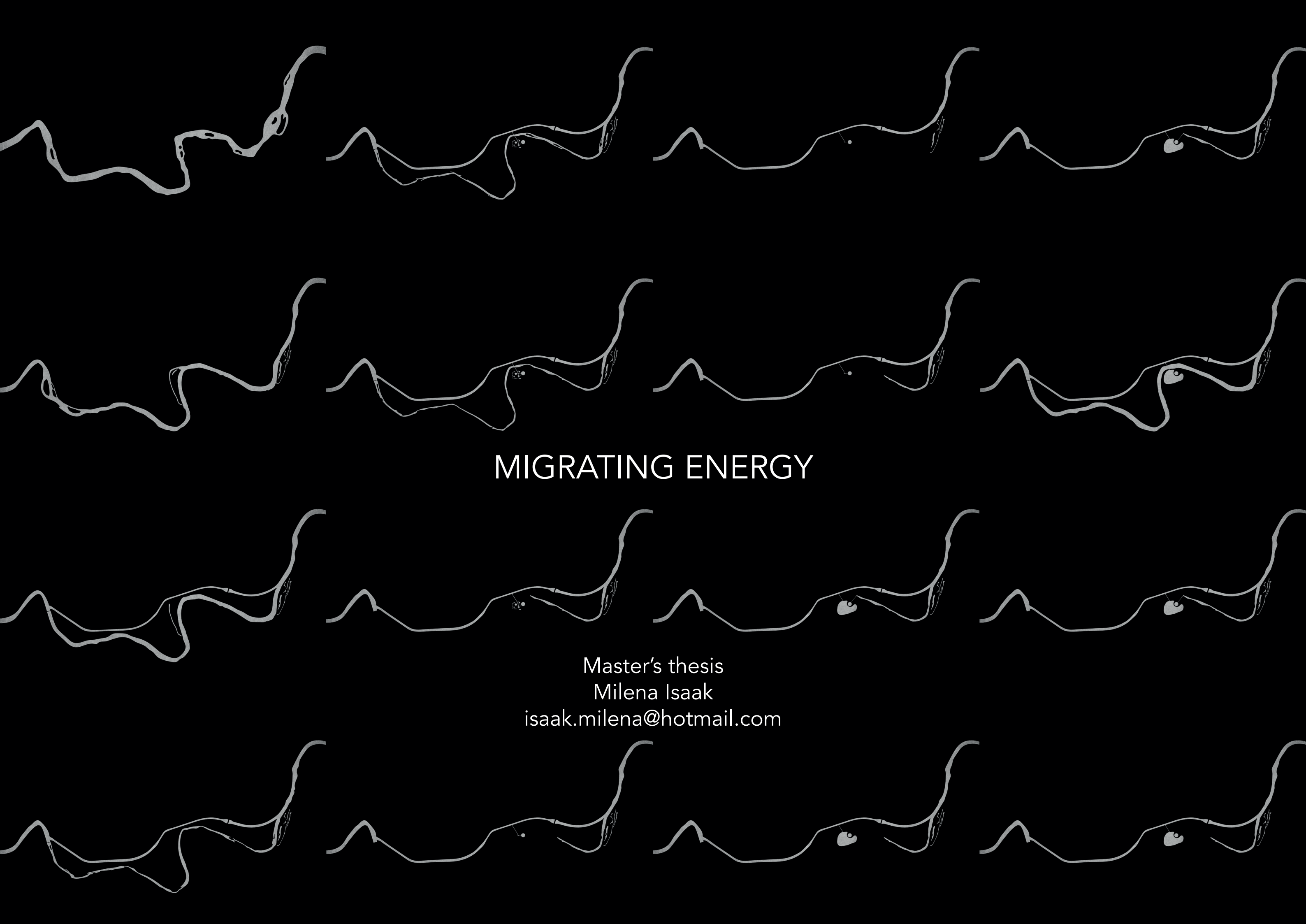
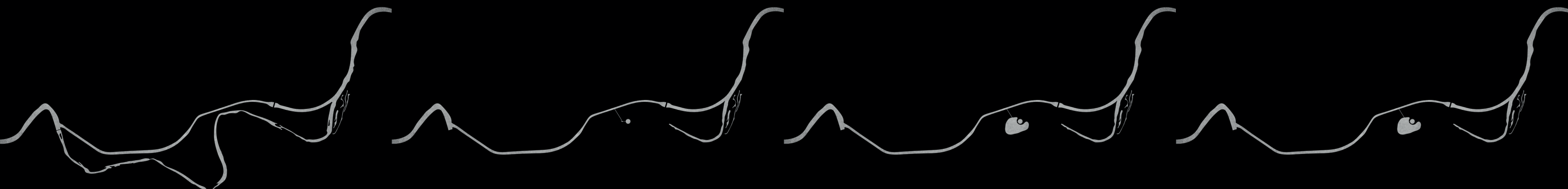
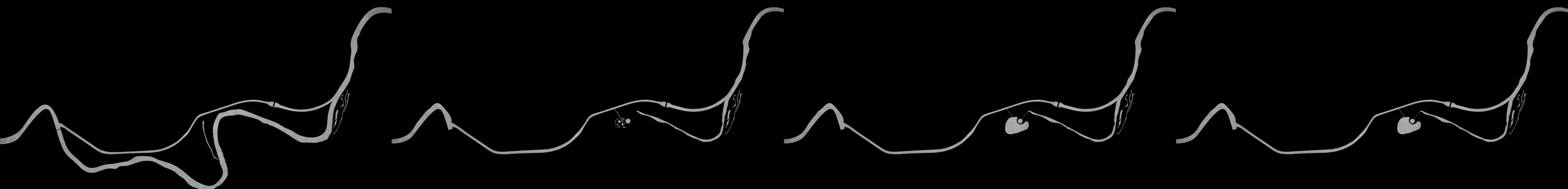
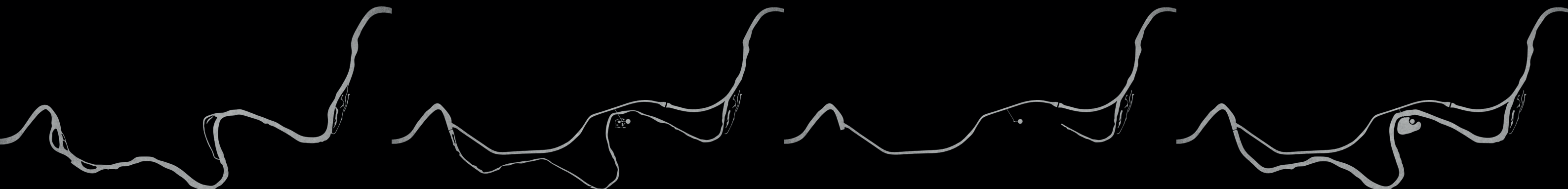
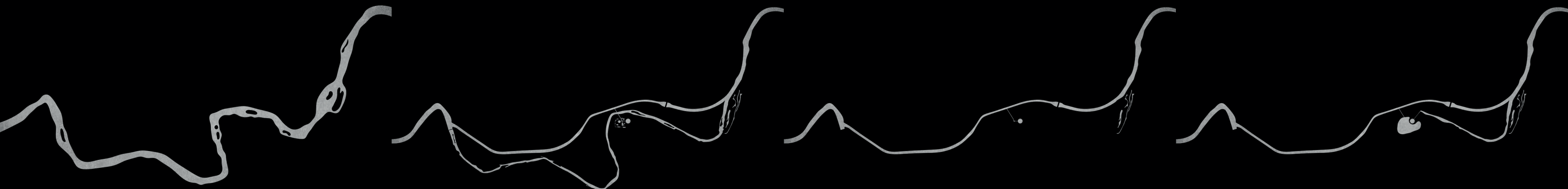




MIGRATING ENERGY

Master's thesis
Milena Isaak
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Formative events along the river

1870: Bally shoes factory produces its own energy by means of a tributary

1917: Construction of the hydro power plant, weir and dam

1979: Construction of the nuclear power plant

2040: Shutdown of the nuclear power plant

Migrating energy

The river Aare is dynamic and constantly in change. Its water is a renewable sought-after source of energy, one of the main resources in this area between Olten and Aarau. The river has shaped its surrounding and the humans have simultaneously cultivated the river. Dams, canals and vast infrastructures were built to extract as much energy as possible. The area around Gösgen became highly regulated and is part of a circuit.

Today, the river and the power production seem exhausted. With climate change glaciers are losing their significance as water storage, fluctuations will increase and weather extremes will occur more often. By the end of this century, the river Aare will only carry half the amount of water in summer and dry out in places. At the same time, the local electricity production will decrease, as the nuclear power plant will be shut down in 2040. From this point on, the lever of the circuit will be switched.

