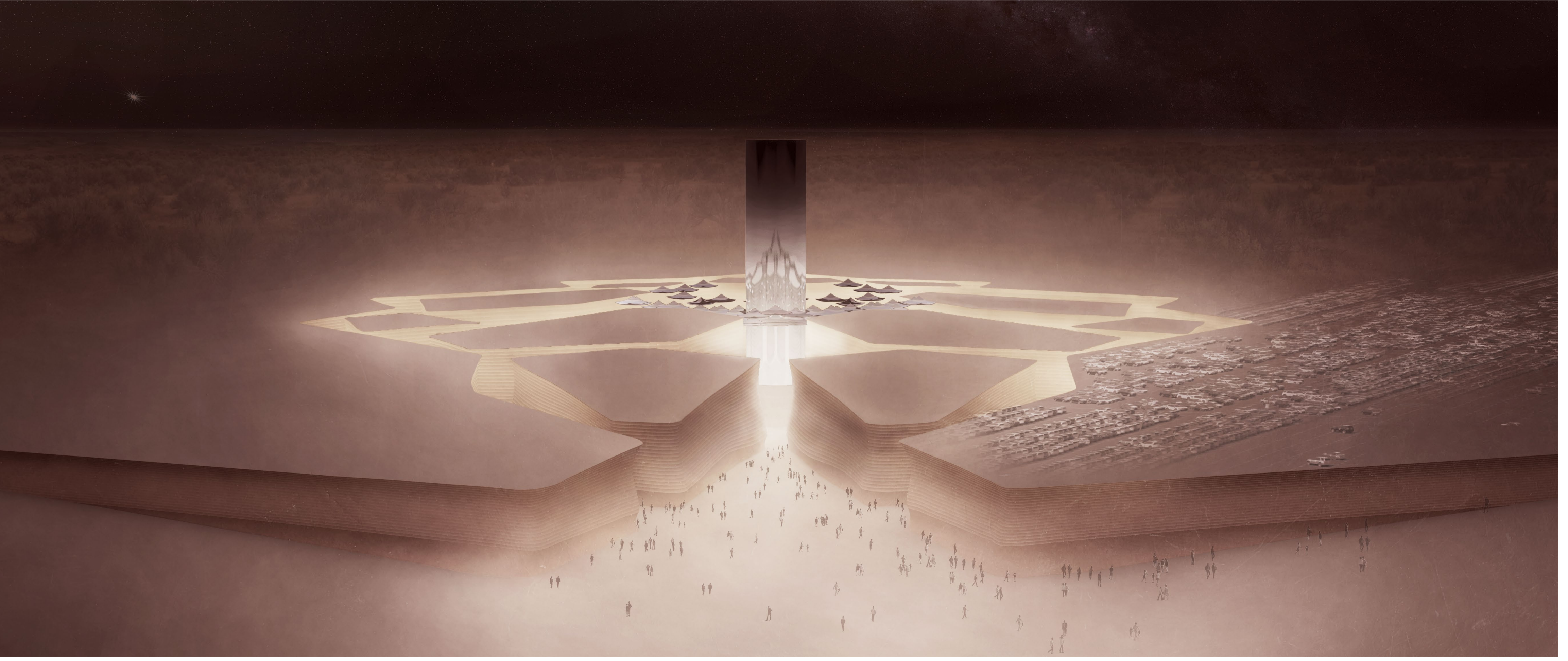


Above A grand entrance – full of expectation

ERODED BY SOUND

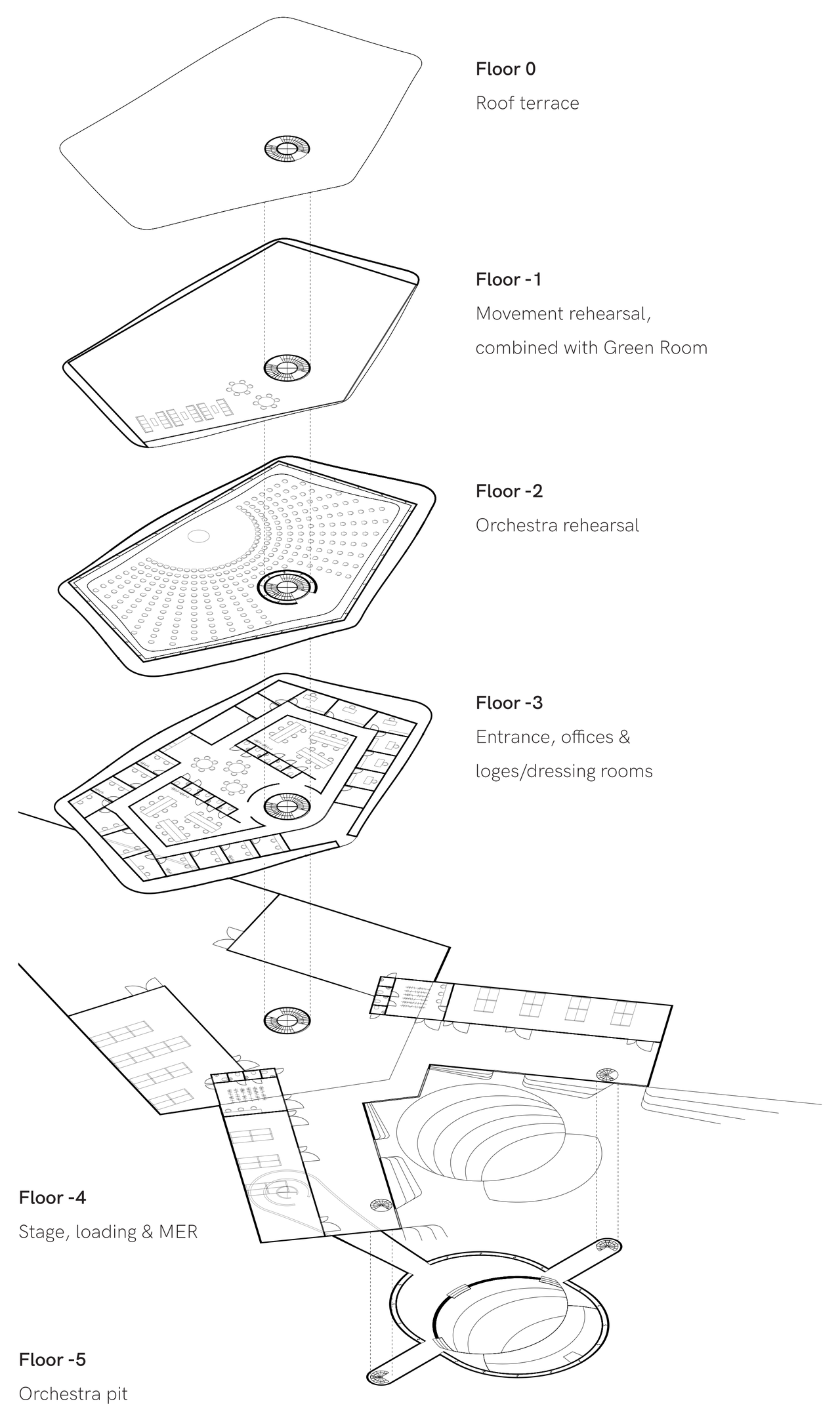
A COMPLETE TAKE ON THE CONCERT EXPERIENCE

In the barren desert of southern Oregon, there is a concert hall like no other. In a grand concert canyon, people gather around a stage in the same way one would around a fire.

