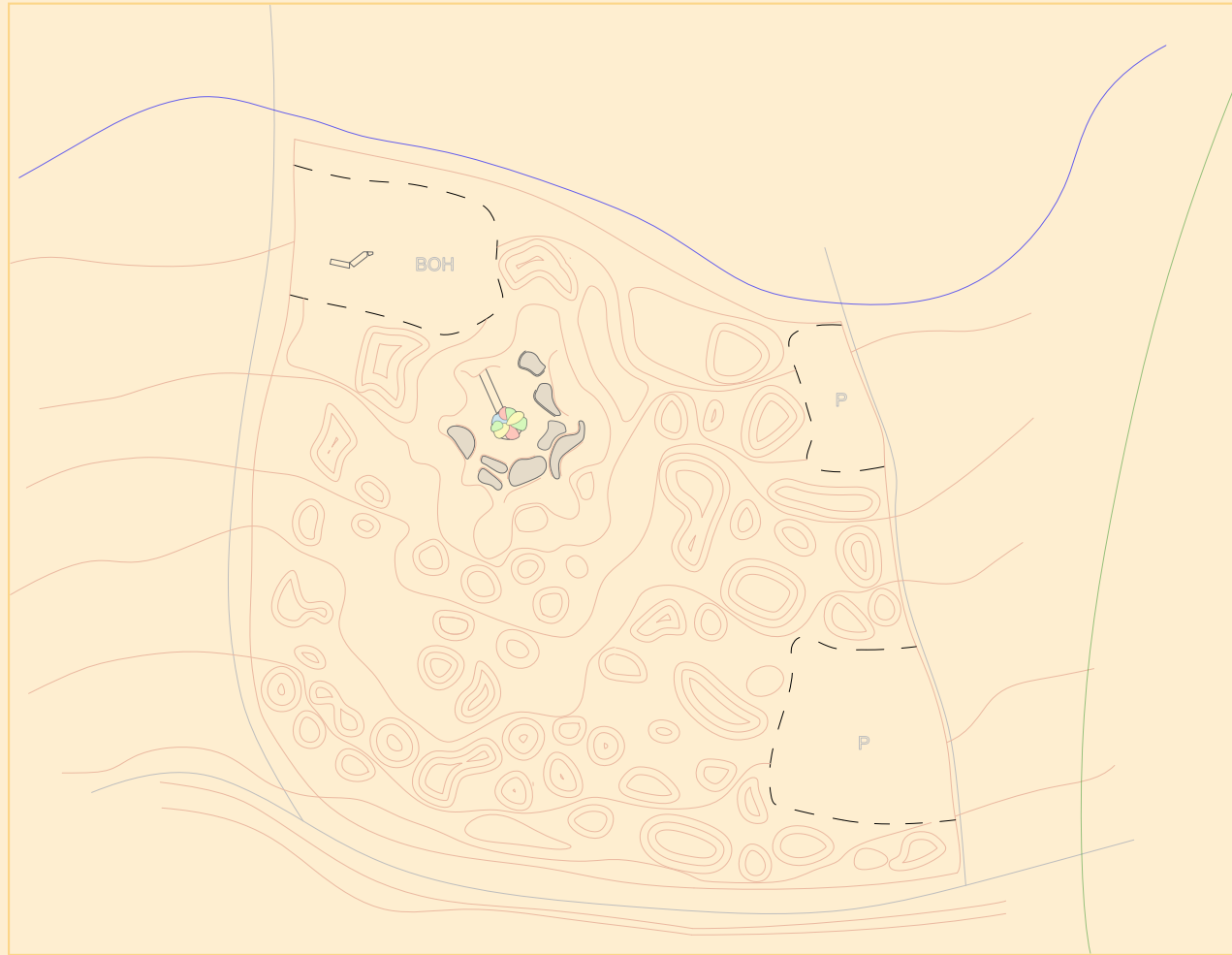
Looking ahead, I hope to gain practical experience through an internship where I can learn more about working in different types of projects and further develop my skills. I am particularly interested in understanding how different disciplines contribute to a project and how they can be effectively coordinated. In the long term, I would like to deepen my knowledge of project leadership and gradually grow into roles with greater responsibility for planning, coordination, and project management.