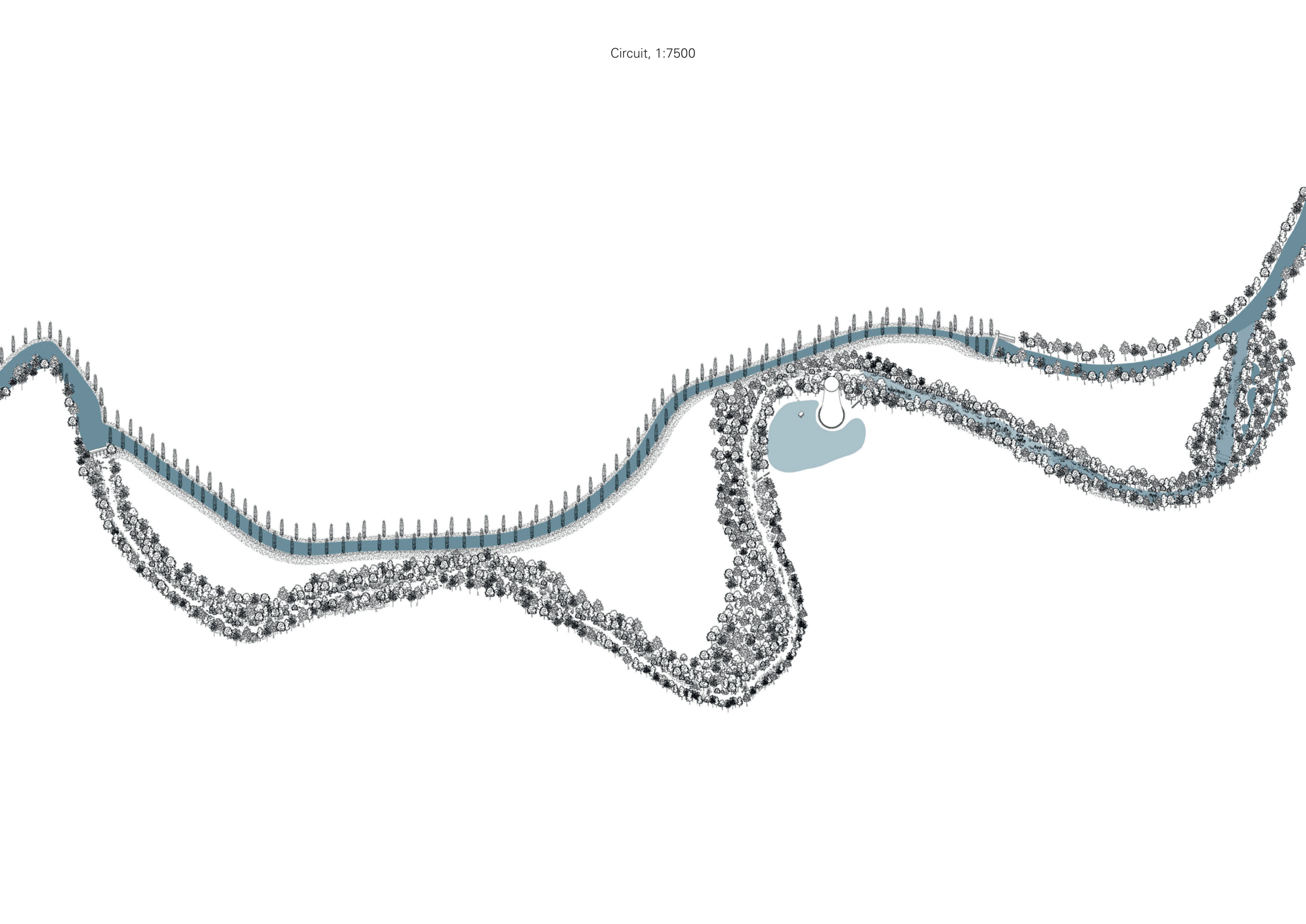
The circuit consists out of the weir, the hydro- and the nuclear power plant, the old river and the canal. The hydro power plant will continue to run and requires a constant amount of water. The weir is closed and opens just in case of high waterlevel or floods, while smaller seasonal fluctuations are balanced with the existing waterpipe- system of the nuclear power plant. In between, a new biotope is created, consisting of two parts: The dried out river and the wet river.

Next to the weir, stairs lead down to the old riverbed. This is the entrance to the five kilometer long rambla (arab. ramla = “sand” or “sandy riverbed”). The stony and sandy landscape extends down to the nuclear power plant. Four to five times a year, this part will be flooded.

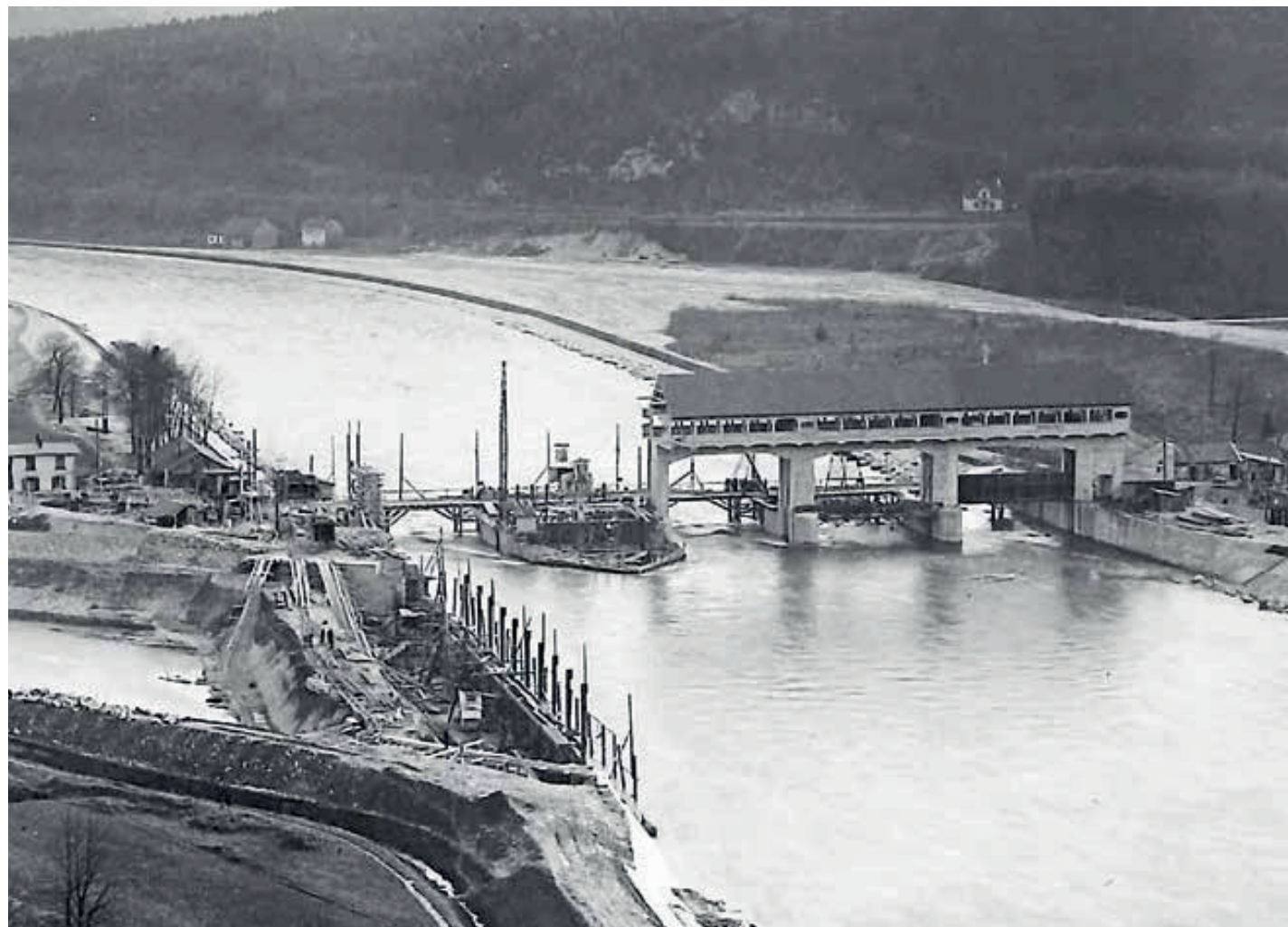
After the nuclear power plant is shut down and being dismantled, only the existing pump and parts of the cooling-water-system will remain in place. The excavated pond forms a waterstorage and habitat for fishes, such as the three meters long catfish. Through the existing underground water pipe system the overflow of the canal is brought to the pond. Reaching a certain height, the water passively drains into the under part of the river a wetland is created.

Considering the whole history of the river Aare, the mentioned events mark only a very short phase in it. The rigid structures and systems of the circuit are broken up and reorganized. Balancing the increasing fluctuations and diverting them by using the existing infrastructures creates a new form of energy. In times of unsteadiness and energy storms, this biotope generates a shelter, a space for animals, plants and people. The energy migrates once more.

