JAKOB NORÉN

LIMHAMN
PROJECTORIUM
& NATURE RESERVE

15 LIFE ON LAND

CONTENT

SCALE 1:2000

THE CONCEPT

"The Limhamn Projectorium" is a reinterpretation of the building type "Naturum" and uses video mapping technology as well as holograms to educate the visitors about our impact on the environment, and how nature can reclaim itself. Traveling through the building and the exhibition you end up in a small cafeteria with an exit that leads you out into the quarry, where a series of pathways enables the visitors to explore it. The concept utilises the whole site to make it accessible to the public to be able to experience this unique landscape, that serves as a reminder of how we are changing the earth. The site helps to contextualise the building and exhibition, and vice versa.

The concept utilises parametric design to simulate a tensile structure that enables large open spans and a cave like interior that offers seamless surfaces for projections. The whole structure is also designed to be constructed from small modules that can be manufactured industrially and assembled at site. The building merges with the landscape, not revealing its true size until you enter, where you travel downwards and get immersed into this environment that blends the virtual with reality.

THE EDUCATION

The whole project is heavily related to the Sustainable Development Goals, especially goal 15.9 which talks about the integration of ecosystem and biodiversity values into different processes. The aim of the project is to create a total environment that helps to spread and educate people about our impact on our environment, ecosystems, and biodiversity. The aim is to create a building and an exhibition that is fun to explore, making the education become synonymous with entertainment, a so called "edutainment" process, that makes it easy and enticing for the visitors to take in the information. The landscape helps to contextualise the educational aspects as it acts as a real-life example of our impact on the environment, and what happens when we let nature reclaim itself. Therefor, the building, exhibition and landscape can synergise to strengthen the concept and the aim.

THE SURROUNDING

The focus site in the project is an old limestone quarry, situated in Limhamn in southern Sweden, that has stopped all production and has since been turned into a nature reserve that offers a unique landscape in its context.

The building site in the quarry has been chosen with the connections to Malmö and Copenhagen in mind and the way in which the visitors can most easily access it. The placement offers an easy access to the building and utilises the built to create connections to the whole site, offering a new and better entry point for the visitors to explore the area.

MALMÖ

LIMHAMN

LIMHAMN QUARRY

(FOCUS AREA)

BUILDING SITE

← COPENHAGEN

THE HISTORY

The extraction of limestone in this site started in 1866 and carried on up until the beginning of the 1990s. During this time, the quarry has changed in different stages where different buildings and railways have changed the environment in ways that show still today. The excavation methods have created steeps that make plateaus in the area and the railways have created paths that links these plateaus together. Some of the buildings of this site stand still today and the dams and pump stations that date back to at least the 1910s are still active, continuously pumping water out of this area rendering it relatively dry. This has opened up the space to be inhabited by a range of animals, some which are only found in this relatively small area (Schlyter 2010).

Pumphouse at the quarry, probably taken durring the 1910s [Source: Limhamns Museiförening]

The quarry at around 1940 [Source: Limhamns Museiförening]

THE NATURE RESERVE

The area inside the old quarry is quite barren but filled with life. A unique fauna is found here with a combination of plants and animals not found anywhere else in the surrounding area. The landscape stands out in its context, offering great views and a serene calmness and beauty, but which today is quite inaccessible to the public. In the proposal there is a strong focus on strategy to make these views and the experience of the landscape more accessible.

[Photo: Jakob Norén]

LIMESTONE

The limestone makes a strong impression in the quarry, always surrounding you as you walk through the area.

LEVELS

The experience of levels in this area is prominent and the presence of these plateaus enables movement through and down the site in many loops.

VIEWS

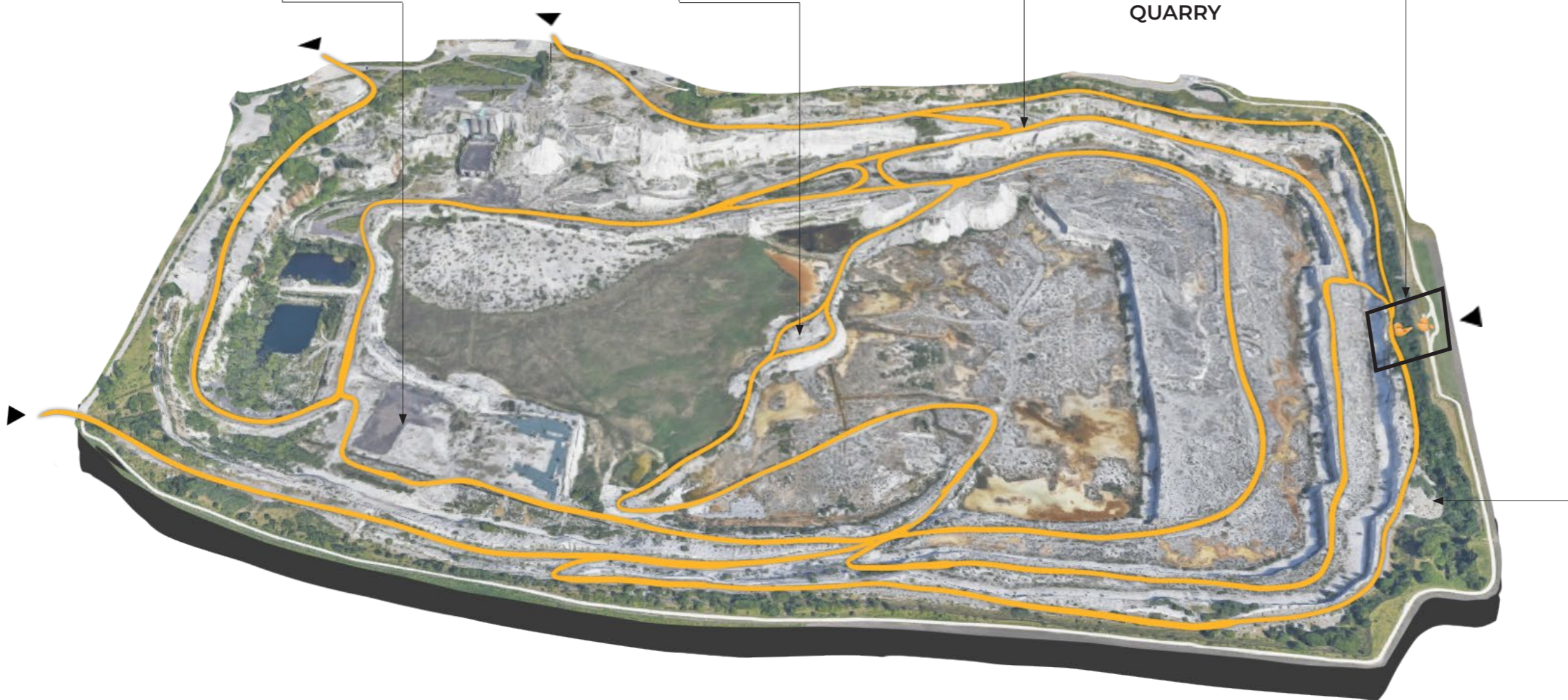Moving down the landscape a series of striking views are offered from several angles.