During this project, I contributed both to the organization of the team's work and to the creative development of the concept. I often took responsibility for arranging meetings and helping the group maintain a holistic view of the project. Alongside this, I actively participated in brainstorming and concept development, with the flower concept being one of the ideas I contributed that was later incorporated into the final design.

interdisciplinary collaborations

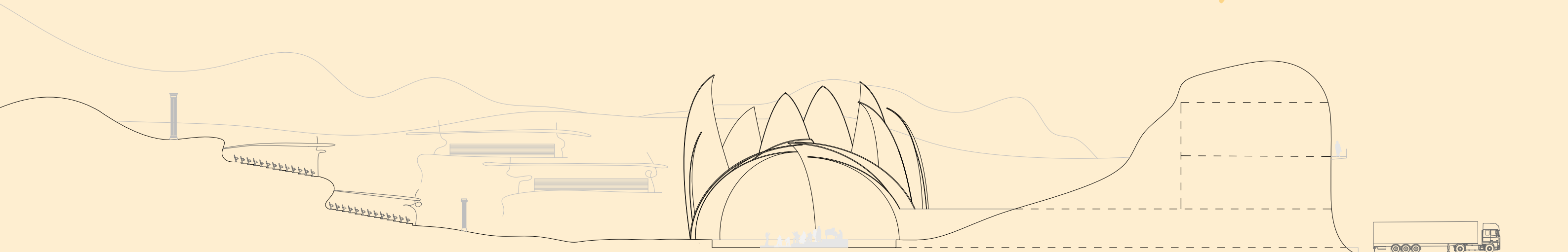
The project was developed through the integration of architectural design, landscape architecture, acoustics, and structural considerations. Acoustic requirements informed both the shaping of the landscape and the design of the performance space, demonstrating how technical disciplines can actively contribute to architectural form and spatial quality.

