

Terraforming

*Reclaiming post-mining territory as an unfinished laboratory
for an integrative transformation*

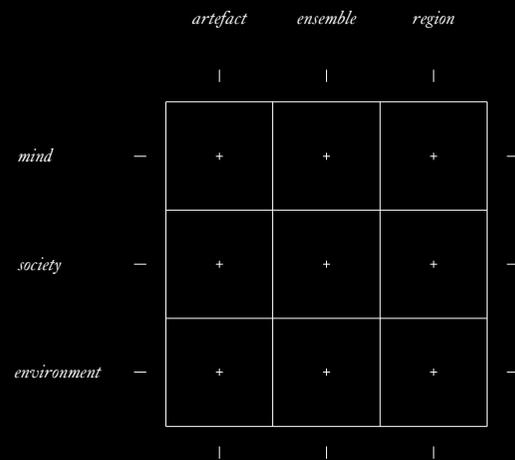
Damian Lachtara



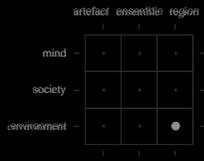
project's site
coal mine "KWK Centrum", Bytom, Poland



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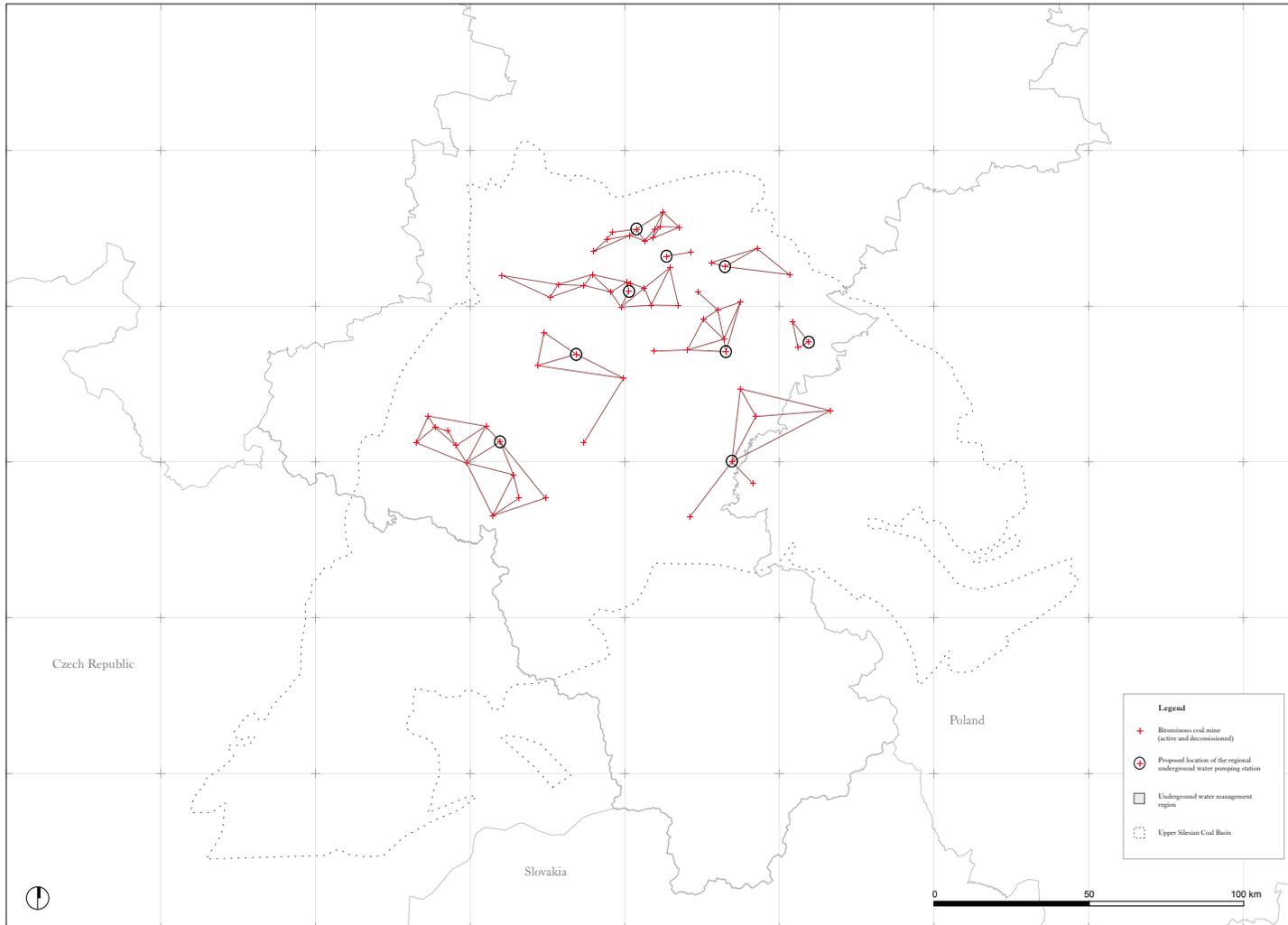
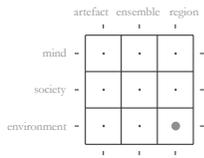
Duisburg-Nord Landscape Park
 Part of Emscher Park, Duisburg, Germany
 Latz+ Partners

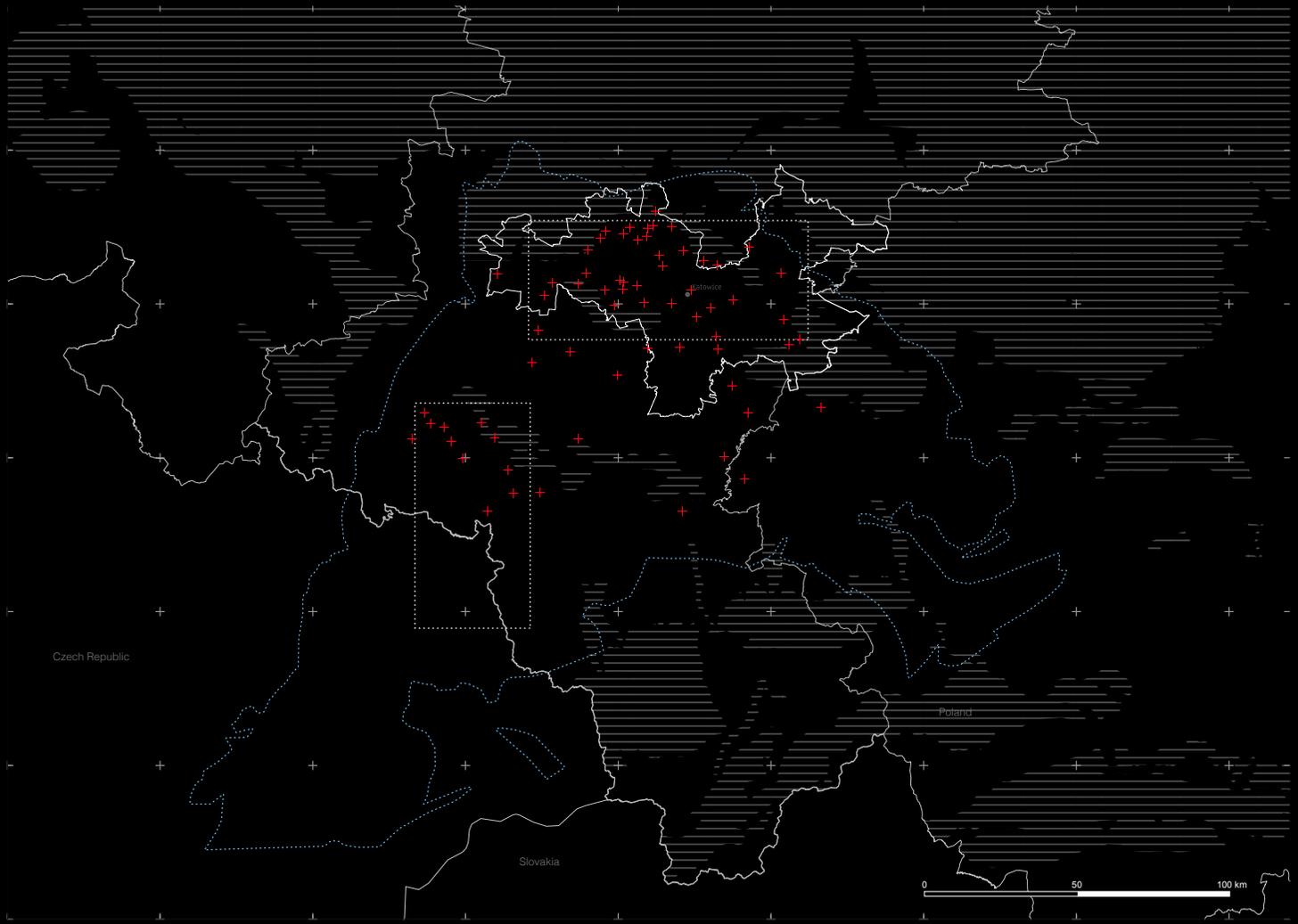
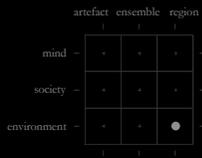


mining coal



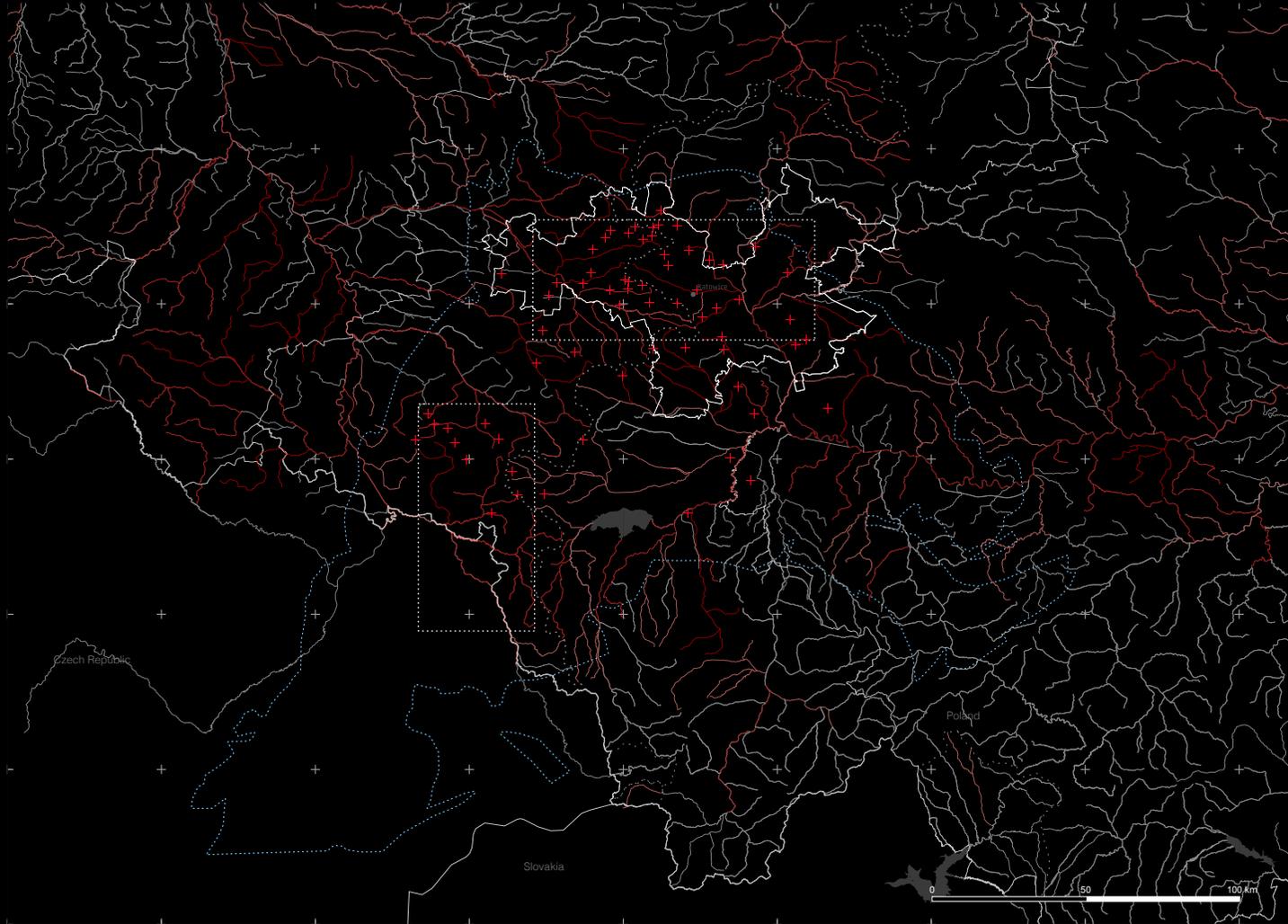
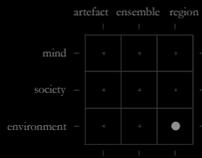
mining water





Distribution of the Urban Settlements / Groundwaters

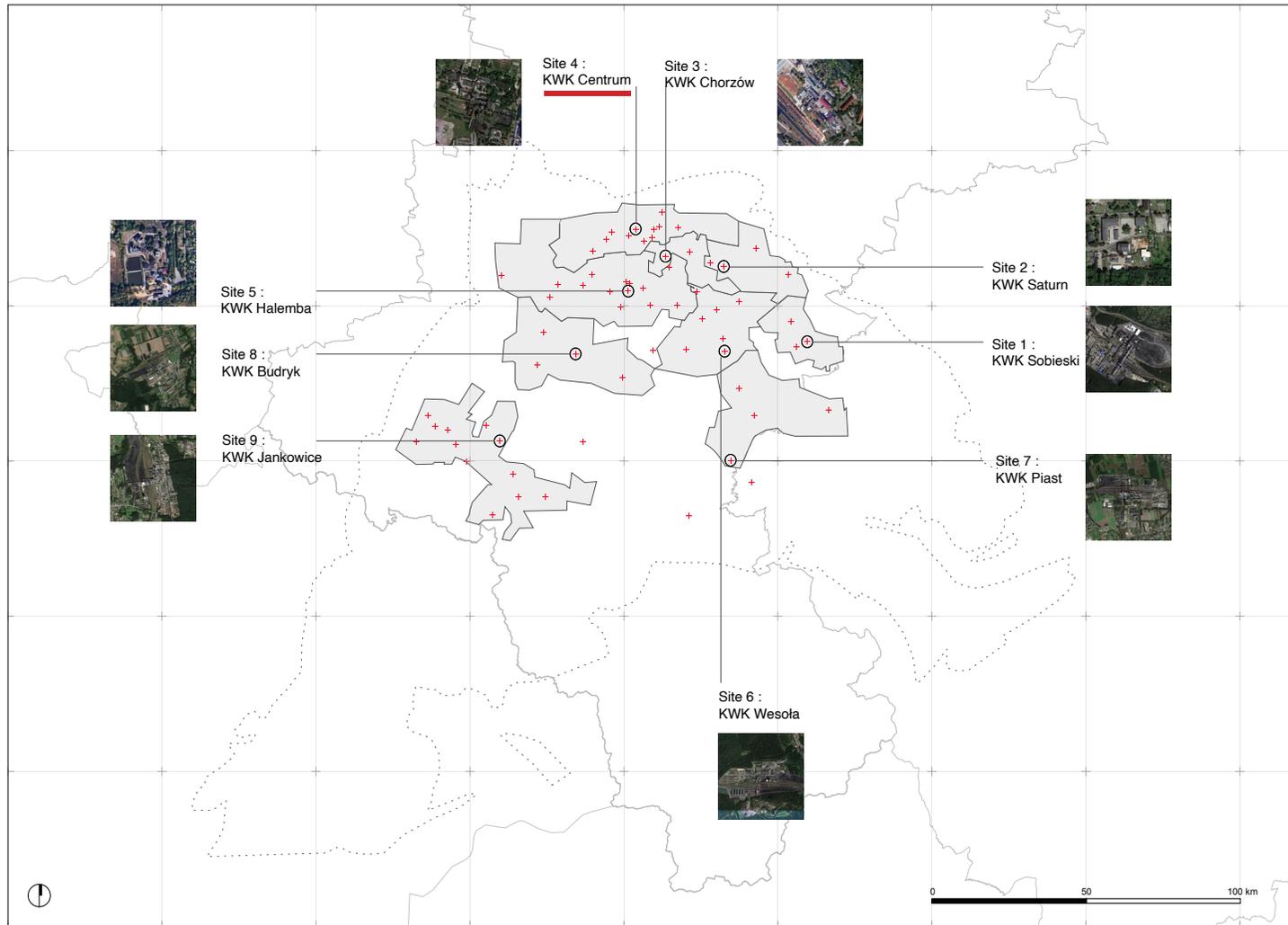
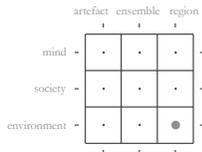
- Katowice Conurbation
- Upper Silesian Agglomeration
- Geological Region: Upper Silesian Coal Basin
- ≡ Groundwaters
- + Open-pit Lignite Mine
- + Underground Bituminous (Black) Coal Mine
- International Border
- Concentration of Urban Settlements and Mining Operations



Distribution of the Urban Settlements / Surface Waters

- Katowice Conurbation
- Upper Silesian Agglomeration
- - - Geological Region: Upper Silesian Coal Basin
- ≡ Groundwaters
- ⊕ Open-pit Lignite Mine
- ⊕ Underground Bituminous (Black) Coal Mine
- International Border
- - Concentration of Urban Settlements and Mining Operations

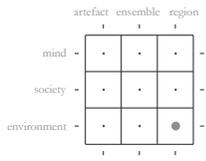
- Ecological Condition of River:
- Bad
 - Poor
 - Moderate
 - - Better than Moderate



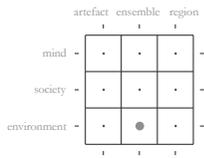
Territorial Water Management System

- Geological Region: Upper Silesian Coal Basin
- + Underground Bituminous Coal Mine
- ⊕ Underground Bituminous Coal Mine / Pioneer Site (Regional Groundwaters Management Station)
- International Border

9 Strategic Sites
Systemic Approach

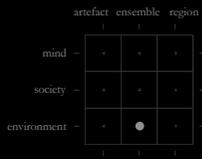


9 Strategic Sites
Systemic Approach



project's site
Bytom, Upper Silesia, Poland

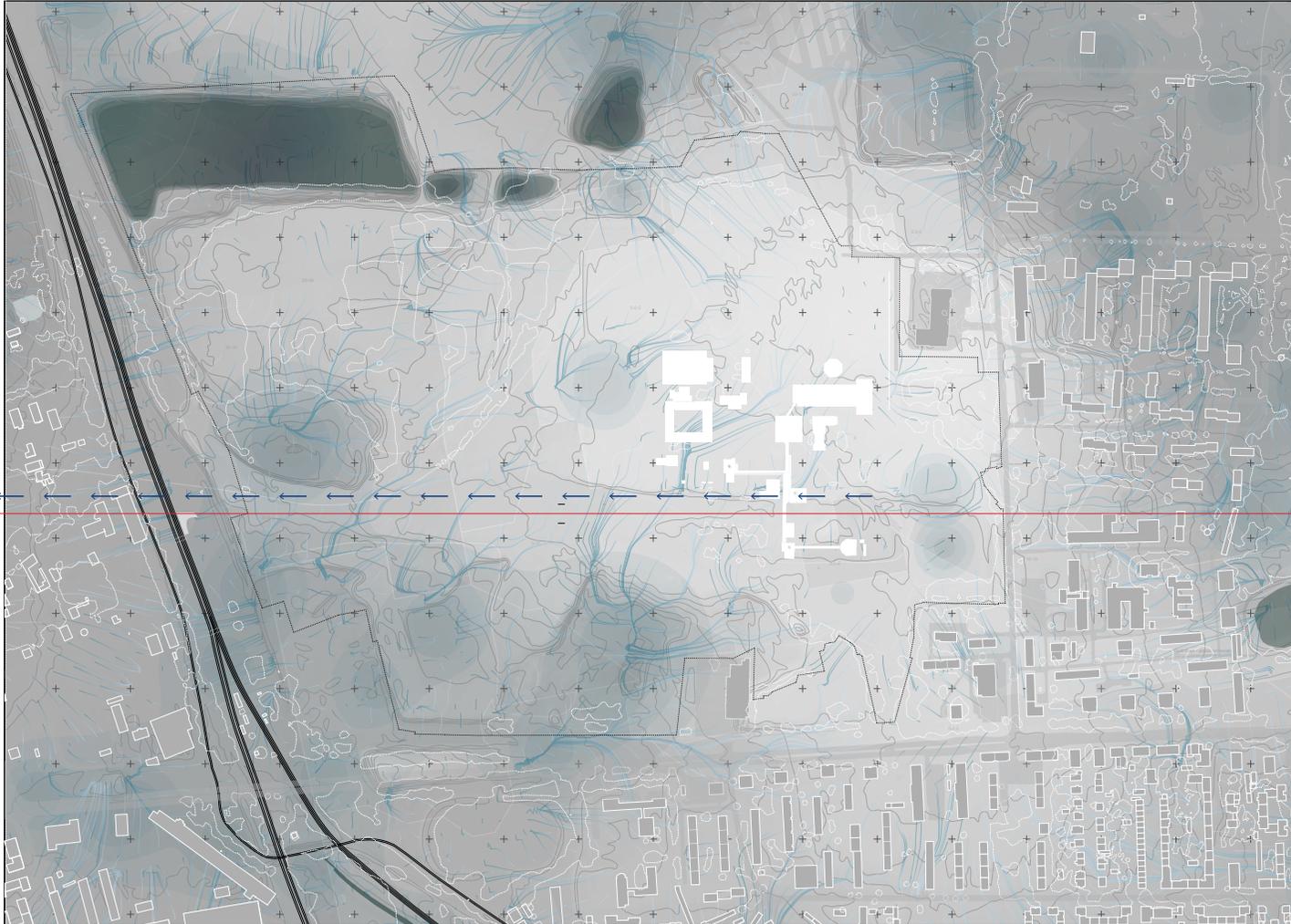
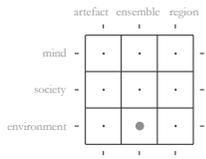
(source: author)



Design Question.

