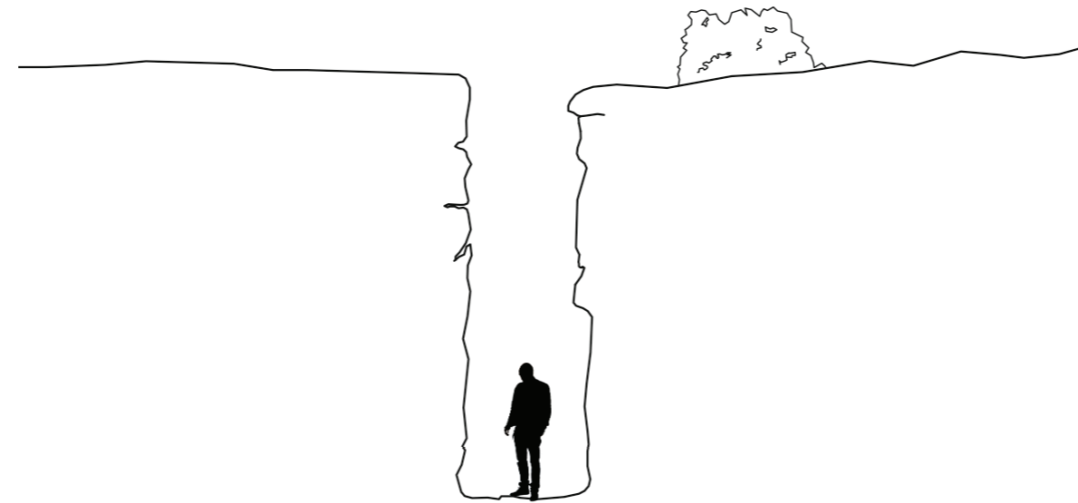
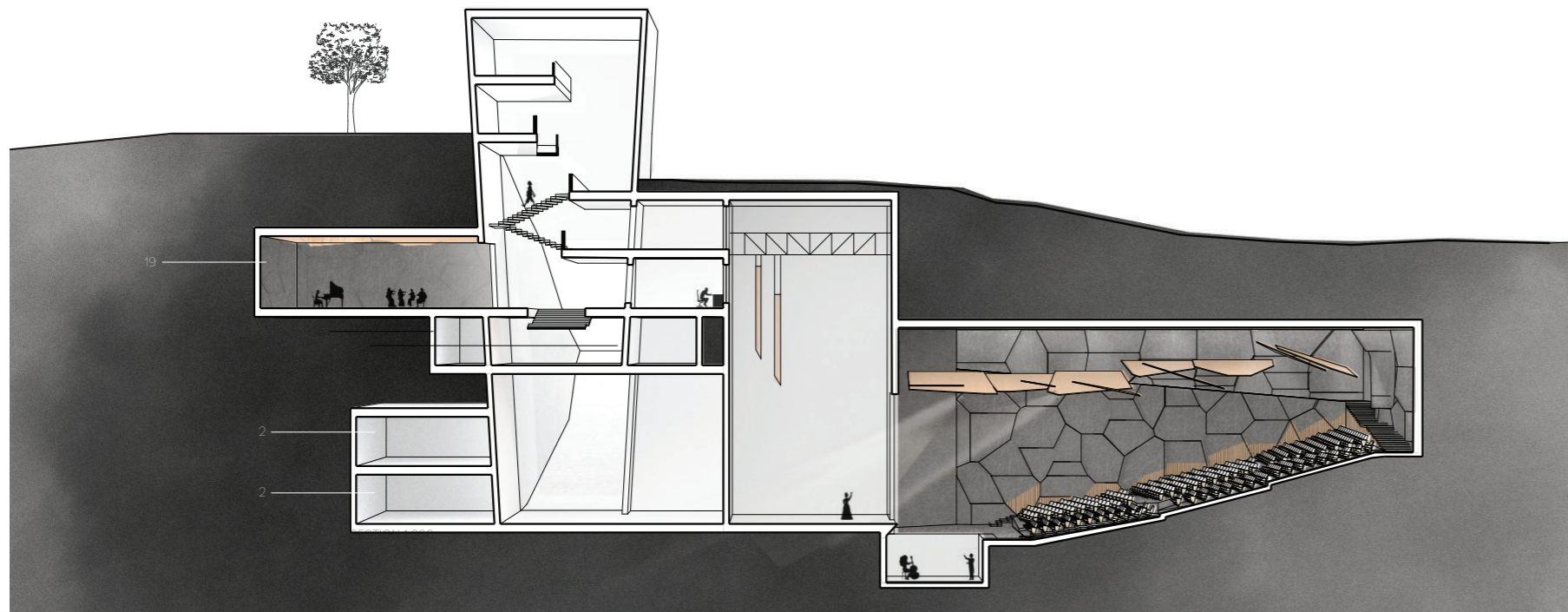


# PORTFOLIO

*THE WEDGE*

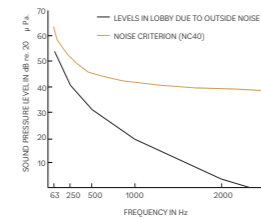
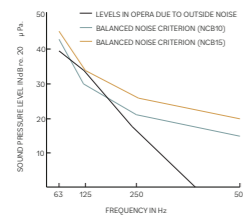




## NOISE AND VIBRATION CONTROL

Due to heavy coverage of soil above the auditorium there is no need for a room within a room construction. The 5 m of soil dampens the outside noise of airplanes and cars completely in the 2 and 4 kHz range but for the very low frequencies the reduction in sound pressure levels is slimmer.

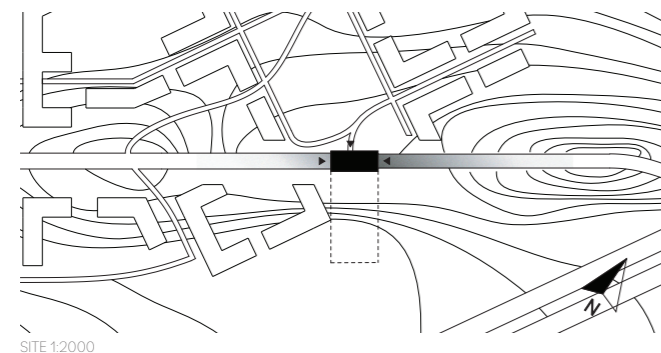
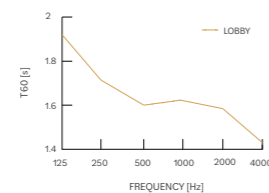
For that reason, dense concrete is chosen as material for the roof of the auditorium. With a thickness of 50 cm the critical frequency is below the lowest frequency of interest, in this case 63 Hz, causing decent dampening in all the frequencies above.