the project



site plan

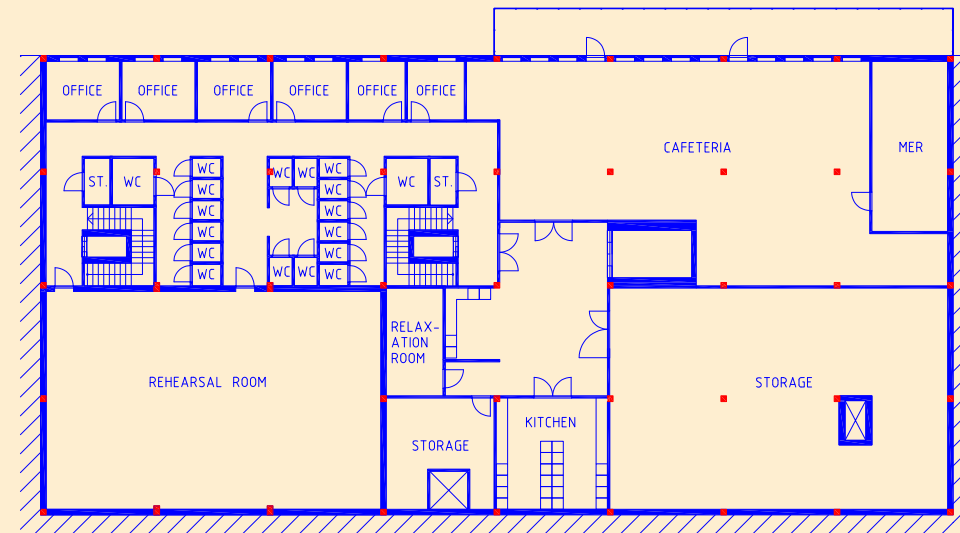
landscape section



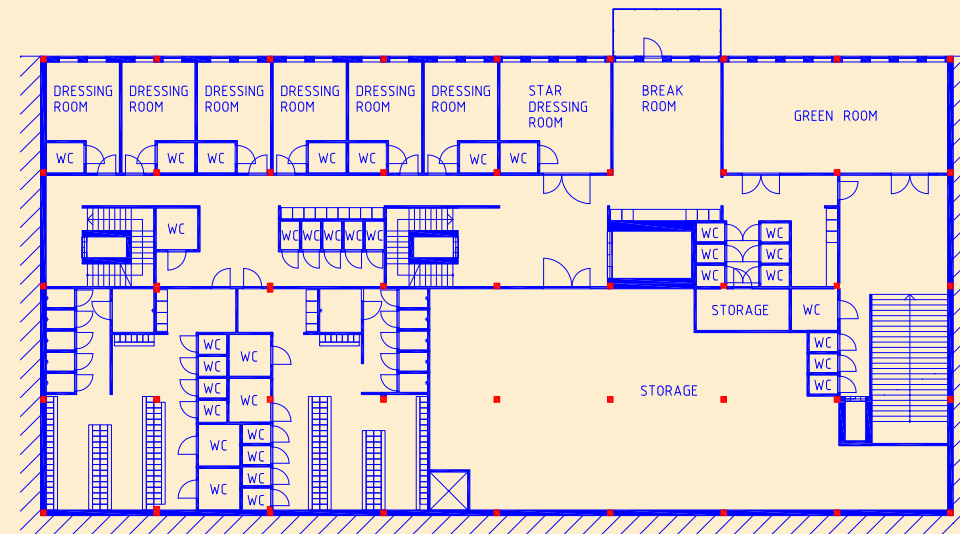
the project

back of house

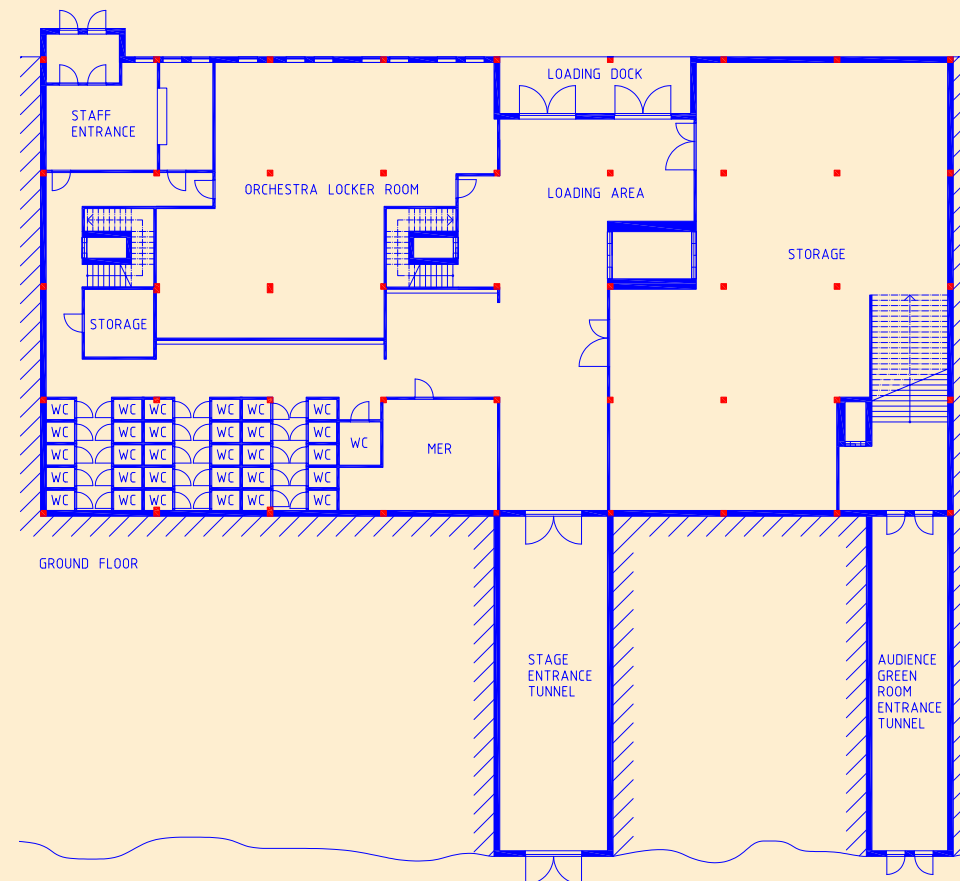
floor plans



FLOOR PLAN