As ancient as nature itself is the need to gather like this and collect memorable, magical, experiences.
In this concert hall, man meets nature.

Listen to Eroded By Sound!

Above A night with the festival symphony orchestra



Floorplan 1:500

Dug into the ground - Acoustically shielded from its surroundings

A concert hall, embedded 35 meters down in the desert floor – acoustically shielded from its surroundings. Thanks to the low positioning of the stage and audience as well as the long distance from the highway, the background noise levels are keep very low – in fact the environmental sound pressure average was calculated to be around 35 dB in the concert hall, in a crass estimate considering the highway traffic noise data provided.

Additionally, the set being acoustically isolated benefits the nearby housing area – with the canyons acting as absorbing buffer zone to minimize sound leakage during loud concerts.

NOICE & VIBRATION CONTROL

The acoustics have defined the form. The walls of the canyon are cladded with concrete elements with integrated Helmholz resonators. Furthermore, by tailoring the curvature of the walls, the volume of the Helmholz resonators is changed – meaning that the desired amount of each given frequency can be absorbed.

Internally, the acoustically sensitive functions rehearsal room and orchestra pit have been placed on spring bed to protect them from undesired vibrations. Furthermore, the MER has been placed strategically on a generous distance, surrounded by thick concrete.

Logistics

Containing all the necessary functions for the operation of the facility, is the «island» located just behind the stage. People move through this logistical building using a staircase/elevator (additionally acts as a light shaft), while scenography and instruments is transported directly to the stage level by truck.

Situation

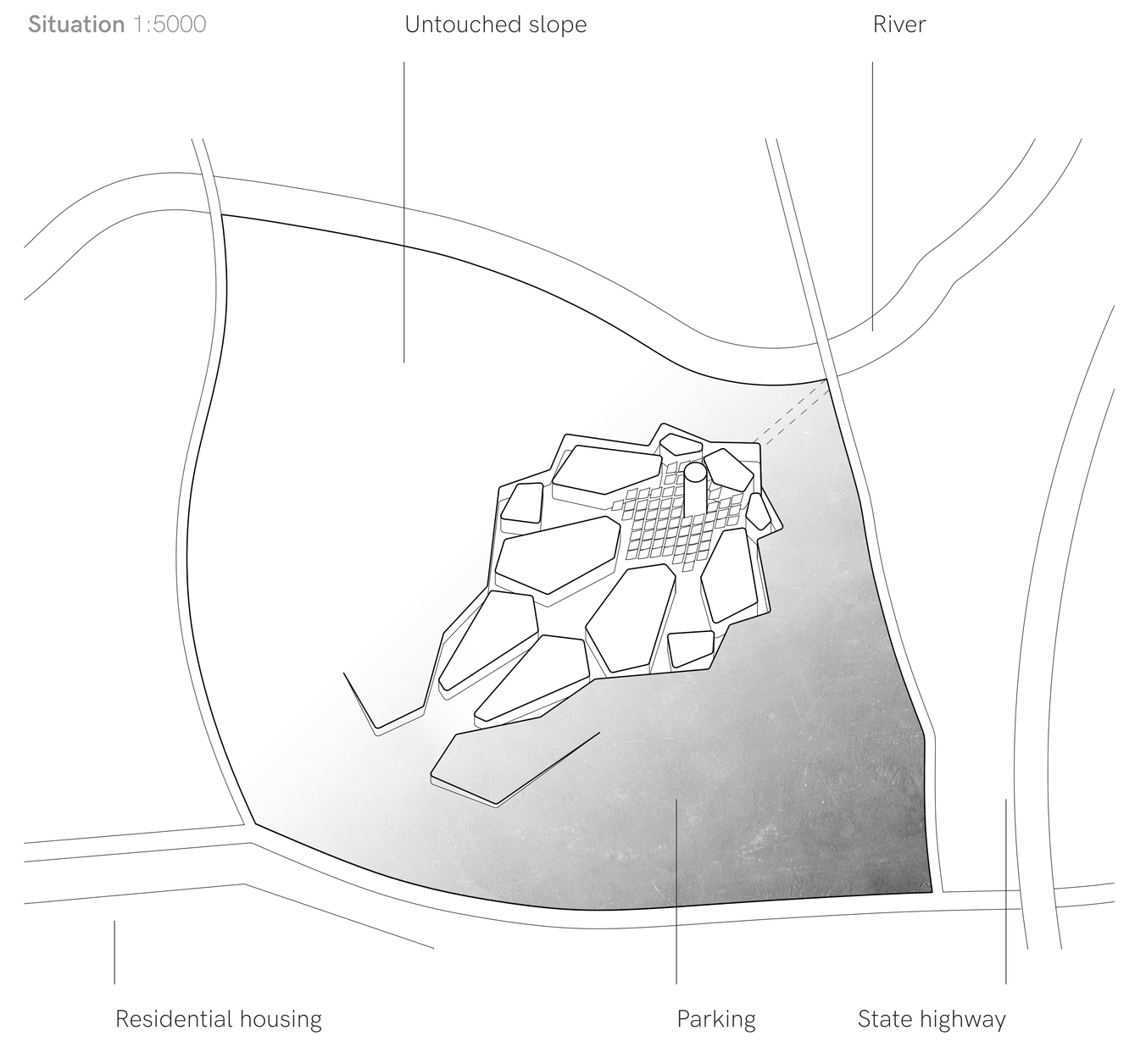
Located in a NE SW axis the opening of the facility is facing the quiet corner of the plot reducing background noise entering the canyon. During the evening, the cylinder is lit up by the descending sun as excited visitors enter the underground complex.