Circuit, 1:7500



Construction of the weir and the dam in 1917

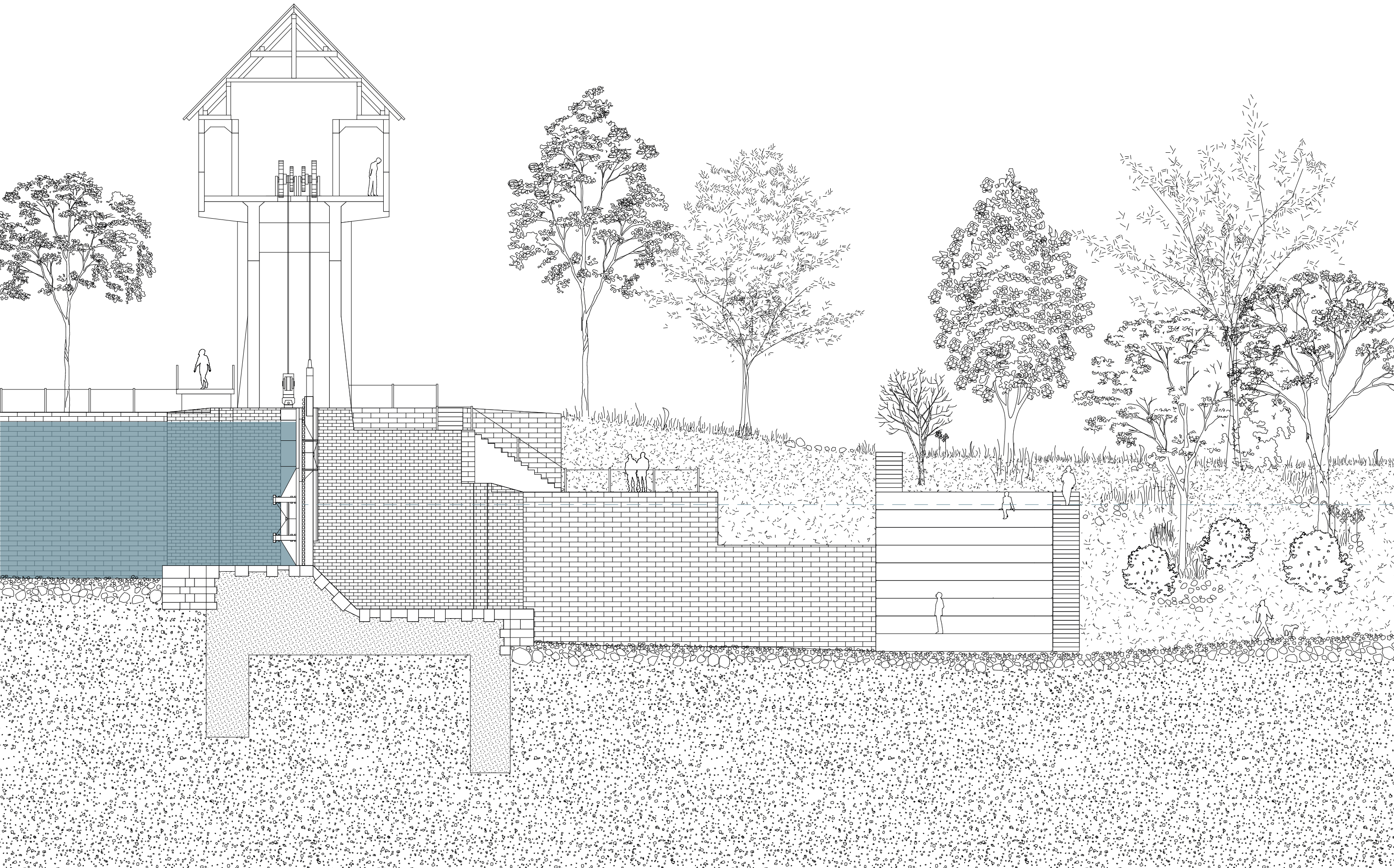


Bildarchiv Alpiq



Bildarchiv Alpiq

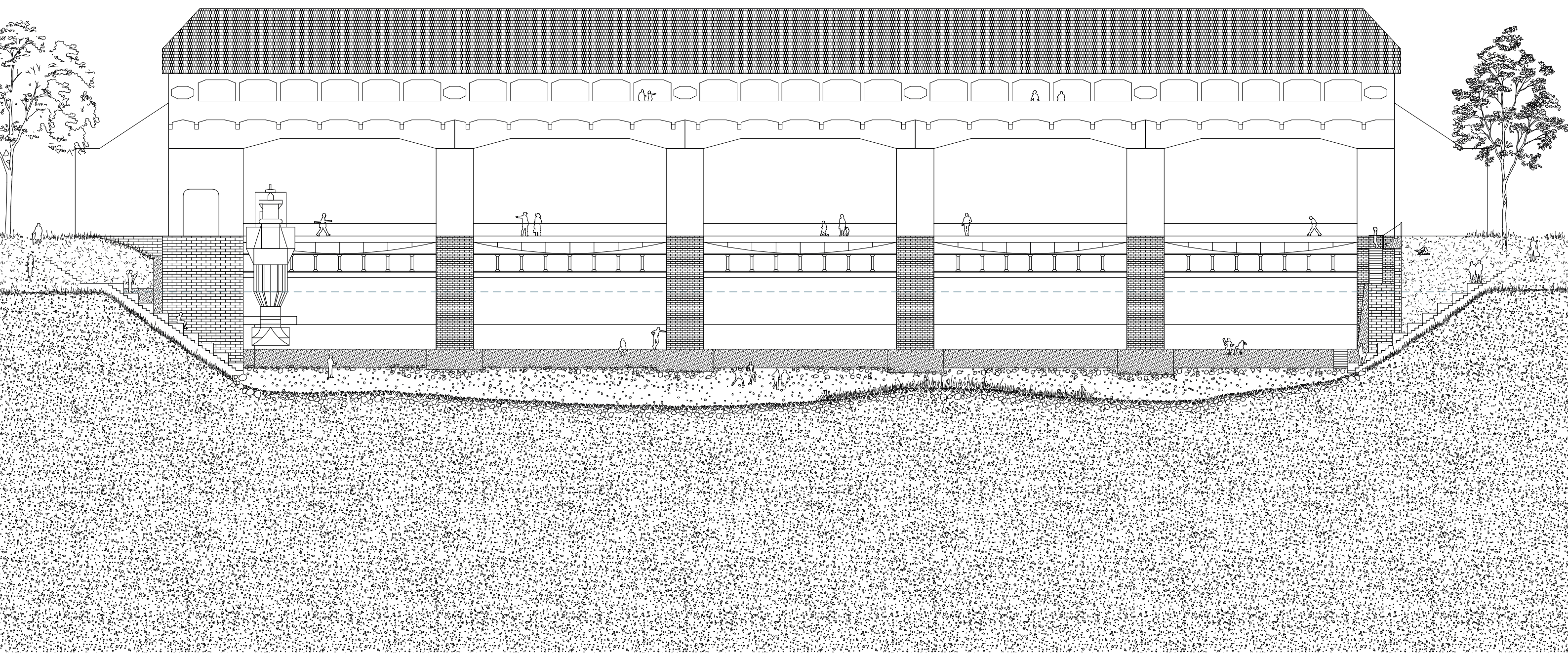
Weir section in 2070, 1:300



Weir floor plan in 2070, 1:500



Weir view in 2070, 1:300



Dried out river

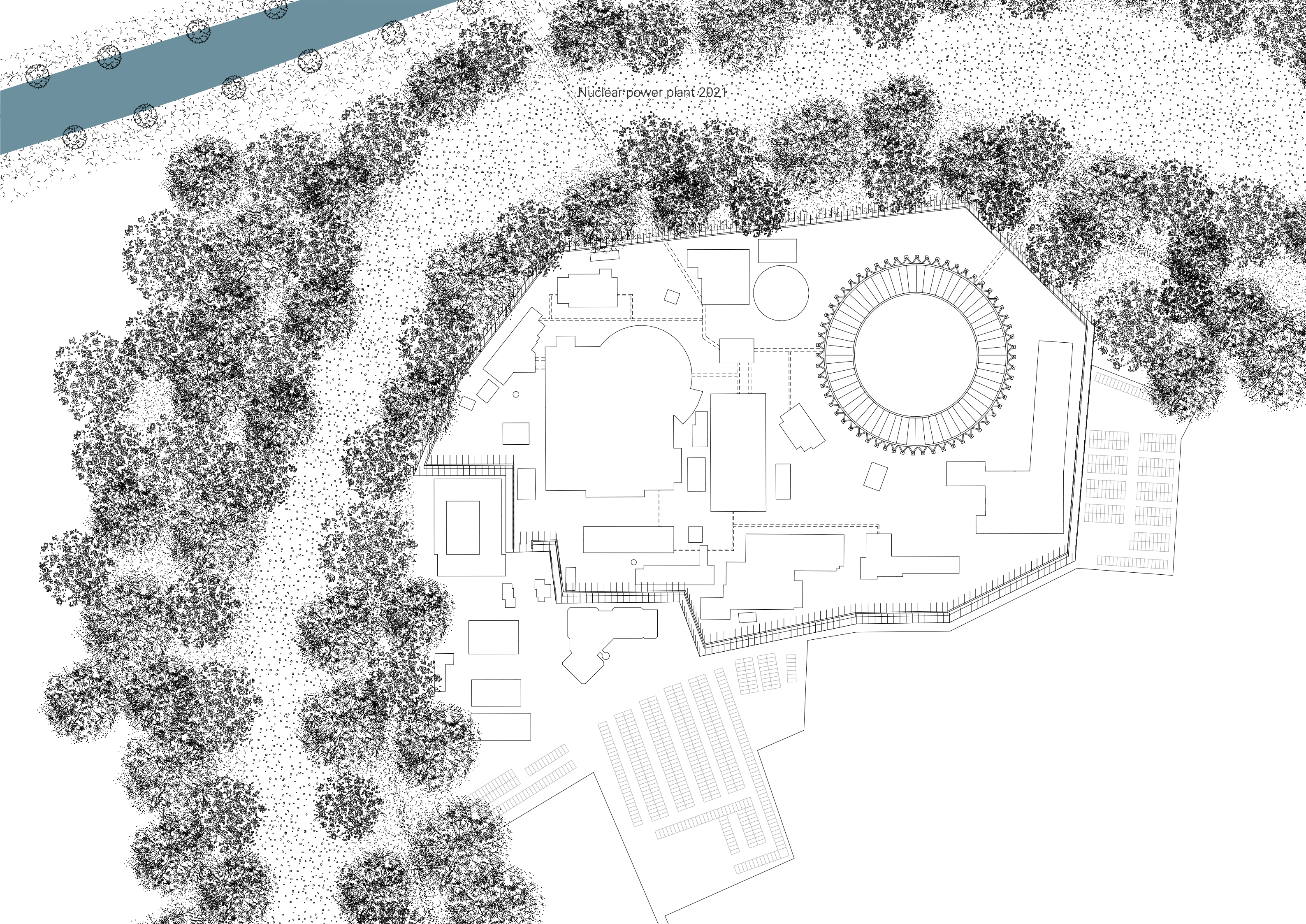


Photo taken in september 2021

Construction of the connecting water pipe in 1979

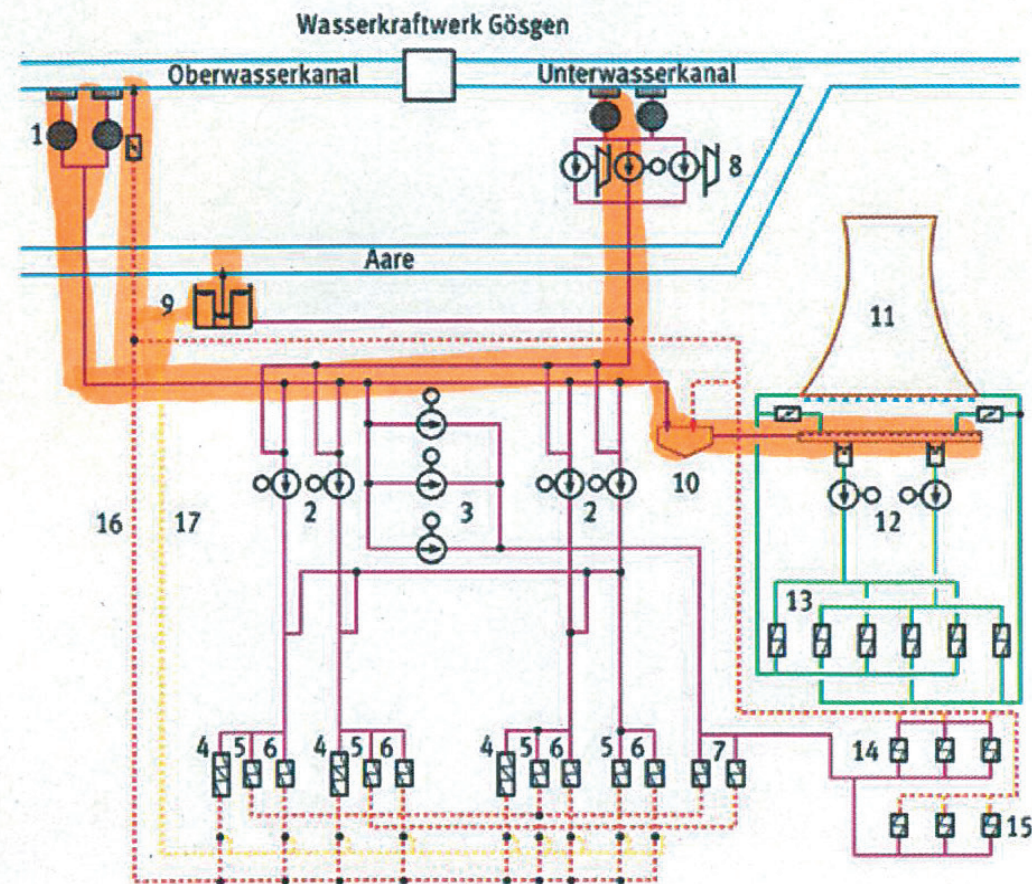


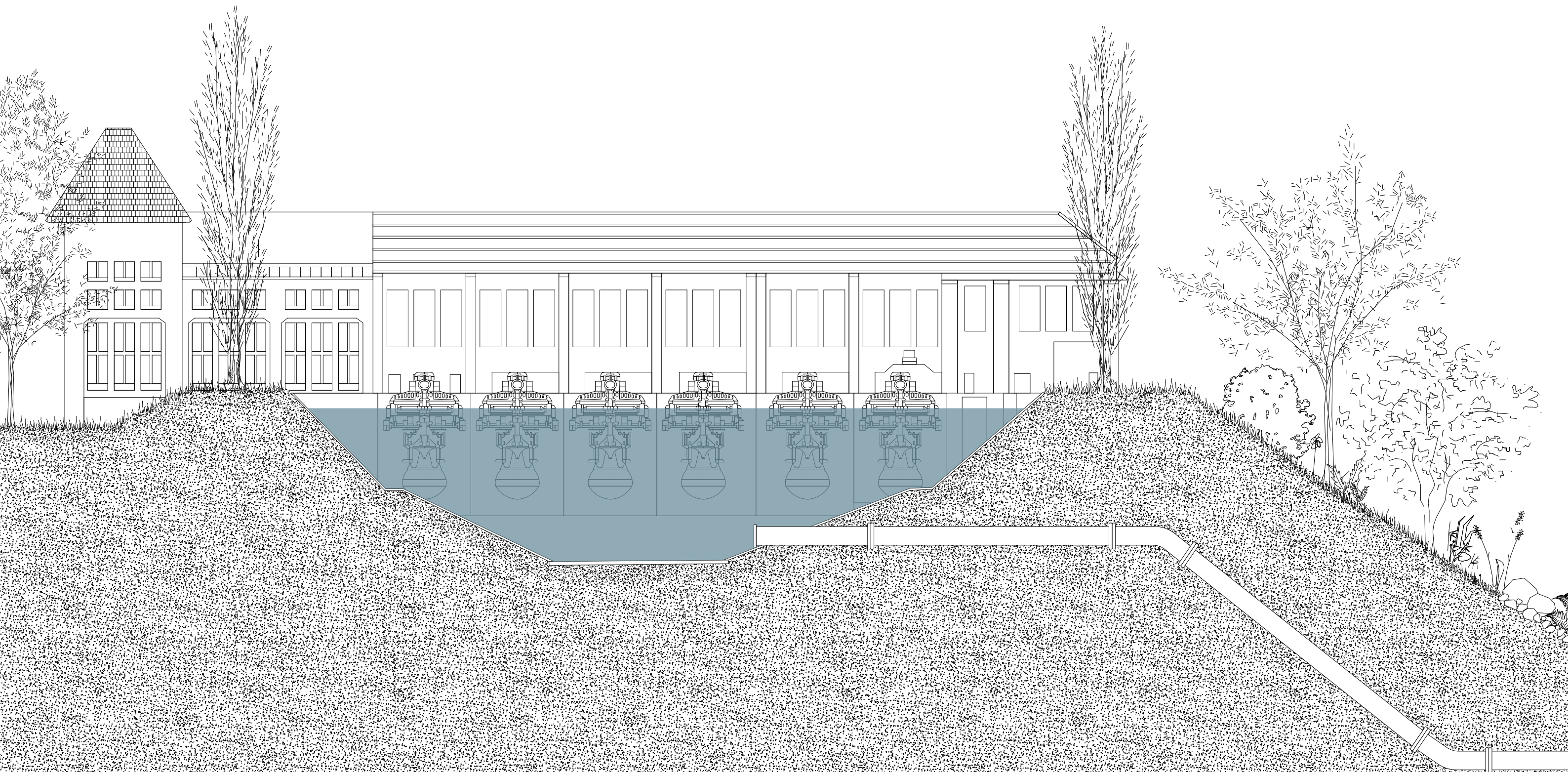
Nuclear power plant 2021