[Photos: Jakob Norén]

ART EXHIBITION
SPACE

RESTING SPACE

PATHWAYS

BUILDING SITE /
MAIN ENTRY TO
QUARRY

CAMPING SPOT

THE PARK STRATEGY

THE PATHWAYS

The design concept takes the whole quarry into account to try to connect the building to the landscape and making the experience of this site accesible. By implementing a new set of pathways through the area the visitors are guided through the quarry to be able to experience the whole extent of the landscape while at the same time deterring the visitors from accessing a large part of the area as to not disturb the local fauna.

THE BUILDING SITE

These pathways connect to the building whose interior then connects to the outside of the quarry and the rest of the city. Only a portion of the building is experienced from the outside as it flows down into the quarry, seemingly in two parts as a large portion of the building is located underground. This allows for moments of surprises moving through the building as the interior reveals itself as much larger than would have been expected from the outside.
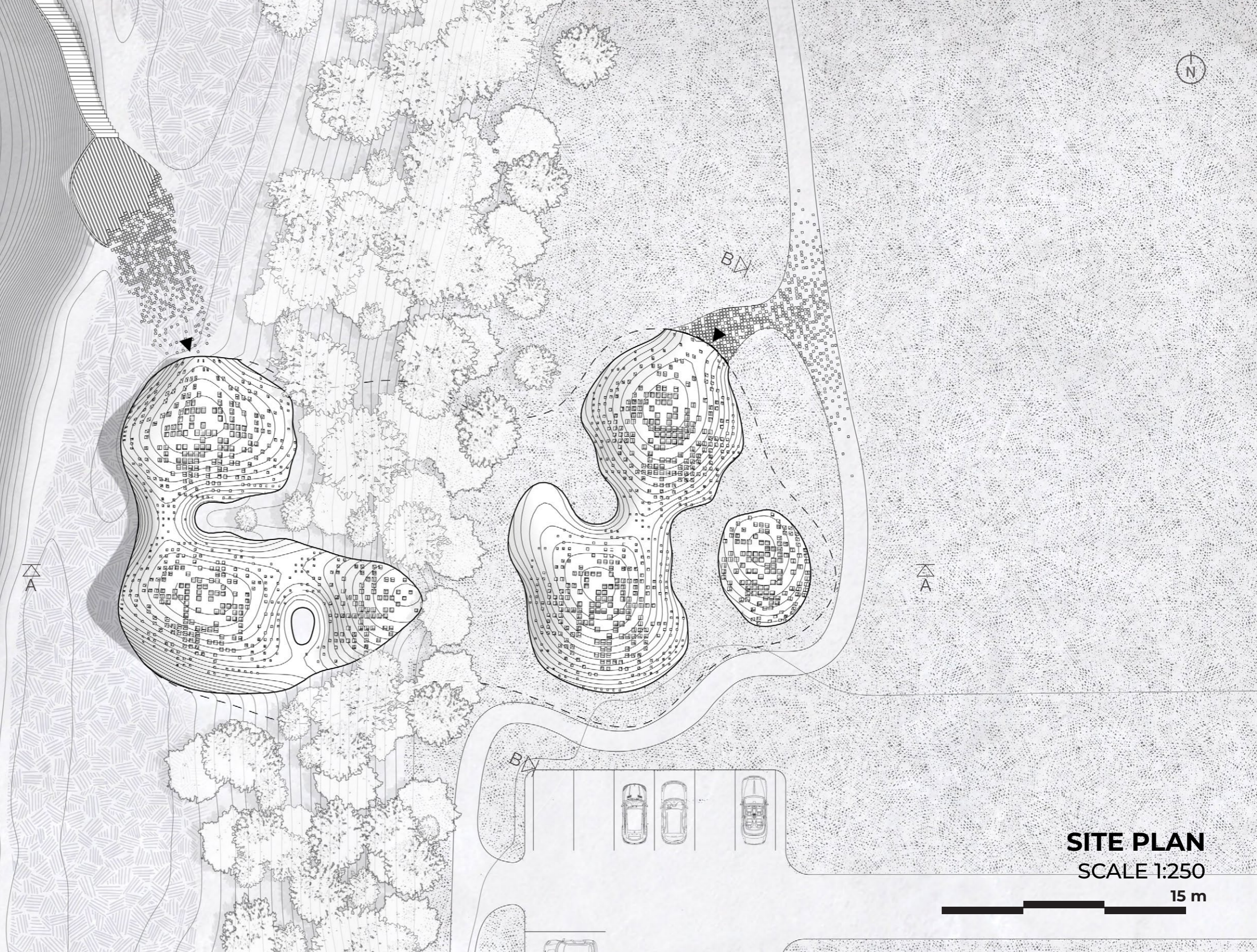
SITE PLAN
SCALE 1:250

15 m

THE BUILDING

By using simulation-based design a tensile structure can be created that makes large open spans possible that offer grand interior spaces. By digging out part of the landscape and then adding it back some of the structure is hidden which changes the expression of the building, making it appear much smaller in scale. It serves to give the visitors a moment of surprise as the true size of the building reveals itself as they enter.