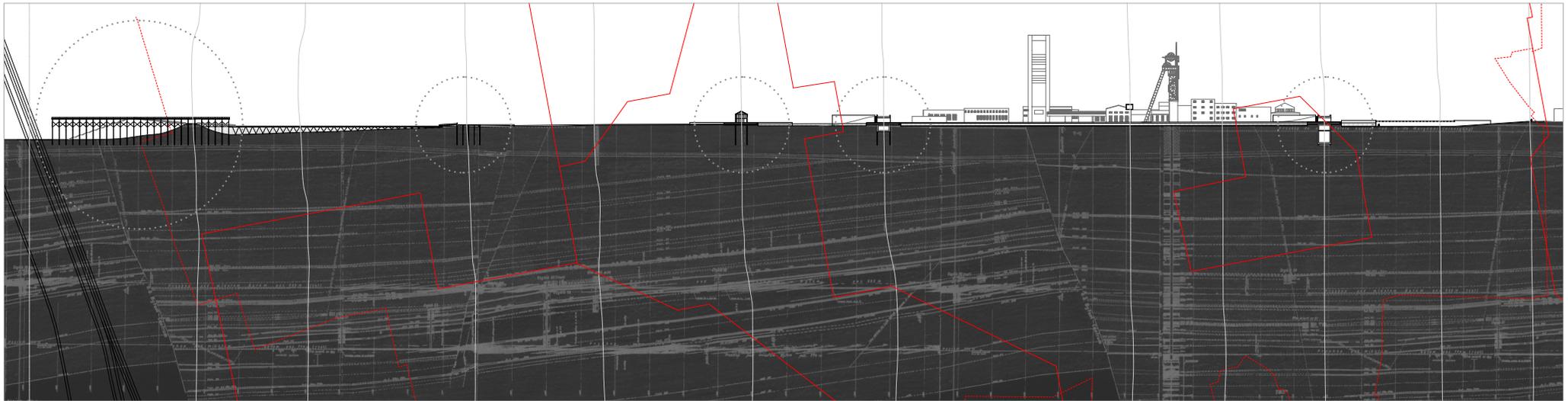
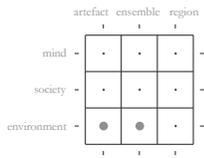
How to integrate the active post-mining infrastructure with site-specific programming of space to achieve multiscalar remediation along the axis of water?

project's site
coal mine "KWK Centrum", Bytom, Poland



critical section



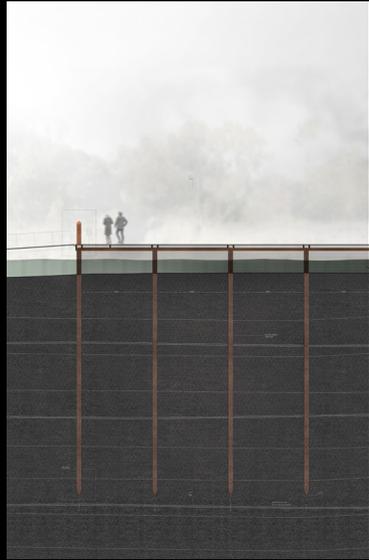
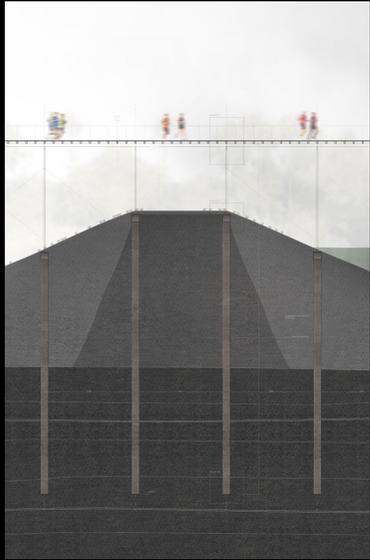
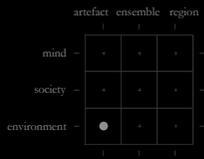


gravitational water flow direction

high insecure terrestrial conditions
heavy underground exploitation
sinking land occurs

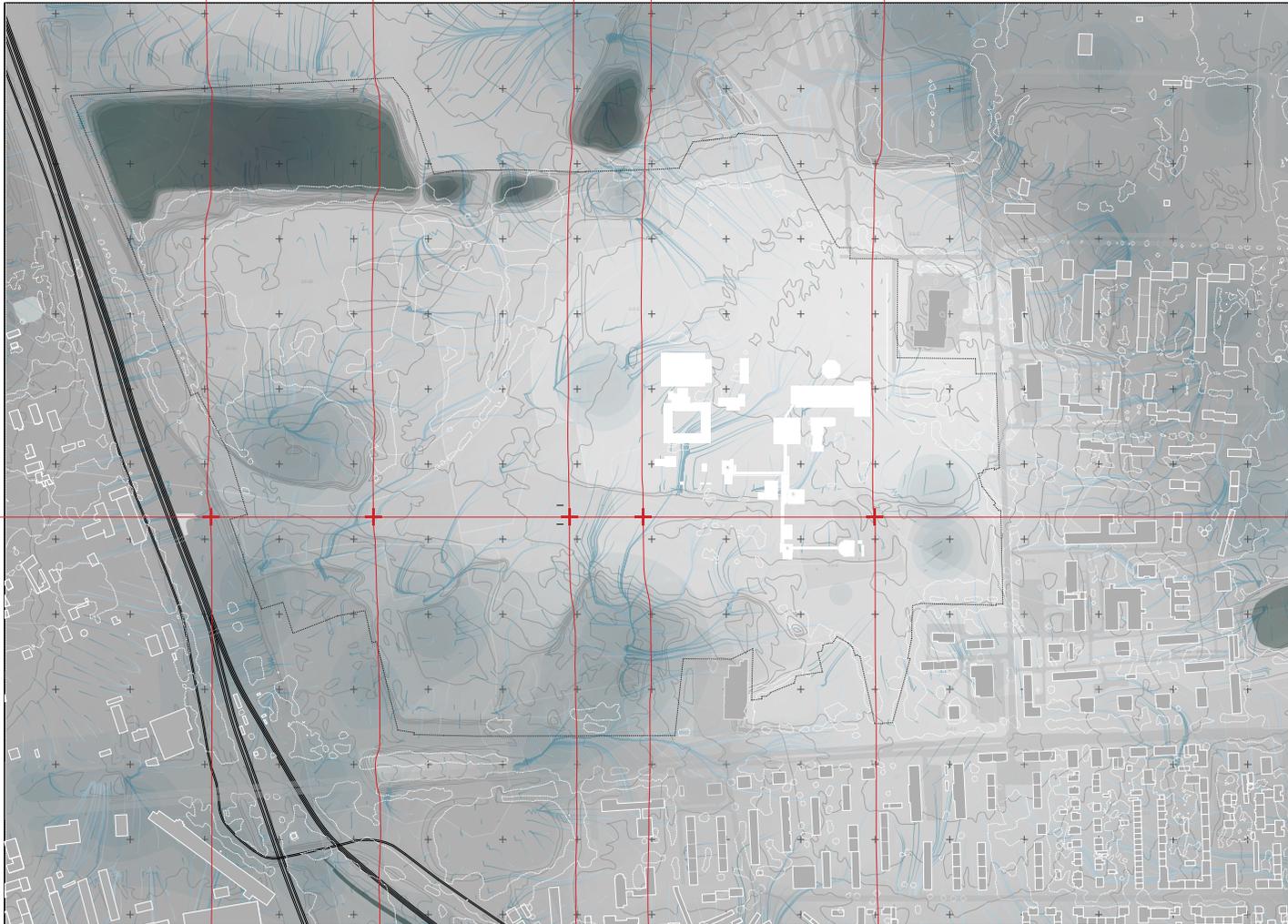
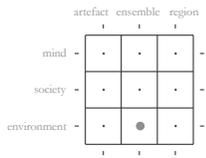
secure terrestrial conditions
no underground exploitation
sinking land does not occur

reconfiguration of the site



high insecure terrestrial conditions
 heavy underground exploitation
 sinking land occurs

secure terrestrial conditions
 no underground exploitation
 sinking land does not occur



critical section

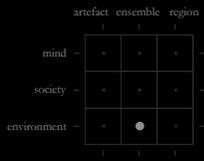
threshold 5

threshold 4

threshold 3

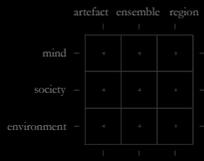
threshold 2

threshold 1

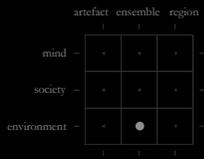


project site - sediment

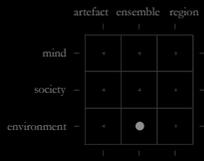
decommissioned black coal mine, "KWK Centrum", Bytom, Poland



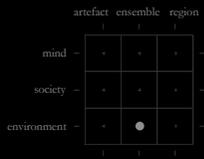
formation of the thresholds



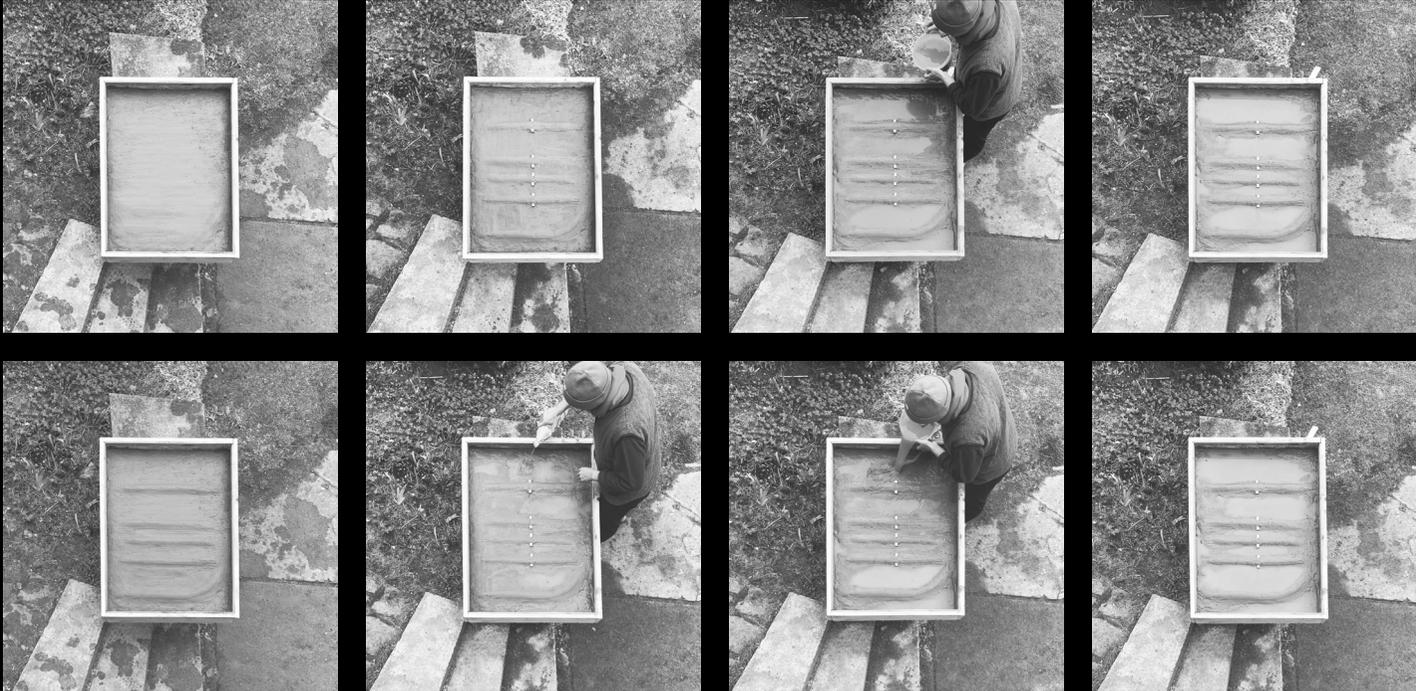
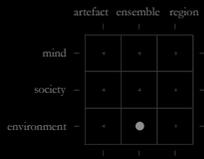
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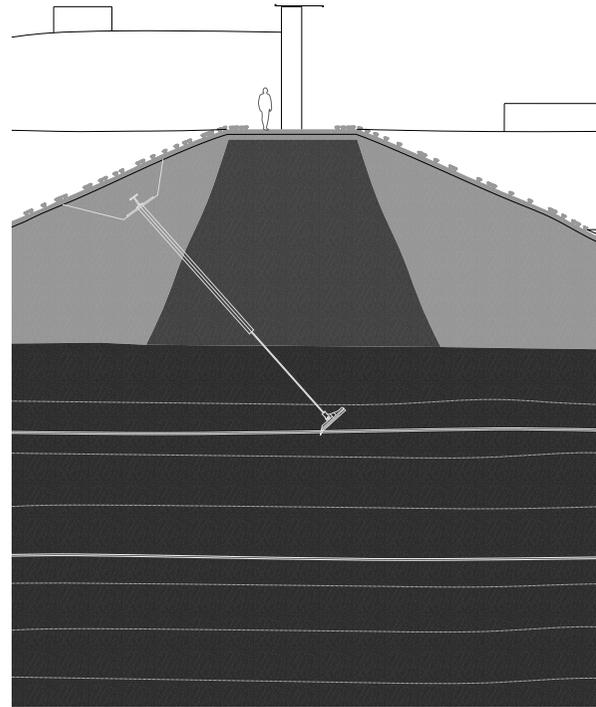
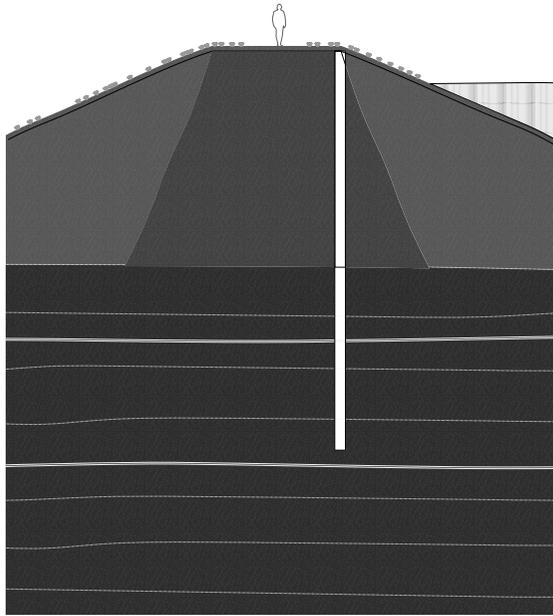
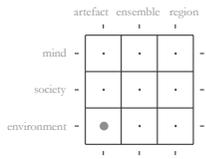
formation of the thresholds



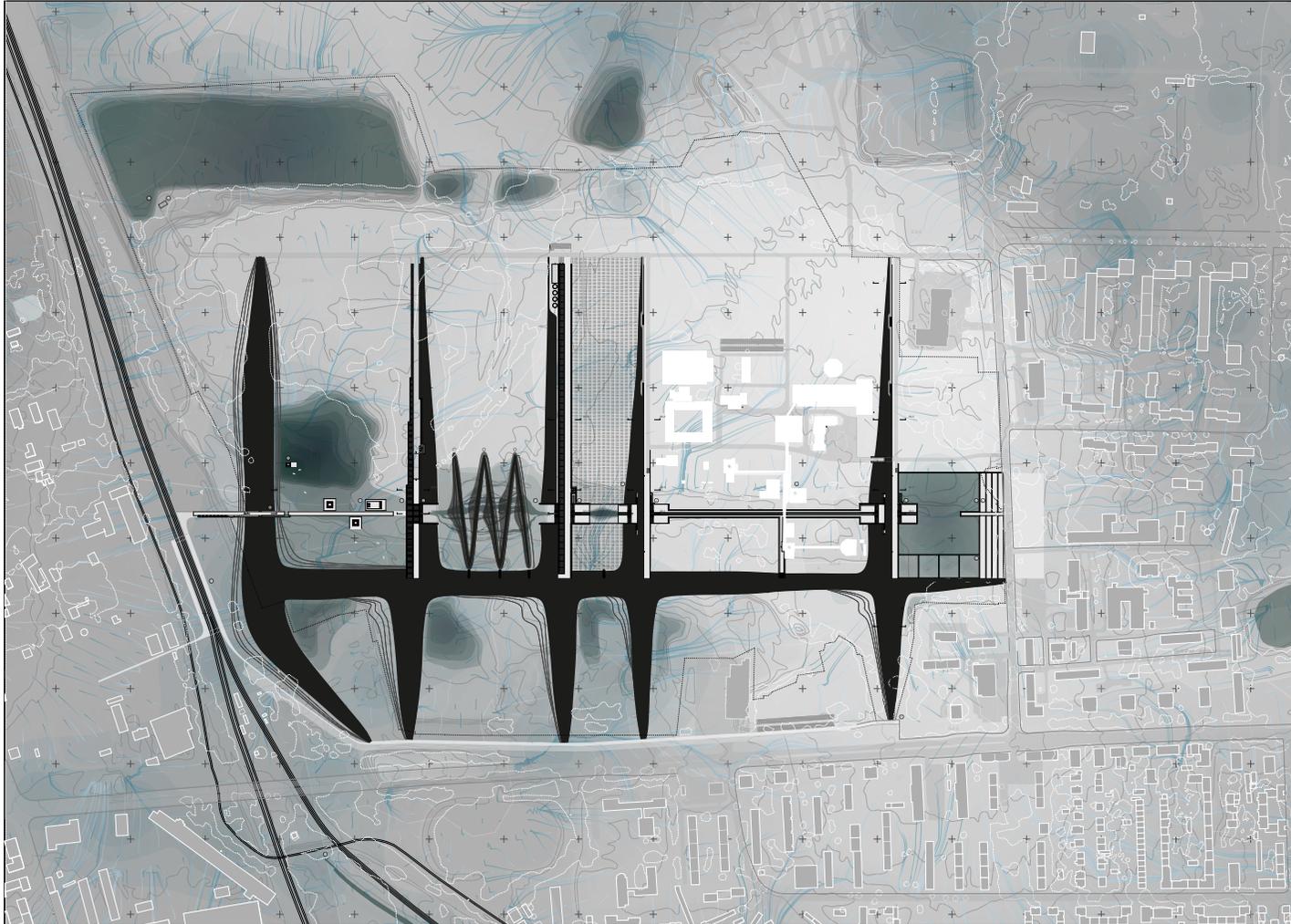
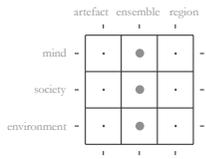
formation of the thresholds



performative model



fixed constructive objects



reconfiguration of the site

	artefact	ensemble	region
mind	.	.	.
society	.	●	.
environment	.	●	.