Kühlwasserversorgung

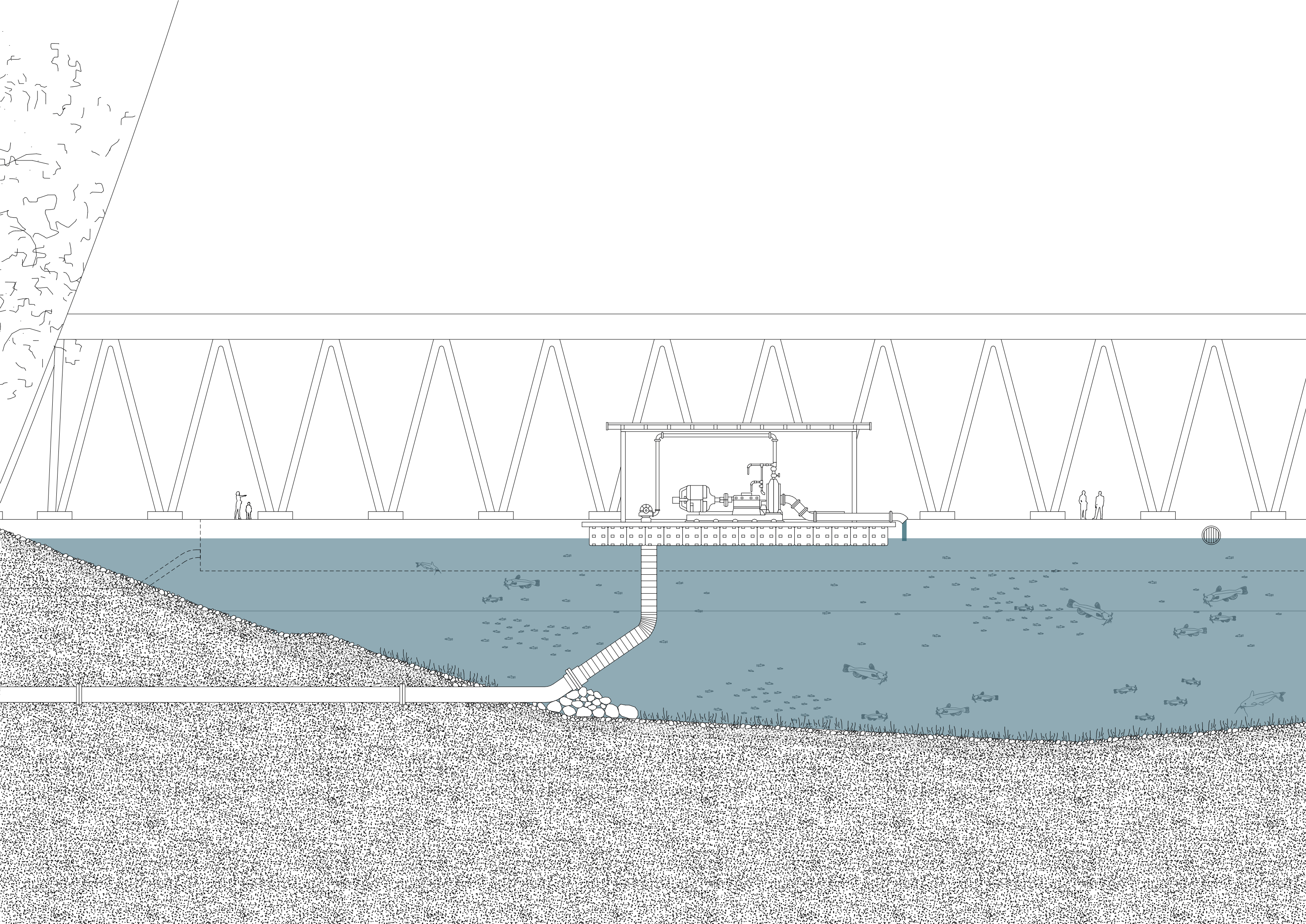
- 1 Einlaufbauwerk
- 2 Nukleare Nebenkühlwasserpumpen
- 3 Konventionelle Nebenkühlwasserpumpen
- 4 Nukleare Zwischenkühler
- 5 Notstromdieselskühler
- 6 Kältemaschinenkühler (notstromgesichert)
- 7 Kältemaschinenkühler (konventionell)
- 8 Zweite Wasserfassung
- 9 Überlaufbauwerk
- 10 Absetzbecken/Kalkfällner
- 11 Kühlturm
- 12 Hauptkühlwasserpumpen
- 13 Kondensatoren
- 14 Konventionelle Zwischenkühler
- 15 Trafozwischenkühler
- 16 Rücklaufleitung zum Oberwasserkanal