TENSILE ROOF STRUCTURE

FLOOR STRUCTURE

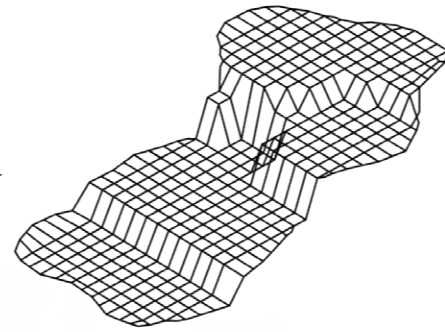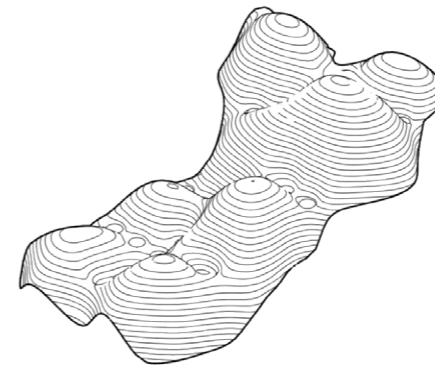DUG OUT SOIL & ROCKS
ADDED BACK

SITE
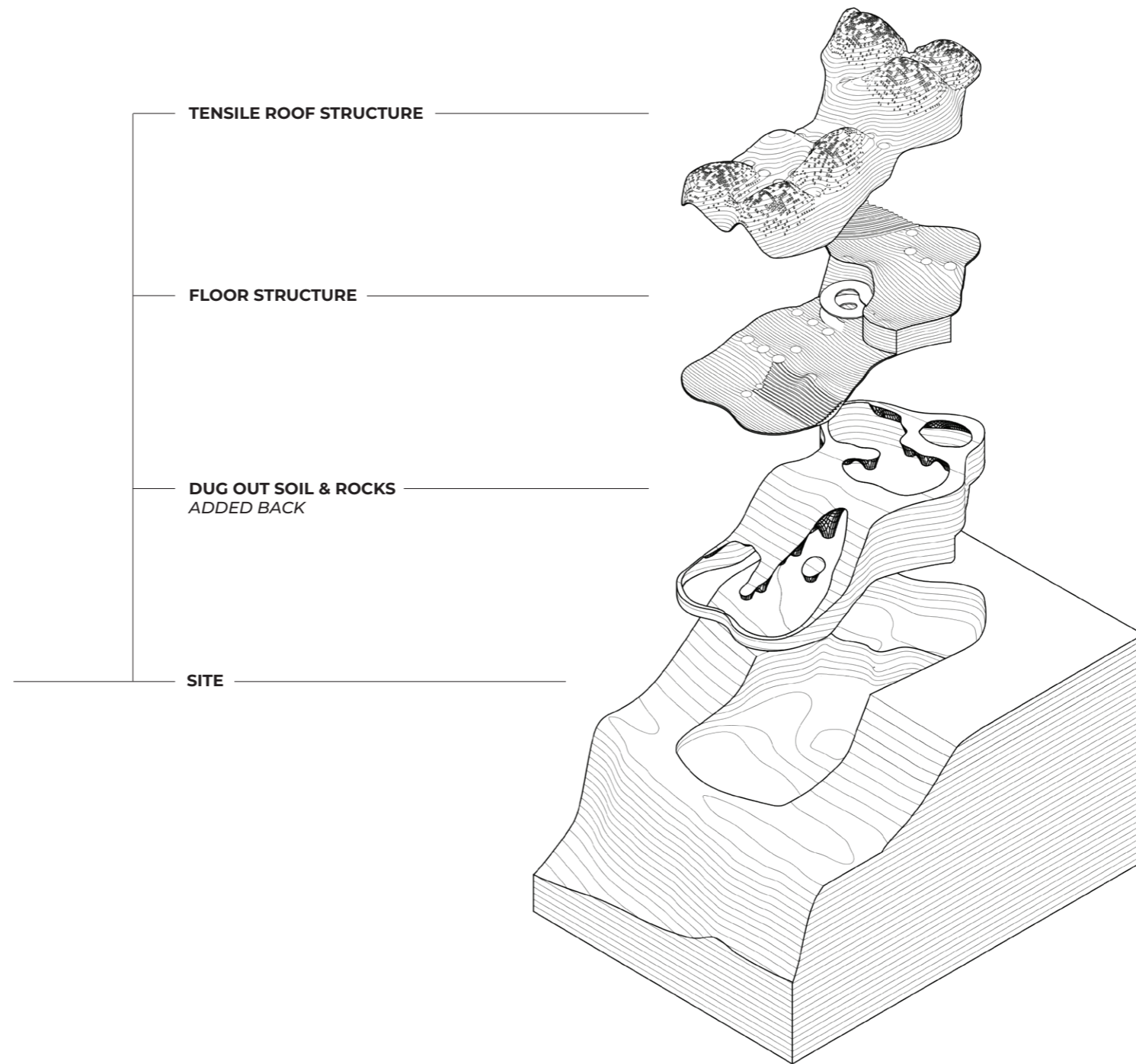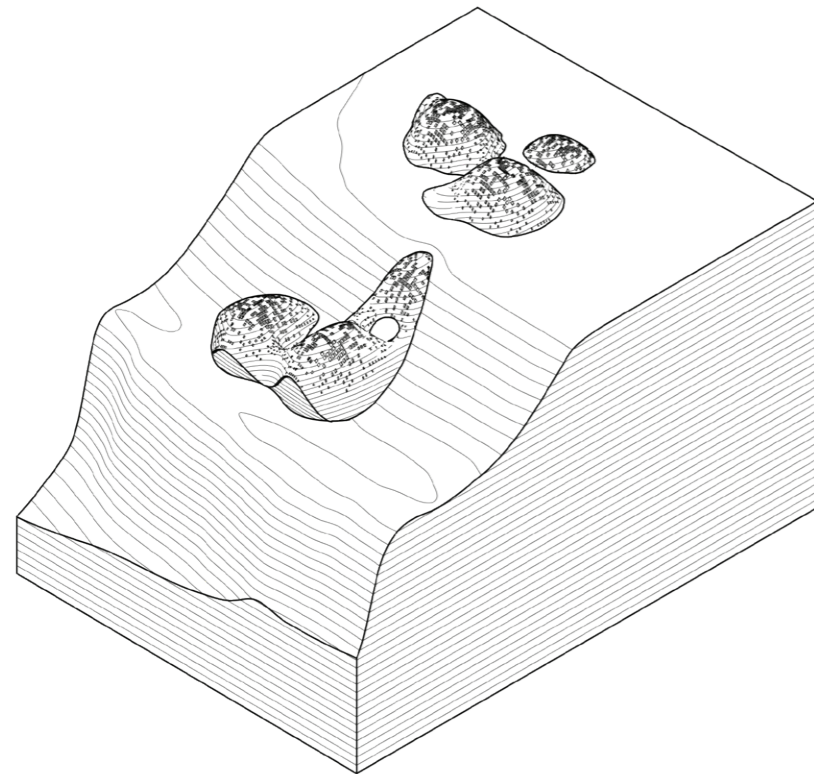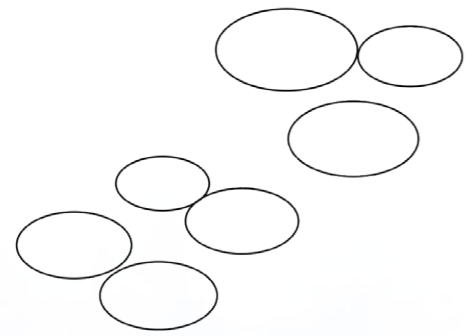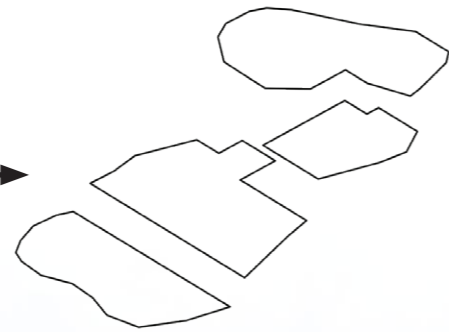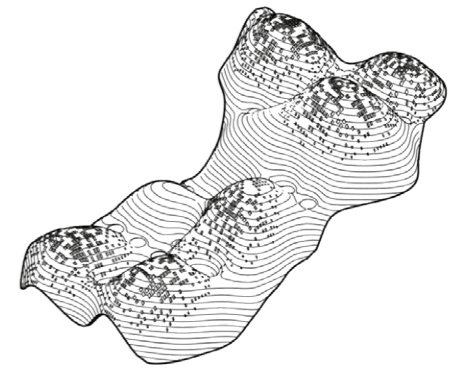
1. PLANNING DOMES   2. PROGRAMMING   3. CREATING PATCH FABRIC   4. FABRIC INFLATION/ TENSILE STRUCTURE   5. EROSION/ BRINGING IN LIGHT