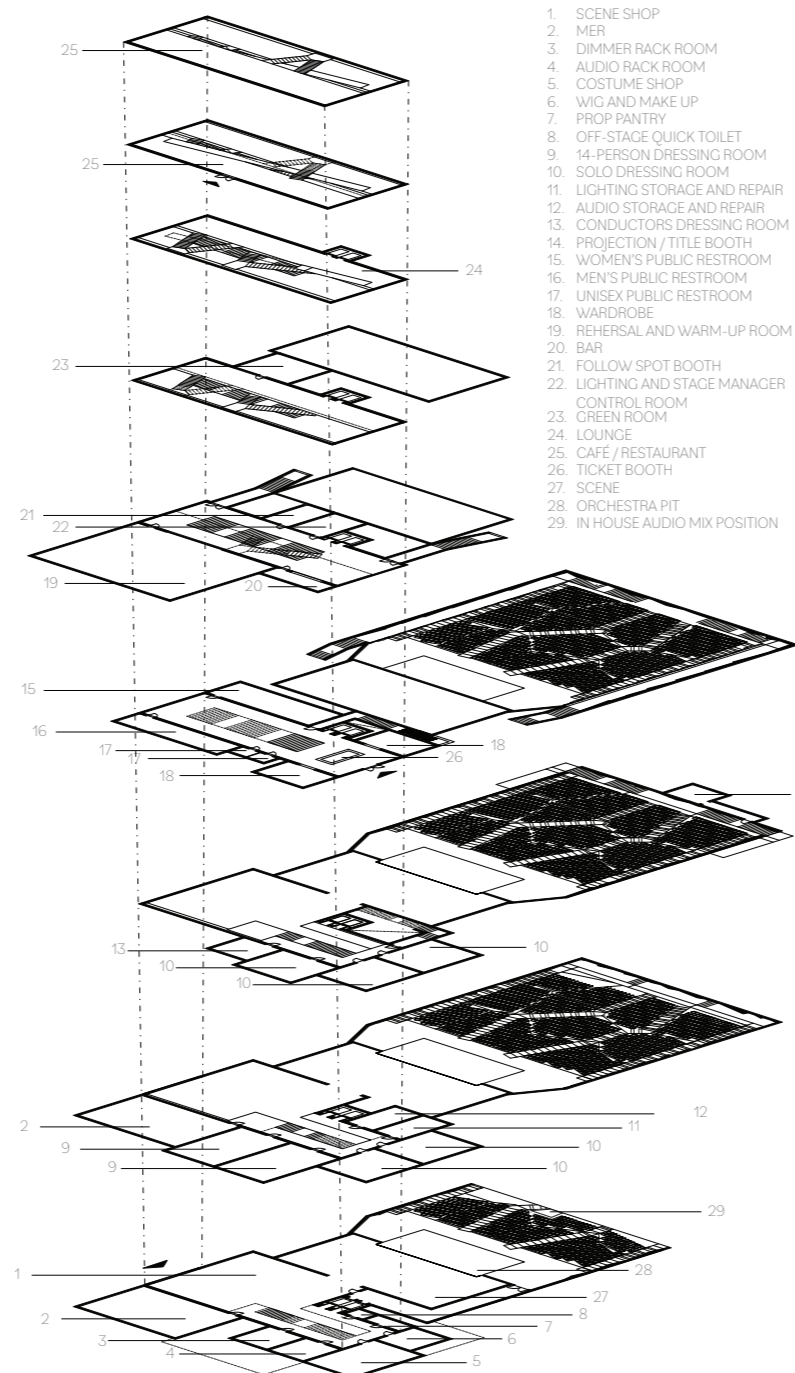
## LOBBY

Inside the lobby we will make use of Helmholtz resonators to take care of lower frequencies. The resonators will have the back covered by glass to let light shine through from behind it. They will be placed on the ceiling on each level.

The reverberation time will be of a satisfying level for a lobby with an T60 value between 1.4 to 1.9 seconds, depending on the frequency.



SITE 1:2000



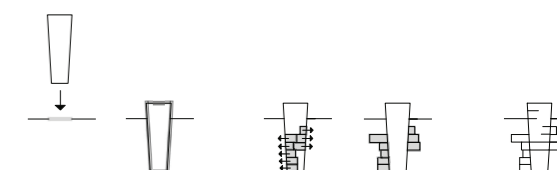
1. SCENE SHOP
2. MER
3. DIMMER RACK ROOM
4. AUDIO RACK ROOM
5. COSTUME SHOP
6. WIG AND MAKE UP
7. PROP PANTRY
8. OFF-STAGE QUICK TOILET
9. 14-PERSON DRESSING ROOM
10. SOLO DRESSING ROOM
11. LIGHTING STORAGE AND REPAIR
12. AUDIO STORAGE AND REPAIR
13. CONDUCTOR'S DRESSING ROOM
14. PROJECTION / TITLE BOOTH
15. WOMEN'S PUBLIC RESTROOM
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26. TICKET BOOTH
27. SCENE
28. ORCHESTRA PIT
29. IN HOUSE AUDIO MIX POSITION



## CONCEPT

Wedging into the ground is the gate to an outstanding musical experience called The Wedge. The opera house is accessed through a gully, exposing both gables of the Wedge to the campus.

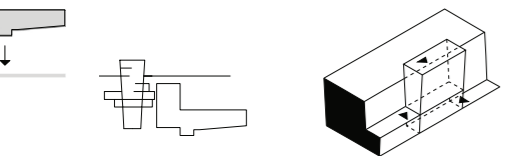
By placing it in the ground, it is possible to move rooms outwards in order to achieve a more accessible architecture. The





doors are then used as means to access the rooms and as a way to experience the building, moving from floor to floor in the wedge.

The project has the objective to optimize the prerequisites for the opera hall. By placing it underground, the noise and vibration from the highway and the airport are significantly reduced.



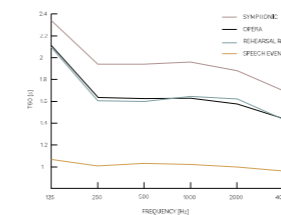
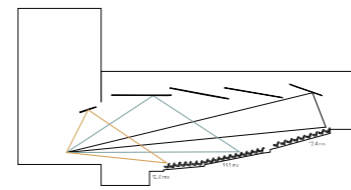
## THE OPERA HALL

The walls, the raisable ceiling and the seating are all divided into irregular blocks that have a seemingly random angle to mimic a natural rock formation. The hall has some wooden details, but otherwise the materials are mainly stone. All of this is to remind the audience that they are in fact underground.