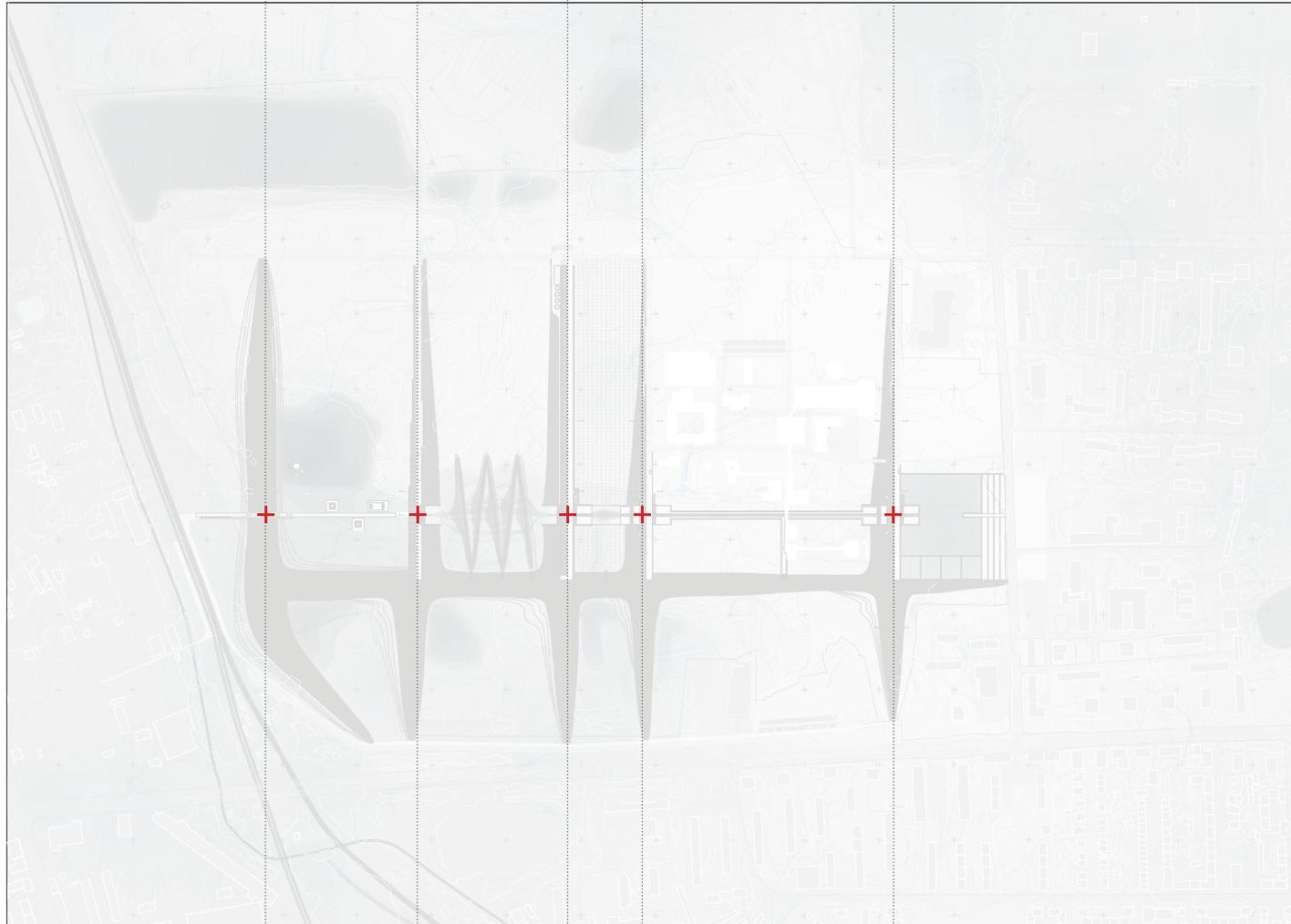
5. balance of accumulation / observation

4. water leisure facility

3. nursery of phytoremediators

2. phytoremediation research

1. water purification



← uncontrolled water environment

→ controlled water environment

reconfiguration of the site

	artefact	ensemble	region
mind	.	.	.
society	.	●	.
environment	.	●	.

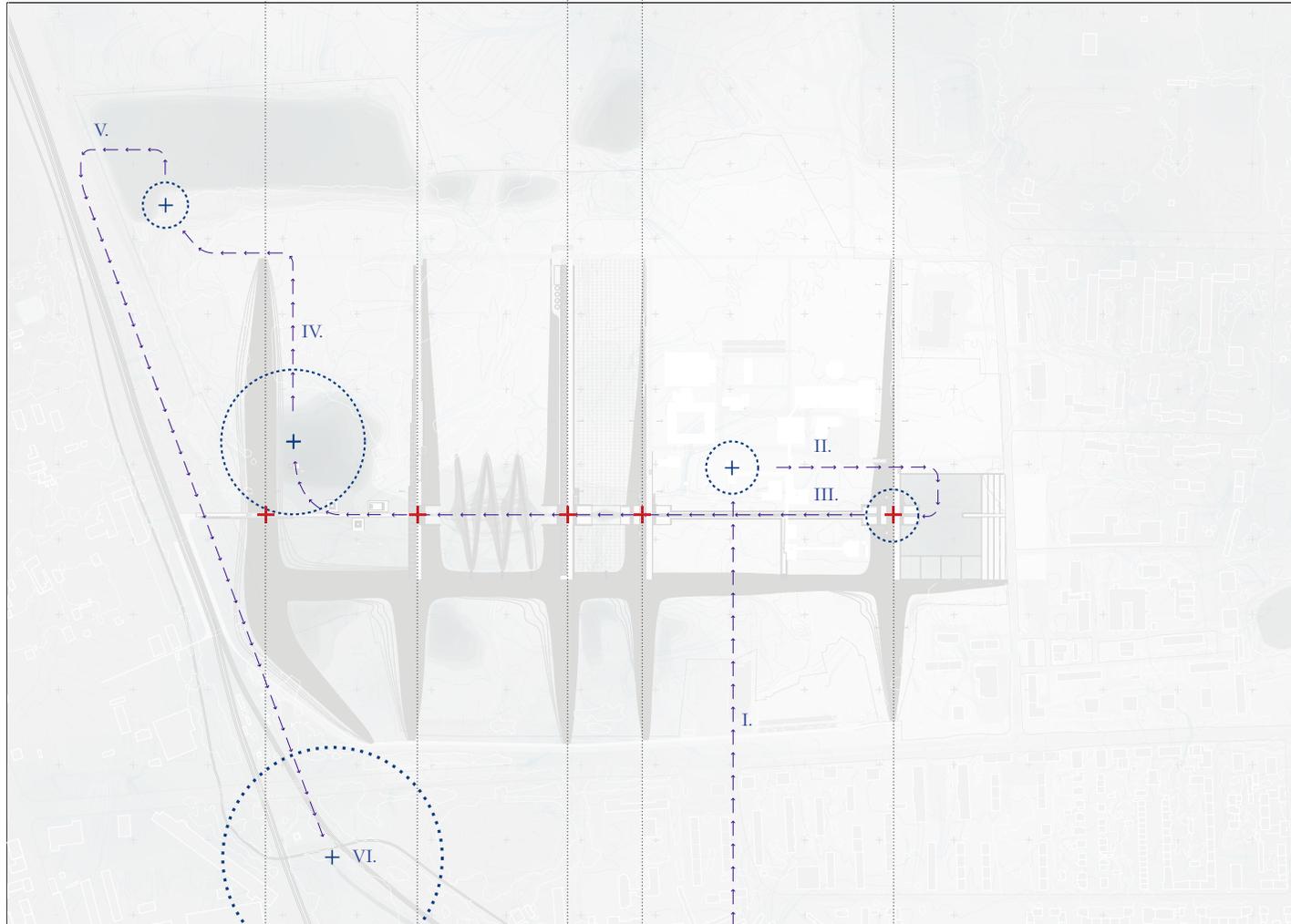
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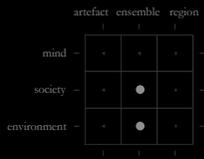
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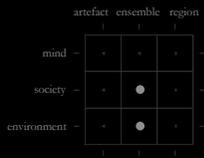
water reconfiguration



space syntax
pedestrian connectivity
integration at 800m

project's site plan
Bytom, Upper Silesia, Poland

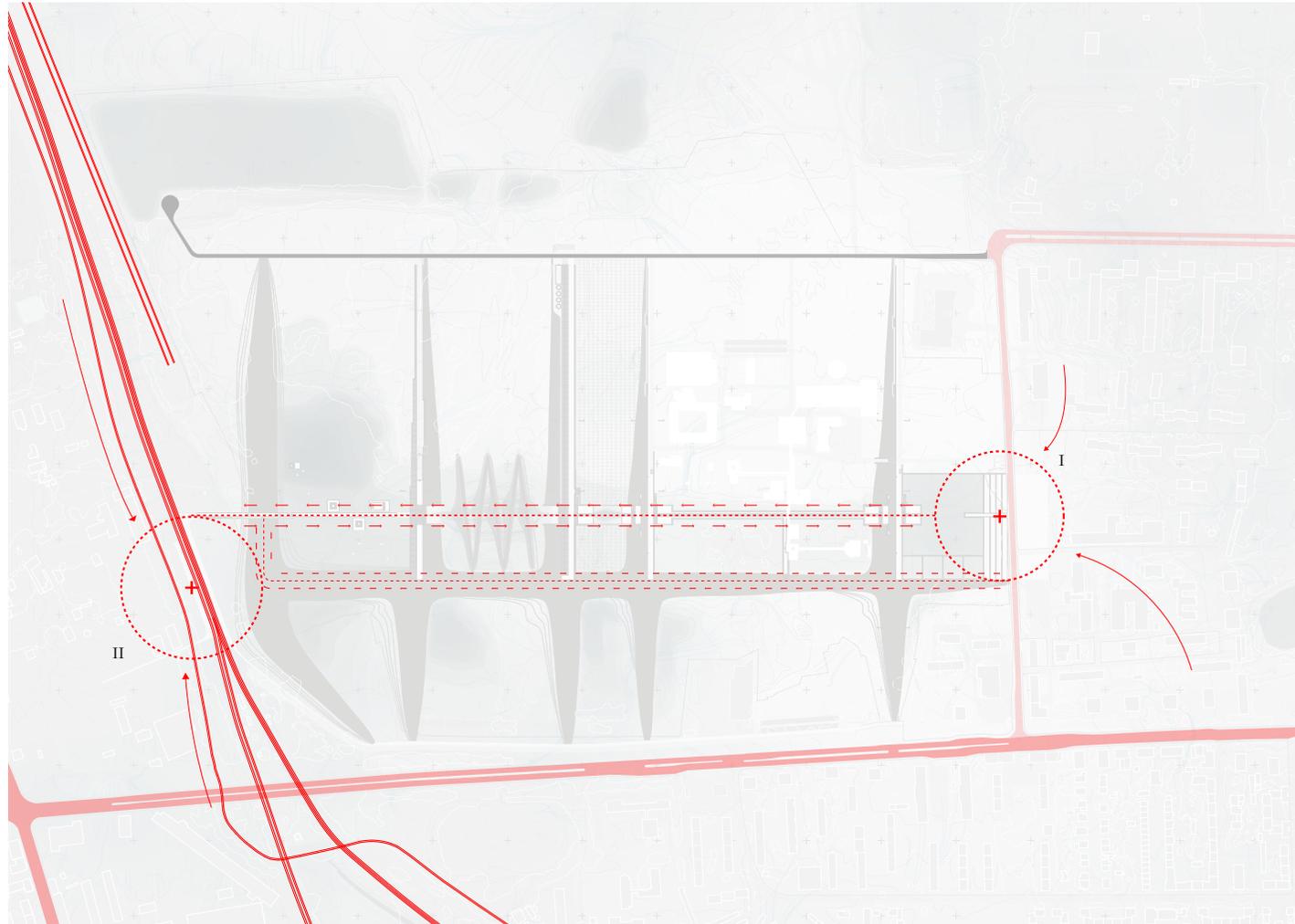
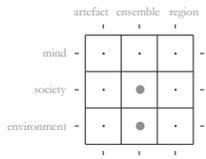
accessability



project's site plan
Bytom, Upper Silesia, Poland

accessability

space syntax
pedestrian connectivity
integration at 800m

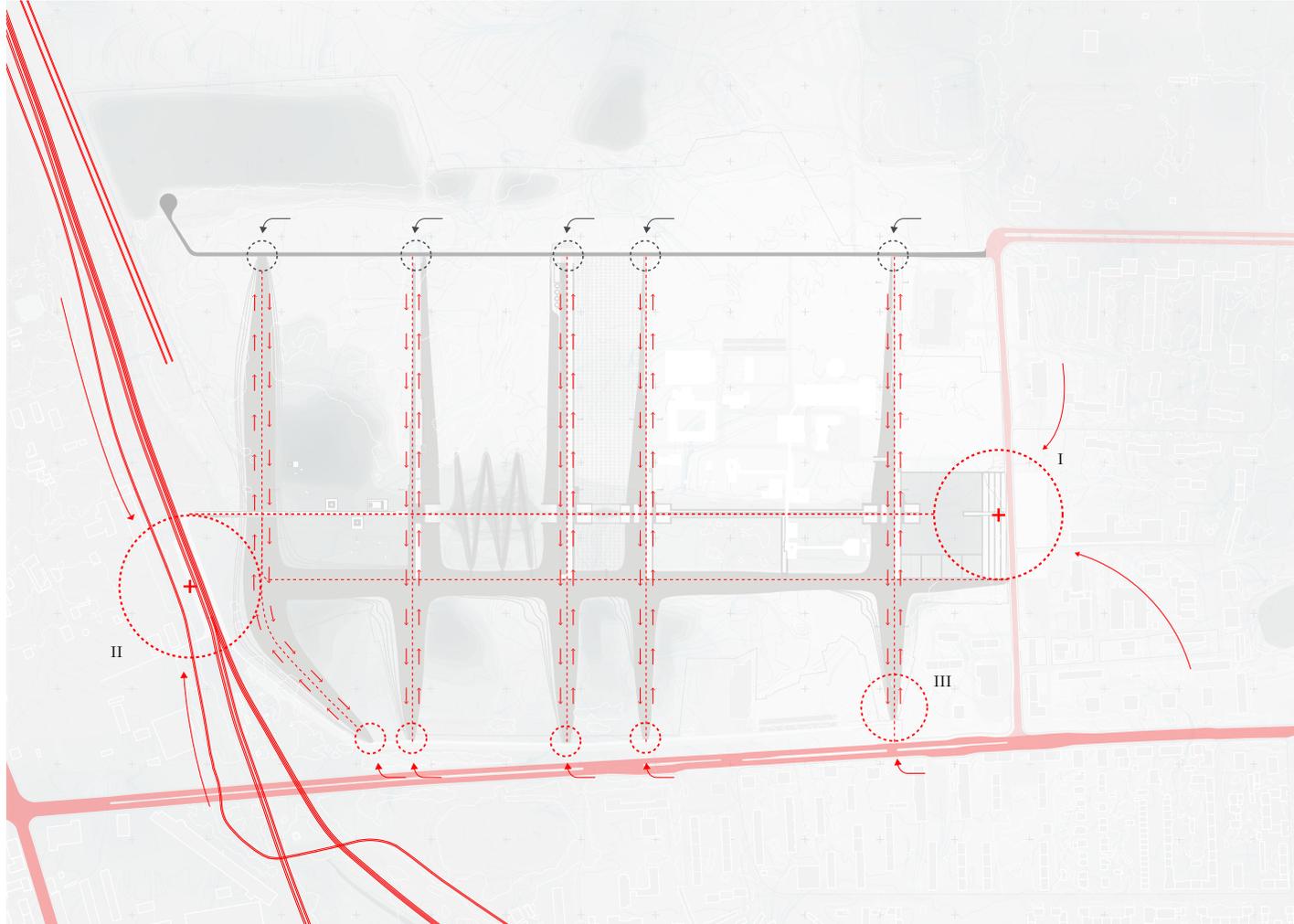
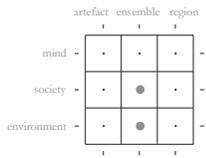


- main four-lane road
- local street
- logistics

project's site plan
Bytom, Upper Silesia, Poland

accessability

(source: author)

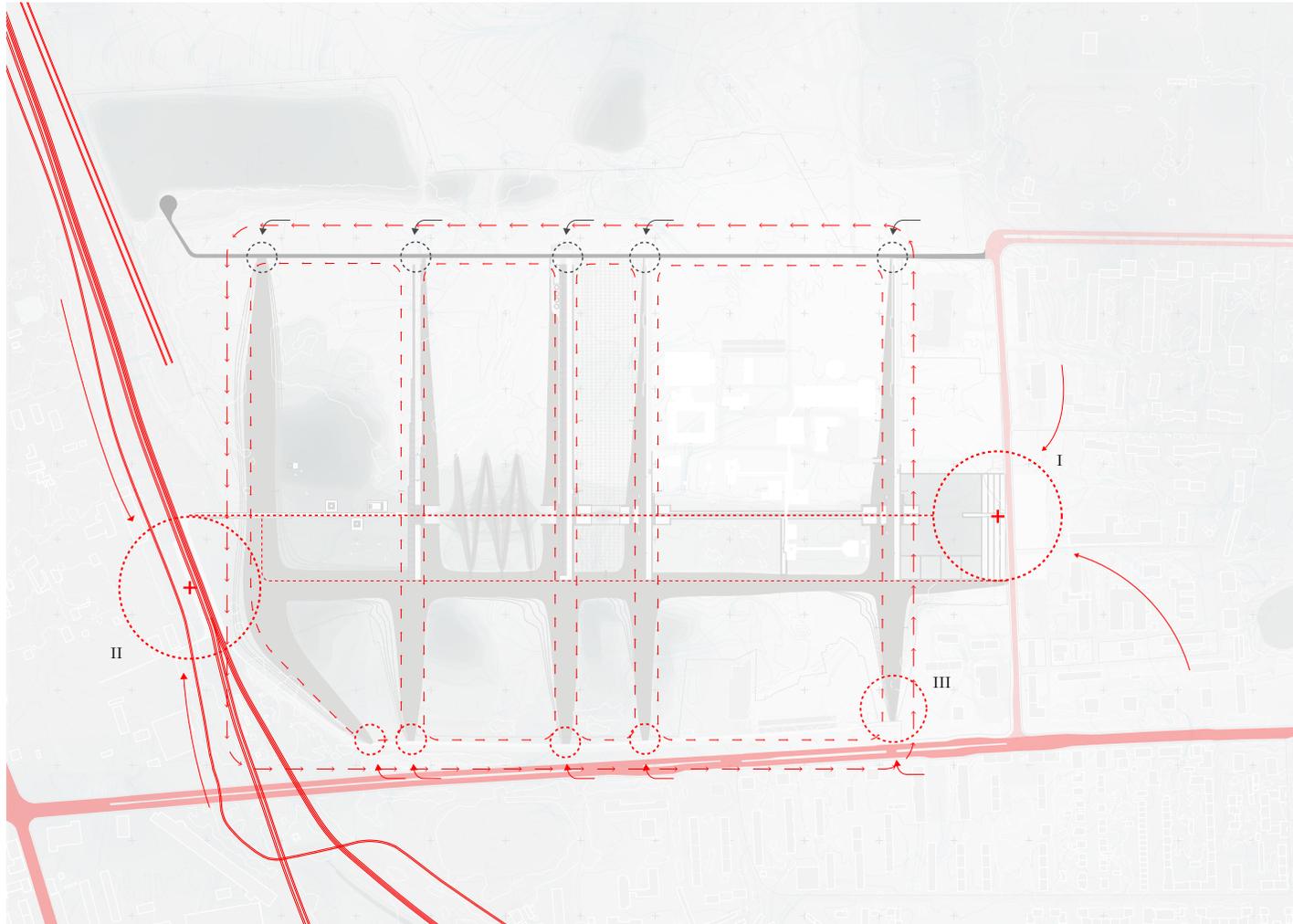
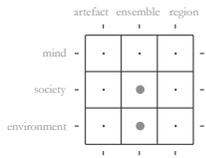