THE FABRICATION

The shape is organic, but incremental in nature. The structure is designed to be constructed from smaller modules that can be fabricated industrially and then assembled at site. Some of the modules are solid while other serves as frames for windows that bring light into the structure that creates a stunning visual expression on the inside. The glass panels are made from "smart glass" that can turn black by running electricity through them, something which is utilised in the exhibition strategy.
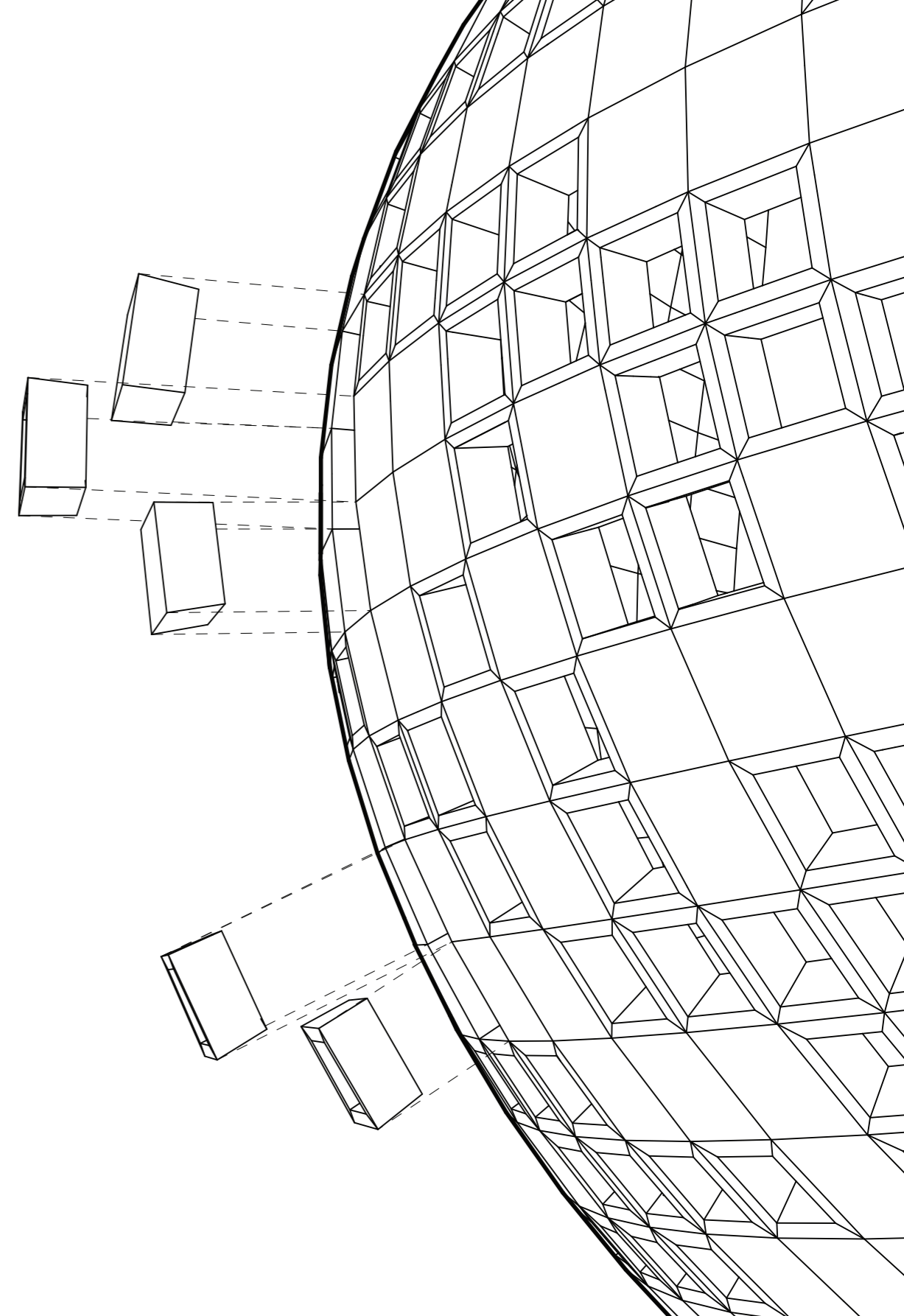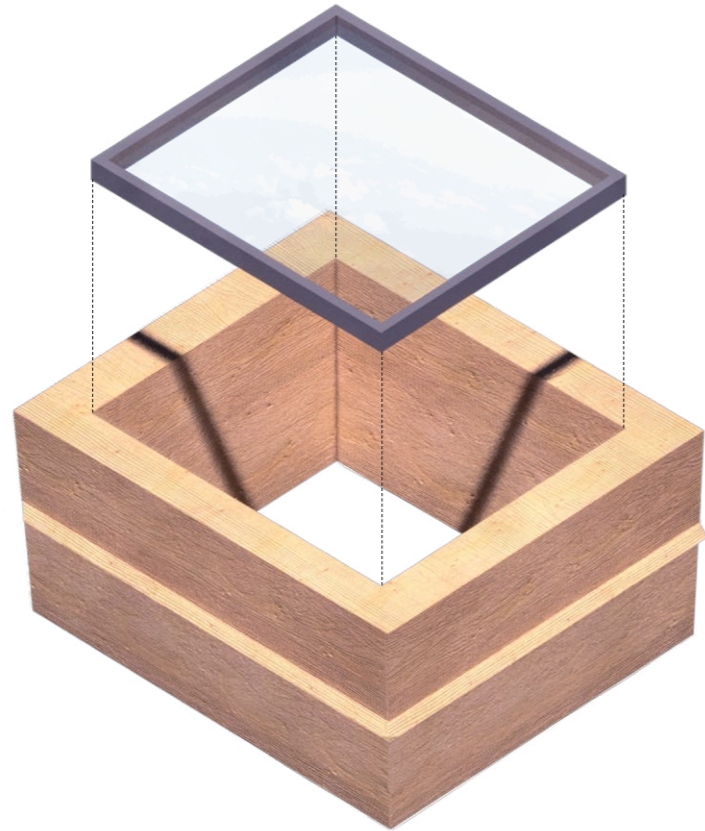
THE INTERIOR