### REVERBERATION TIME

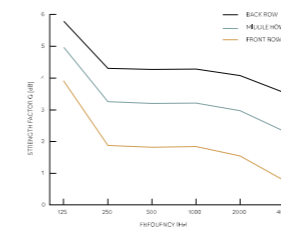
We have good control over reverberation time by using our variable functions to change the volume or the surfaces on the walls. Our T60-value is around 2 seconds when hosting a

concert, 1.6 when hosting an opera and around 1 second when there is a talking event which is very close to optimal values.



### STRENGTH

For concert performances an optimum range 3-6 G is achieved with the lower values further back in the audience area. For opera, the strength is also in the optimal range of 2 to 4,5 G. An important observation is that the strength is slightly higher at 125 Hz which is a property usually found in better ranked operas.



### STAGE

The stage has a proscenium that will aid the sound absorption. The stage can be further enclosed by a portable orchestra shell. Directly behind the stage is the scene shop which can be easily accessible by a loading truck.

### ORCHESTRA PIT

The Orchestra pit is designed for 70 people, but it can be adapted for smaller sizes by raising smaller sections of the pit. The whole pit can be raised to stage level.

### SEATING

The audience seats and the audience both have the same level of absorption because of the upholstered seats, which will keep the reverberation time at the same level regardless of the number of people in the audience. The seating capacity is 1080 for orchestra performances and 1200 for speaking events.

### REHEARSAL ROOM

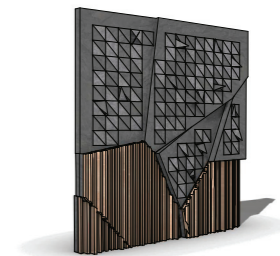
The rehearsal room is covered by the same panels that are being used for the walls in the opera hall. By having variable acoustics in the rehearsal room we can maintain a reverberation time that are very close to the opera hall. The capacity for the room is a full orchestra plus singers.

## VARIABLE ACOUSTICS

The hall is acoustically adaptable, able to host opera as well as concert performances and social events.

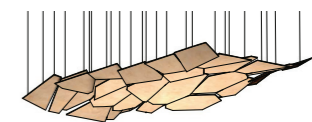
### WALL

The walls will be covered by scattering laths at audience level to give a more pleasant sound (they are designed for 300-3000 Hz). The irregularities of the walls will also contribute to a more diffuse sound. Above the diffusers the walls will be partly covered by triangular modules that can be rotated 180 degrees to change between a reflective or absorbing material.



### ROOF

The opera hall will feature an adjustable roof that can be raised or lowered in order to adjust the volume of the room to adjust reverberation time. The roof will also be adjusted to give a low ITDC (provide early reflections to the center audience).

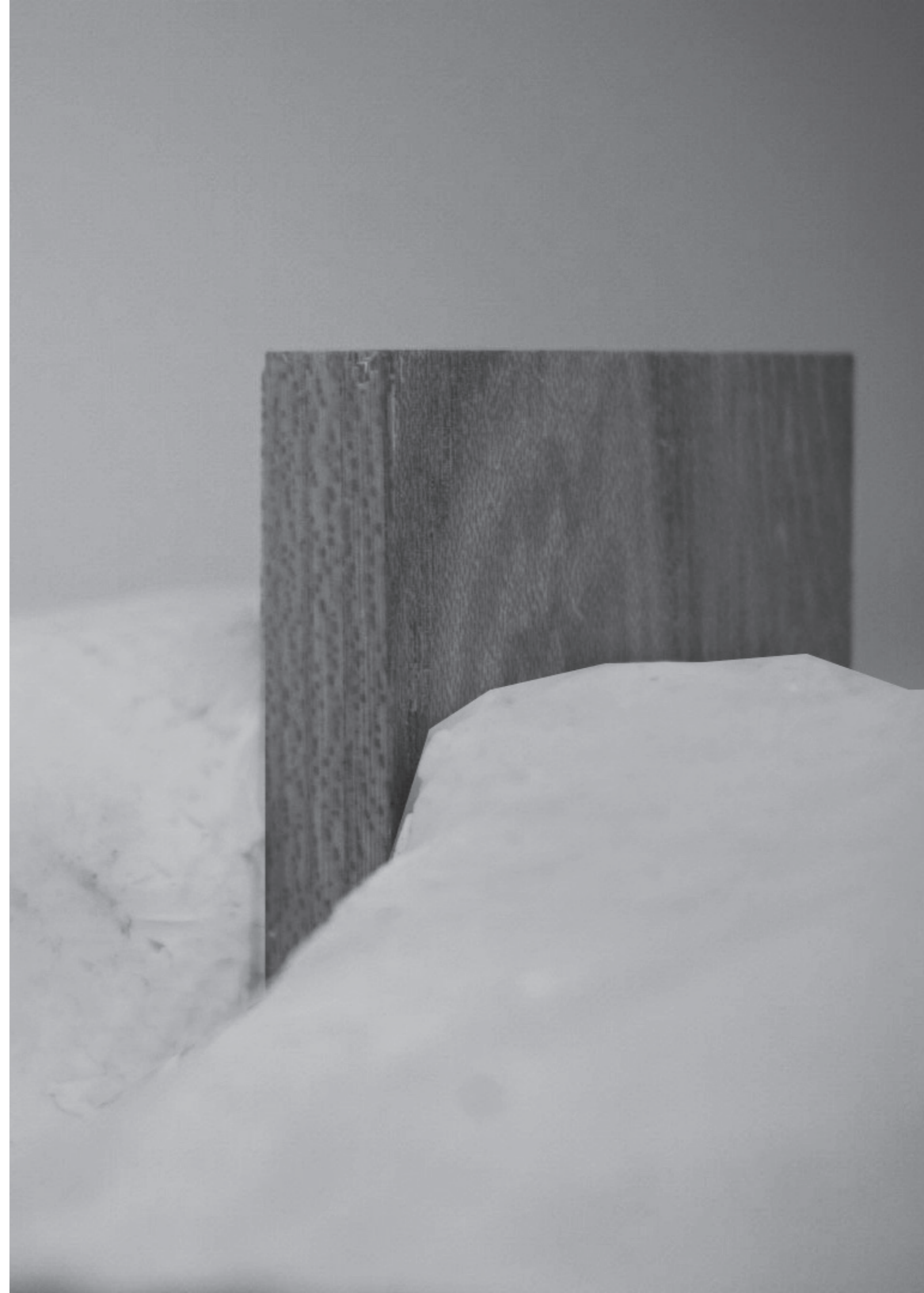
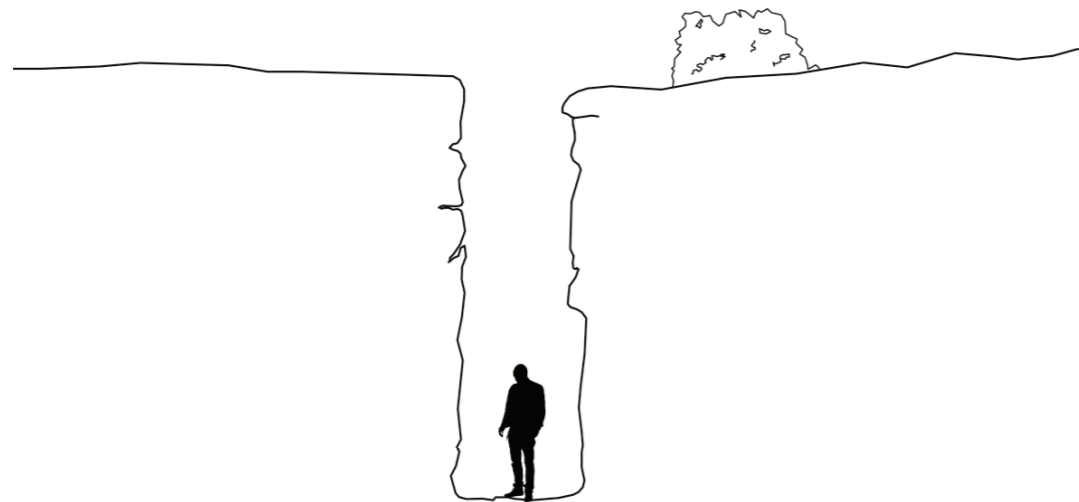