IL FIORE - BACK OF HOUSE
STRUCTURAL ELEMENTS
SECOND FLOOR
1:200



FLOOR PLAN
IL FIORE - BACK OF HOUSE
STRUCTURAL ELEMENTS
FIRST FLOOR
1:200



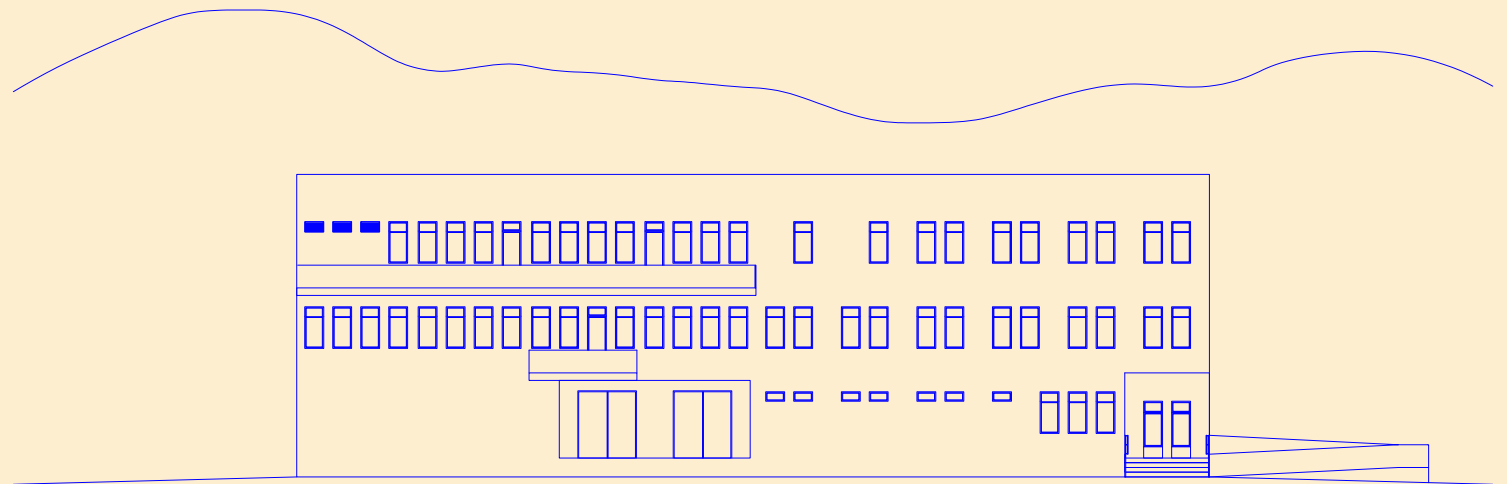
FLOOR PLAN
IL FIORE - BACK OF HOUSE
STRUCTURAL ELEMENTS