The tensile structure merges walls and ceiling seamlessly, creating a cave like interior that can be explored through the experience of the exhibition. Much like the quarry, the interior lets you move downwards through different plateaus. The exhibition brings you down to a viewpoint of the site and a cafeteria that then leads out to the quarry and the pathways. The exhibition is delivered using projections and holograms that educate the visitors about our impact on our ecosystems and biodiversity in an exciting and immersive way.
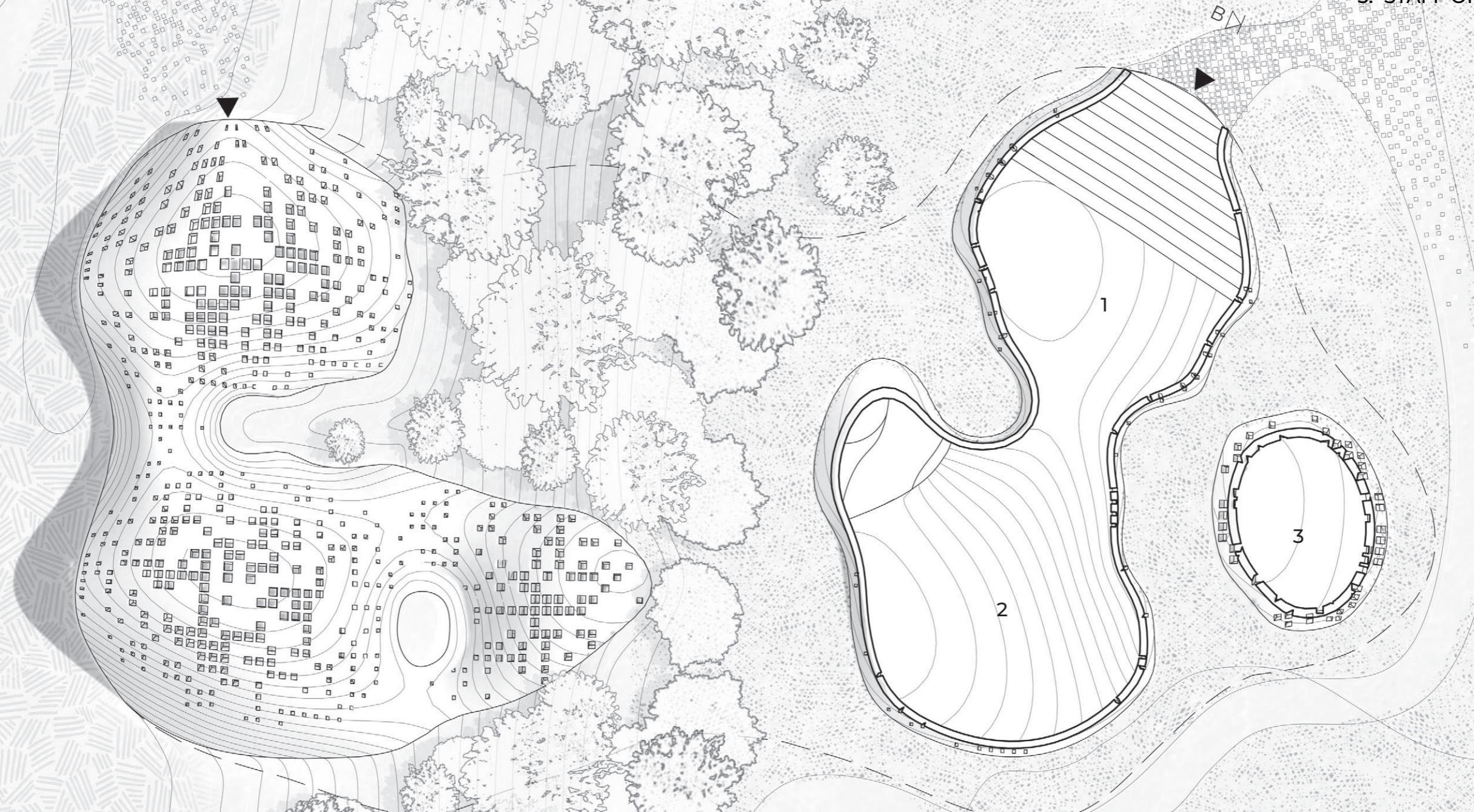