## TIDIG INSPIRATION

Processen började med att leta sektioner i naturen. En av sektionerna var en spricka/klyfta i marken som delade upp landskapet i två. Från denna föddes idén att kila ner en byggnad som skulle fungera som kommunikation för de rum som var inskjutna i berget. Själva operahallen skulle vara begravd under marken.

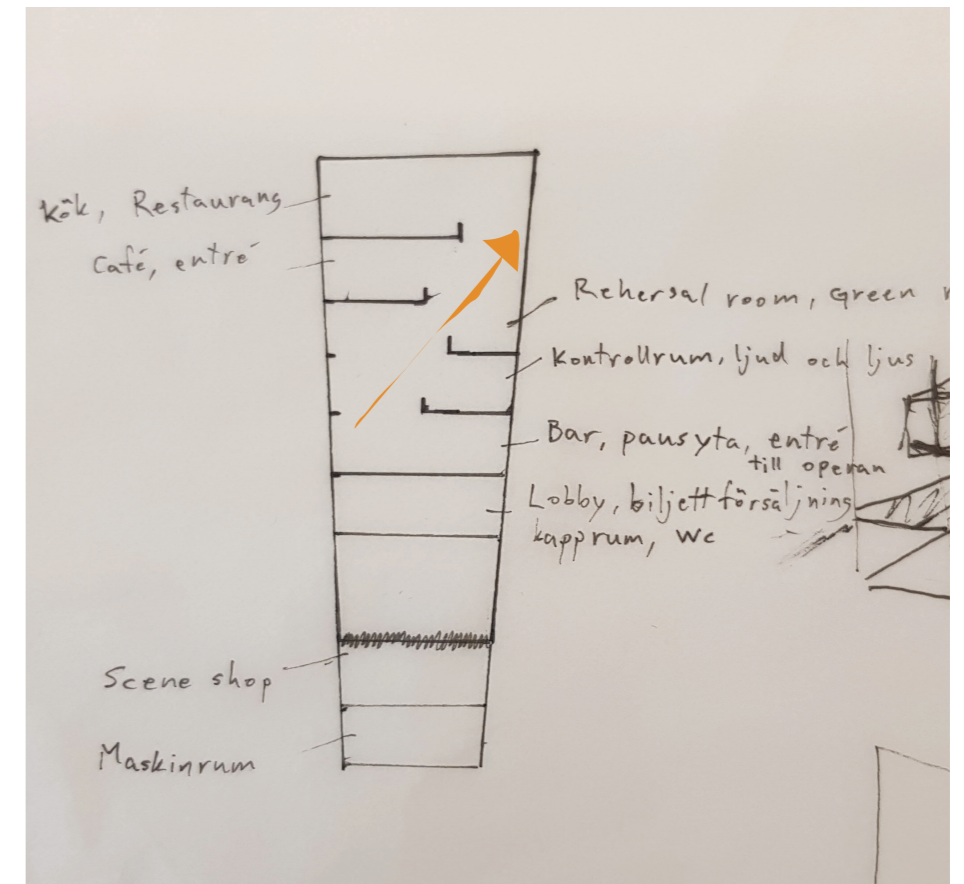
**Till höger** Arbetsmodell av lera och trä som illustrerar The Wedge nerkilad i berget.

**Nedanför** Sektion som visar sprickan i berget.

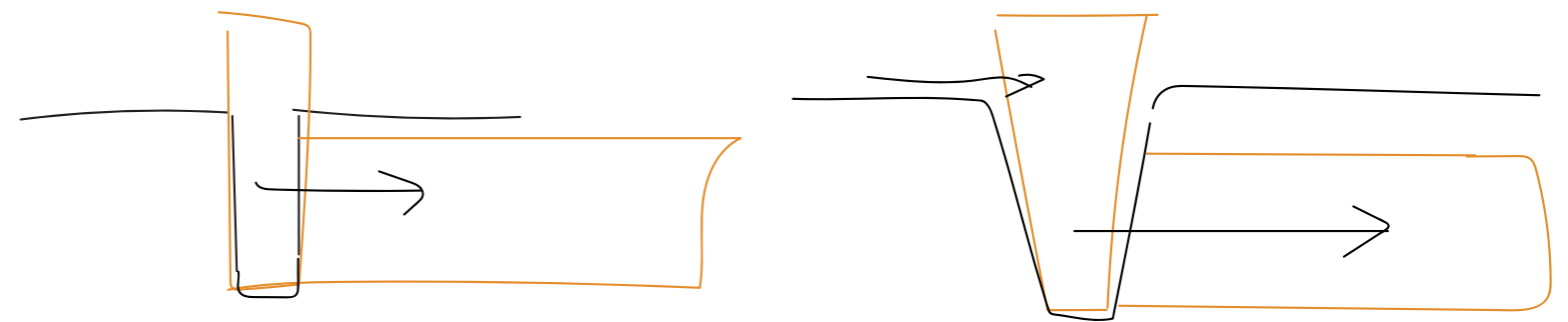


## DESIGN PROCESS

Design processen utgick från tre olika förslag som härstammade från tre olika landskapssektioner liksom den på föregående sida. Dessa sektioner presenterades tillsammans med en film tillhörande respektive sektion. Bilden nedan är en stillbild tagen från filmen tillhörande sektionen på föregående sida.