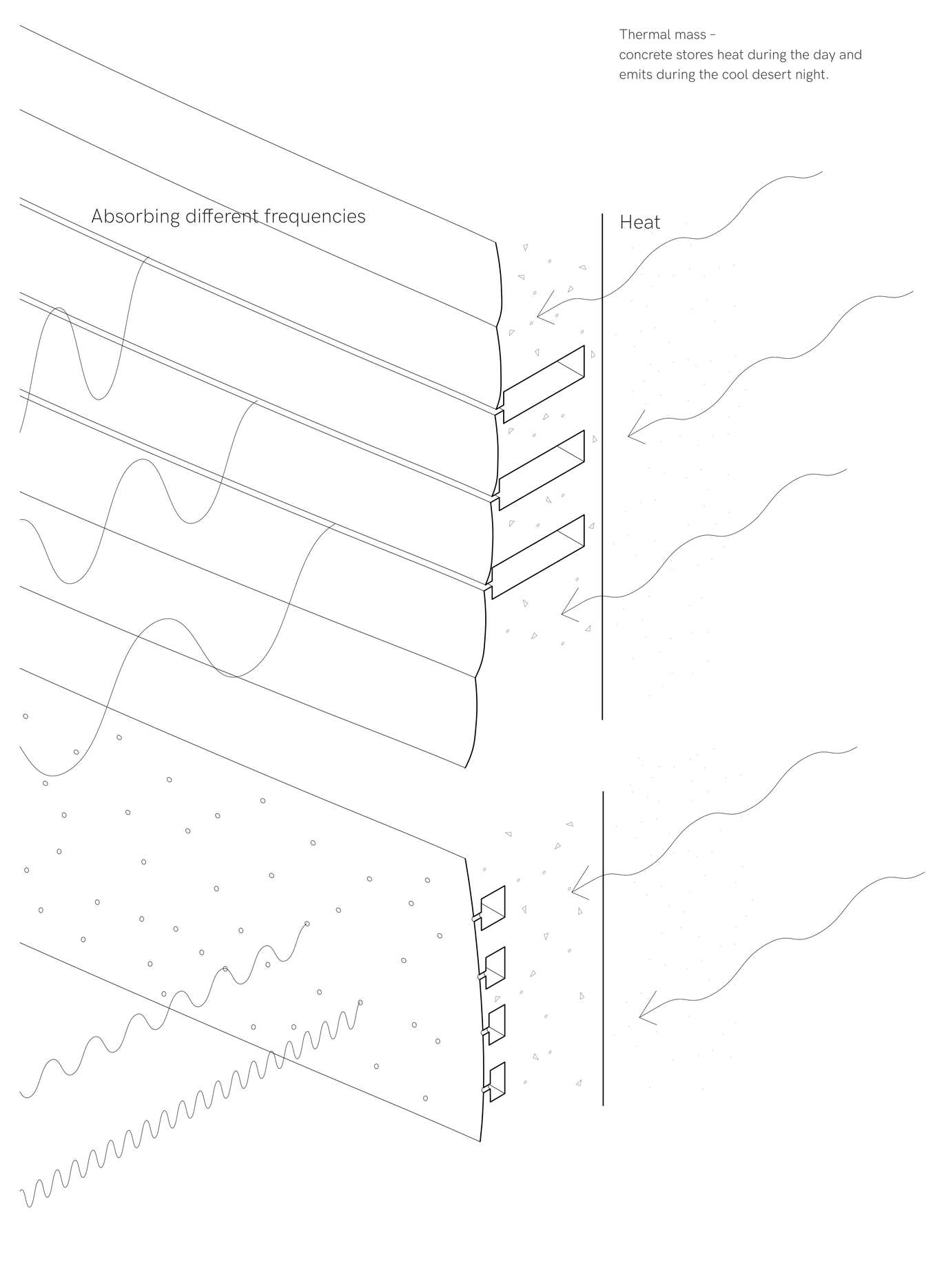
ACOUSTIC ELEMENTS

In terms of acoustical properties, the canyon is constant and never changing. Thanks to the distribution of Helmholz, corresponding to absorption of different frequencies, an even reverberation time is achieved across all frequencies in the concert hall.

As a measure to meet the different acoustical requirements for different genres of performances, flying pans reflect (frequencies from 100 Hz and up) or absorb (250 Hz and up). They swarm out from the cylinder in which they are being stored and position themselves appropriately. When the performance is over, the flying reflector/absorber pans return to their home.

Situation 1:5000





Detail Helmholz 1:50

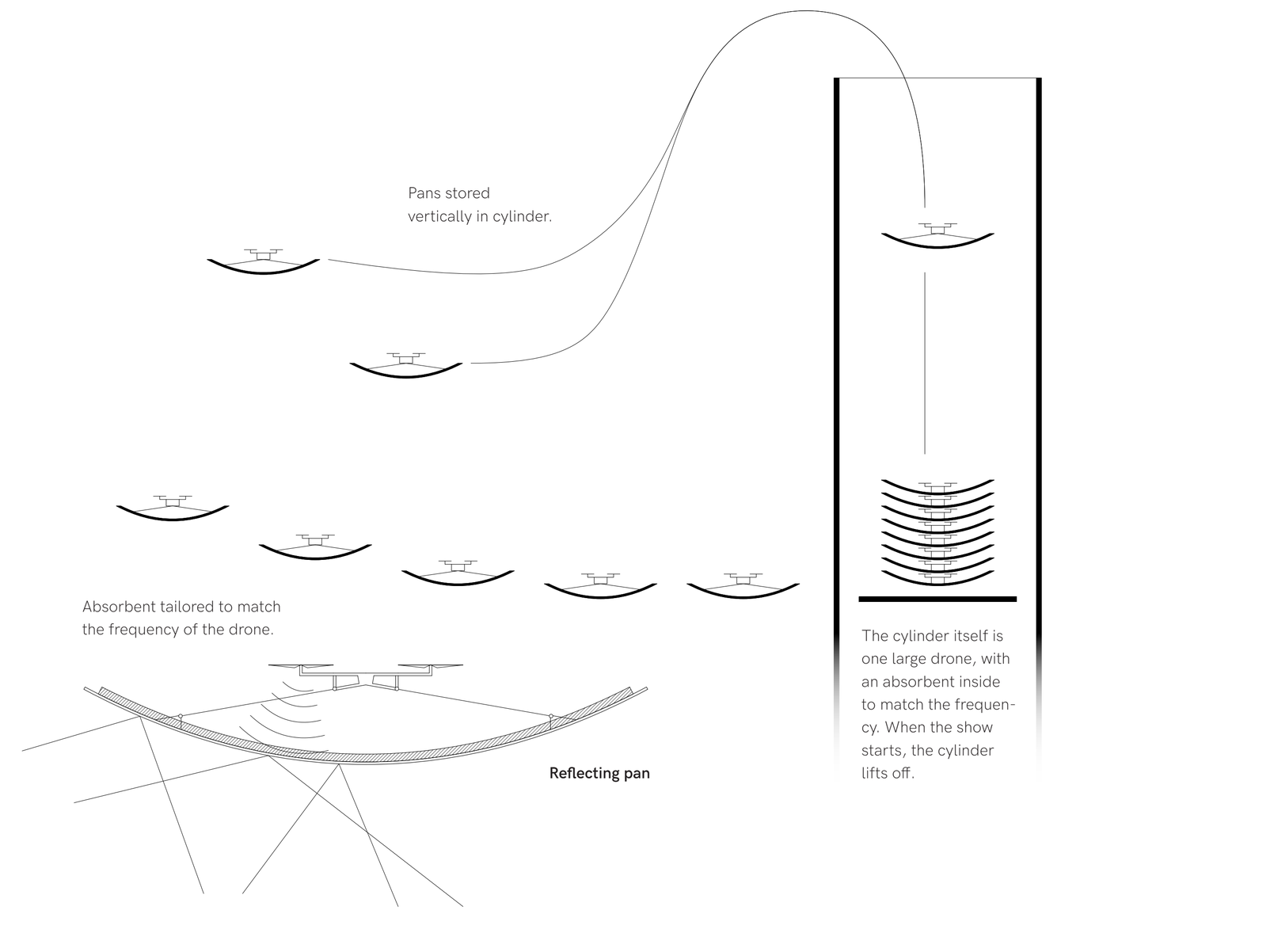
Reflective/absorption pans

Reflective or absorbing elements with double curvature to diffuse the sound. Each pan respectively carried to any given position by a drone. This provides unparalleled flexibility in finetuning the acoustics.