SECTION A:A
SCALE 1:150

5 m
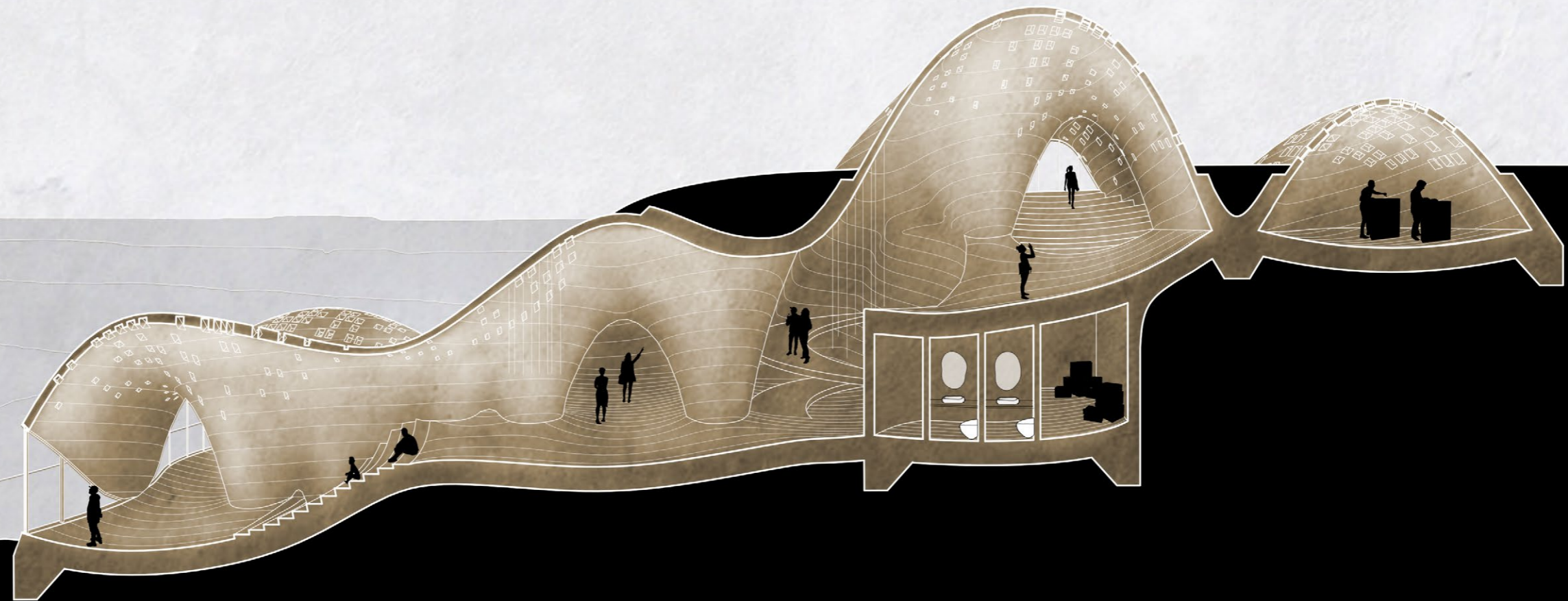
SECTION B:B
SCALE 1:100

5 m

1. ENTRY HALL / GIFT SHOP
2. PROJECTION CHAMBER
3. STAFF OFFICE

1

2

3

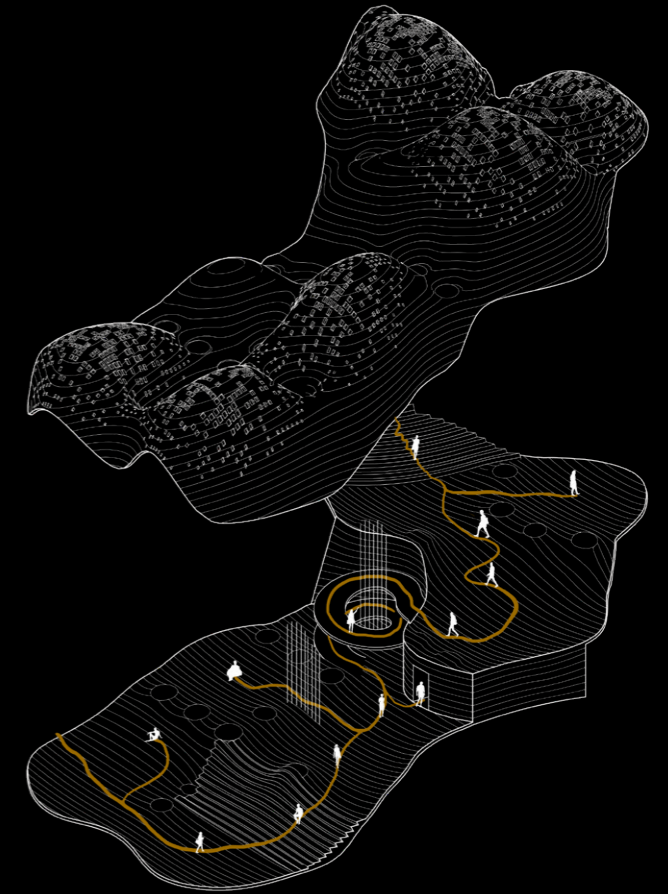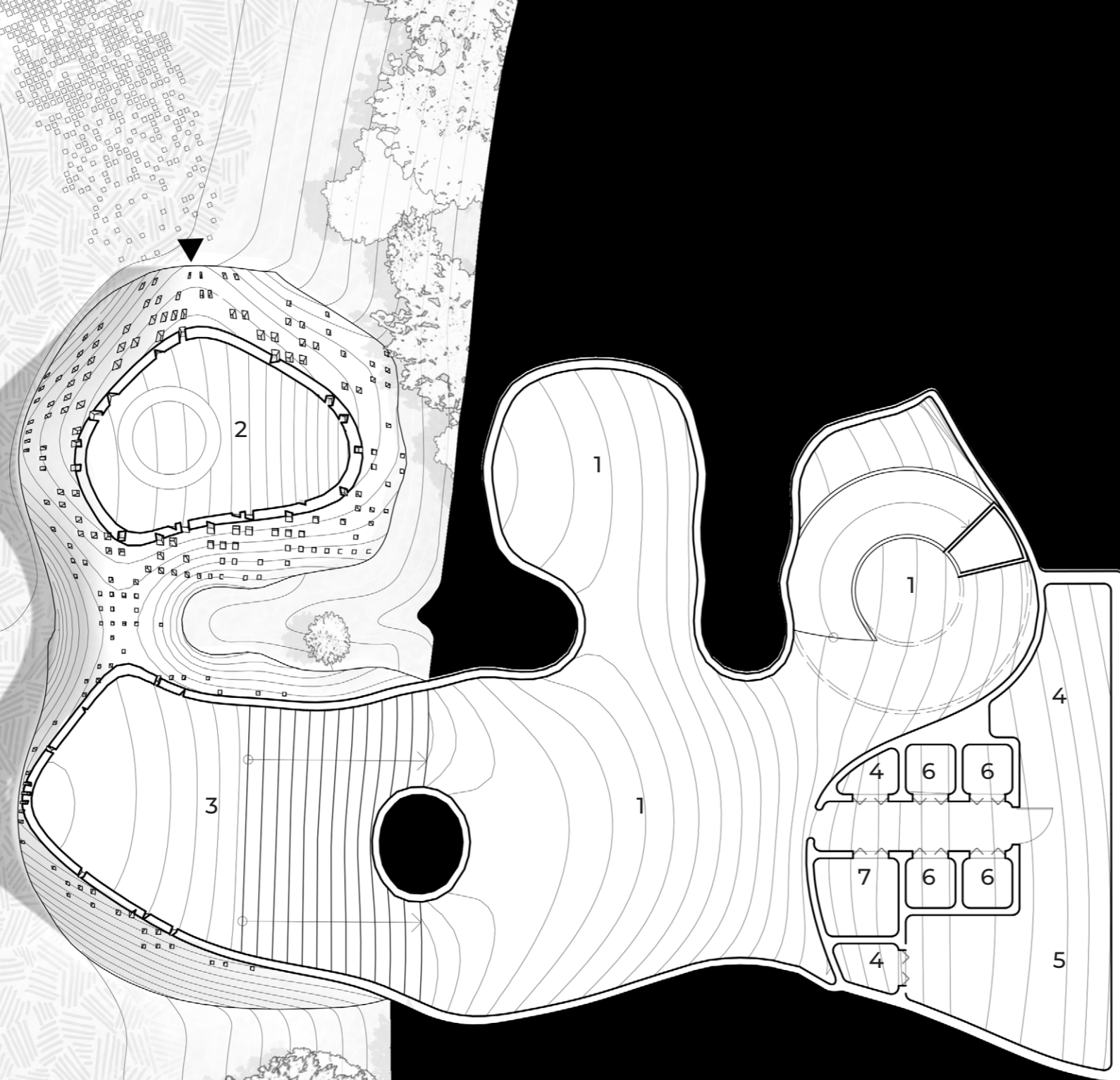**ENTRY FLOOR PLAN**