- main four-lane road
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project's site plan
Bytom, Upper Silesia, Poland

accessability

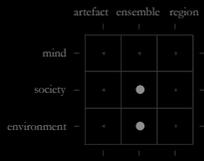
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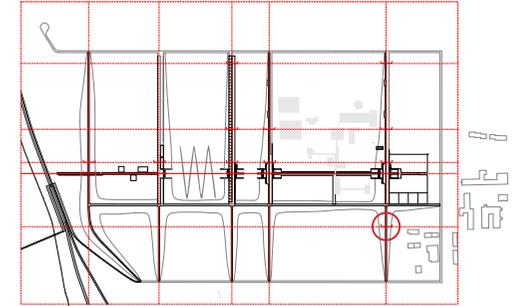
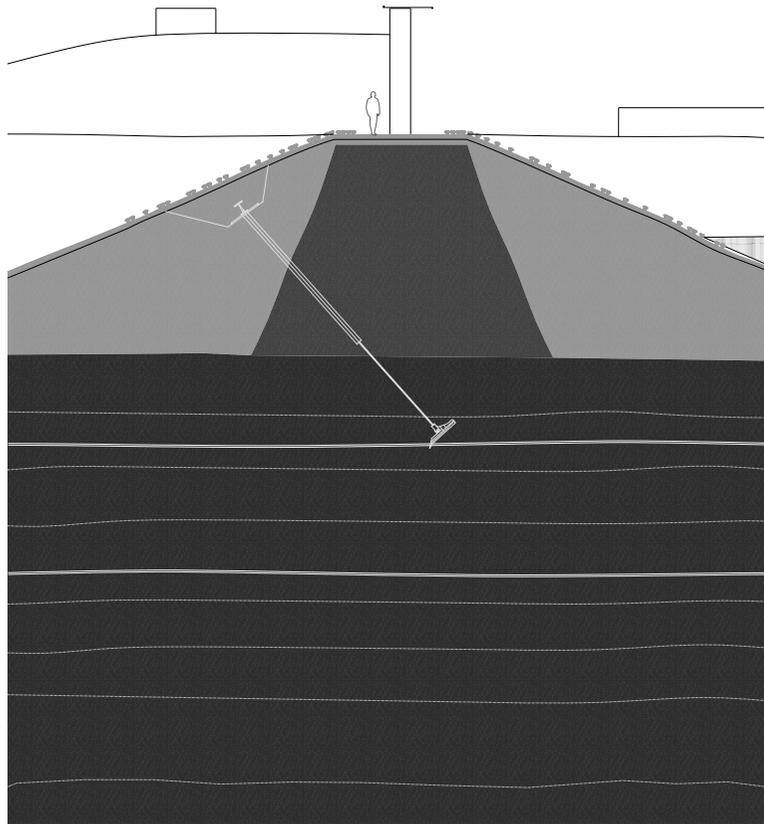
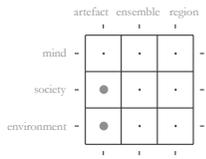
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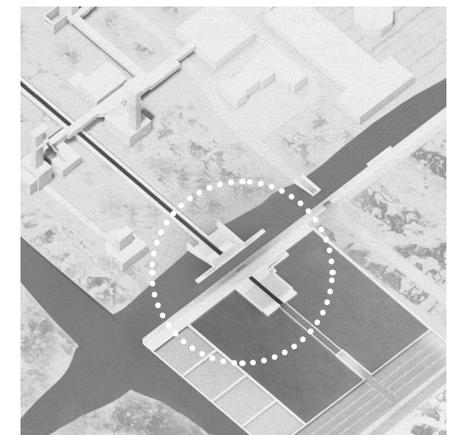
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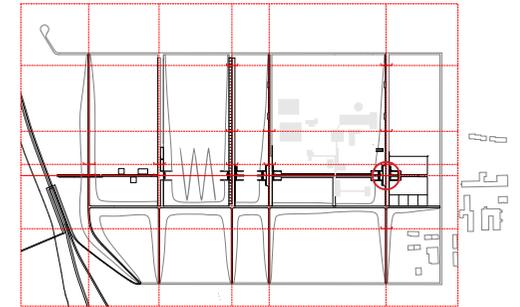
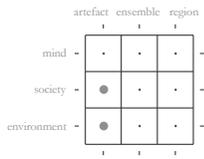
side entrance



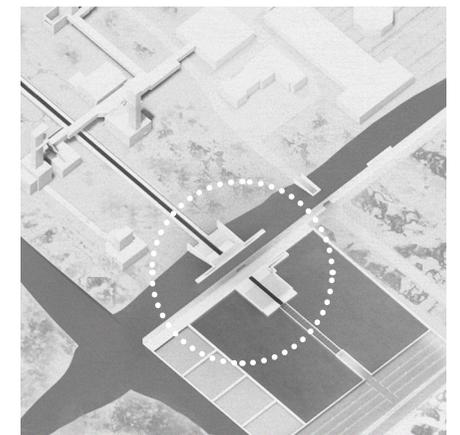
*terrestrial conditions
highly insecure*



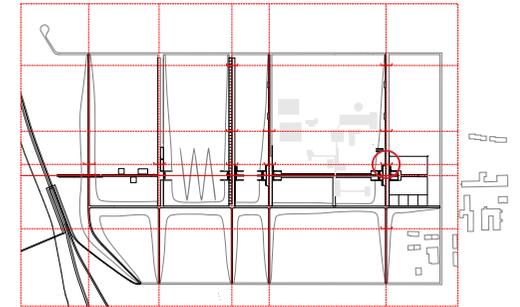
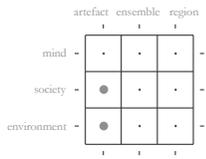
between the land- and the built forms



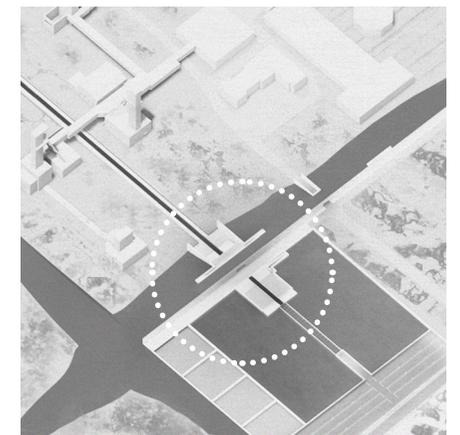
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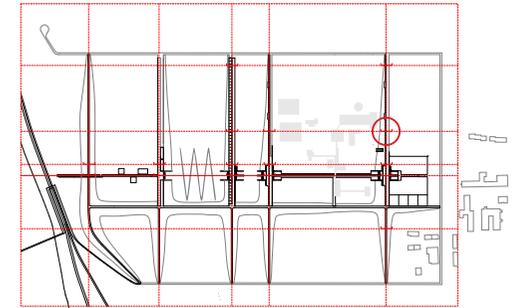
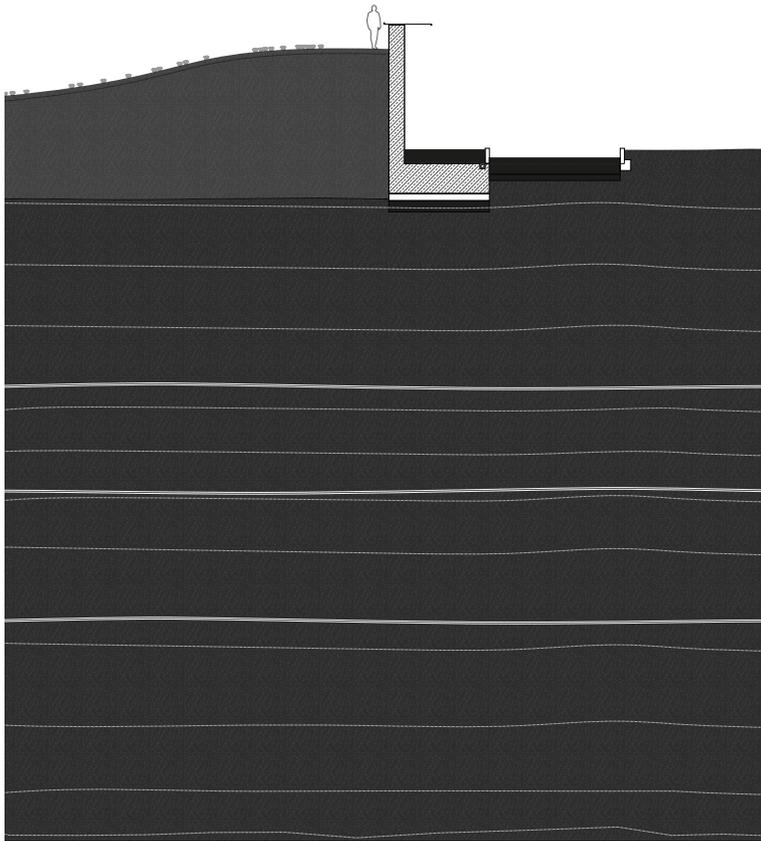
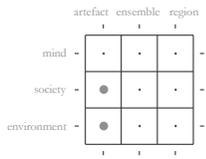
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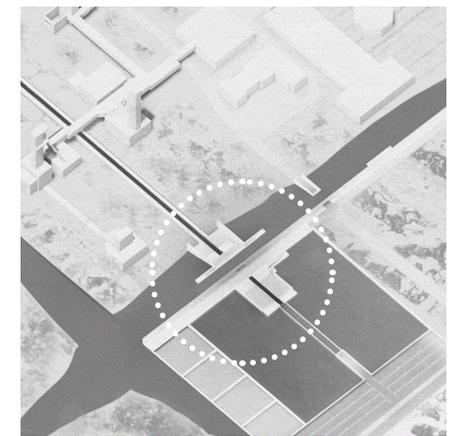
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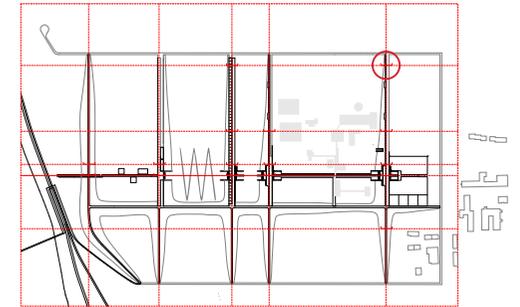
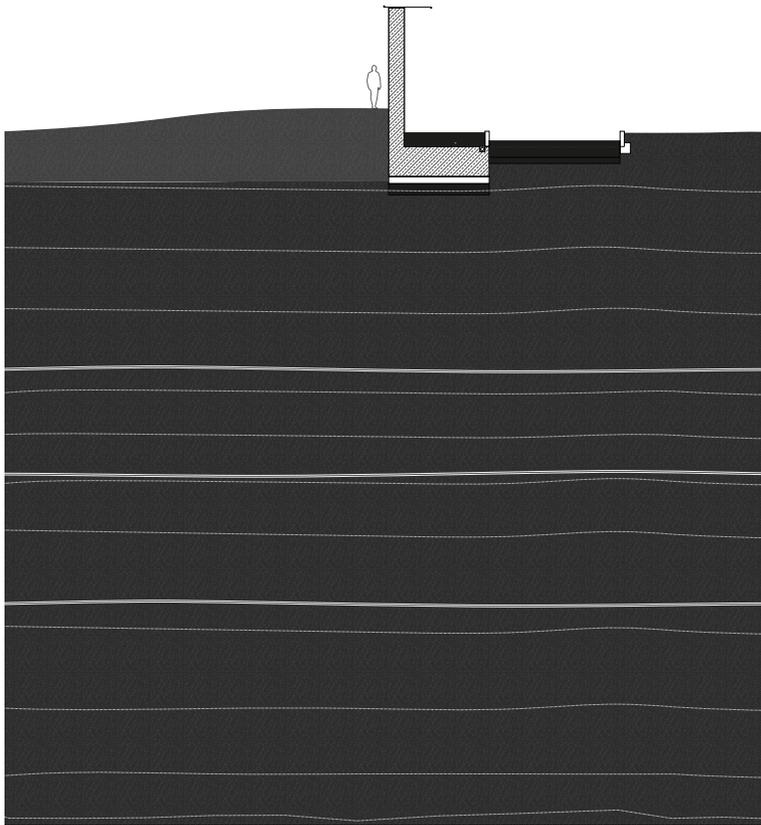
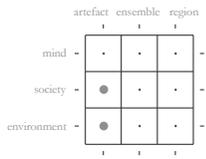
between the land- and the built forms



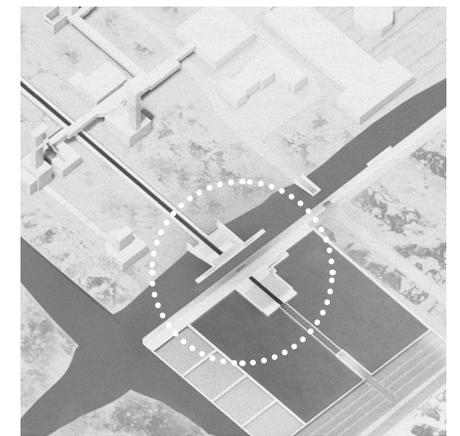
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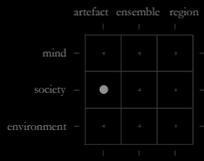
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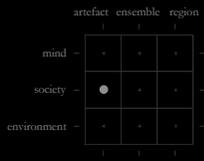


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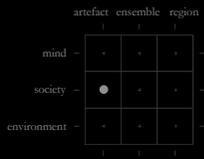


between the land- and the built forms





main entrance



main entrance

	artefact	ensemble	region
mind	●	+	+
society	+	+	+
environment	●	+	+

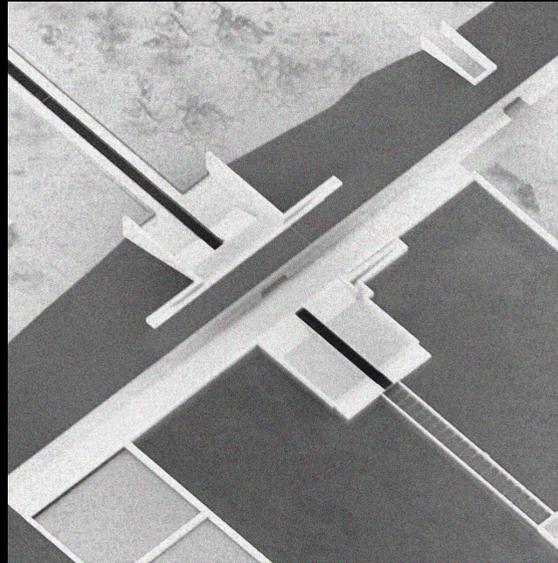
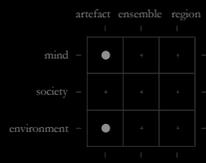


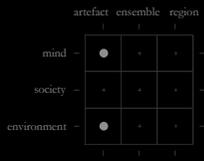
Stalker (1979)
Andrei Tarkovsky

entering the zone

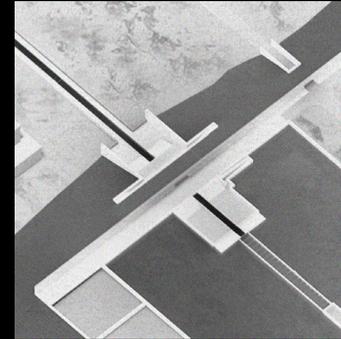
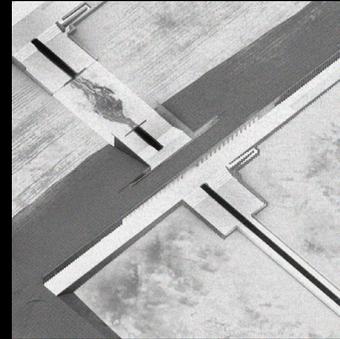
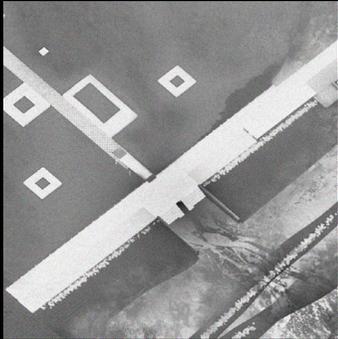
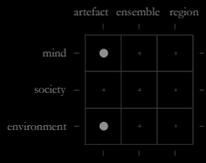
	artefact	ensemble	region
mind	●	+	+
society	+	+	+
environment	●	+	+

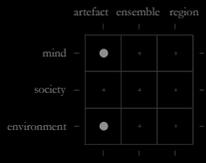


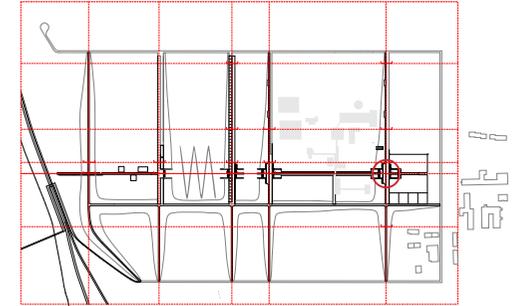
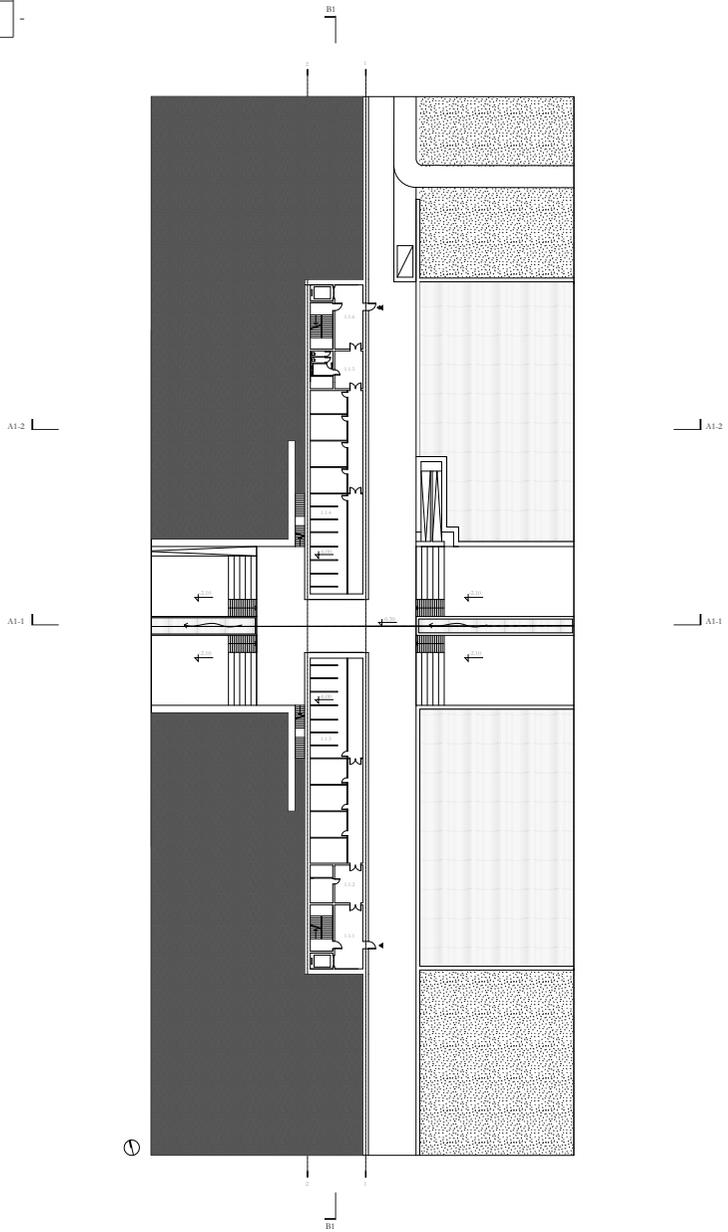
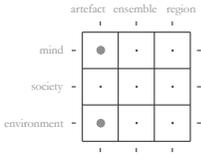