GROUND FLOOR
1:200

the project

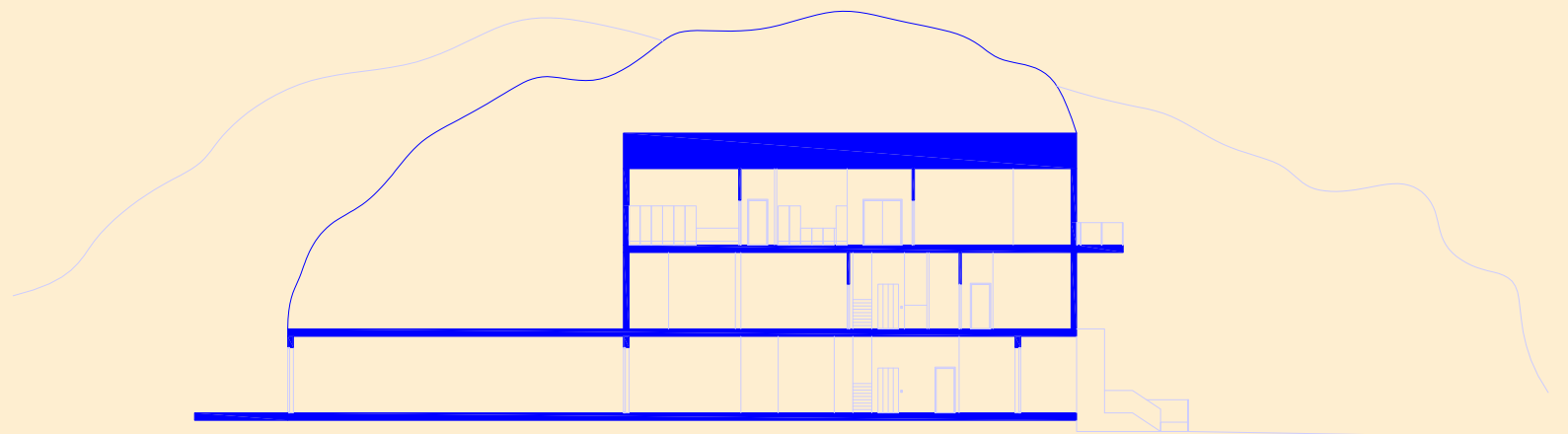
back of house

facade

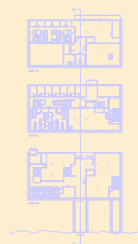
section



FACADE
IL FIORE - BACK OF HOUSE
1:200



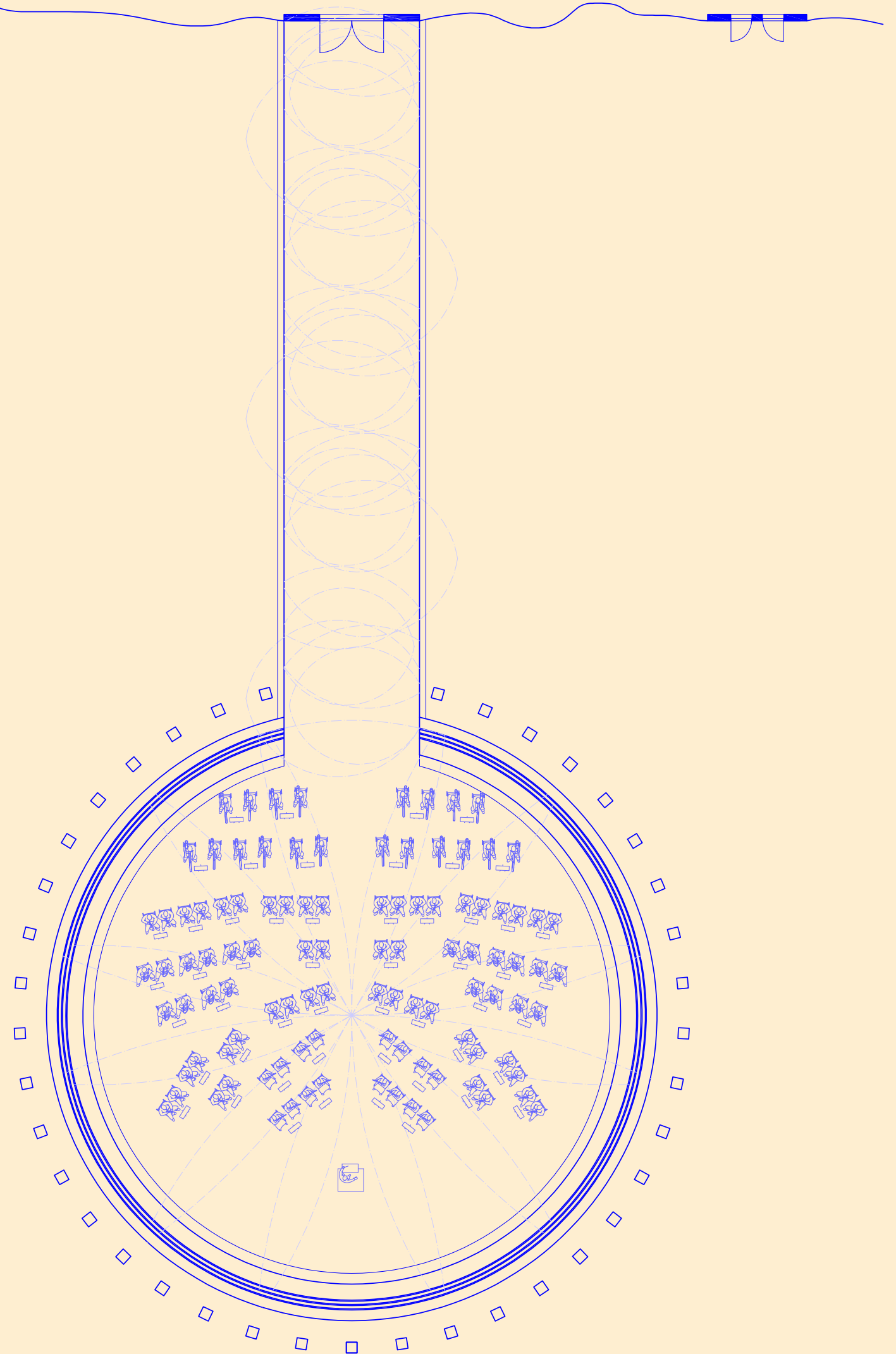