SCALE 1:150

5 m

1. PROJECTION CHAMBER
2. CAFÉ
3. VIEWPOINT / LECTURE SPACE
4. STORAGE
5. CONTROL ROOM
6. WC
7. ACCESSIBLE WC

BOTTOM FLOOR PLAN
SCALE 1:150

5 m

THE EXHIBITION TECHNOLOGIES

HOLOGRAM FANS

Fans equipped with LEDs spin which causes a hologram
effect to be created that appear to be floating in mid air.

[Photo: https://www.pressrelease.com]

VIDEO MAPPING

By mapping projections to the surfaces of the interior the landscape
can be transformed into a mix of the virtual and the real.

[Photo: Foto: teamlab]

NEXT PROJECTION

05:42

THE EXPERIENCE

The visualisation shows a scenario with only a few of the projections running in selected spaces. In this situation light is brought into the building from above, showcasing the architecture of the space. The different areas tell different stories about our planet and invites people to explore. Hologram fans hanging from above portrays a timer counting down to the next "total immersion projection" where the whole space is transformed.

BLACKOUT

00:00

WINDOWS CLOSE - TOTAL IMMERSION STARTS

THE TOTAL IMMERSION

When the timer hits 00:00 electricity starts running through the smart glass panels inhibiting a large portion of the light to penetrate this building. This allows for a much more immersive experience as the projections can take over and virtually modify how the room is experienced. In this instance the whole interior is utilised to tell a story about our planet and our role in relation to it, making for an unforgettable experience.
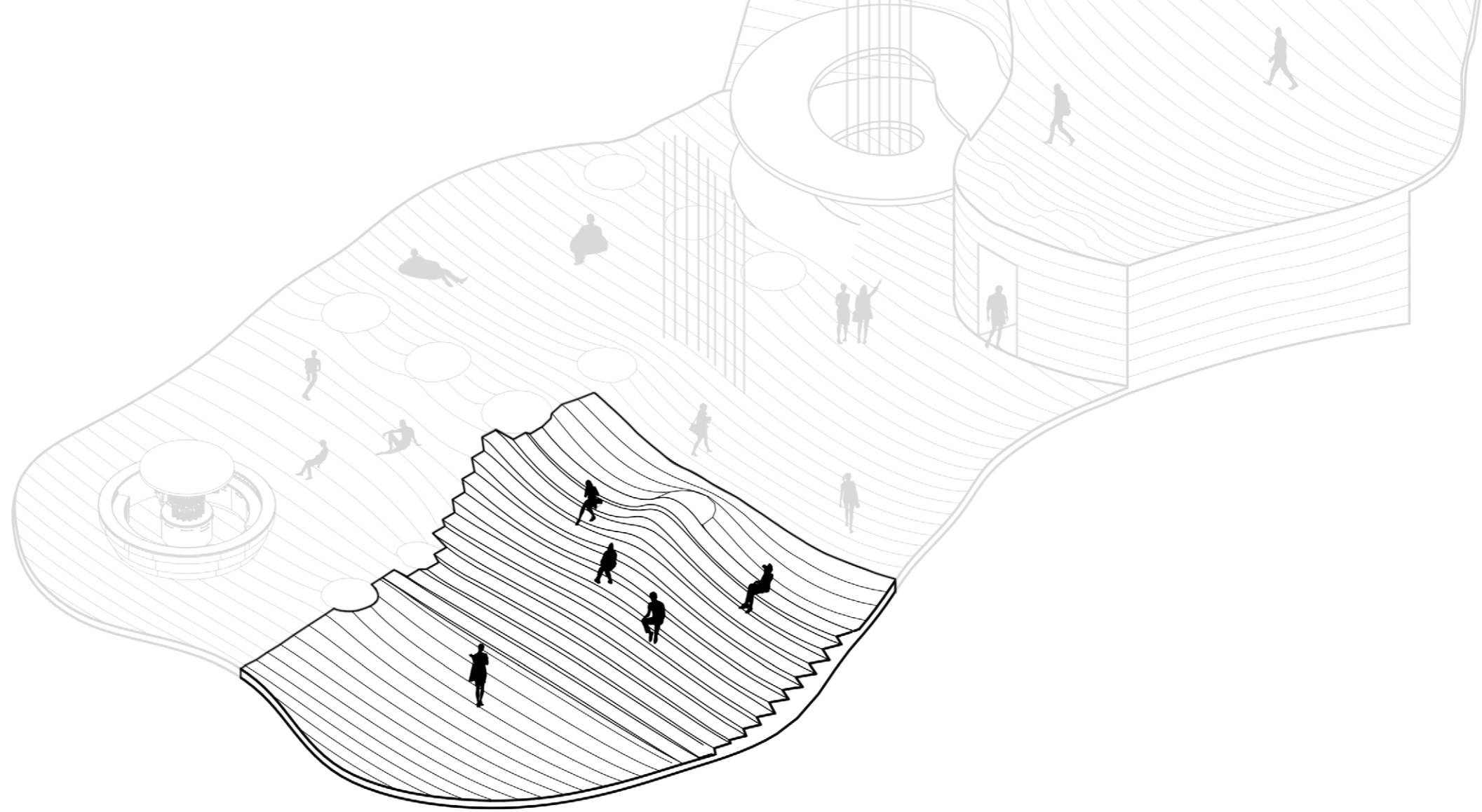
THE LECTURE STAIRS