- 17 Rücklaufleitung zur Aare

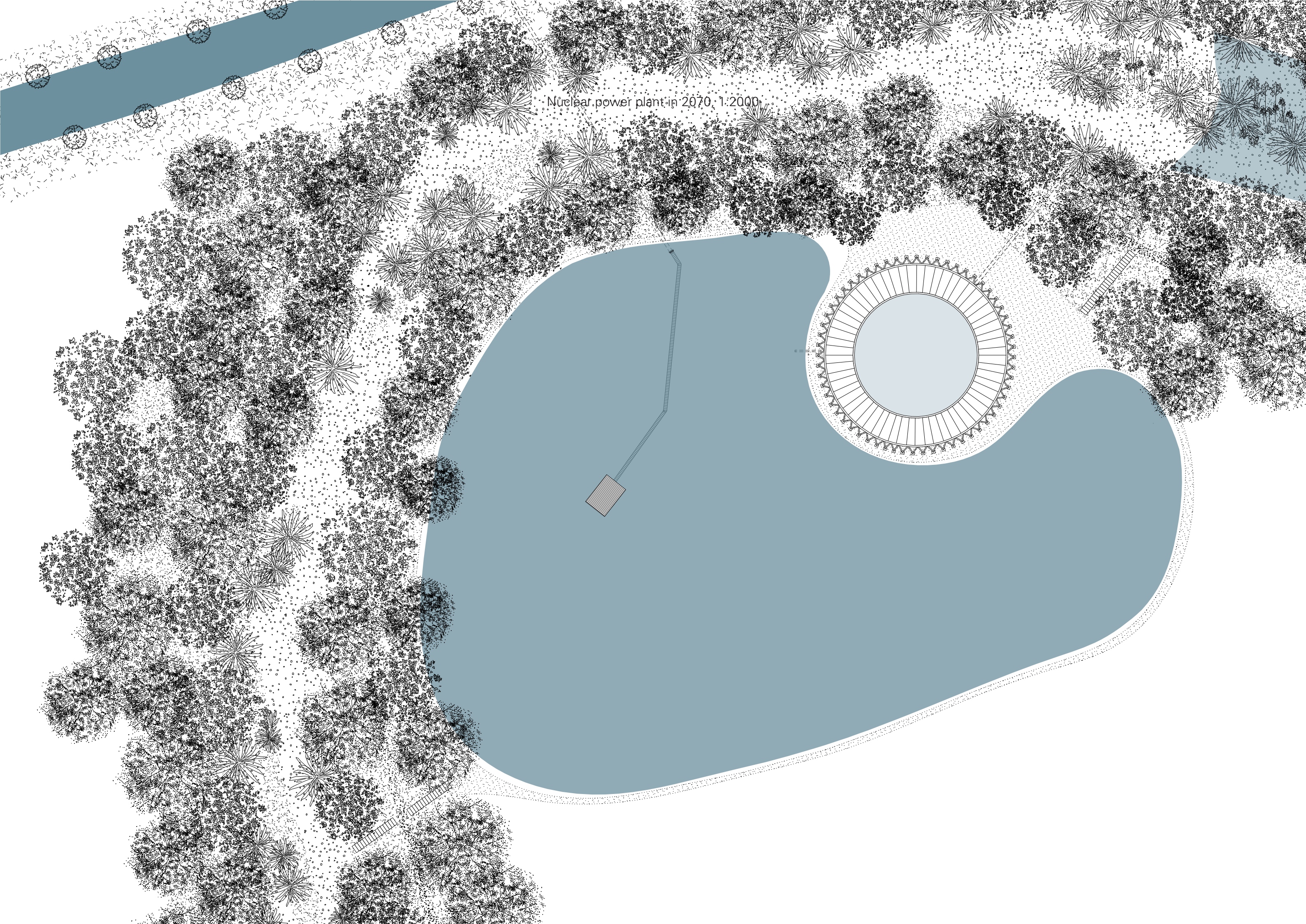




Nuclear power plant section in 2070, 1:200







Nuclear power plant in 2070 + 2000

Construction of the pond

The existing pump will remain in place after the nuclear power plant is dismantled.

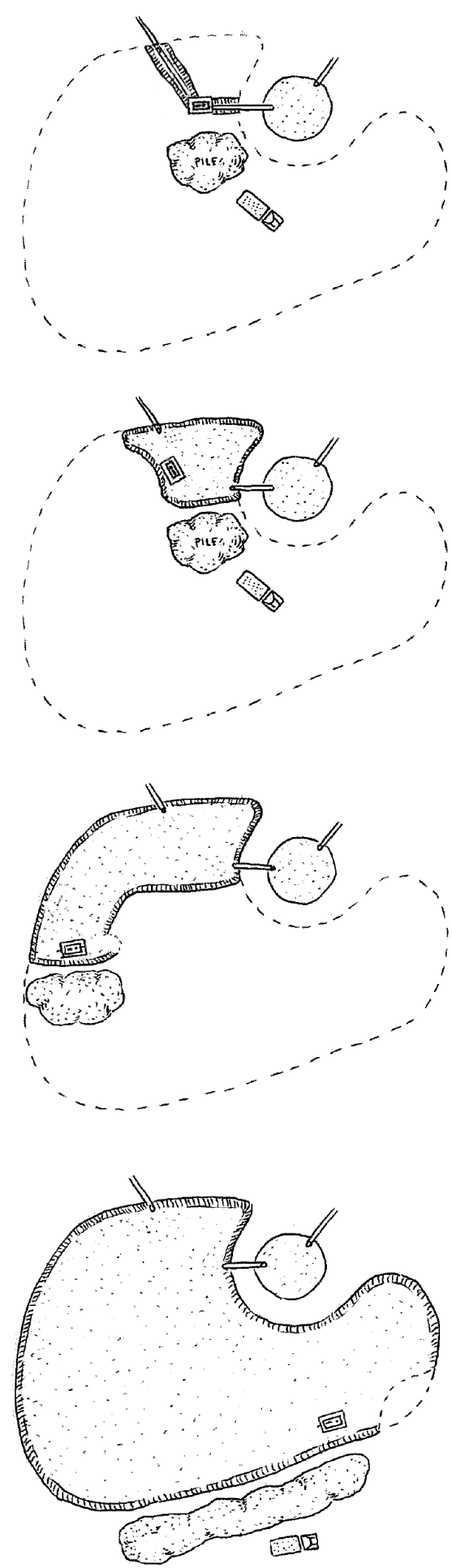
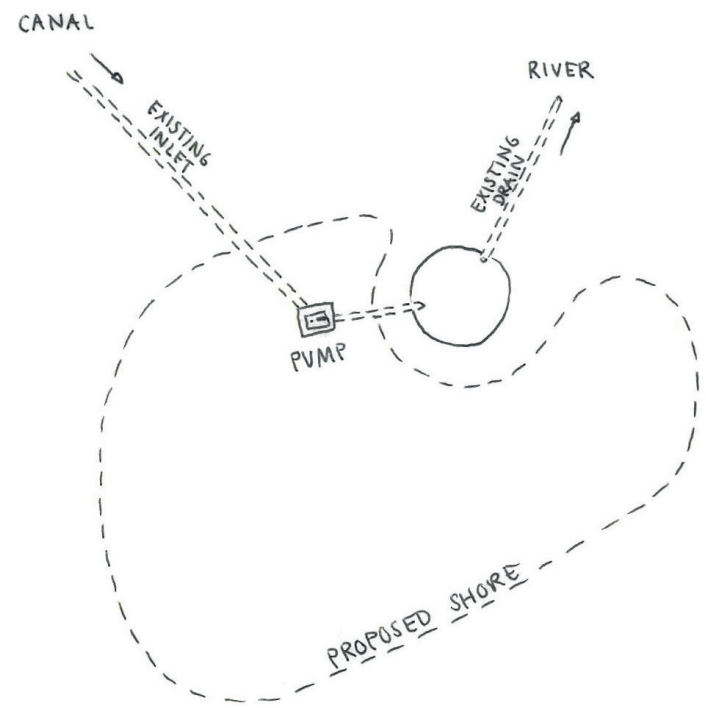
It will be uncovered and placed on a floating base. Parts of the existing inlet pipe will be replaced by a movable pipe so that the pump can flexibly move the pond and maintain it.