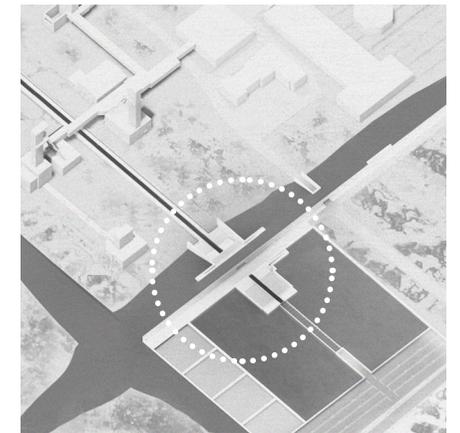
Philip Island House, 1983
Denton Corker Marshall



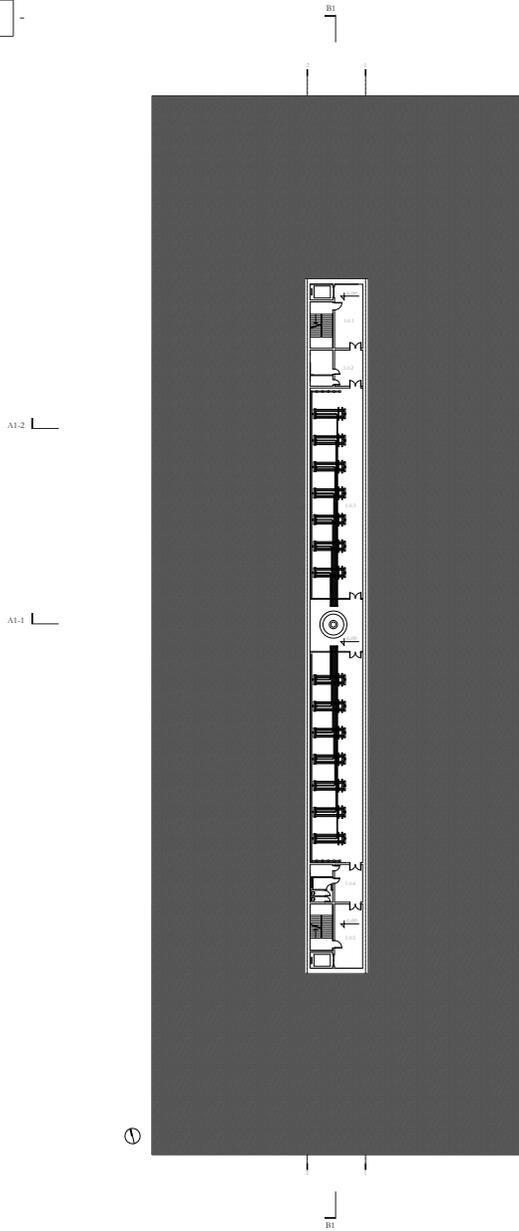
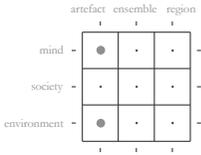




terrestrial conditions
highly insecure



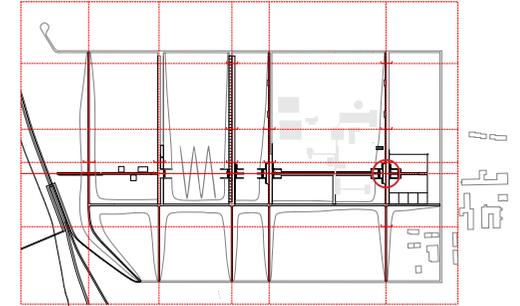
water purification facility



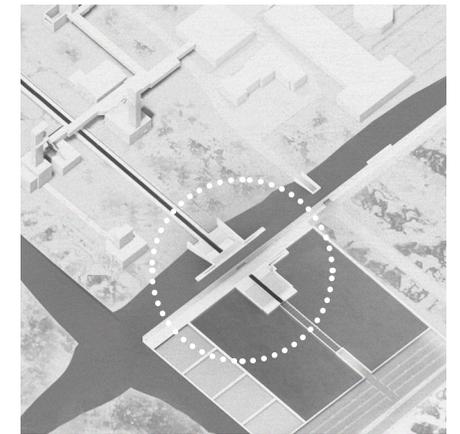
A1-2

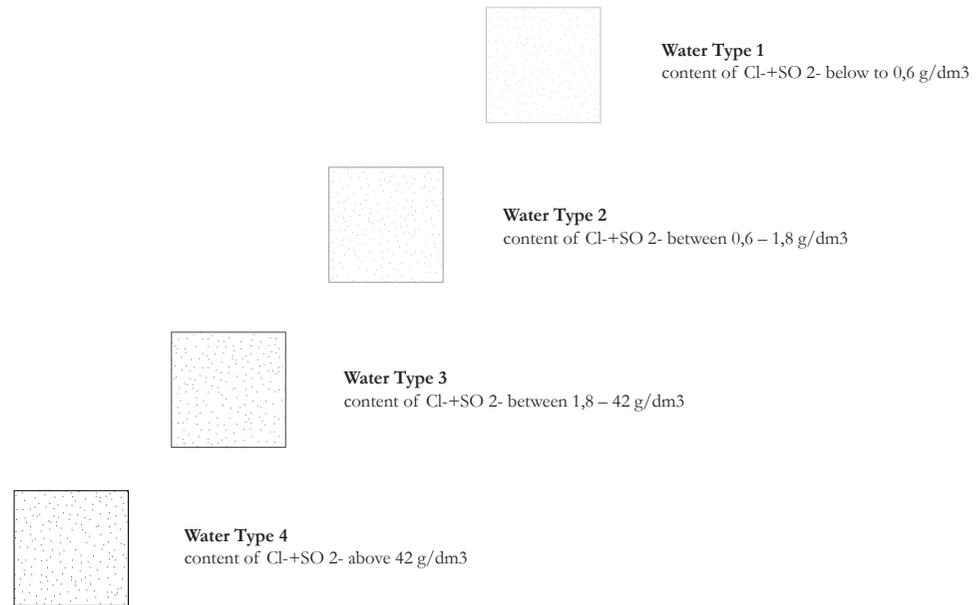
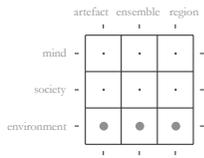
A1-1

water purification facility



terrestrial conditions
highly insecure



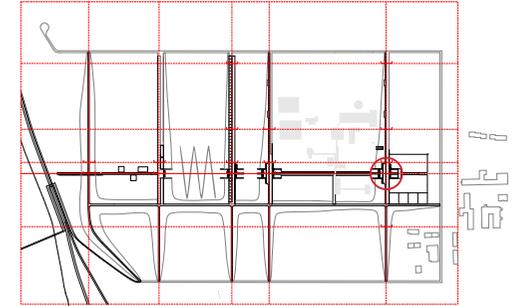
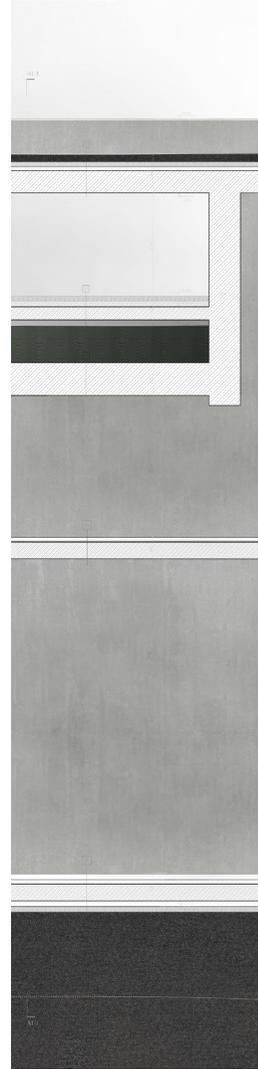
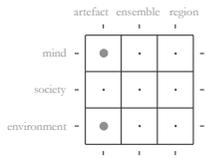


types of released groundwaters

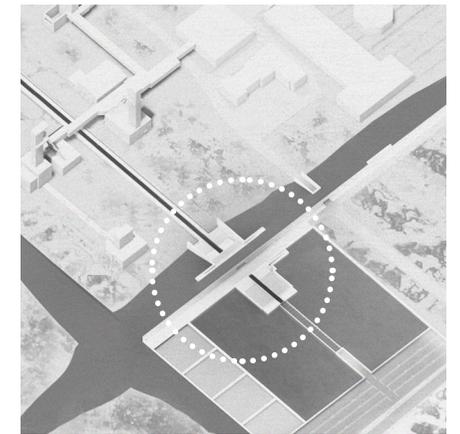
content of saline

(source: SRK)

water purification facility



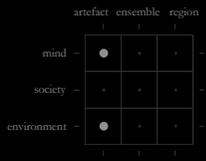
*terrestrial conditions
highly insecure*

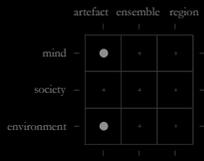


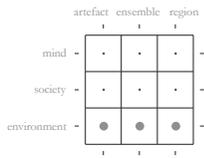
water purification facility

	artefact	ensemble	region
mind	●	+	+
society	+	+	+
environment	●	+	+









phytostabilization

phytoextraction

phytoextraction

insitu
stabilization of pollut-

biomass production
(requires harvesting)

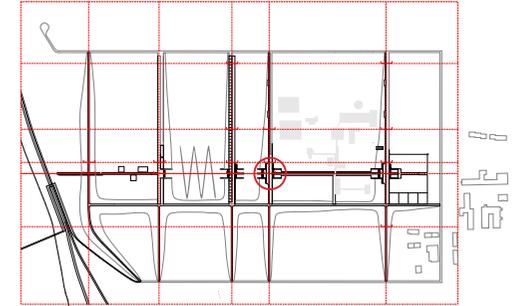
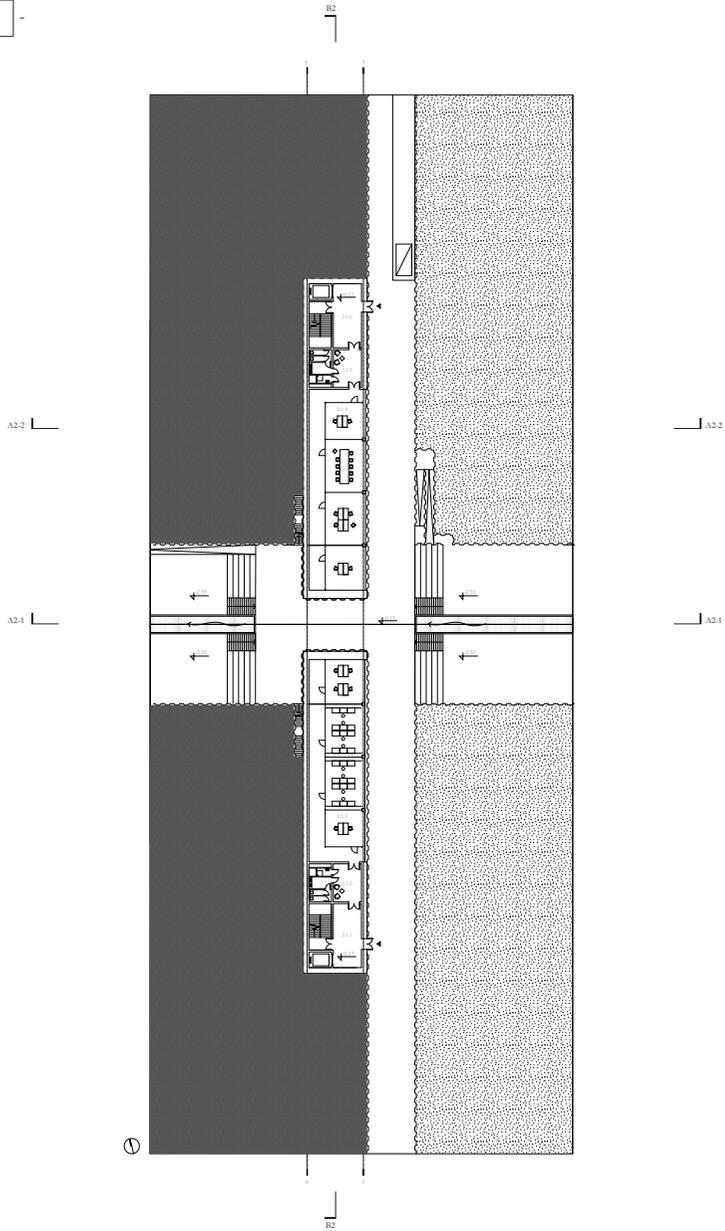
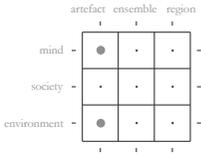
biomass production
(requires harvesting)

easy to extract

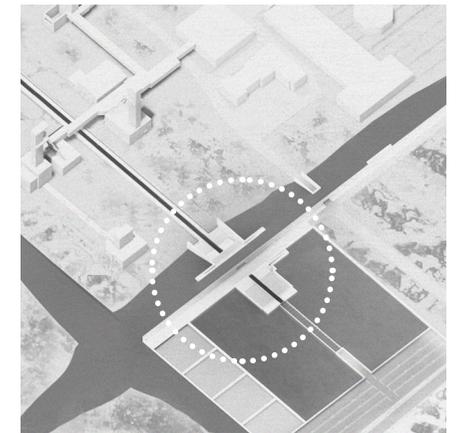
difficult to extract

very difficult to extract

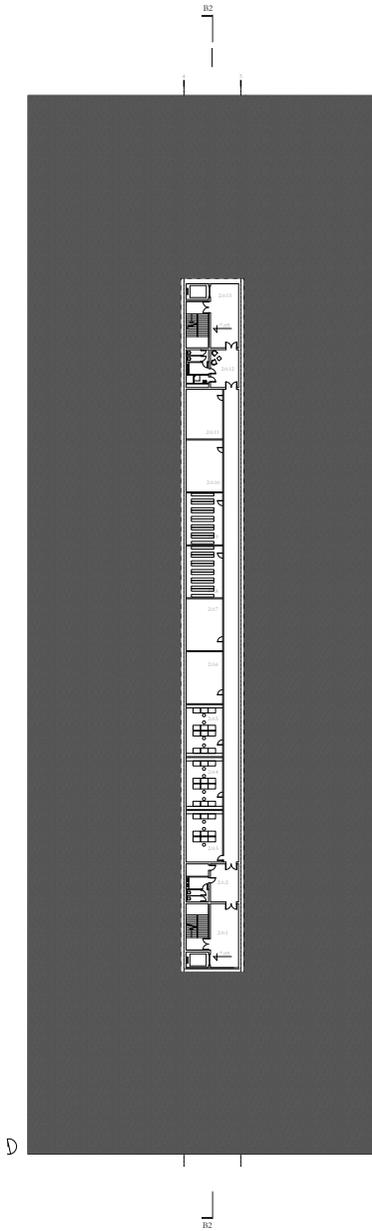
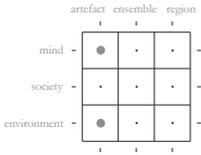
heavy metals on post-mining sites
necessity of test fields



*terrestrial conditions
highly insecure*

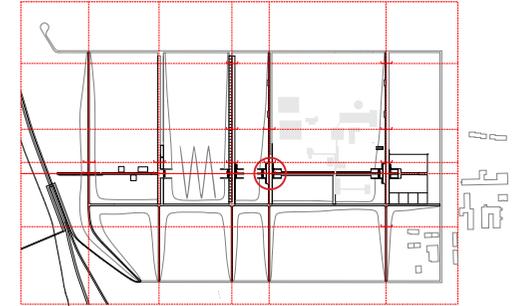


phytoremediation laboratory

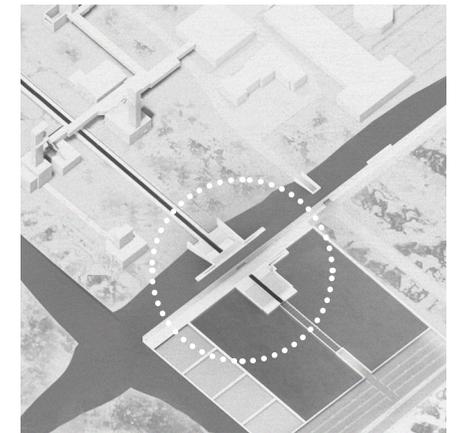


A2-2

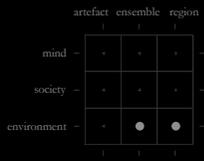
A2-1



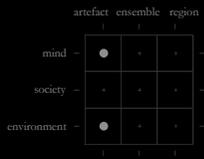
terrestrial conditions
highly insecure



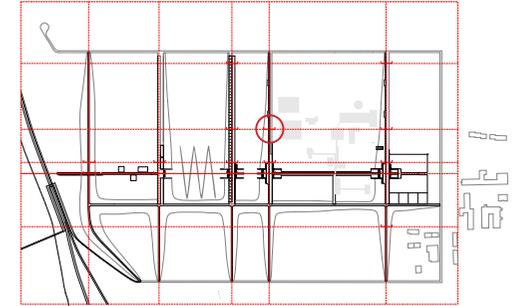
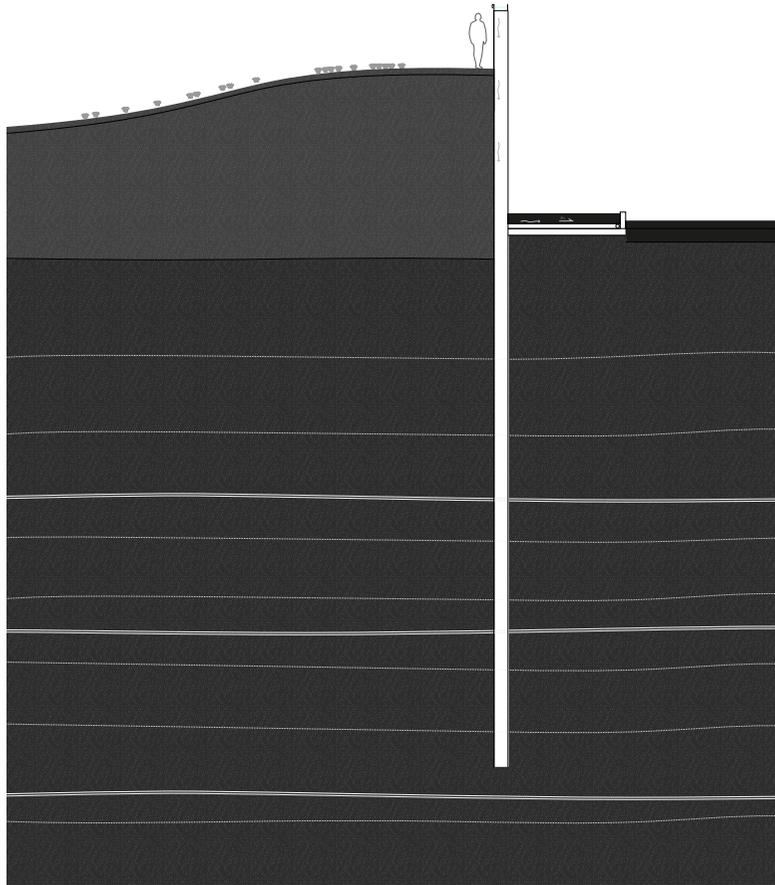
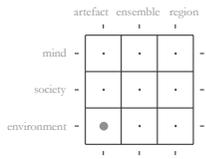
phytoremediation laboratory