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Organically shaped stairs that meld with the floor serves to bring the visitors down to the cafeteria and quarry, but also as a space for a more traditional means of teaching where guides can gather people and talk about different aspects of our environmental impact and where the listeners can be engaged in discussions. This space can be used for many different events and projections can be utilised as an aid for the lecturer in a creative and effective way, offering a new aspect to the lecturing format.

24
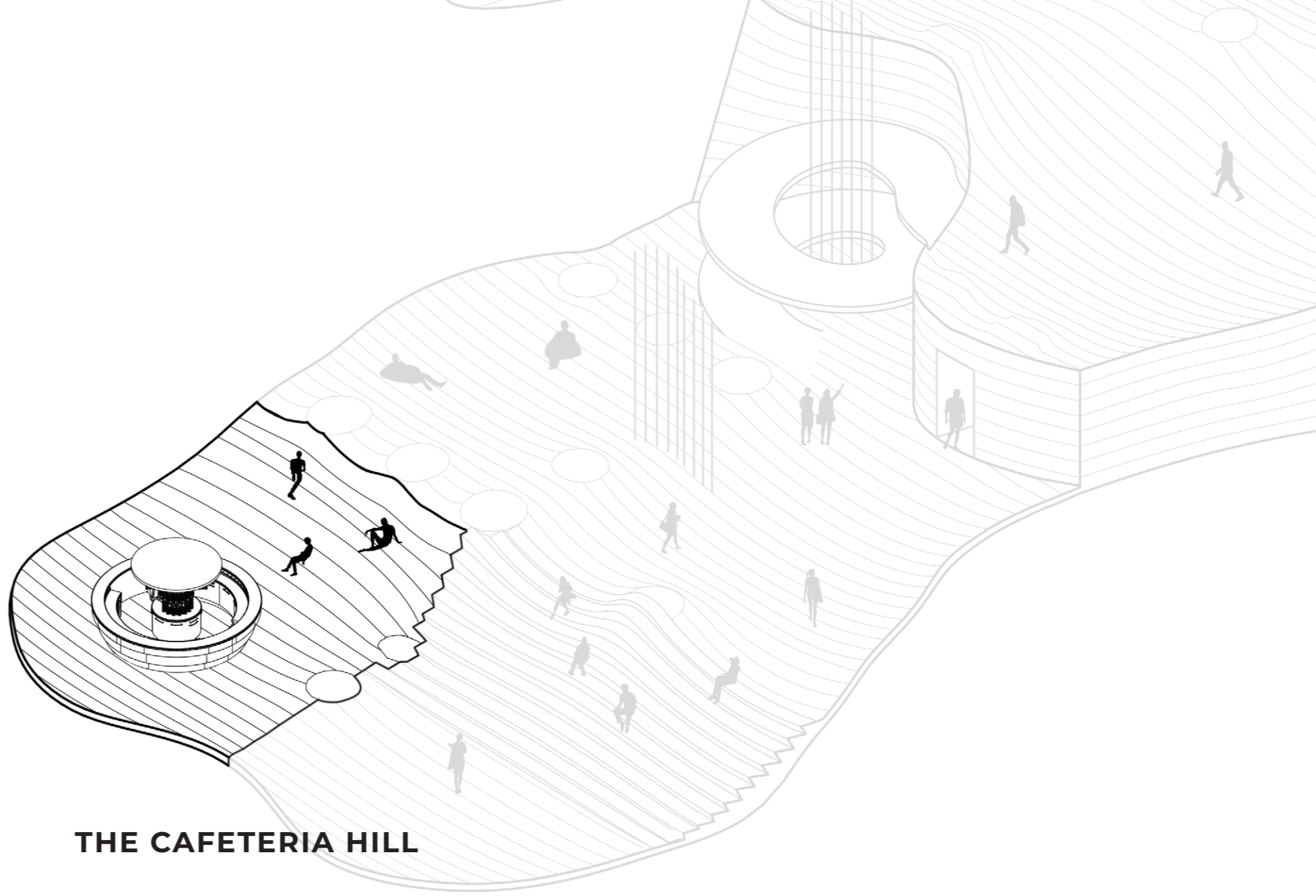
THE CAFETERIA HILL

THE CAFETERIA HILL

The end of the building and the exhibition hosts a café where the floor curves up, much like a hill, to create an interesting space for relaxing and taking a bite to eat or a drink. This space serves as a spot for resting in between exploring the exhibition and exploring the site and offers a great view of the landscape outside. Projections can also be used in this space to create a vibrant environment that constantly changes.

THE REFERENCES

Limhamns Museiförening (u.å.) Bildarkivet. http://limhamnsmuseum.se/besok-bildarkivet/ [2020-06-05]

PressRelease (2018). *Spyro the Dragon Wows E3 With Holographic 3D Created With Blended Matrix Hypervsn.* https://www.pressrelease.com/news/spyro-the-dragon-wows-e3-with-holographic-3d-created-with-blended-20491120 [2020-06-05]

Schlyter, O. (2010). *Limhamns Kalkbrott – Industrihistoriska Lämningar*. Malmö: Malmö Stad.

Sustainable Development Goals (u.å.). *Transforming our world: the 2030 Agenda for Sustainable Development*. https://sustainabledevelopment.un.org/post2015/transformingourworld [2020-06-05]

TeamLab Borderless (u.å). https://borderless.teamlab.art/ [2020-06-05]