The overflow of the canal flows into the basin. It is stored there and flows at a certain level through the basin of the cooling tower and the drain back into the old river.

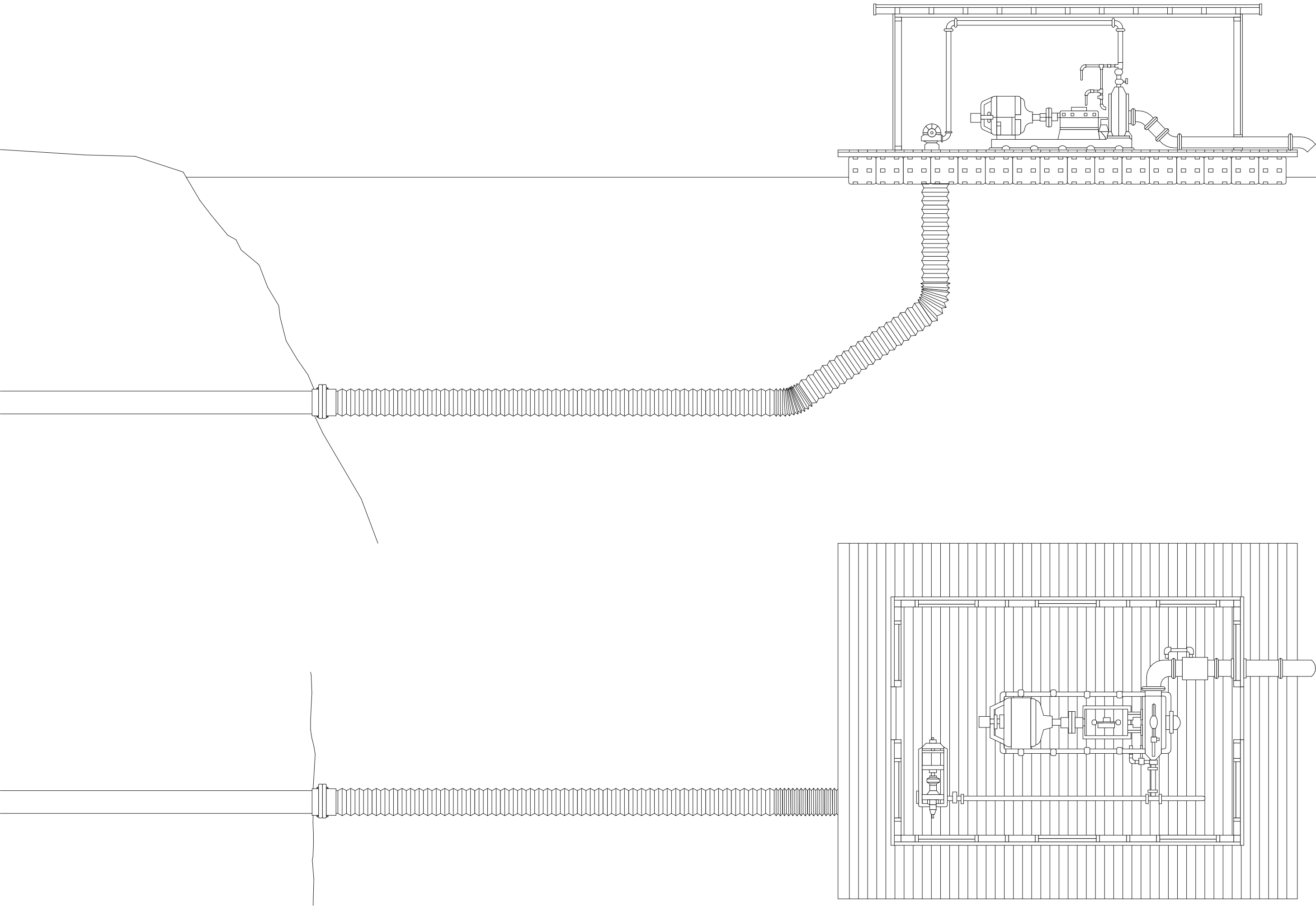
All these pipes are existing and were used for the cooling water-process in the power plant.

Amount of excavated material: 700'000 m³
Compared with dam: 1'300'000 m³

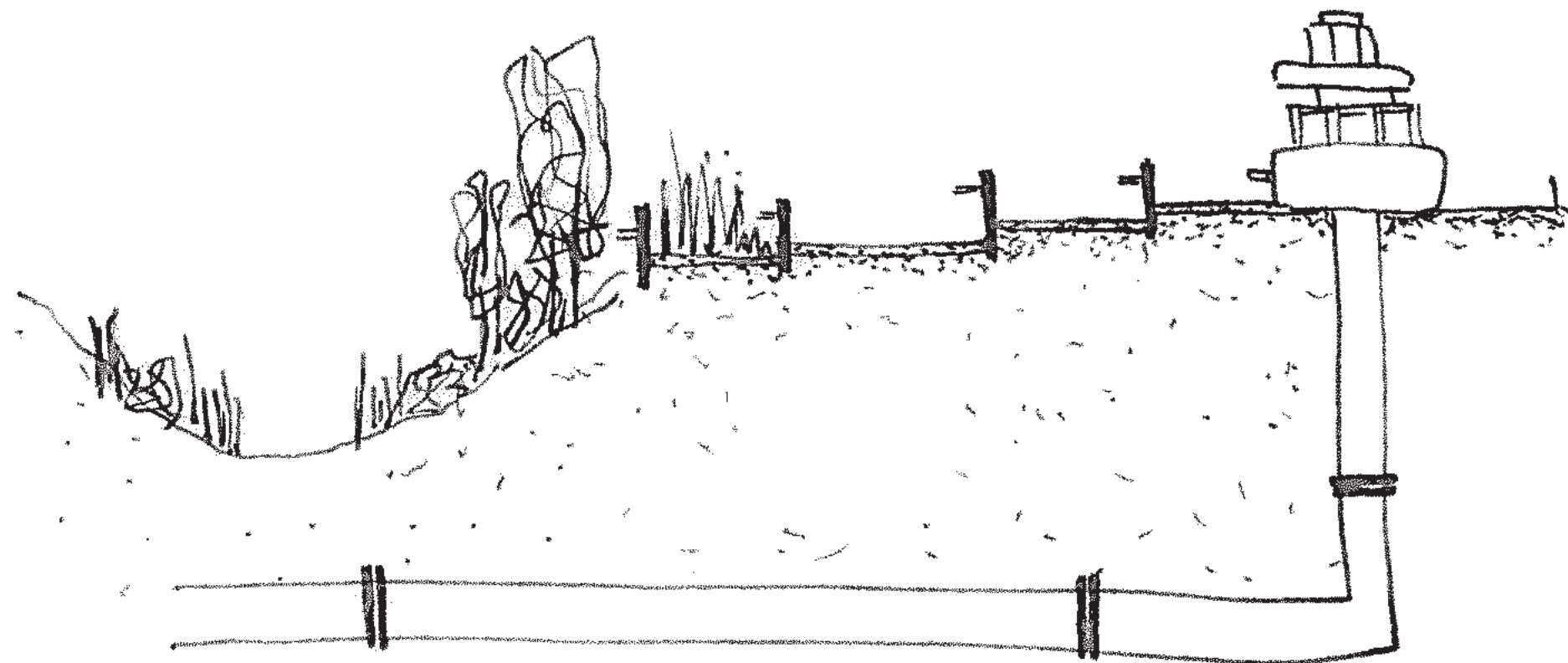
One third of the excavated material will be used for the planned repair of the canal's dam. The rest will be filled into the nearby gravel pits.