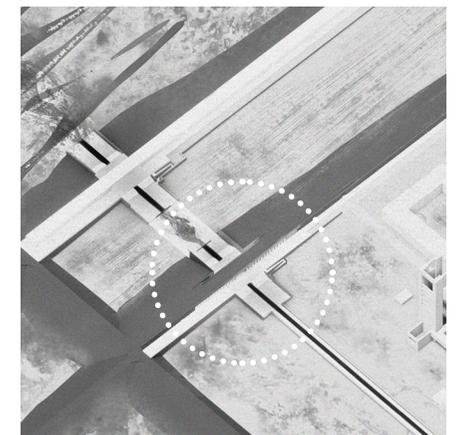
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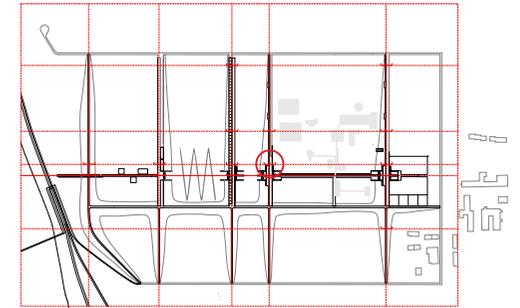
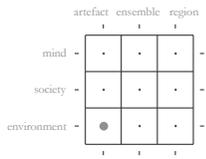
phytoremediation laboratory



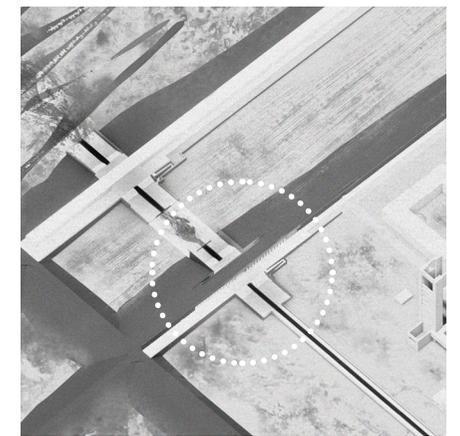
*terrestrial conditions
highly insecure*



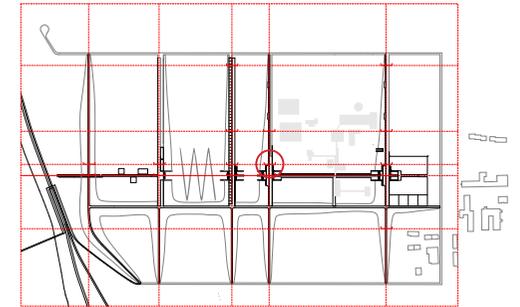
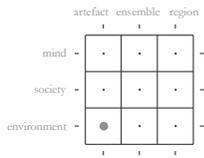
phytoremediation laboratory
between the land- and the built forms



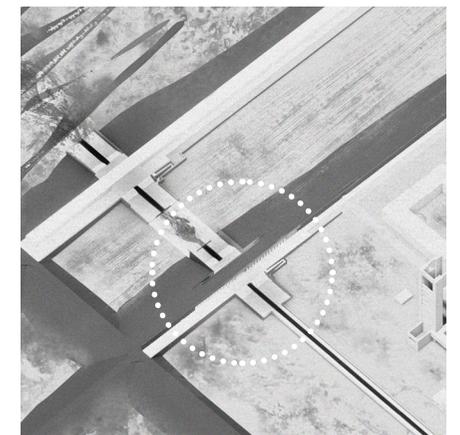
*terrestrial conditions
highly insecure*



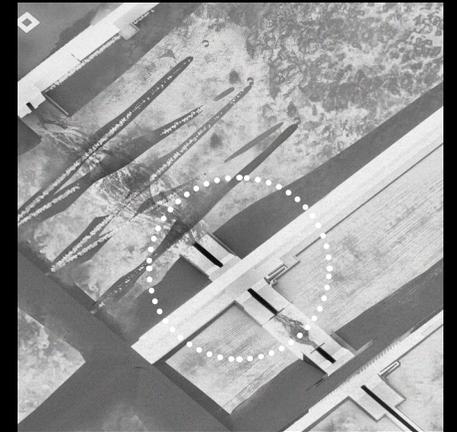
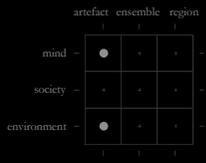
phytoremediation laboratory
between the land- and the built forms

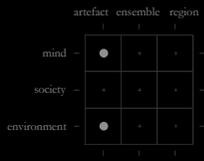


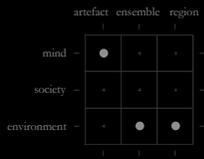
*terrestrial conditions
highly insecure*



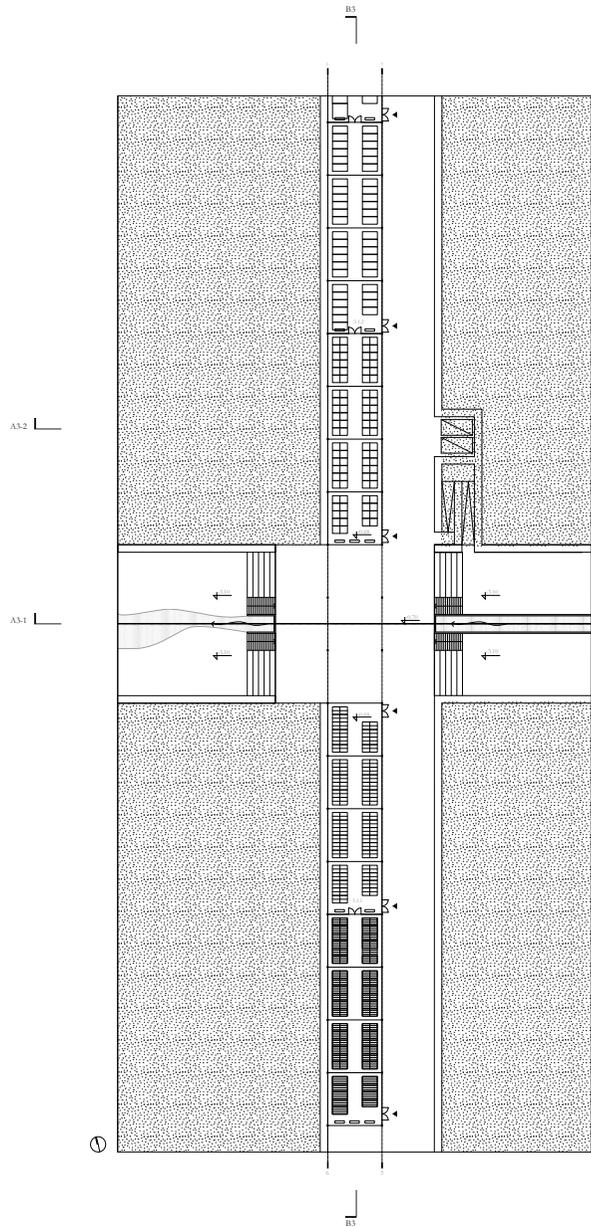
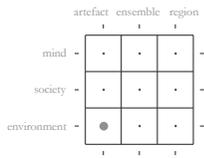
phytoremediation laboratory
between the land- and the built forms







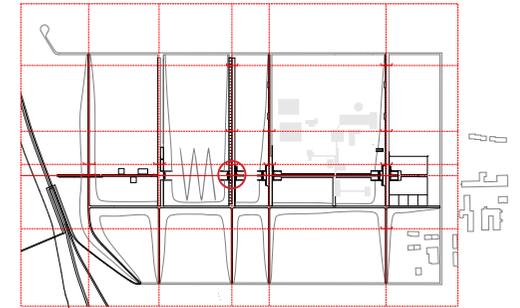
phytoextractors



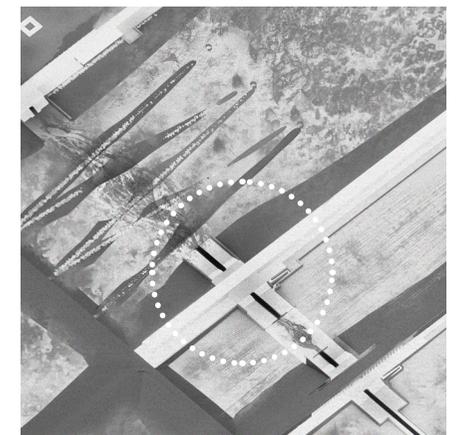
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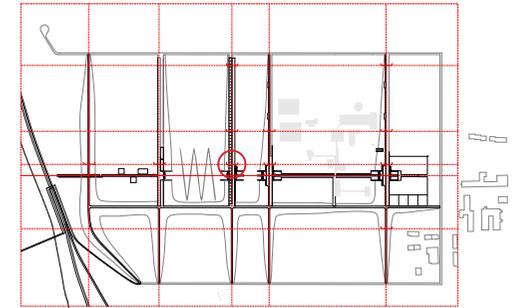
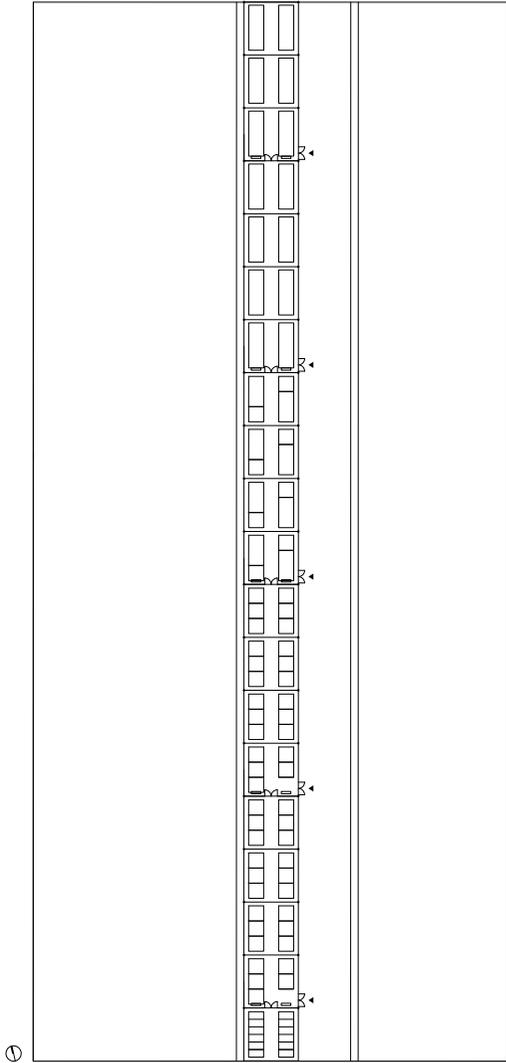
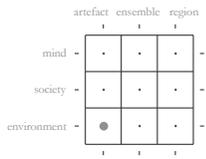
AS-1

nursery of phytoremediators

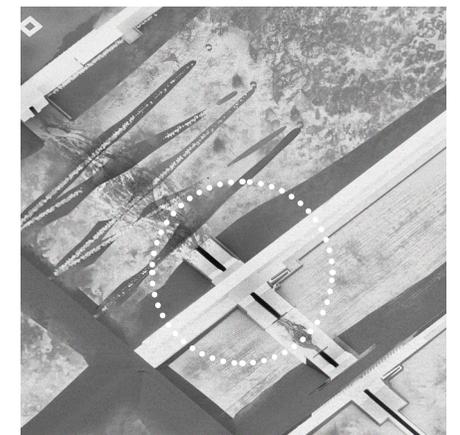


terrestrial conditions
highly insecure

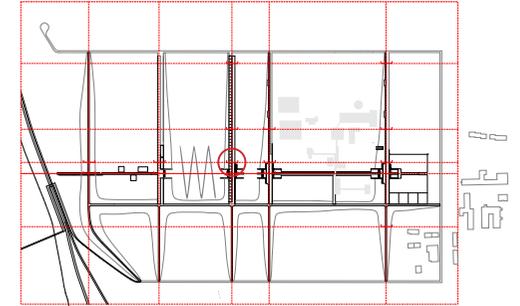
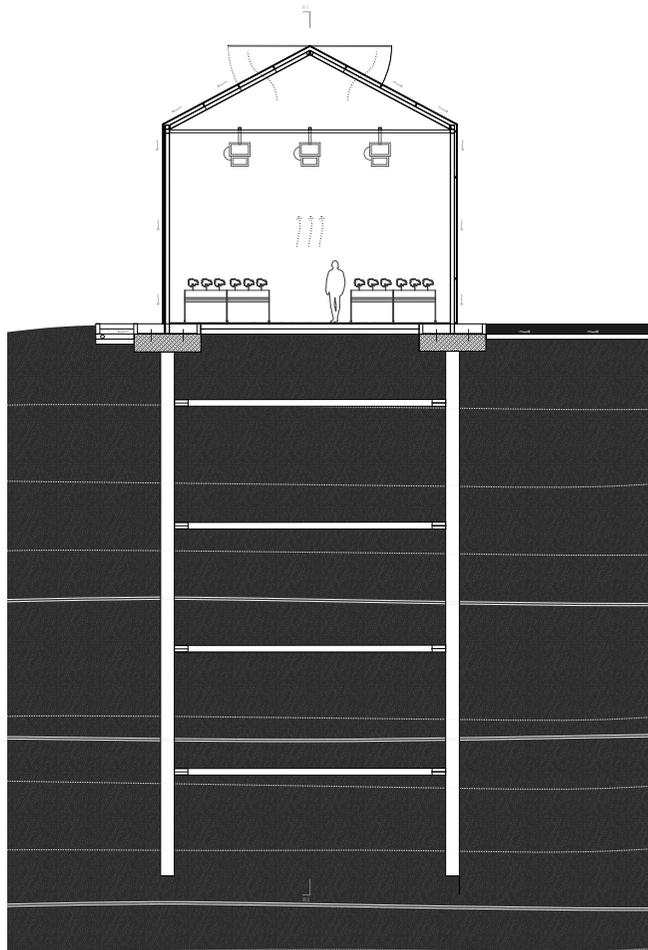
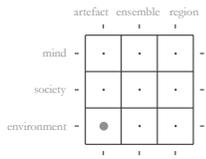




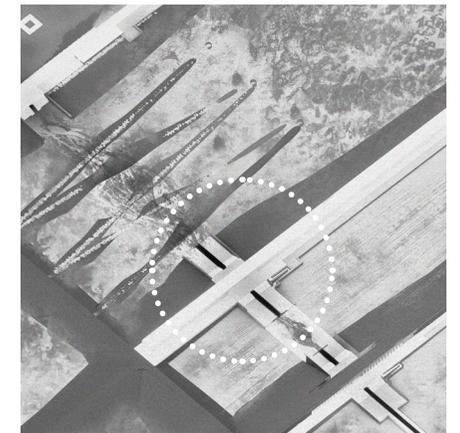
*terrestrial conditions
highly insecure*



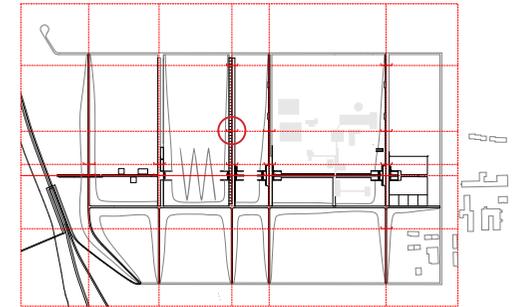
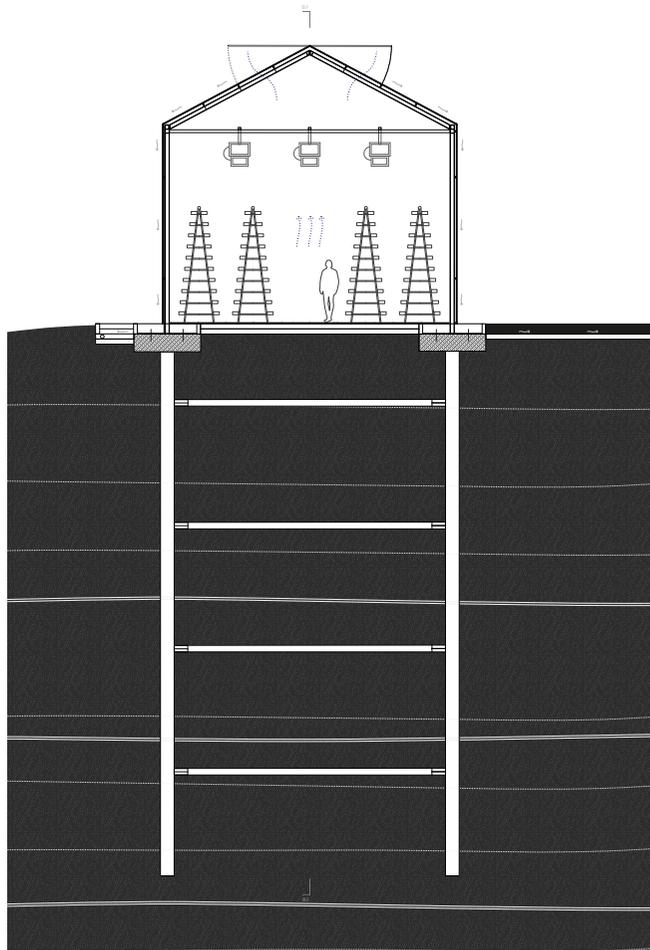
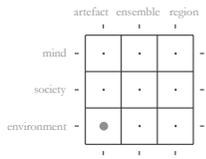
nursery of phytoremediators



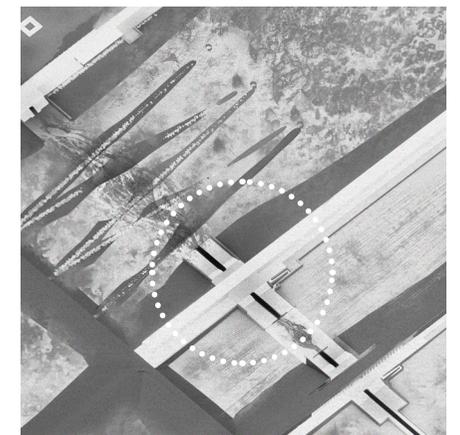
*terrestrial conditions
highly insecure*



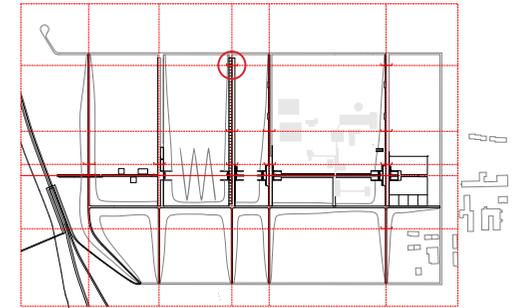
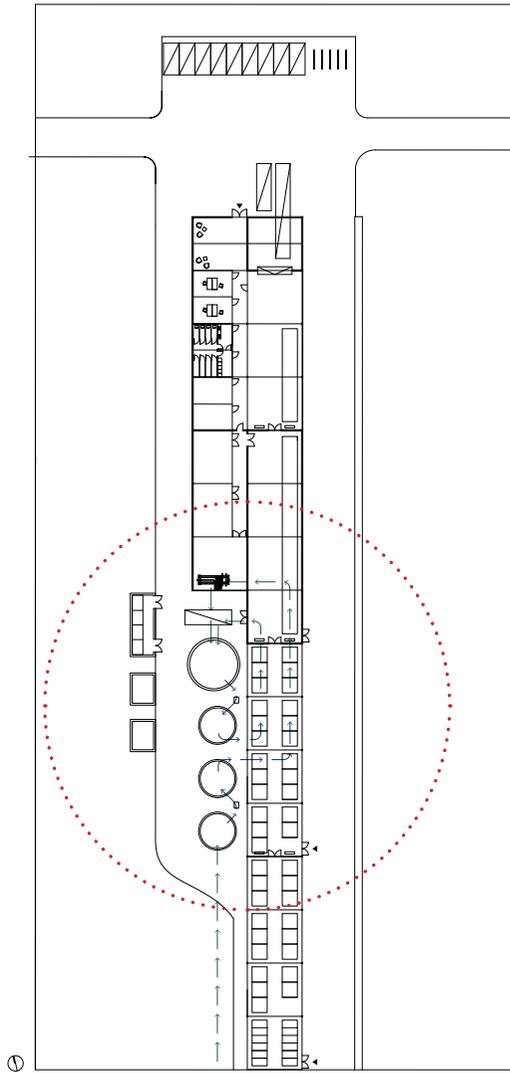
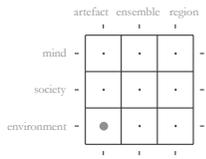
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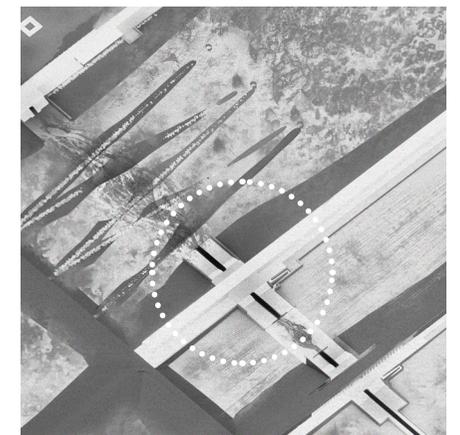
*terrestrial conditions
highly insecure*