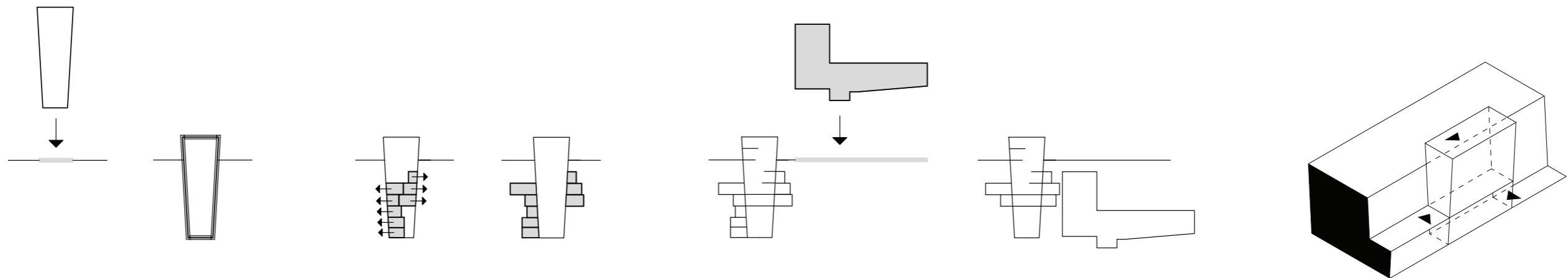
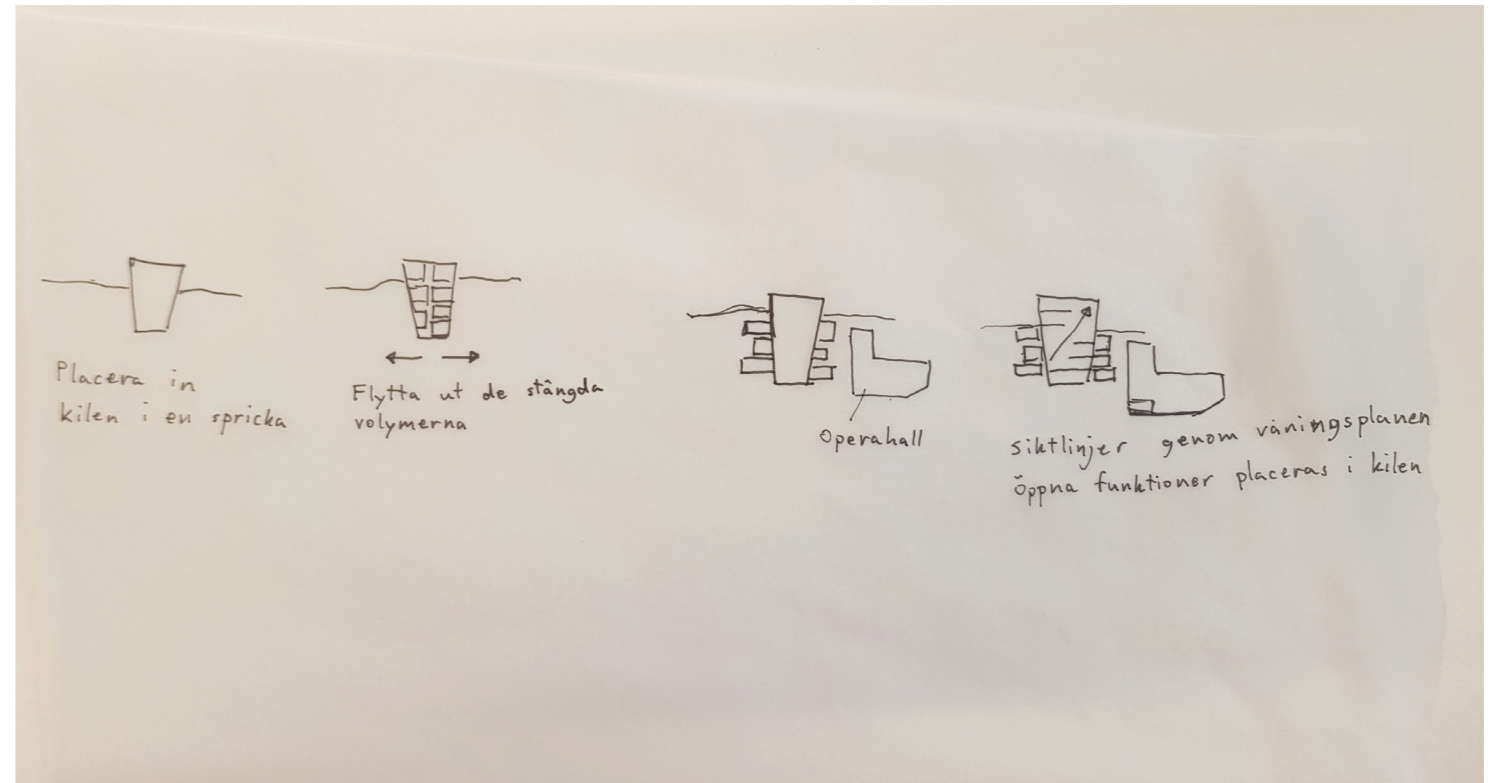


The Wedge utvecklades vidare genom att efterlikna formen av en kil. Idén grundades i att förstärka upplevelsen av att byggnaden var nerkilad. För att förstärka upplevelsen skapades siktlinjer genom kilen så att hela byggnaden kunde upplevas från lobbyn (se bild längst upp till höger).