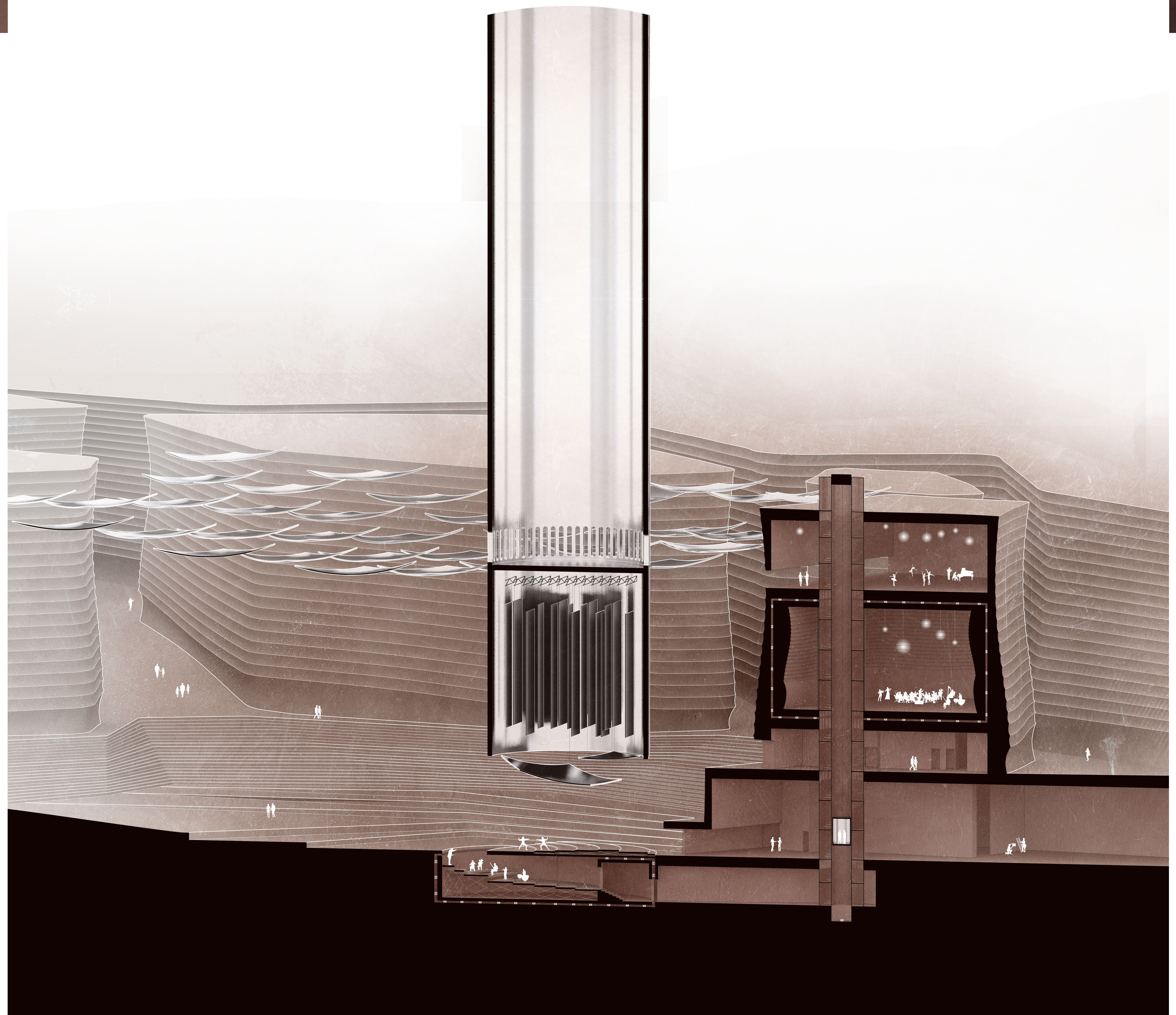
The upper part of the pan, facing the drone, contains absorbers for the specified frequency of the drone. Additionally, the pans act as a roof over the concert hall.

Helmholz resonators

The curvature of the canyon walls implies different volumes for the Helmholz resonators, corresponding to absorption of a desired set of frequencies. Cast in massive concrete to store heat during the day and release it during the chill desert night.

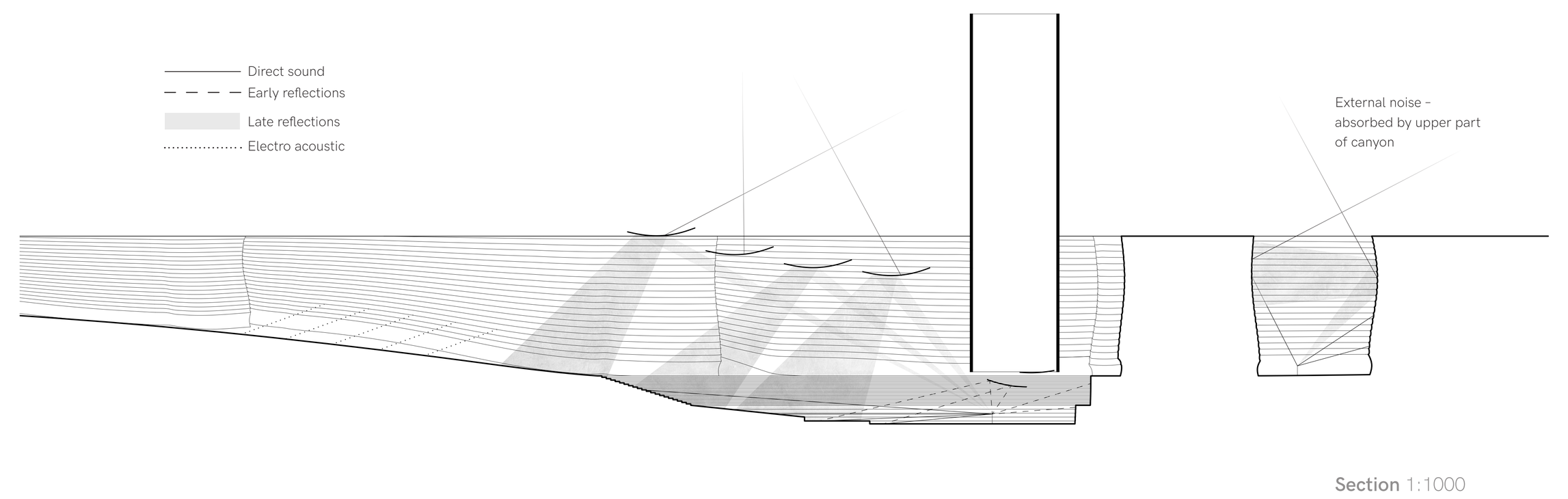


Detail pans 1:500/1:100



Man-made meets nature - A rich concert experience

Like water flows, the audience seeps into the arena. Starry sky, people parking in the endless dessert. Light protruding towards the sky. The pans swarm out, the cylinder lift off and the show begins. Setting the tone for a magical evening.



Section 1:1000

Gershwin mode

Symphonic orchestra

Since ancient times, people have gathered in a circle around the fire to enjoy music. «Eroded by Sound» aims at creating the same sensation of intimacy, intensity and origin.