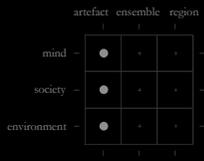
nursery of phytoremediators



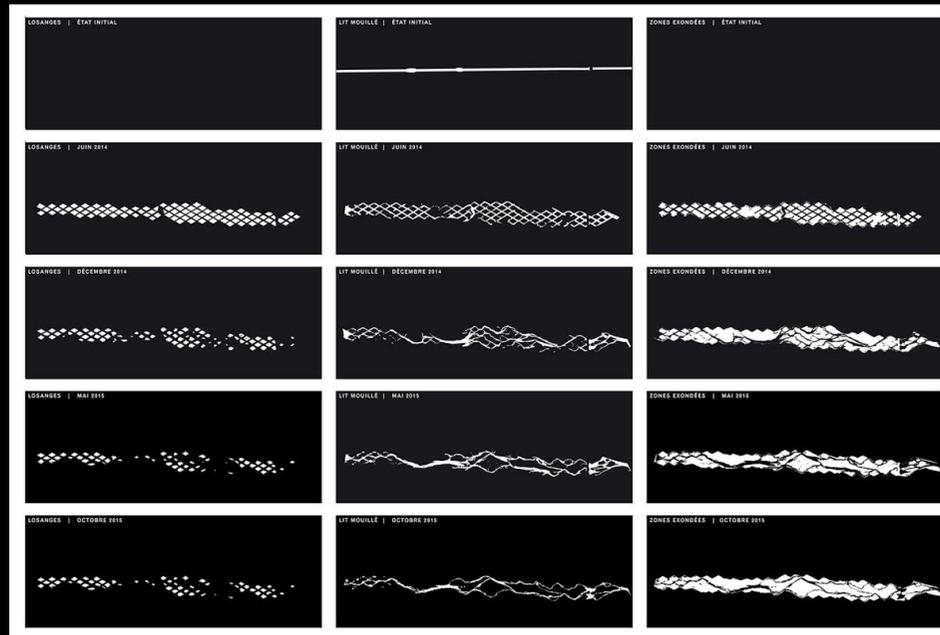
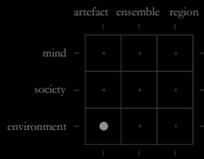
terrestrial conditions
highly insecure



nursery of phytoremediators
water circularity

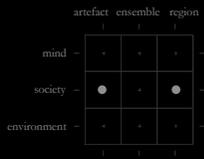


riverbed garden

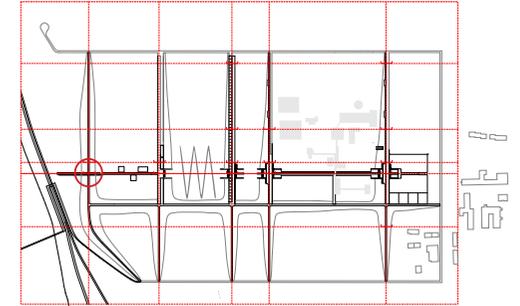
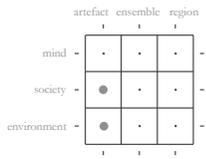


	artefact	ensemble	region
mind	+	+	+
society	+	+	●
environment	+	+	+

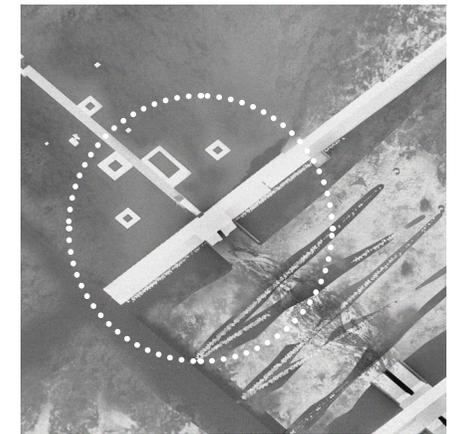




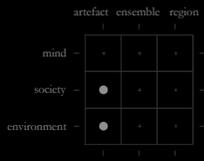
water leisure pier



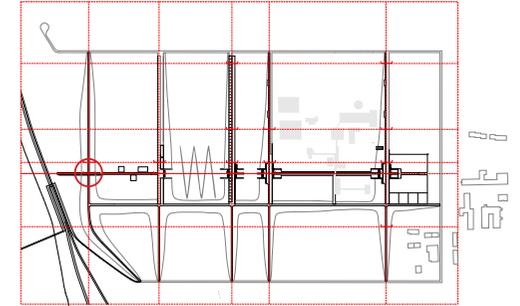
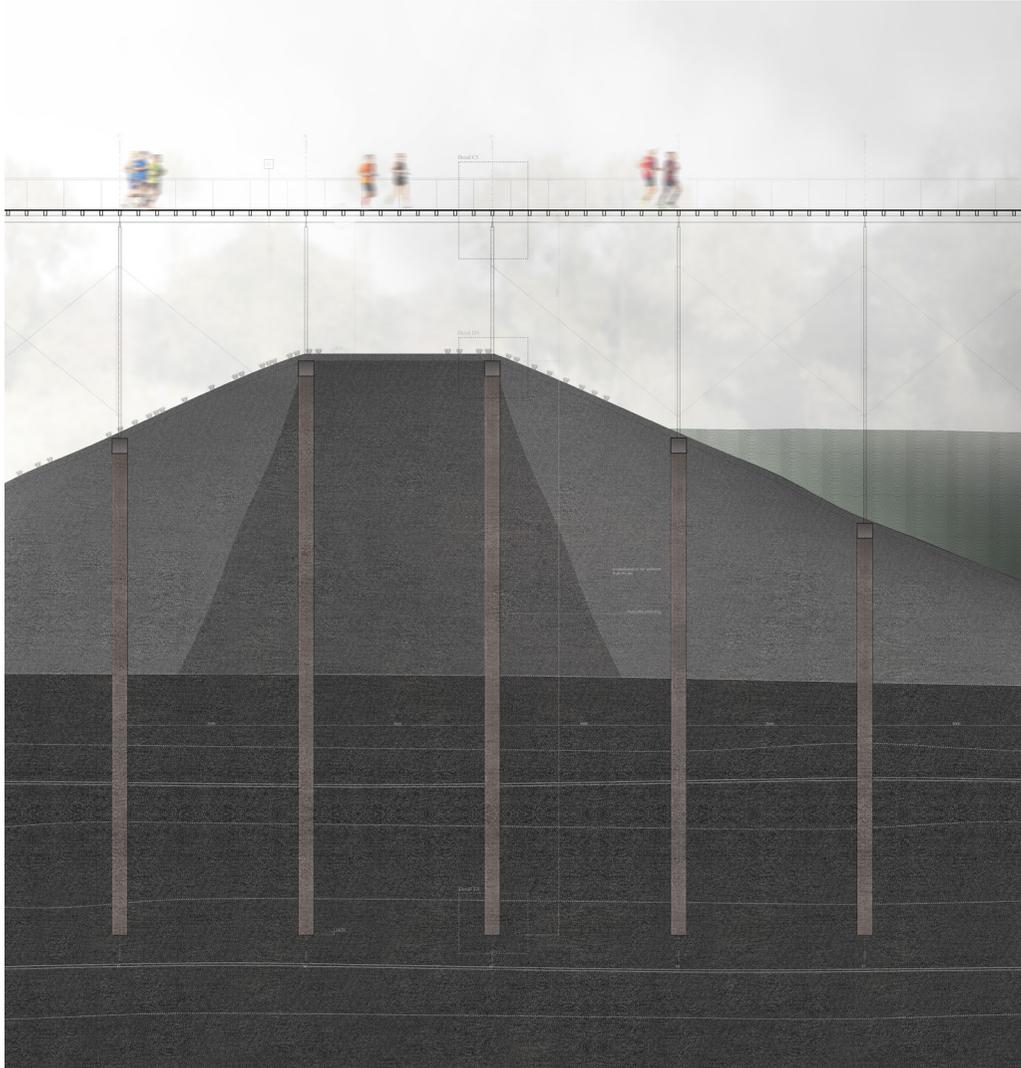
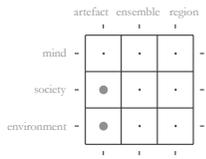
terrestrial conditions
highly insecure



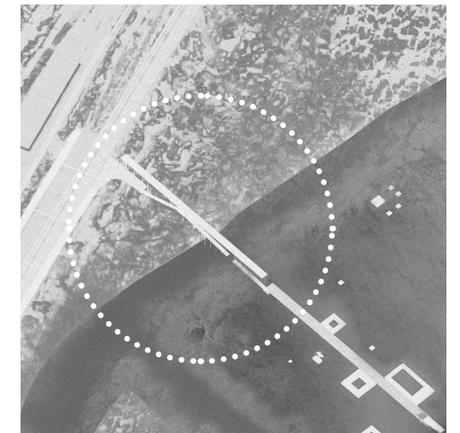
water leisure pier



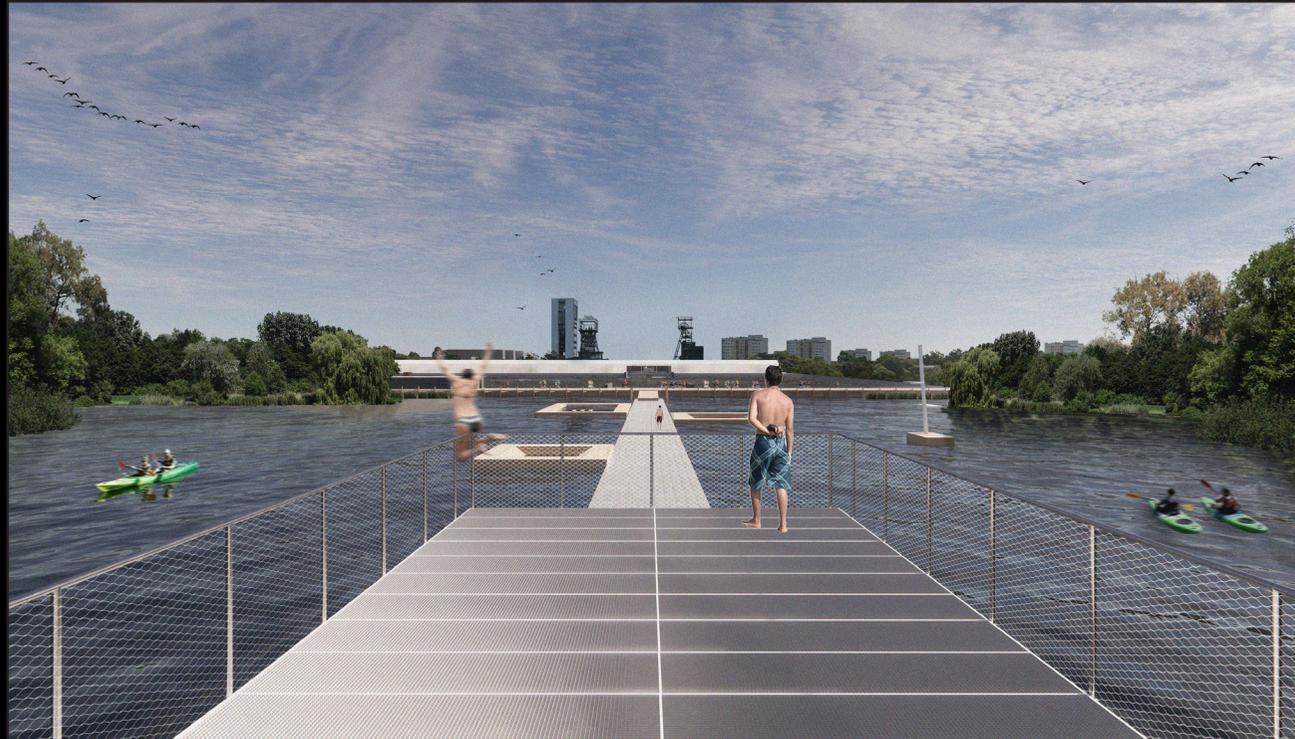
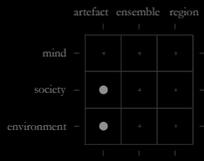
crossing the reservoir



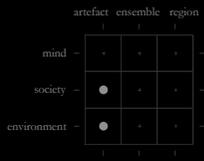
terrestrial conditions
highly insecure



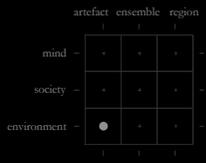
site observation deck



site observation deck



site observation deck



evolution

	artefact	ensemble	region
mind	+	+	+
society	+	+	+
environment	●	+	+

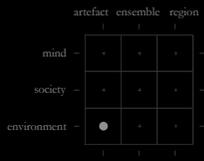


evolution

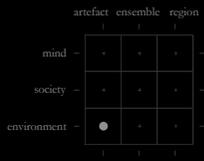
	artefact	ensemble	region
mind	+	+	+
society	+	+	+
environment	●	+	+



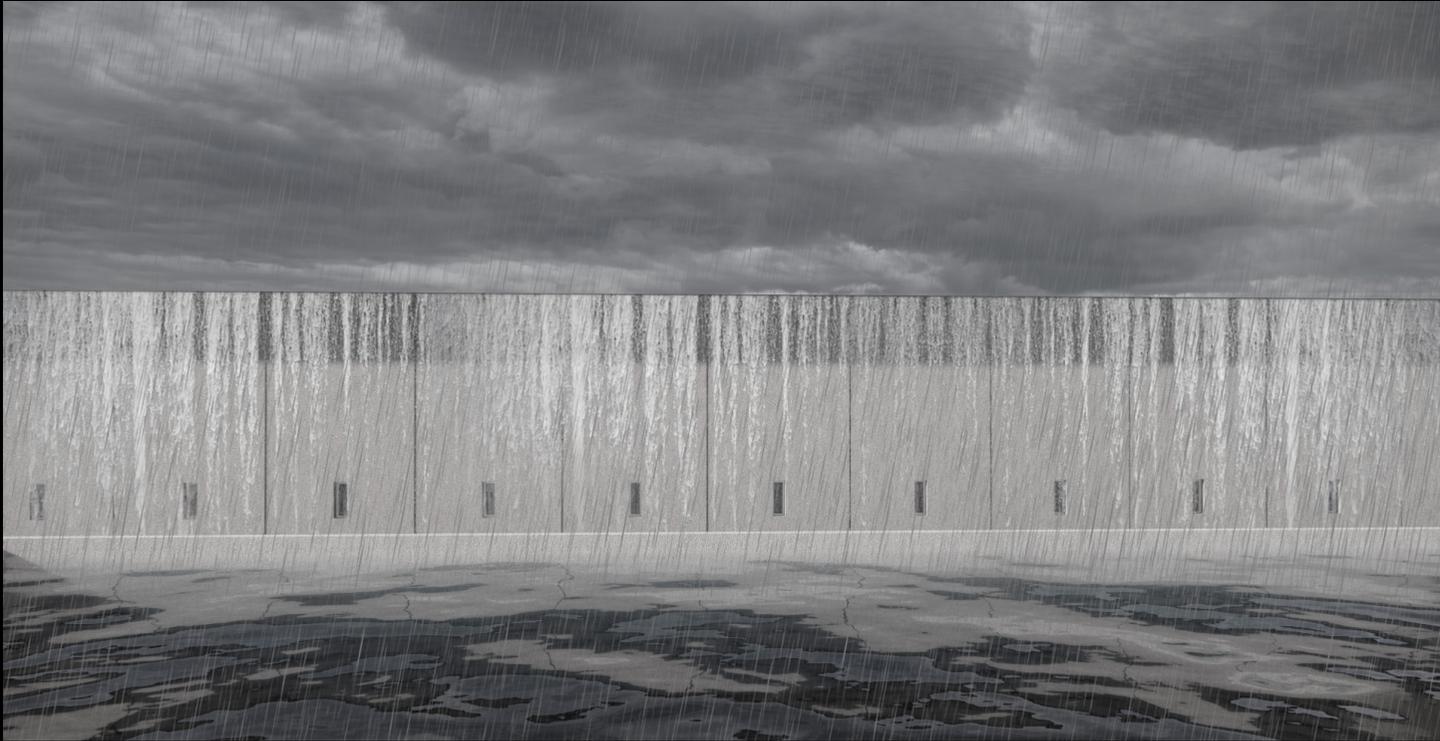
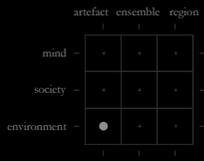
evolution



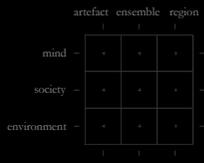
evolution



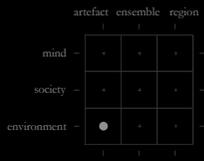
evolution



evolution



evolution



evolution

	artefact	ensemble	region
mind	+	+	+
society	+	+	+
environment	●	+	+

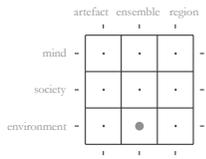


evolution

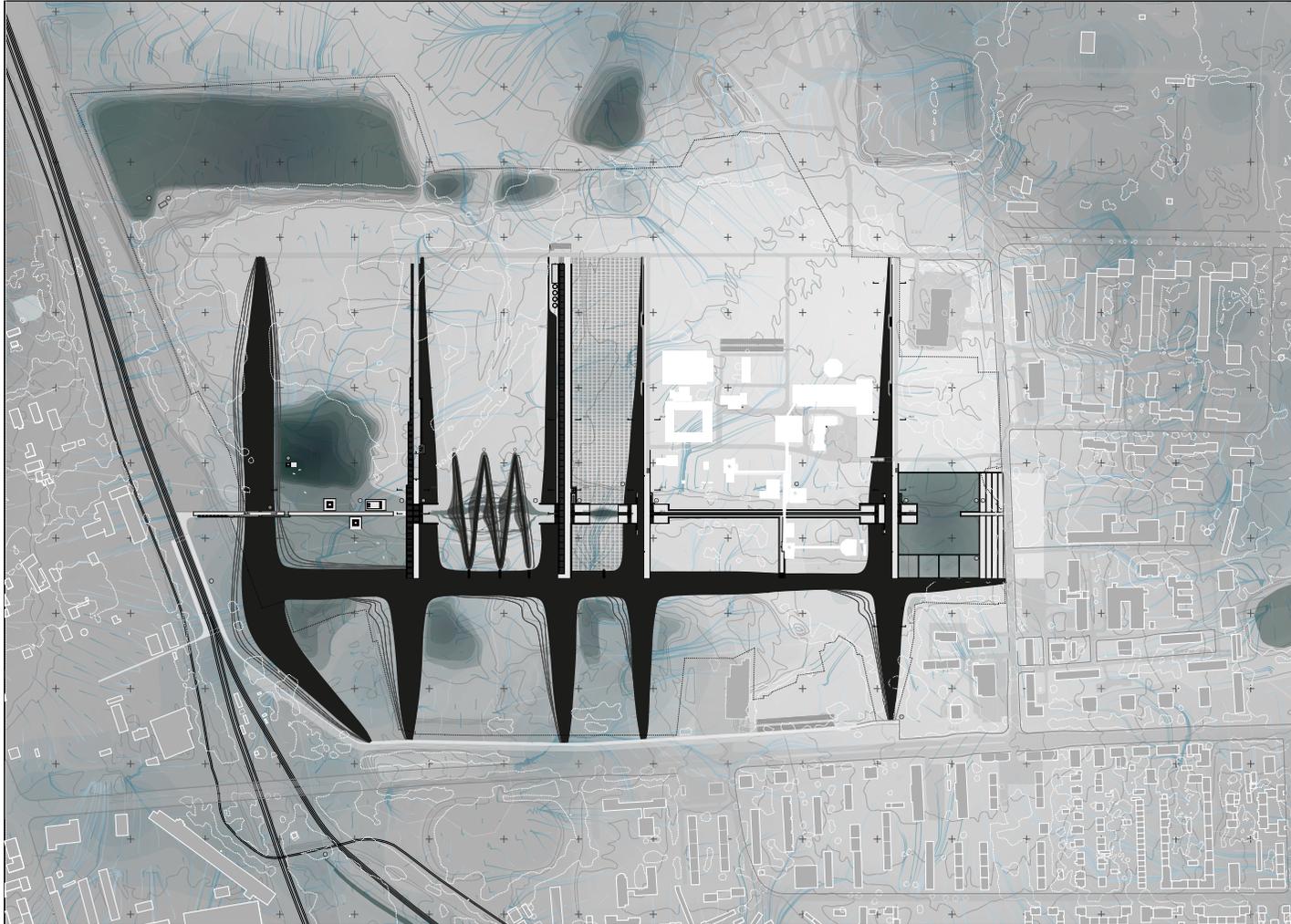
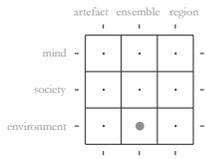
	artefact	ensemble	region
mind	+	+	+
society	+	+	+
environment	●	+	+