SECTION
IL FIORE - BACK OF HOUSE
1:200



the project

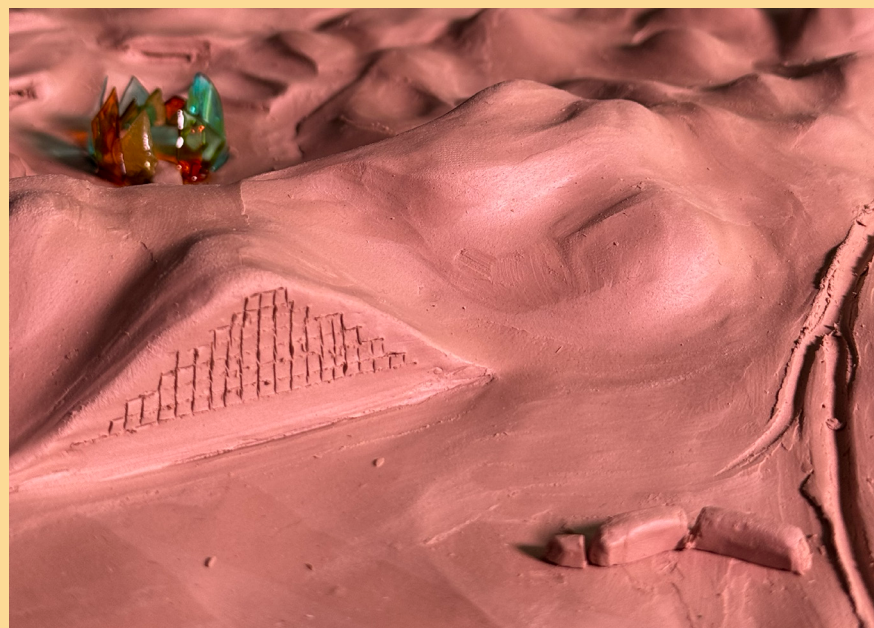
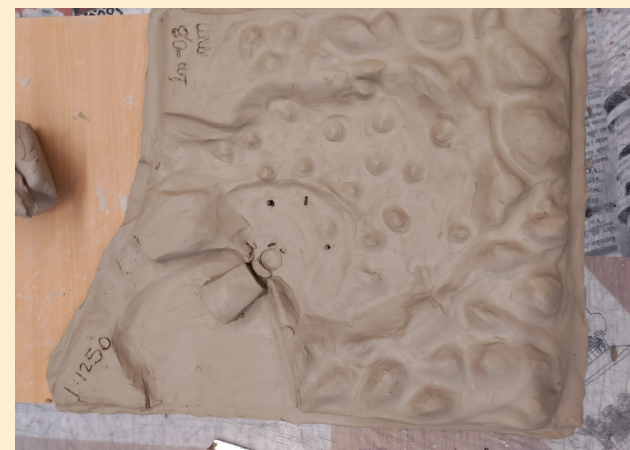
stage

floor plan



clay model

landscape



clay model

stage



sugar glass model