Tosca mode

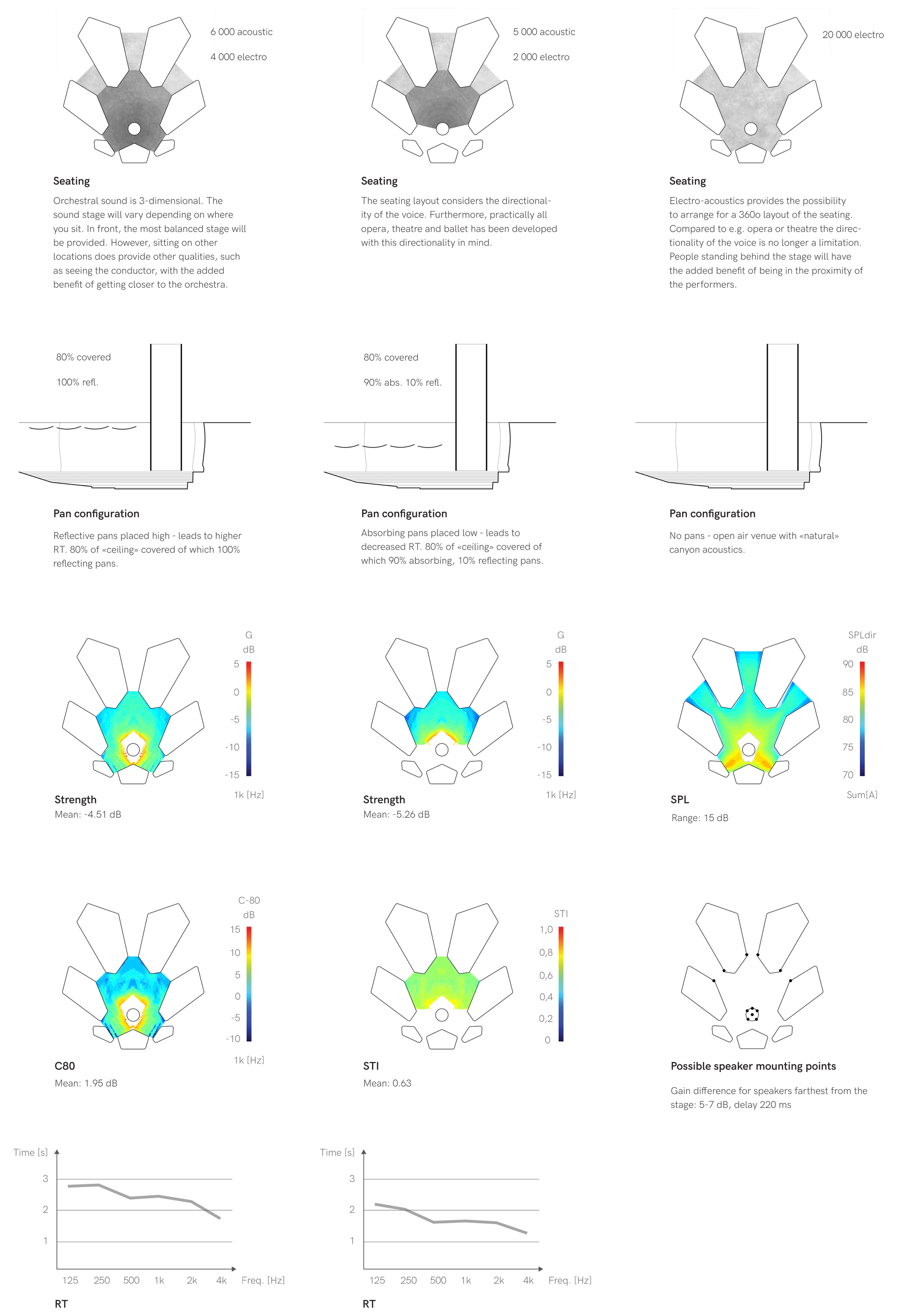
Opera, ballet, theatre, chamber music and broadway

A contemporary take on opera. The dramatic plays will find a new home in this spectacular landscape and the popular appeal will reminisce that of Verona.

Gaga mode

Rock and jazz

Imagine, crowding densely under a magically starry sky to enjoy a truly epic concert with Lady Gaga. A central stage makes it possible to be as close as possible to the performing star.



Electro acoustic seating

The geometry of the «islands» decouples the electro acoustic seating from the naturally acoustic zone. Multiple small loudspeakers allow for electro acoustic precision and refinement.

Concert hall

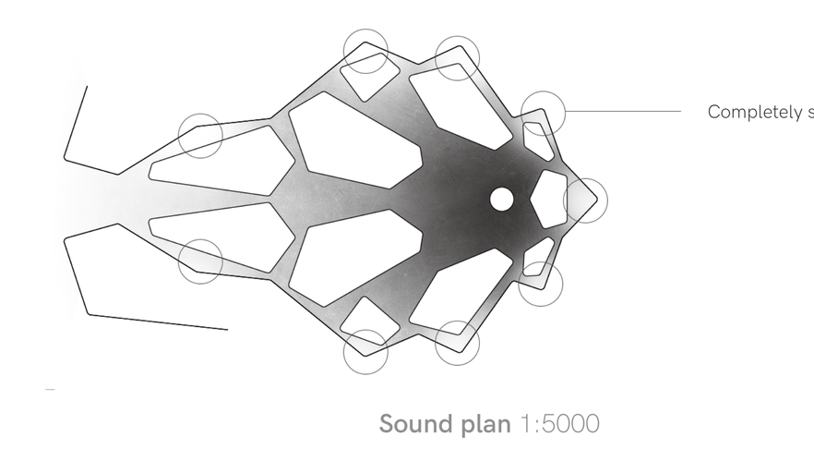
Pans, literally flying above the hall, handle late reflections and absorption. The fact that each pan is completely independent from any other structure provides flexibility and therefore a possibility to fine-tune the acoustic properties to any given situation.

Canyon

The Helmholz resonators in the lower parts of the canyon walls have been optimized to absorb the higher frequencies created by the audience when conversing or walking. Additionally, the resonators of the upper section are calibrated to frequencies corresponding to background noise (the river, the road and the sky above).

Controlled sound leakage

Within the canyon system, sound partially leaking out is embraced as audial guidance. Paired with the geometry of the canyons, with light just around the next corner leading from one space to the next, the visitor can easily orient himself/herself in relation to the actual concert hall.



Sound plan 1:5000

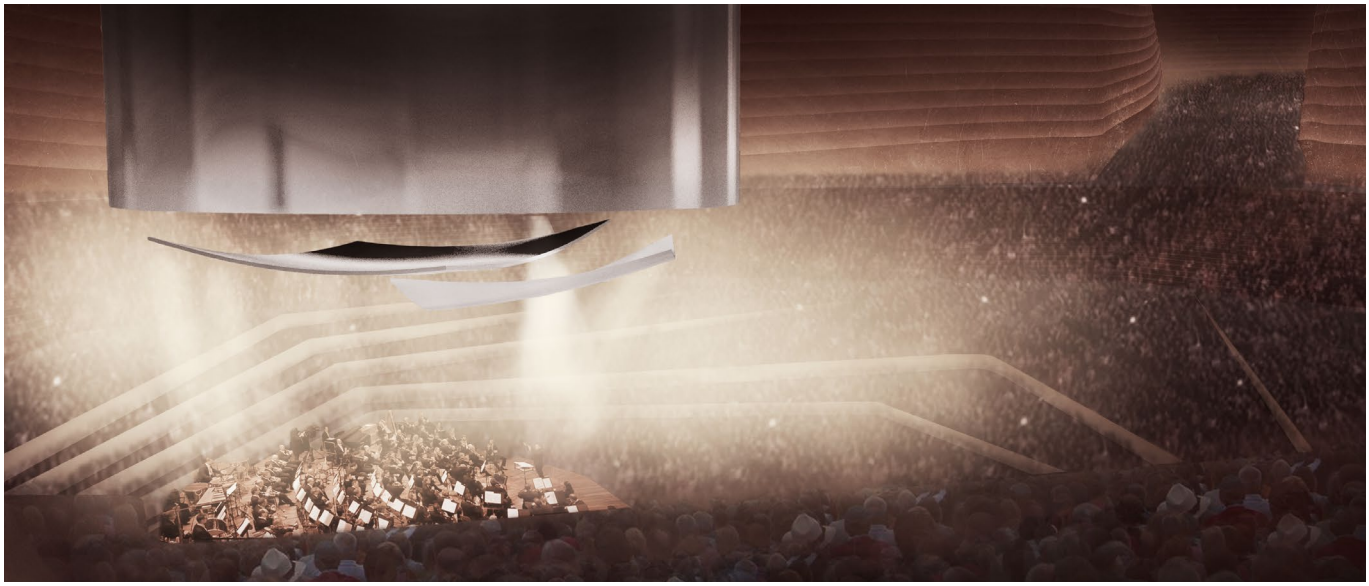
Right An evening at the opera

Multipurpose outdoor concert venue with superior acoustical qualities and background noise control. A Newman Student Design competition proposal.