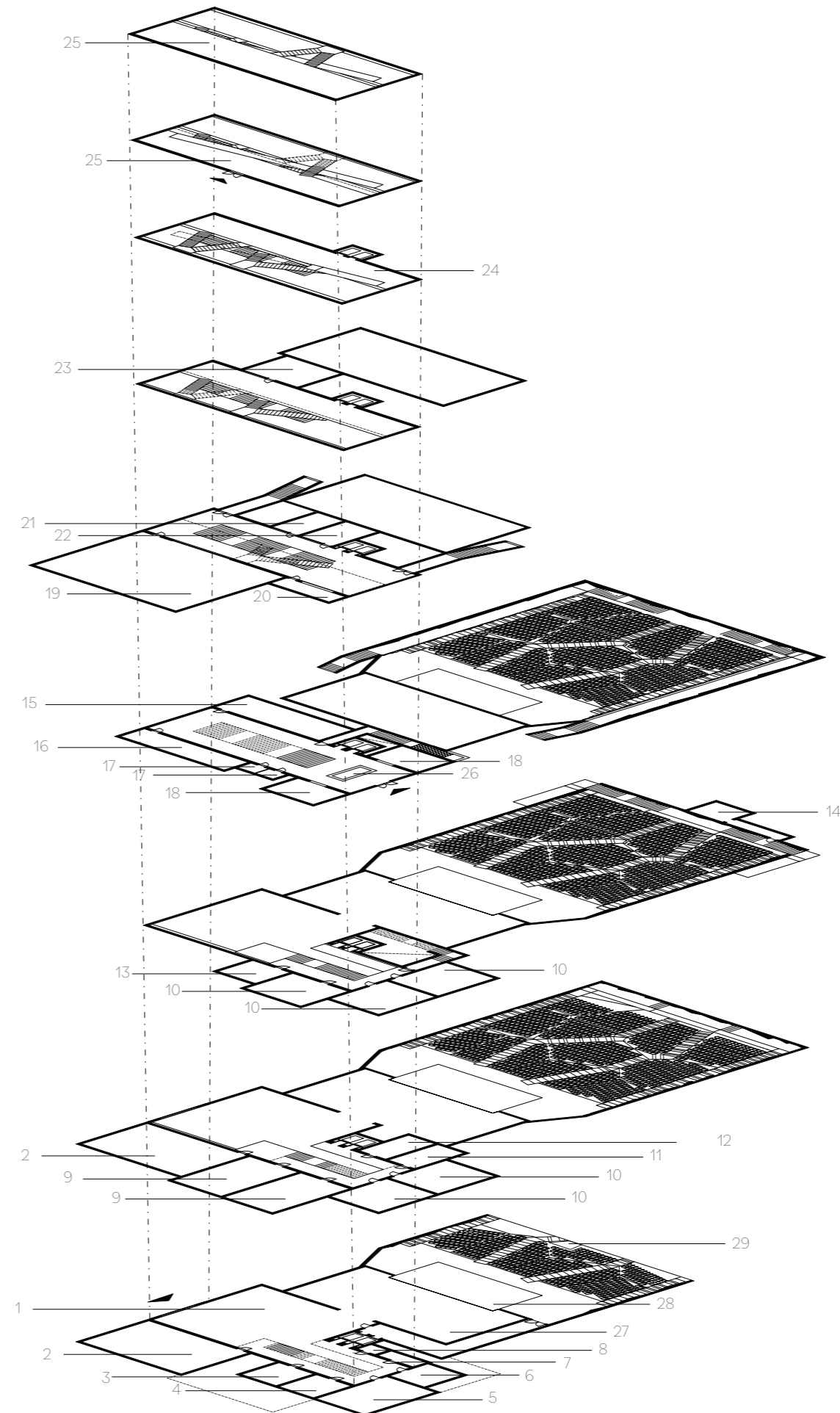
# KONCEPT

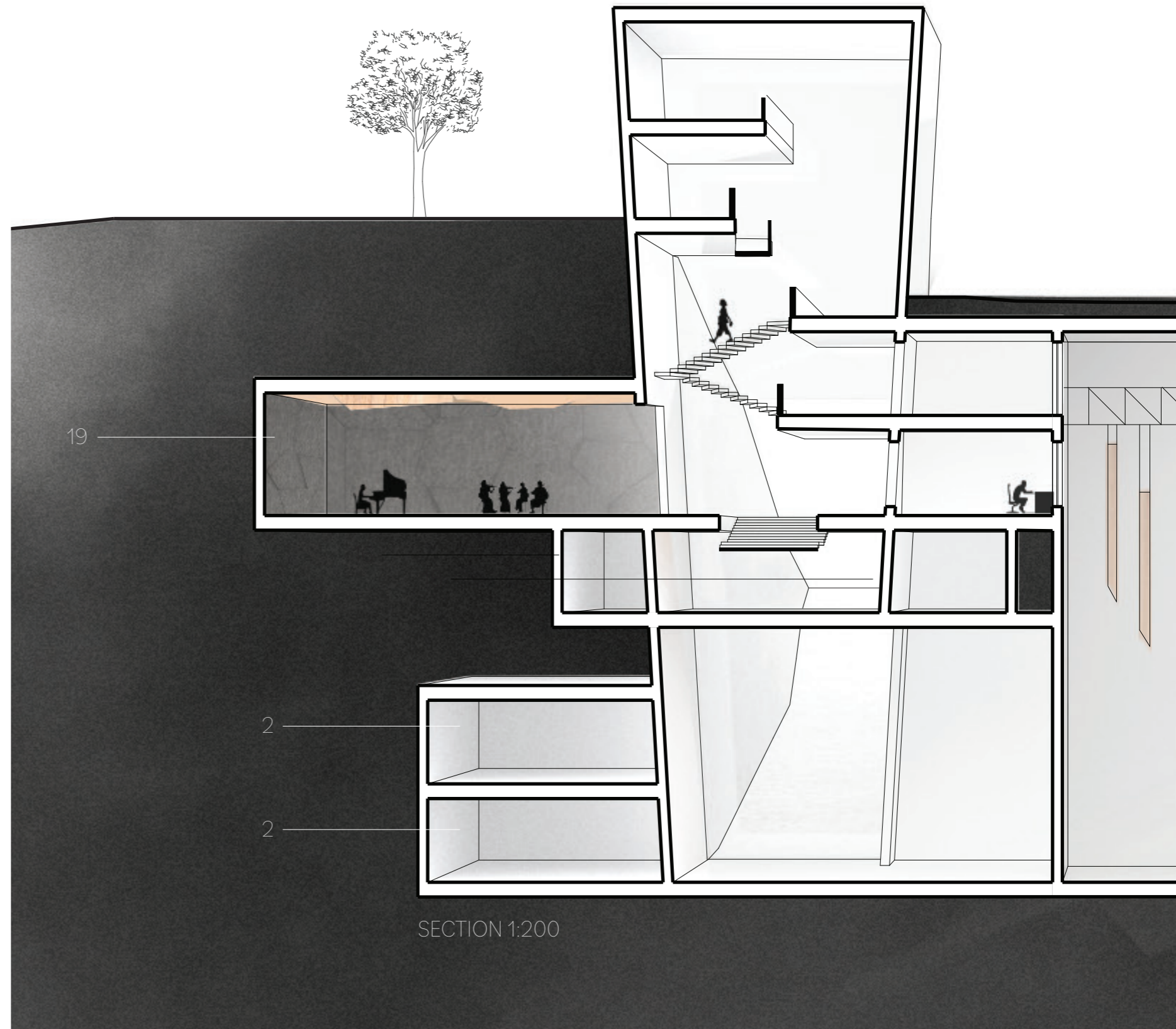
Konceptet bygger på att gräva ner och samtidigt öppna upp. De rum som inte behöver direkt dagsljus skjuts ut i berget och har direkt access från kilen.