Floating waterpump, 1:200



Principle of passive drain

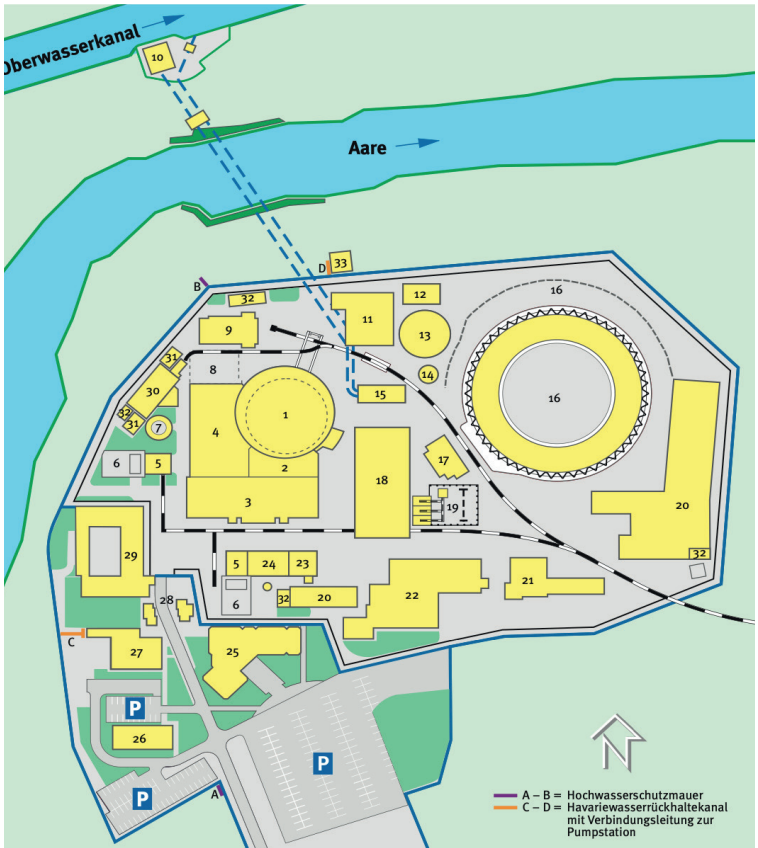


Robert Smithson: Broken Circle

- Kombination von Damme und Kanal
- Charakteristika von Erdschneidern und Kanalisieren
- Polderlandschaft Hollands wurde dadurch erst urban (durch Kultivierung)
- linksdrehende Spirale → irreversible Entwicklung
- Kanal und Damm fügen sich zu einem unterbrochenen Kreis, in dessen Mitte ein riesiger Findling liegt
- aus Torf, Abbauprodukt der Region
- Sandgucke, in der es liegt, ist ein Resultat der Natursanierung
- Abgraben von Wasser: Anspielung auf die Kultivierung
- ↳ Kultivierung von Landschaft, dadurch wurde Energiegewinnung erst möglich (Kanal)



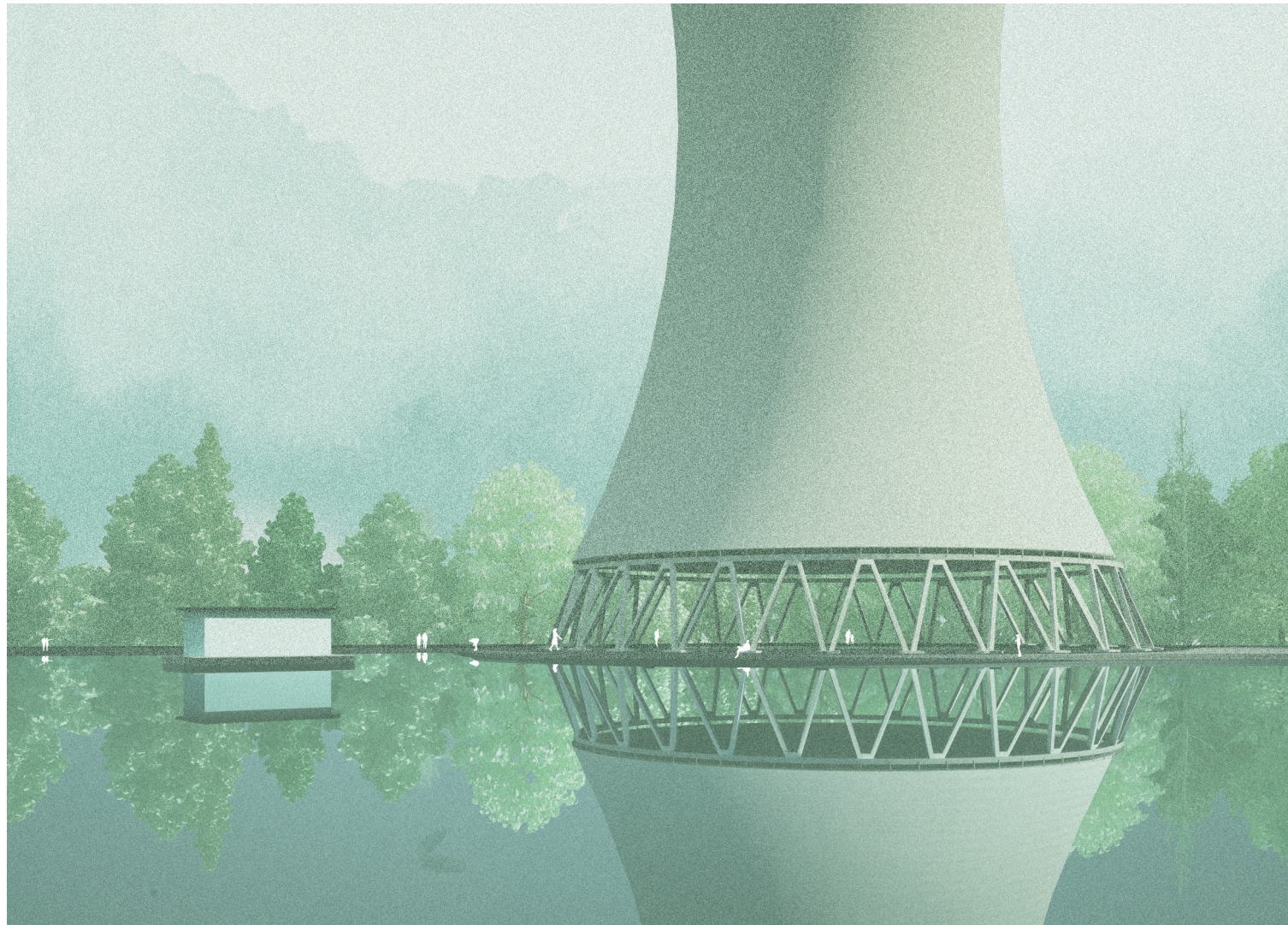
Jan Niks, Sammlung Fotomuseum Winterthur



www.kkg.ch

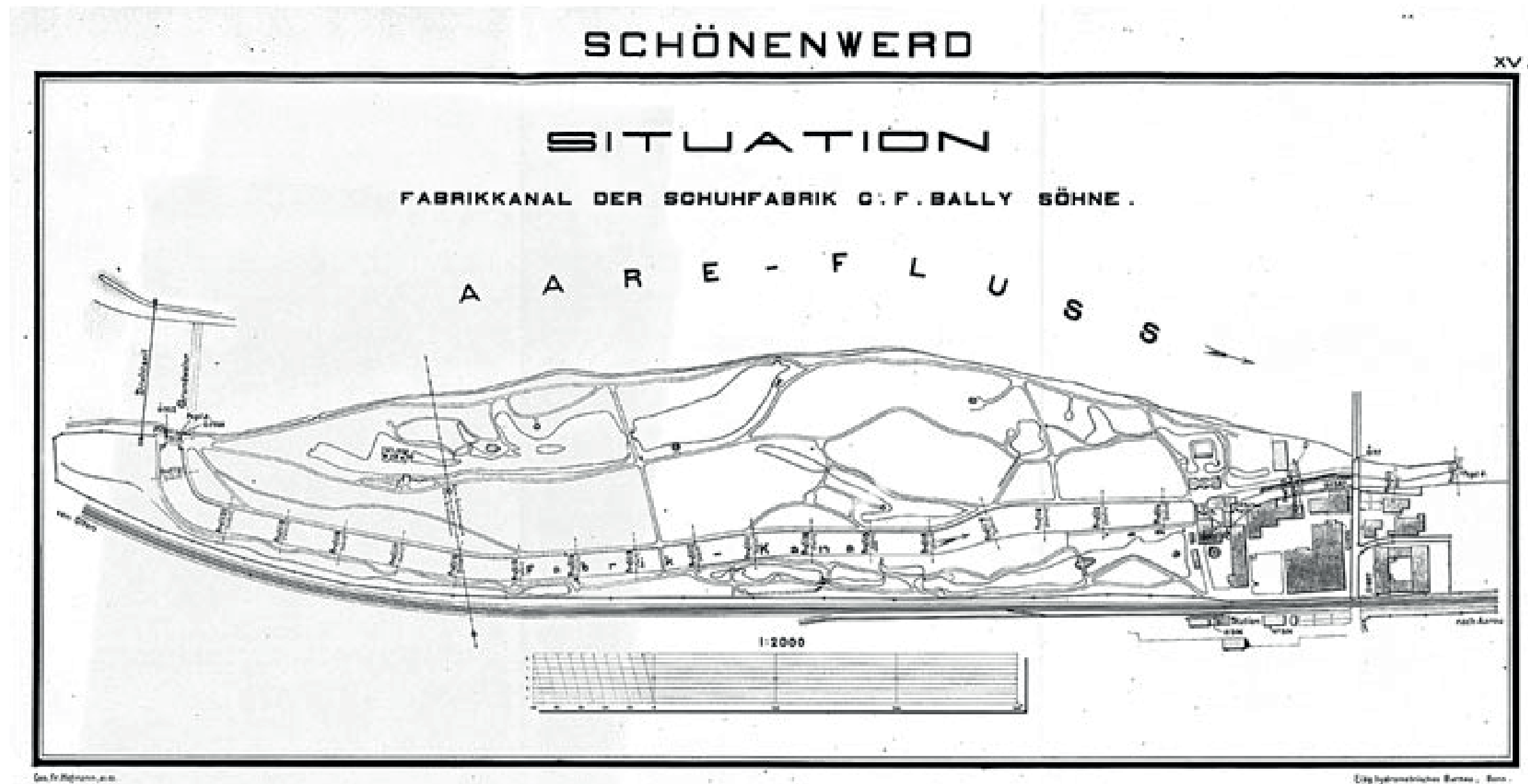
The nuclear power plant is as a finding which becomes part of an open system (circuit) rather than a closed circle (so far).