Eroded by sound

In the barren desert of southern Oregon, there is a concert hall like no other. Like water flows, the audience seeps into the arena. Starry sky, people parking in the endless dessert. Light protruding towards the sky. The pans swarm out, the cylinder lift off and the show begins. In a grand concert canyon, people gather around a stage in the same way one would around a fire. Setting the tone for a magical evening. As ancient as nature itself is the need to gather like this and collect memorable, magical, experiences. In this concert hall, man meets nature.

Sixth semester, Bachelor, Spring 2020
In collaboration with Martin Skarby
Morten Lund as examiner, Peter Christiansen as supervisor & Martha Tsigkari as critic.
Rhino, Grasshopper & Photoshop.

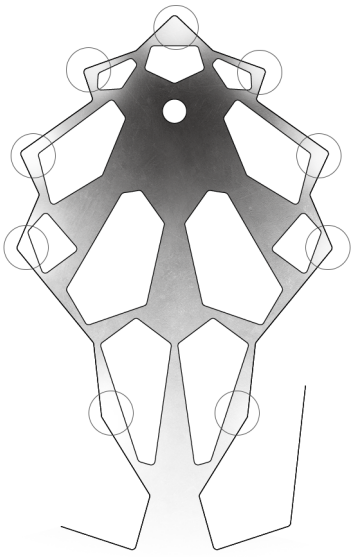


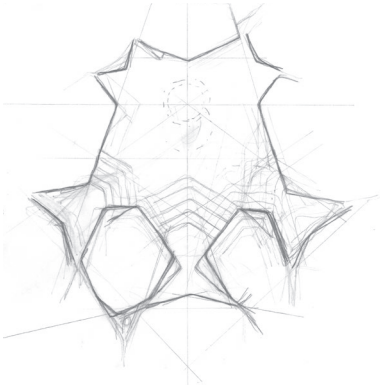
Concert hall
A night with the festival symphony orchestra

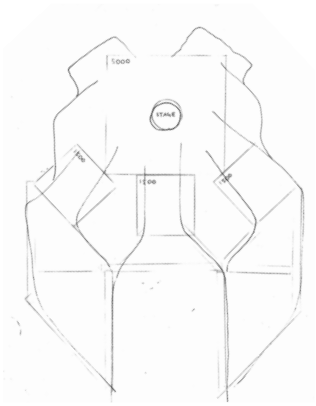
«Architecture is about directing the senses. As the first collaborative workflow, this opened my view towards acoustics and the listening sensation. Shaping rooms not only with acoustics in mind but by acoustics.

An empiric way of moving forward in constant discussion with the Sound and Vibration student involved. Not seeing the room with different eyes but instead start to listen. A collaboration making me eager to discover.»

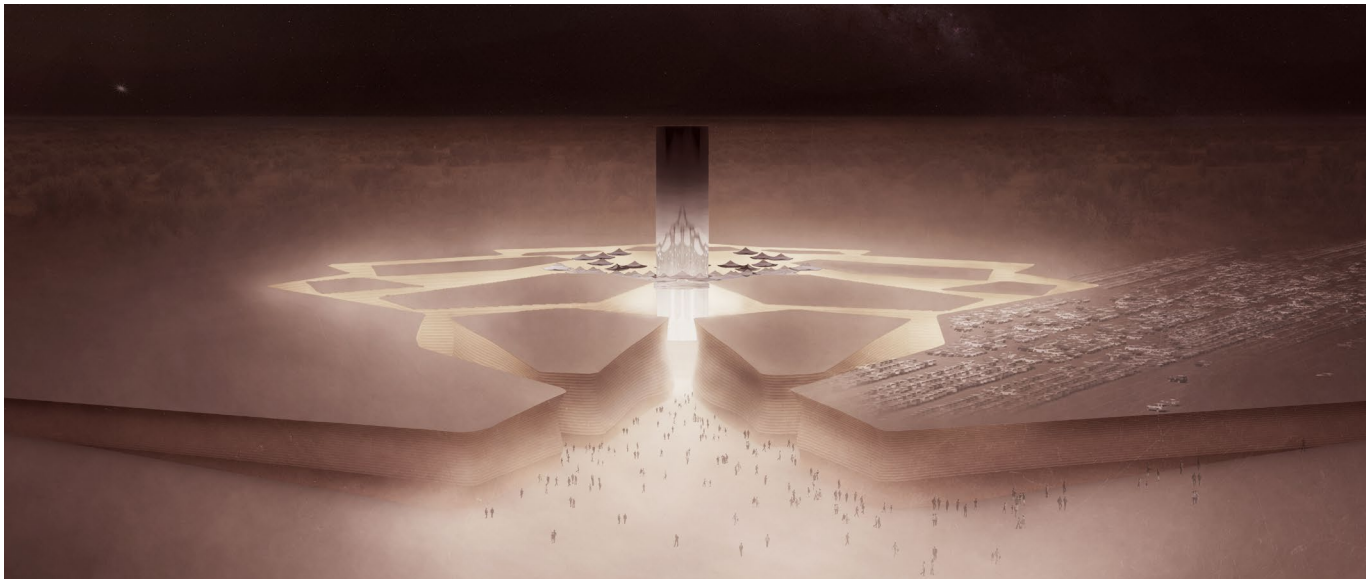
Reflection on working in acoustic collaboration



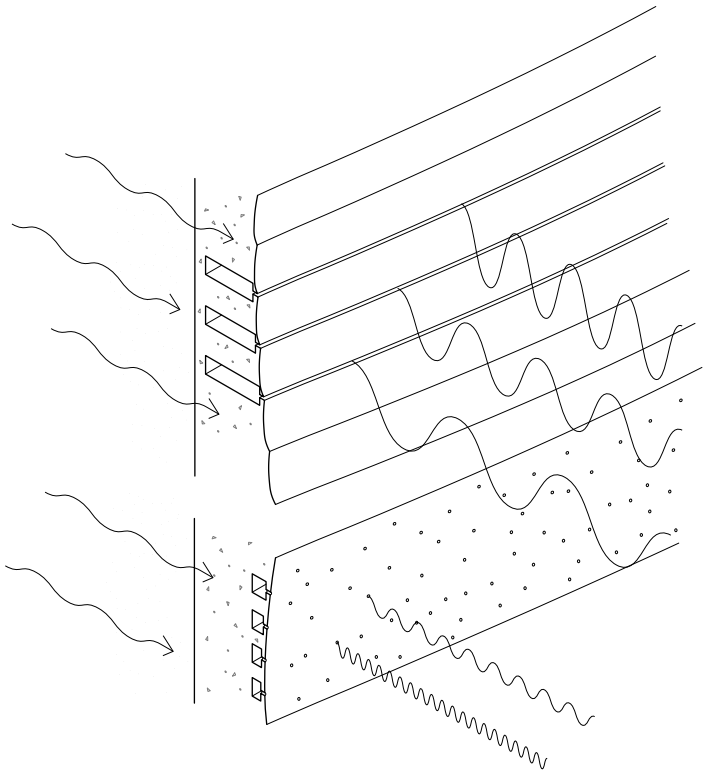




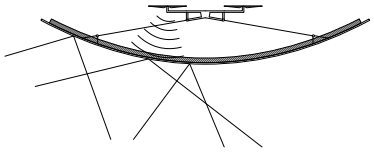
Soundplan
Development of the plan distinguished by the varying sound zones. Quite corners for mingling.
1:5000