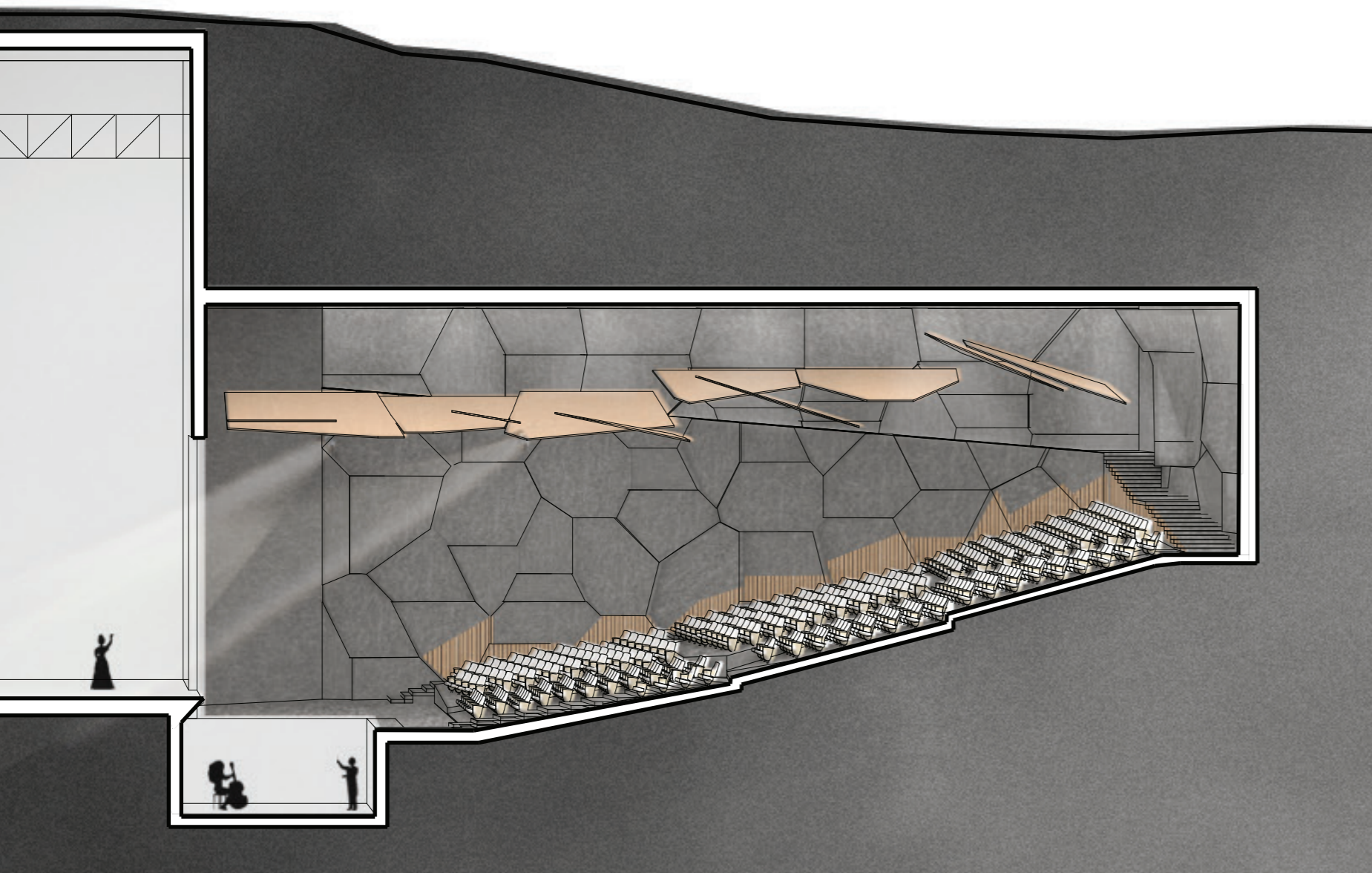
# PLANER

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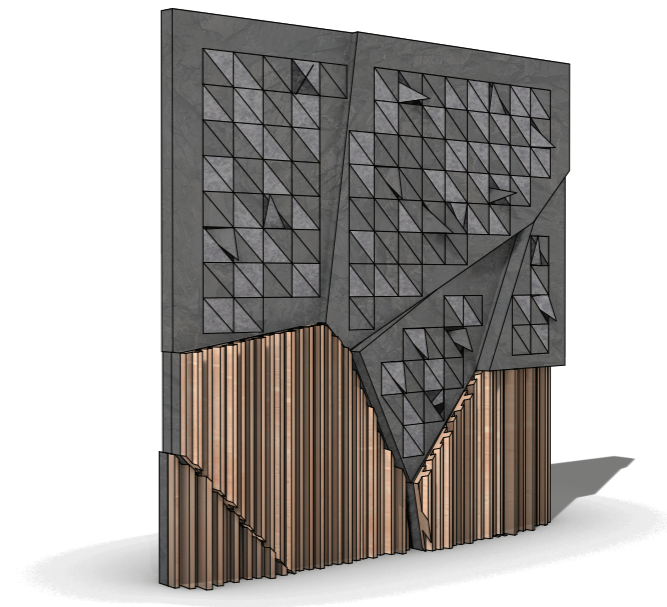
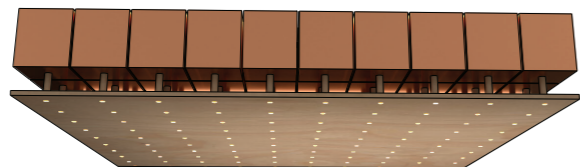
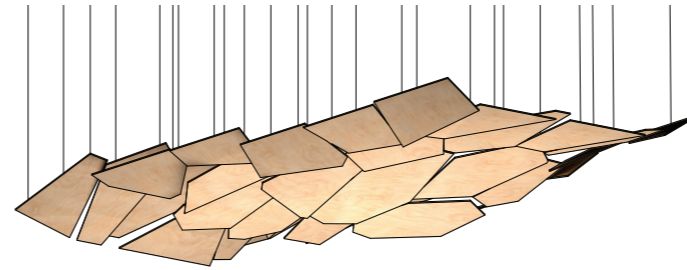