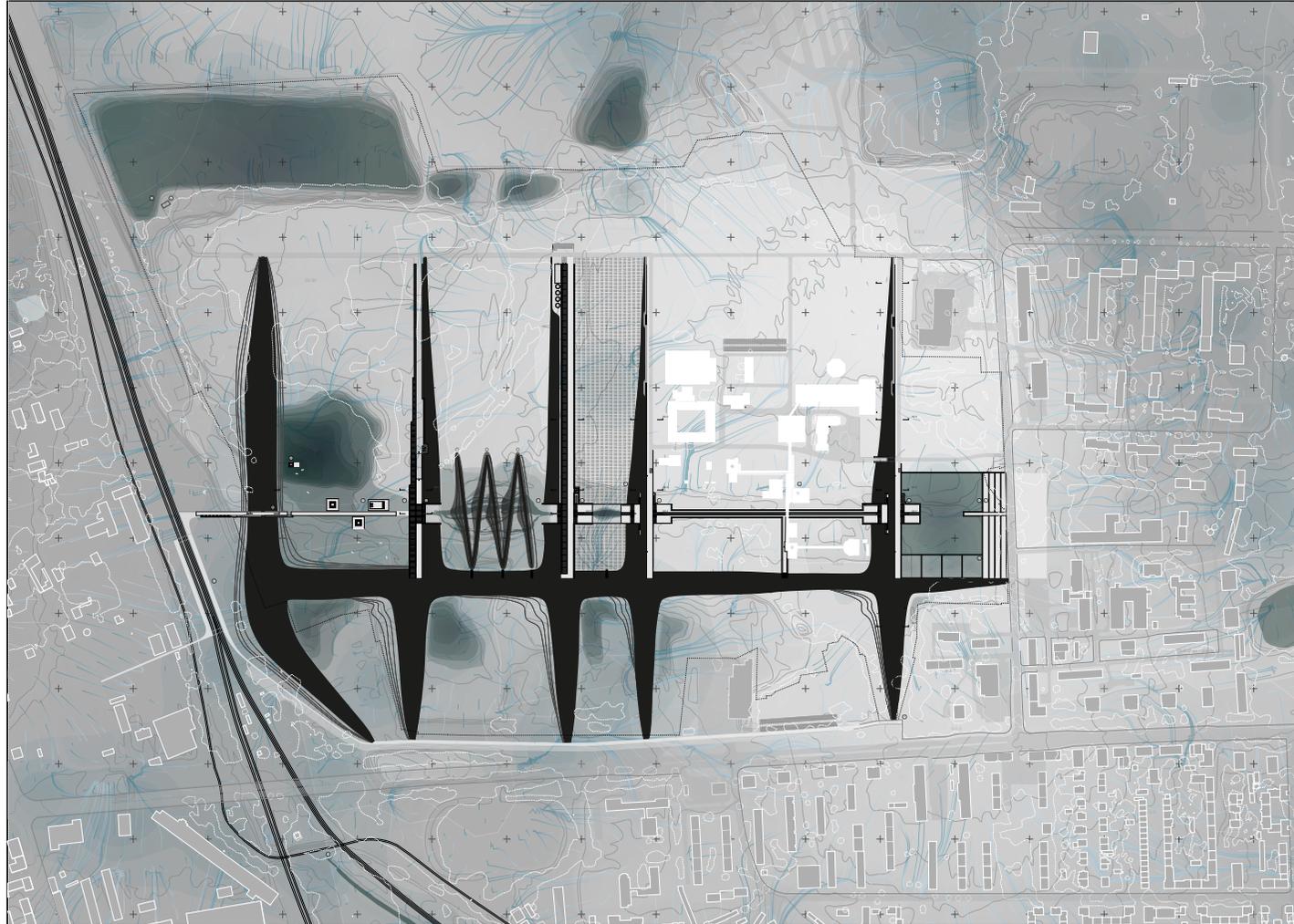
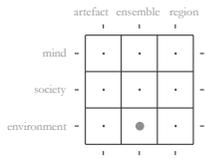
evolution



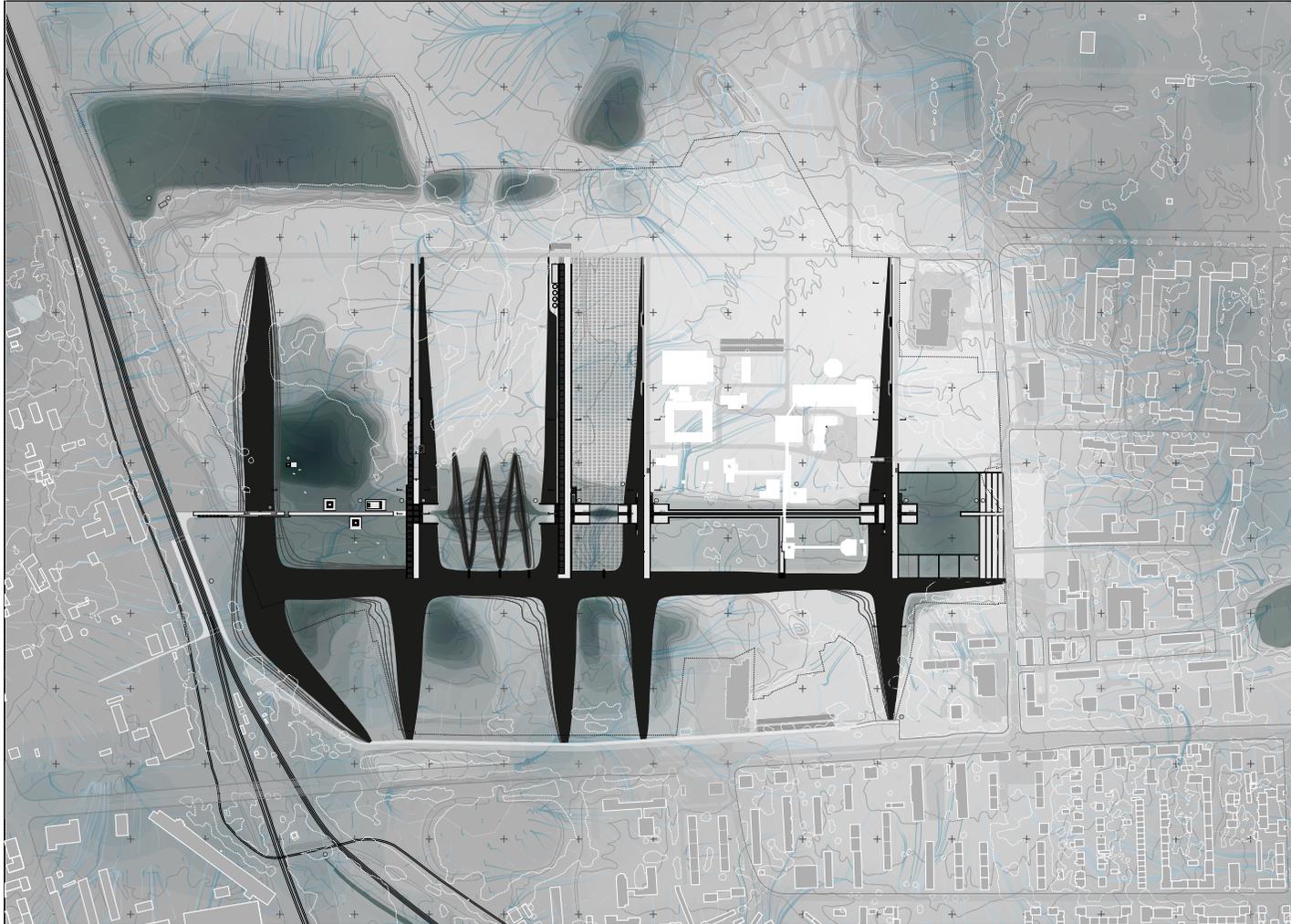
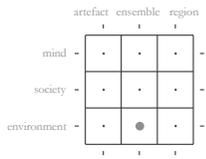
evolution
systemic retention reservoir



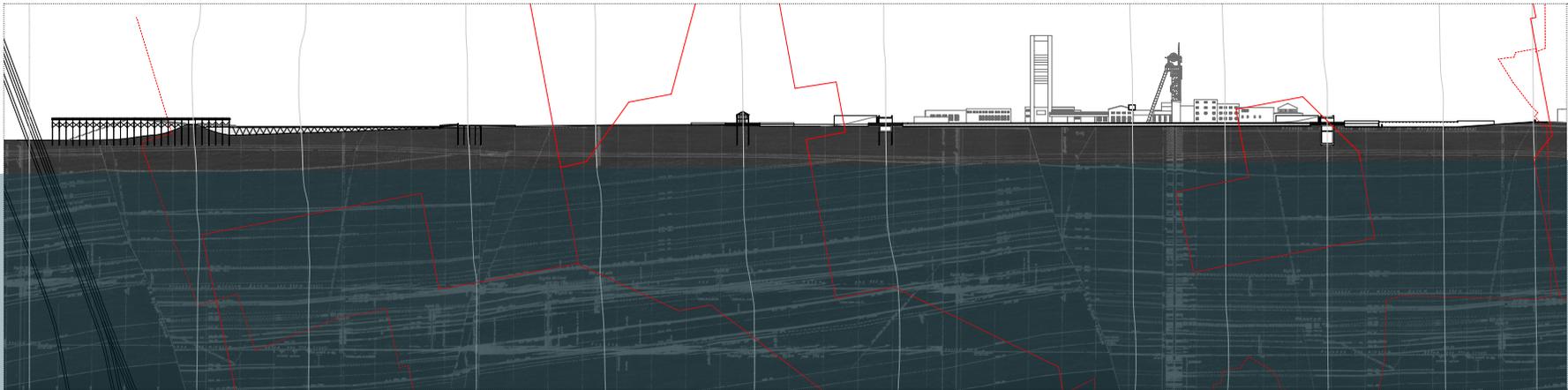
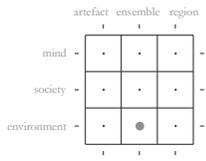
evolution
systemic retention reservoir



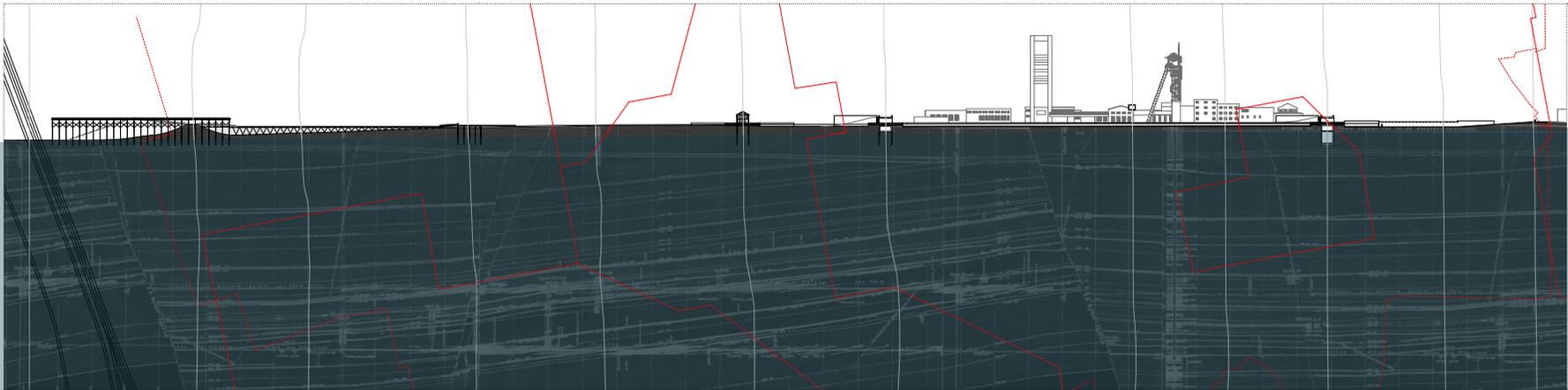
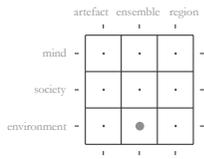
evolution
systemic retention reservoir



evolution
systemic retention reservoir

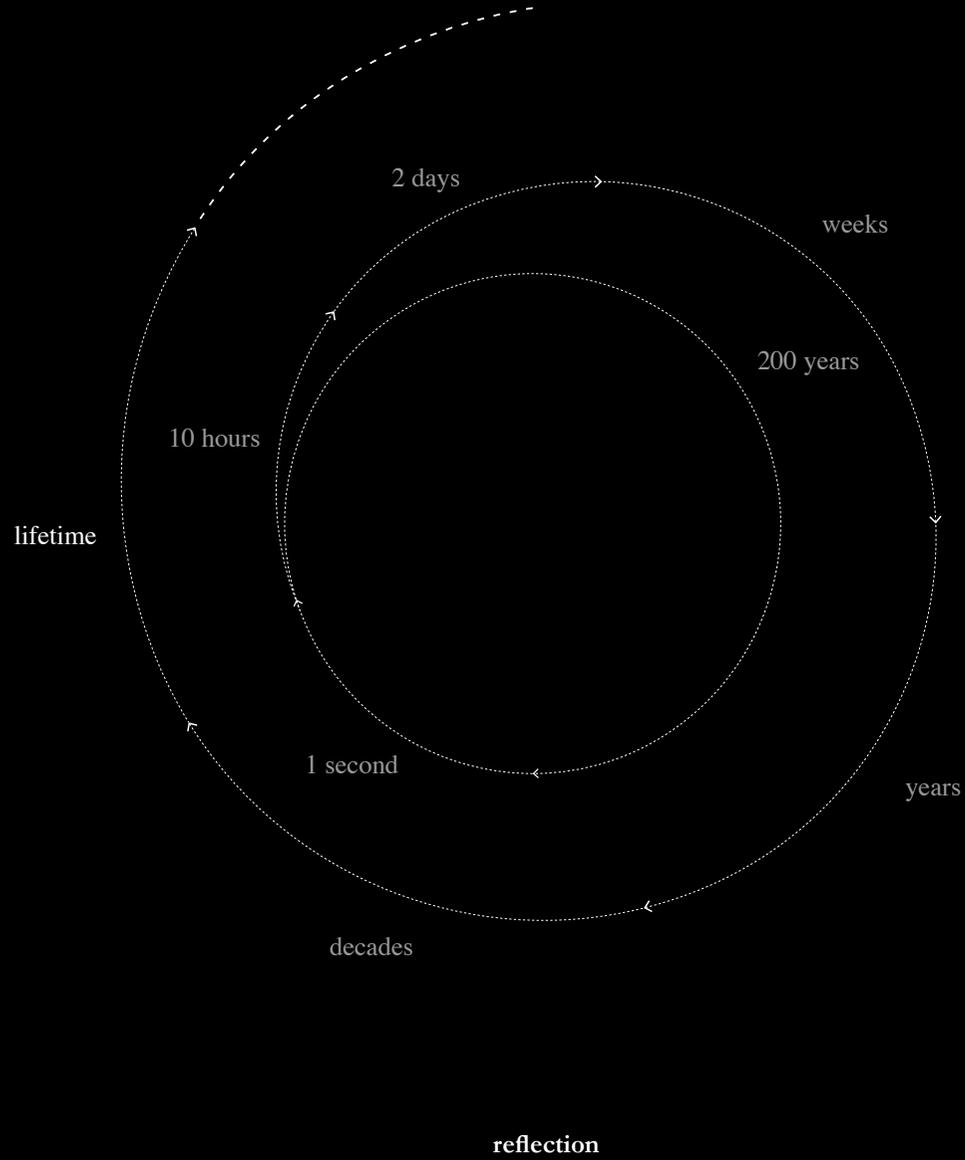


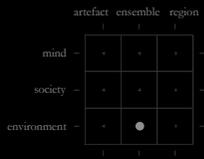
evolution
 rise of the groundwaters level



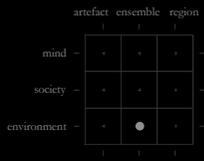
evolution
 rise of the groundwaters level

	artefact	ensemble	region
mind	+	●	+
society	+	●	+
environment	+	●	+

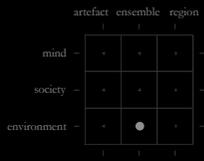




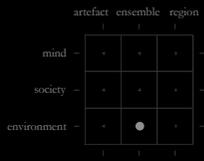
reflection



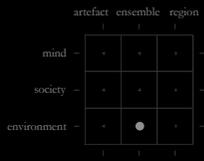
reflection



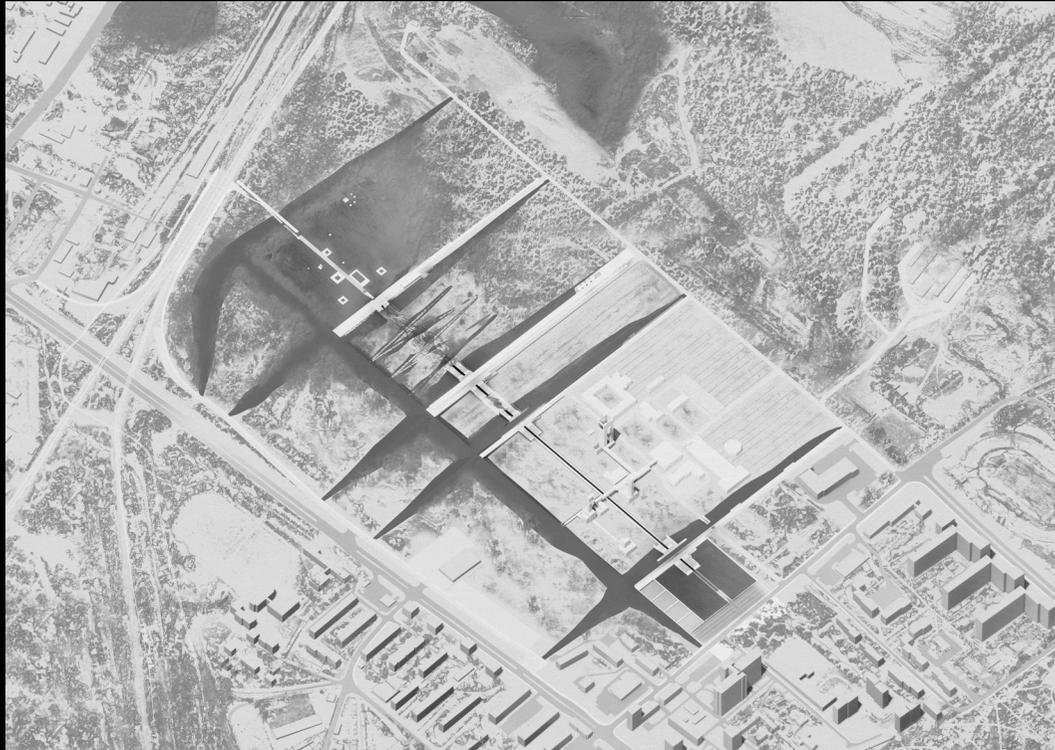
reflection



reflection



reflection



Terraforming

*Reclaiming post-mining territory as an unfinished laboratory
for an integrative transformation*

Damian Lachtara