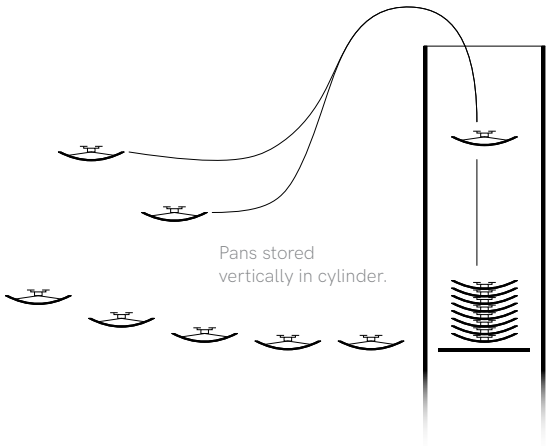
Overview
A grand entrance – full of expectation



Thermal mass –
concrete stores heat during the day and emits during the cool desert night.

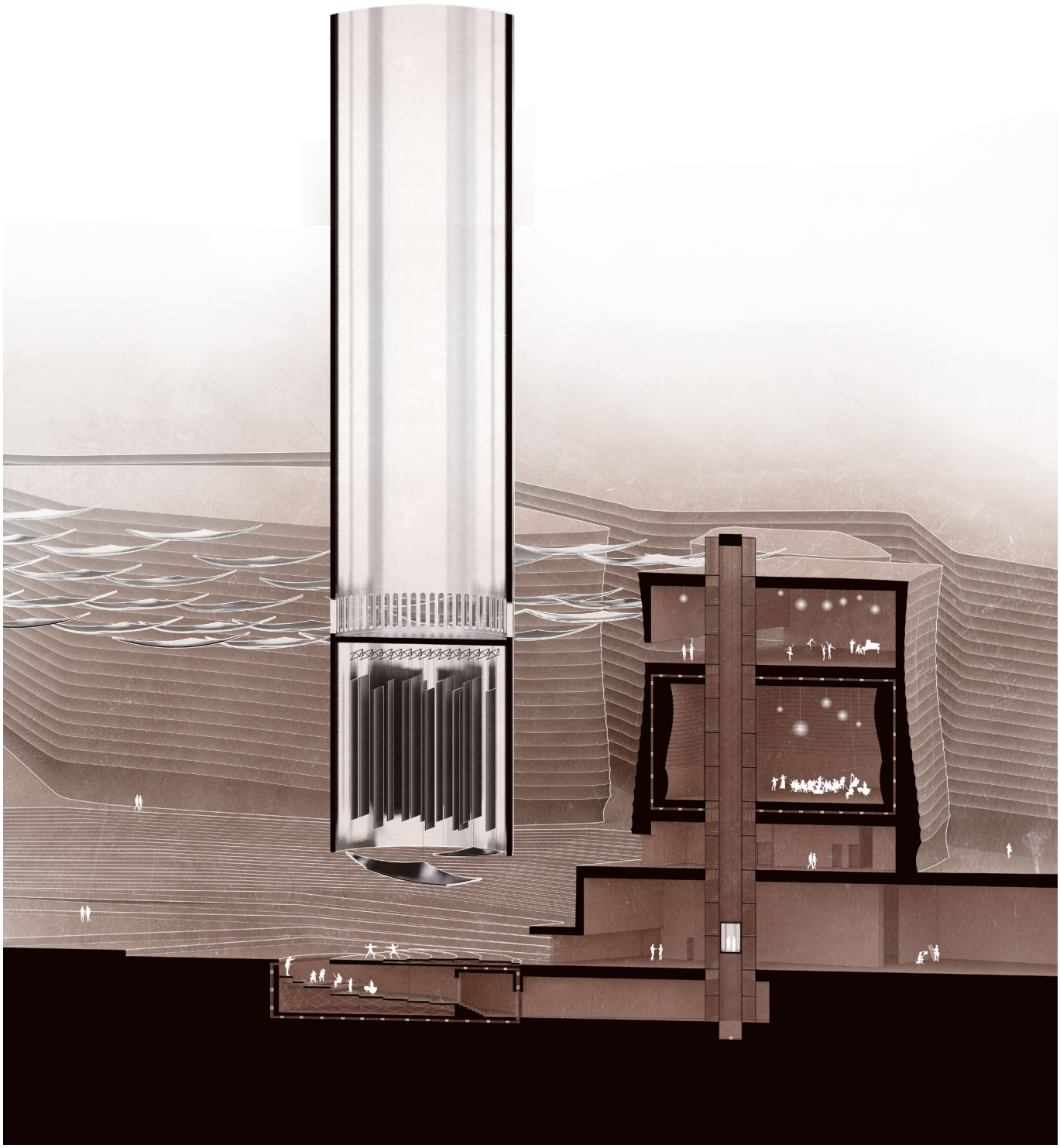


Absorbent tailored to match the frequency of the drone.



The cylinder itself is one large drone, with an absorbent inside to match the frequency. When the show starts, the cylinder lifts off.

Acoustic concepts
Constant Helmholz resonators in symbiosis with volatile flying pans to finetune the acoustics.
1:100 ⁄ 1:500



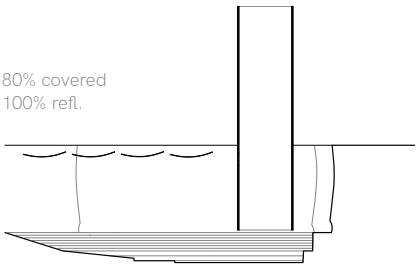
Axonometric view
The logistics in the context of a canyon.
Rehearsing, performing and strolling.
1:500

Gershwin mode

Symphonic orchestra

Since ancient times, people have gathered in a circle around the fire to enjoy music. «Eroded by Sound» aims at creating the same sensation of intimacy, intensity and origin. Orchestral sound is 3-dimensional. The sound stage will vary depending on where you sit. In front, the most balanced stage will be provided. However, sitting on other locations does provide other qualities, such as seeing the conductor.

Pan configuration

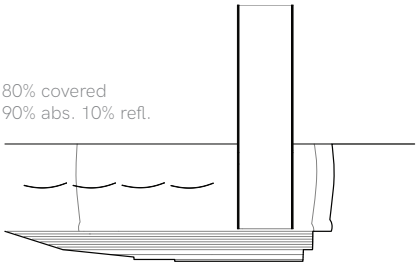


Tosca mode

Opera, ballet, theatre,
chamber music and broadway

A contemporary take on opera. The dramatic plays will find a new home in this spectacular landscape and the popular appeal will reminisce that of Verona. The seating layout considers the directionality of the voice. Furthermore, practically all opera, theatre and ballet has been developed with this directionality in mind.