SECTION 1:200

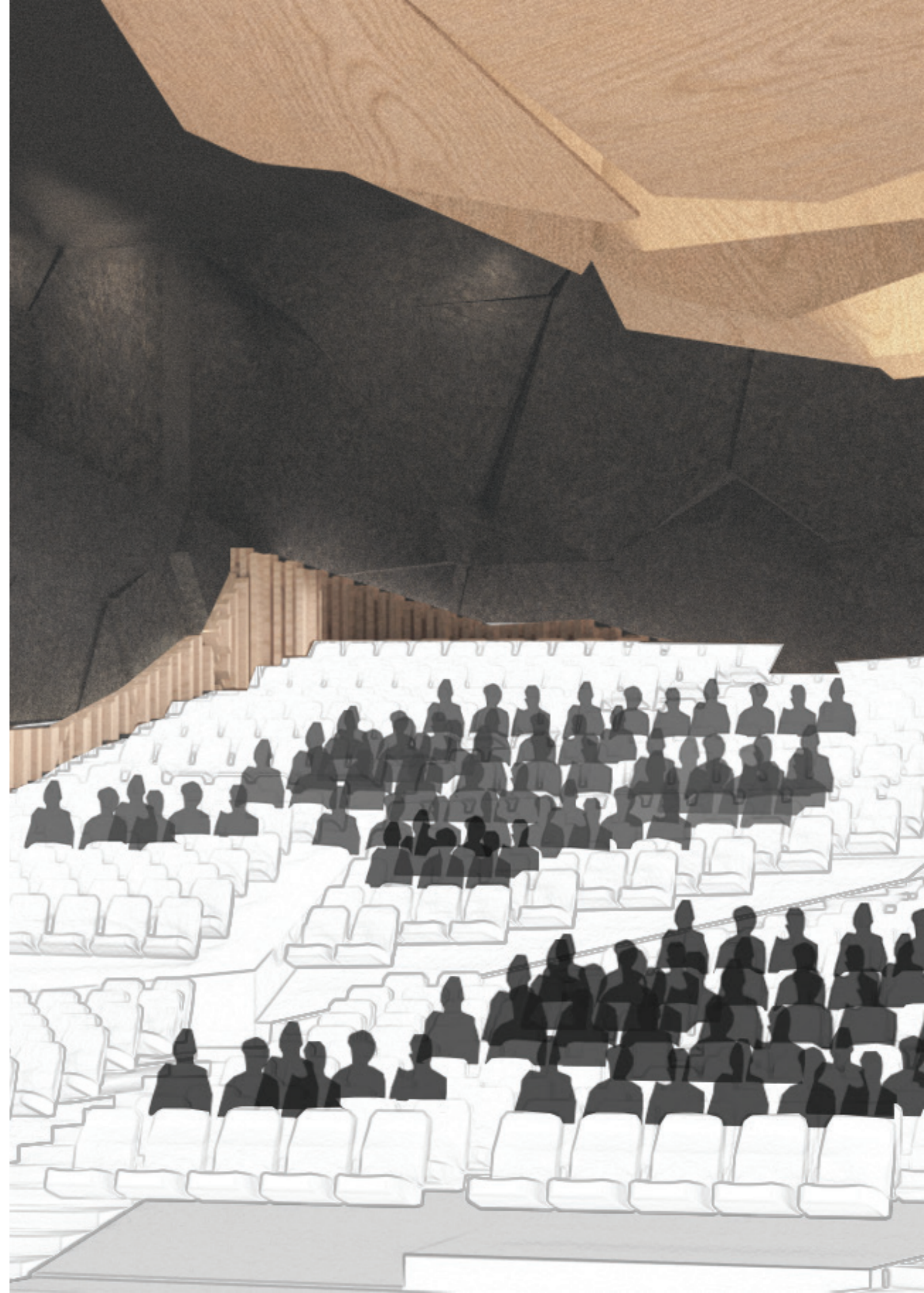
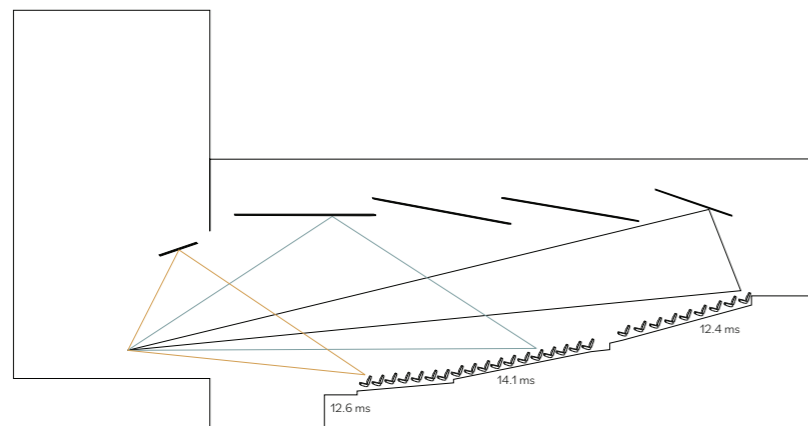
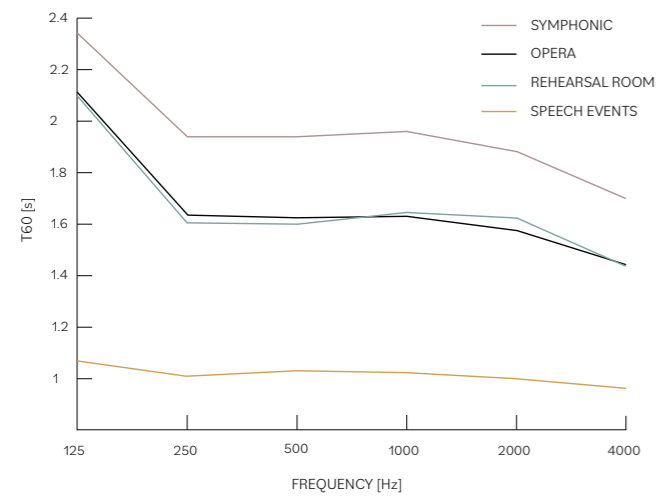


# AUKUSTISKA PROTOTYPER

De akustiska prototyperna utvecklades tillsammans med en akustiker.



# OPERAHALL OCH AKUSTIK



## REFLEKTION

Jag är mycket nöjd med resultatet, processen och samarbetet. Det interdisciplinära samarbetet (AT-studenter och akustiker emellan) var mycket givande och lärorikt och framför allt kul!

I efterhand kan jag tycka att operahallen och kilen behandlades som två olika koncept, operahallen som ett kilen som ett annat. På ett sätt tyckte jag att detta stärker projektet. Rörelsen ner till den underjordiska operahallen från den ljusa och öppna kilen blir en del av helhetsupplevelsen. I en fortsatt process hade jag ytterligare utvecklat kopplingen mellan dessa två koncept. Vill man att det ska vara en skarp och tydlig gräns mellan det underjordiska och kilen eller en mjuk och långsam övergång?

Krafen när man driver ner något i marken är stark och var något som vi genom hela projektet ville lyfta fram. I presentationen kom detta främst med i moneyshoten på andra planshen men är något som jag hade velat göra ännu tydligare för att stärka konceptet ytterligare.

Projektet är till stor del underjordiskt vilket löste en del akustiska problem och samtidigt är det lättillgängligt, ljust och öppet. Detta är jag särskilt nöjd med att vi lyckades få till.