Doubled monument

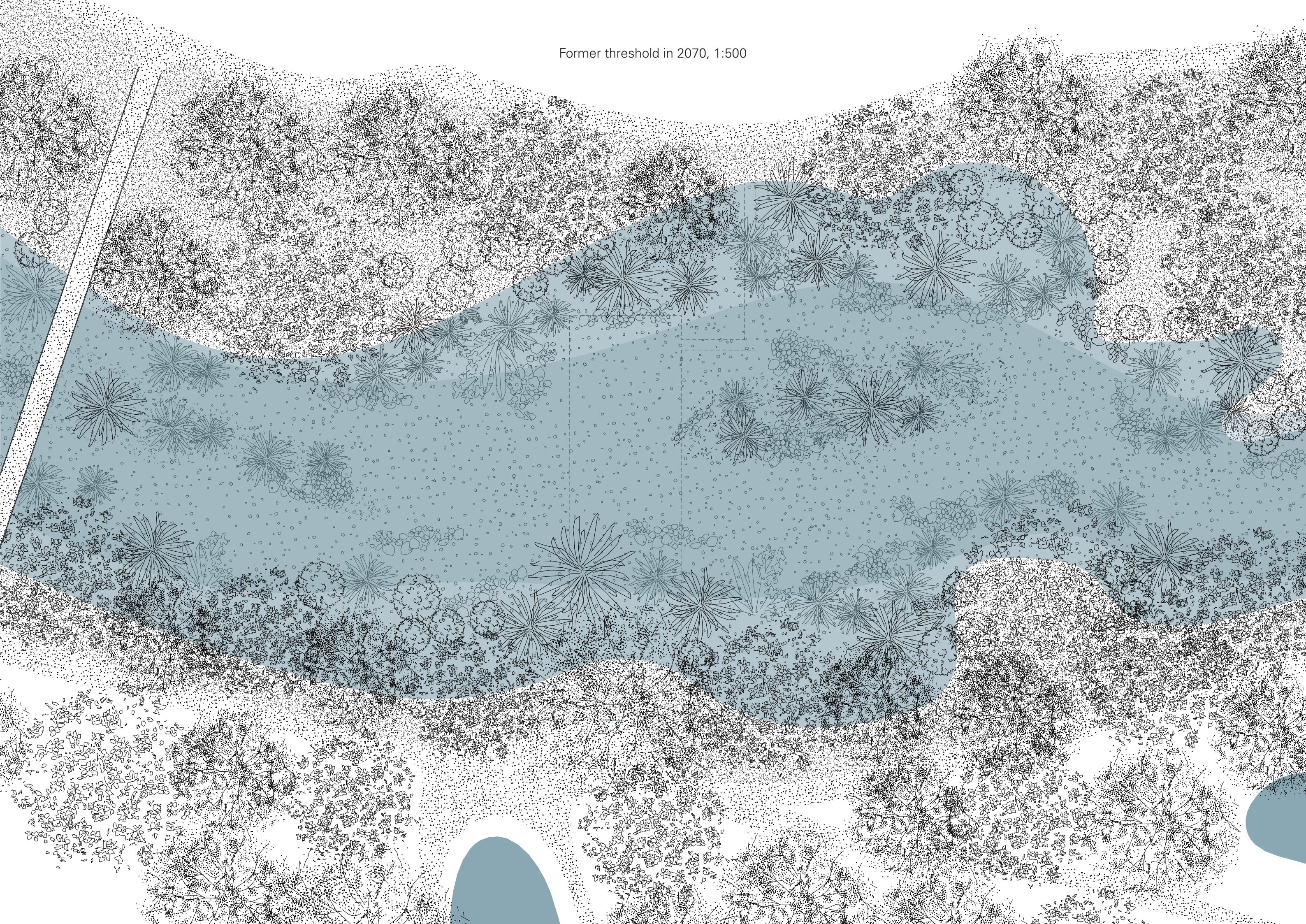


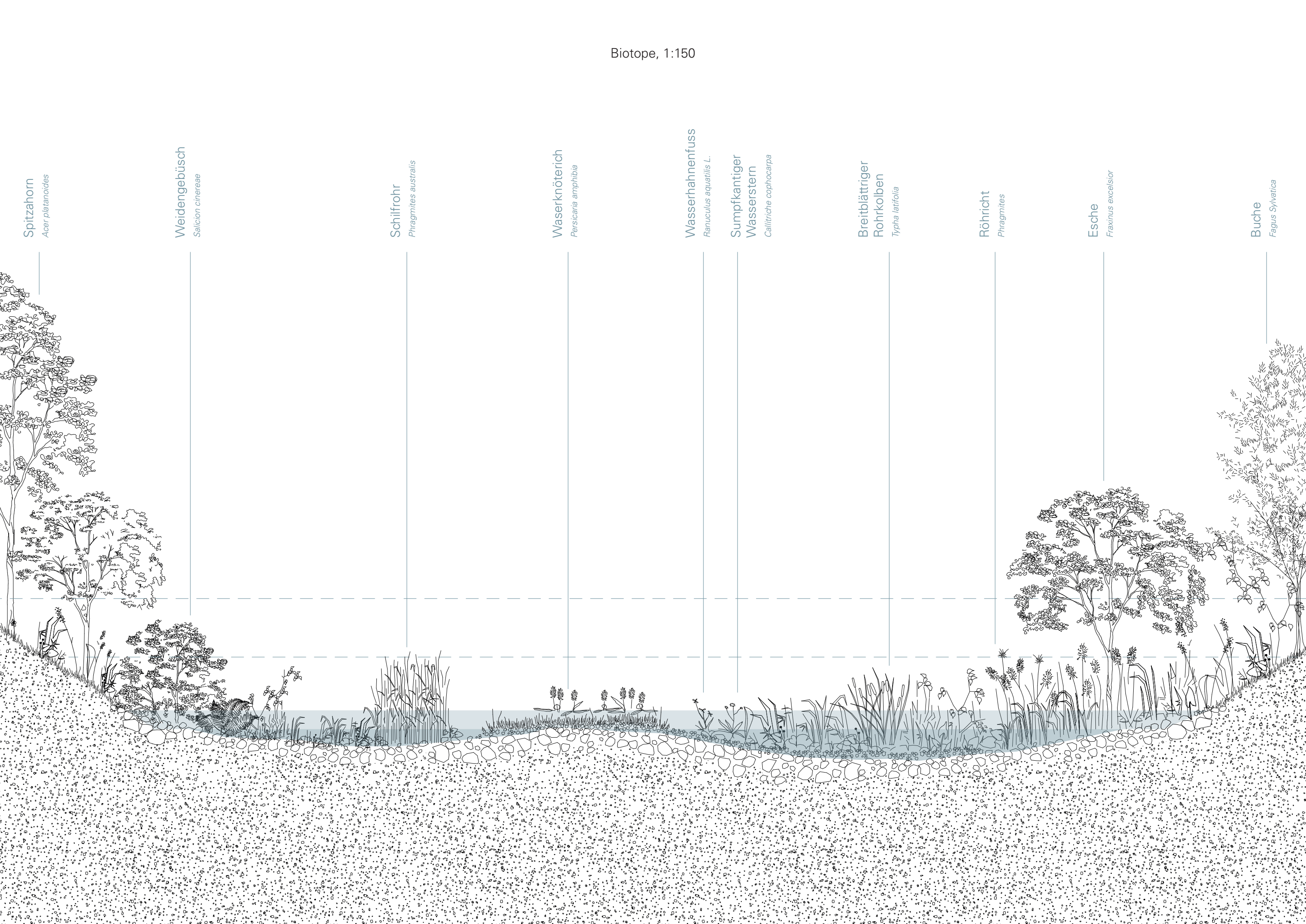
Biotope consisting of the dry rambla and wetland





Former threshold in 2070, 1:500





Spitzahorn
Acer platanoides

Weidengebüsch
Salix cinerea

Schilfrohr
Phragmites australis

Waserknöterich
Persicaria amphibia

Wasserhahnenfuss
Ranunculus aquatilis L.

Sumpfkantiger
Wasserstern
Callitriche cophocarpa

Breitblättriger
Rohrkolben
Typha latifolia

Röhricht
Phragmites

Esche
Fraxinus excelsior

Buche
Fagus sylvatica