Pan configuration

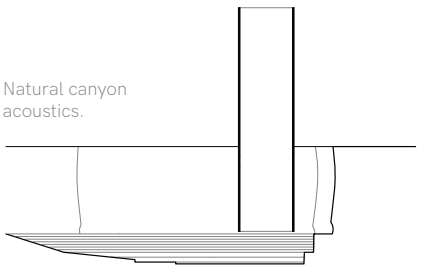


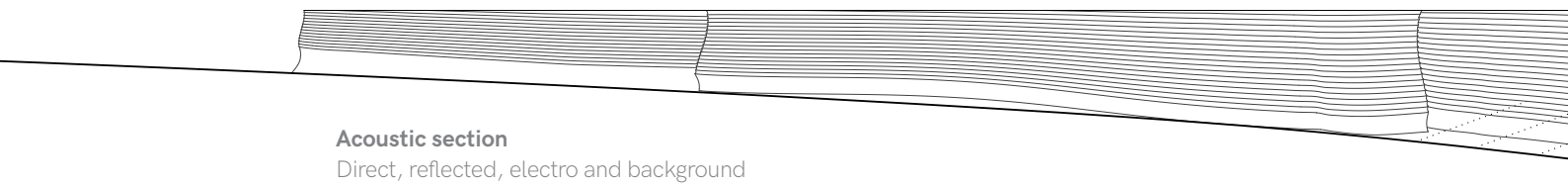
Gaga mode

Rock and jazz

Imagine, crowding densely under a magically starry sky to enjoy a truly epic concert with Lady Gaga. A central stage makes it possible to be as close as possible to the performing star. Electro-acoustics provides the possibility to arrange for a 360o layout of the seating. Compared to e.g. opera or theatre the directionality of the voice is no longer a limitation.

Pan configuration



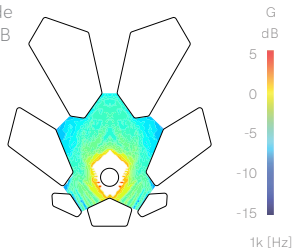


Acoustic section

Direct, reflected, electro and background sound, in concert hall and canyon.
1:1000

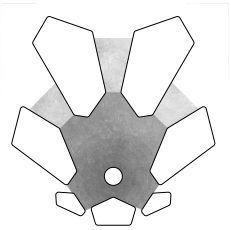
Strength

Gershwin mode
Mean: -4.51 dB



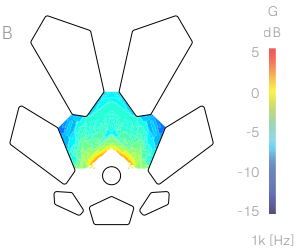
Seating

Gershwin mode
6 000 acoustic
4 000 electro



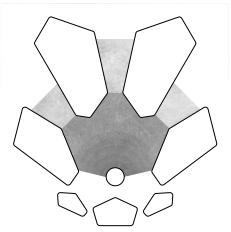
Strength

Tosca mode
Mean: -5.26 dB



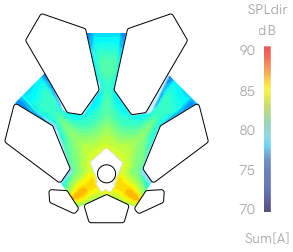
Seating

Tosca mode
5 000 acoustic
2 000 electro



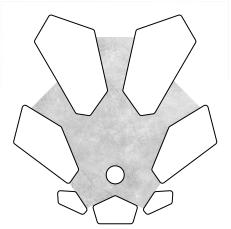
SPL

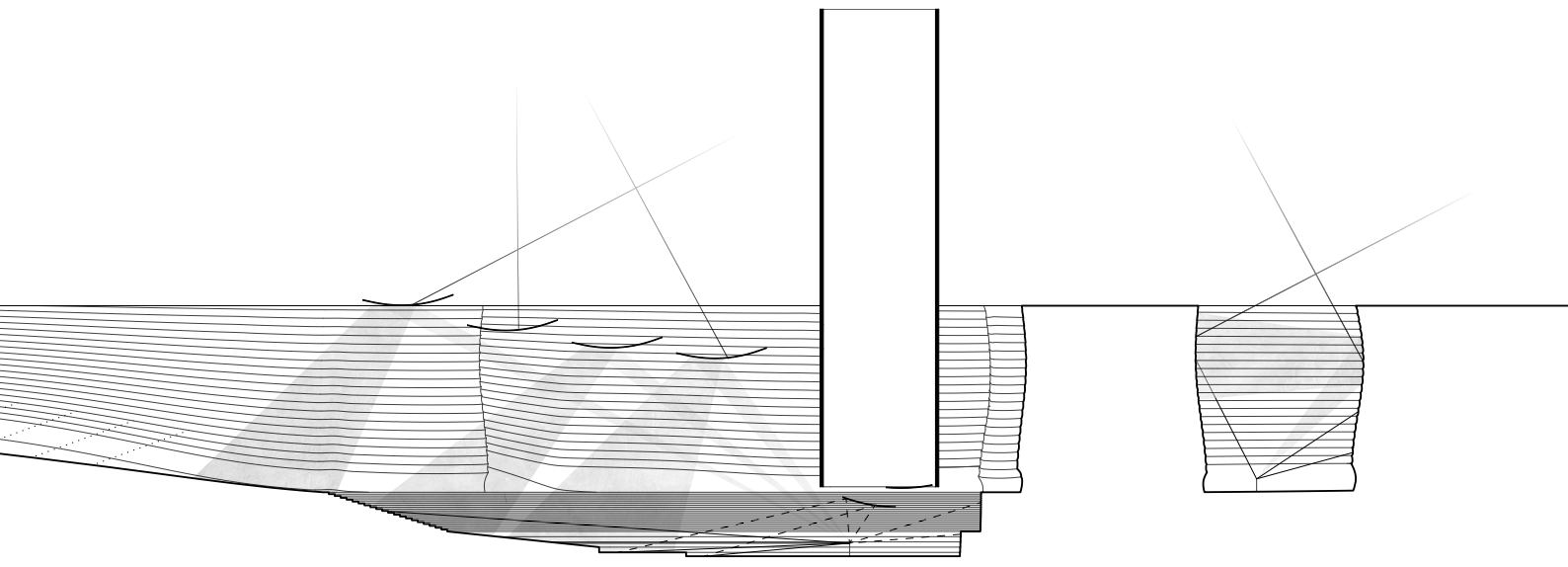
Gaga mode
Range: 15 dB



Seating

Gaga mode
20 000 electro





Process ／ Becoming iconic

Making an iconic move leaving the conventional territory can be both uncertain and exciting. Reflectors suspended under drones could not be left out, an idea that instantly put a smile on my face. The balance between the mind-boggling wow-factor and the true esoteric experience must be weighted carefully.
A competition proposal, like this project, need some visionary or perhaps insane ideas to stand out. Those features should always enhance the total perception of the project, making it shine.

Reflection ／ One moment at a time

A true out of the world experience, like Burning Man on steroids. The experience of a great event will consist of brief moments in sequence which we as architects have formed. When focusing on the natural climax, the other parts often get lost. The canyon for example, has potential to play a central role in this sequence. Protect people from the arid dessert, why not optimized to protect from sun and radiate high reverberant sound.
A promise of where you are heading. A holistic experience in many brief moments.