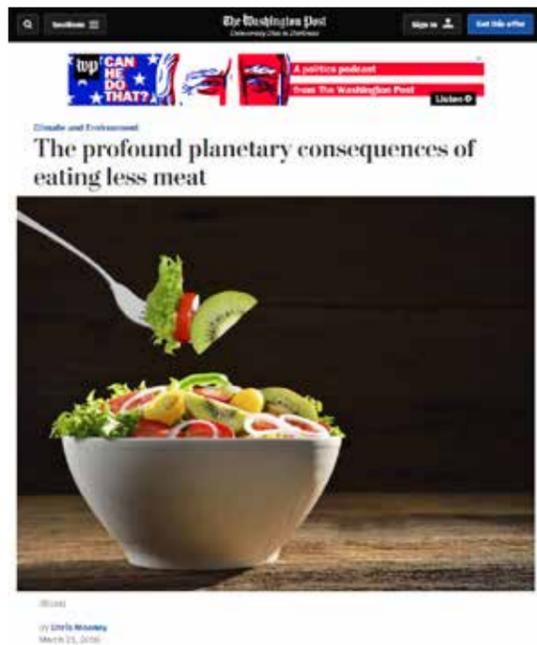




Problem Statement - Global

Meat Crisis



2016



2017



2018



2019

One of the main drivers of deforestation and degradation of wildlife habitats

Biodiversity loss: 80% of farmland is used for livestock production

Contamination of water ways

Animal Cruelty

Produce 18% of global greenhouse gas emissions (more than the global transportation sector)

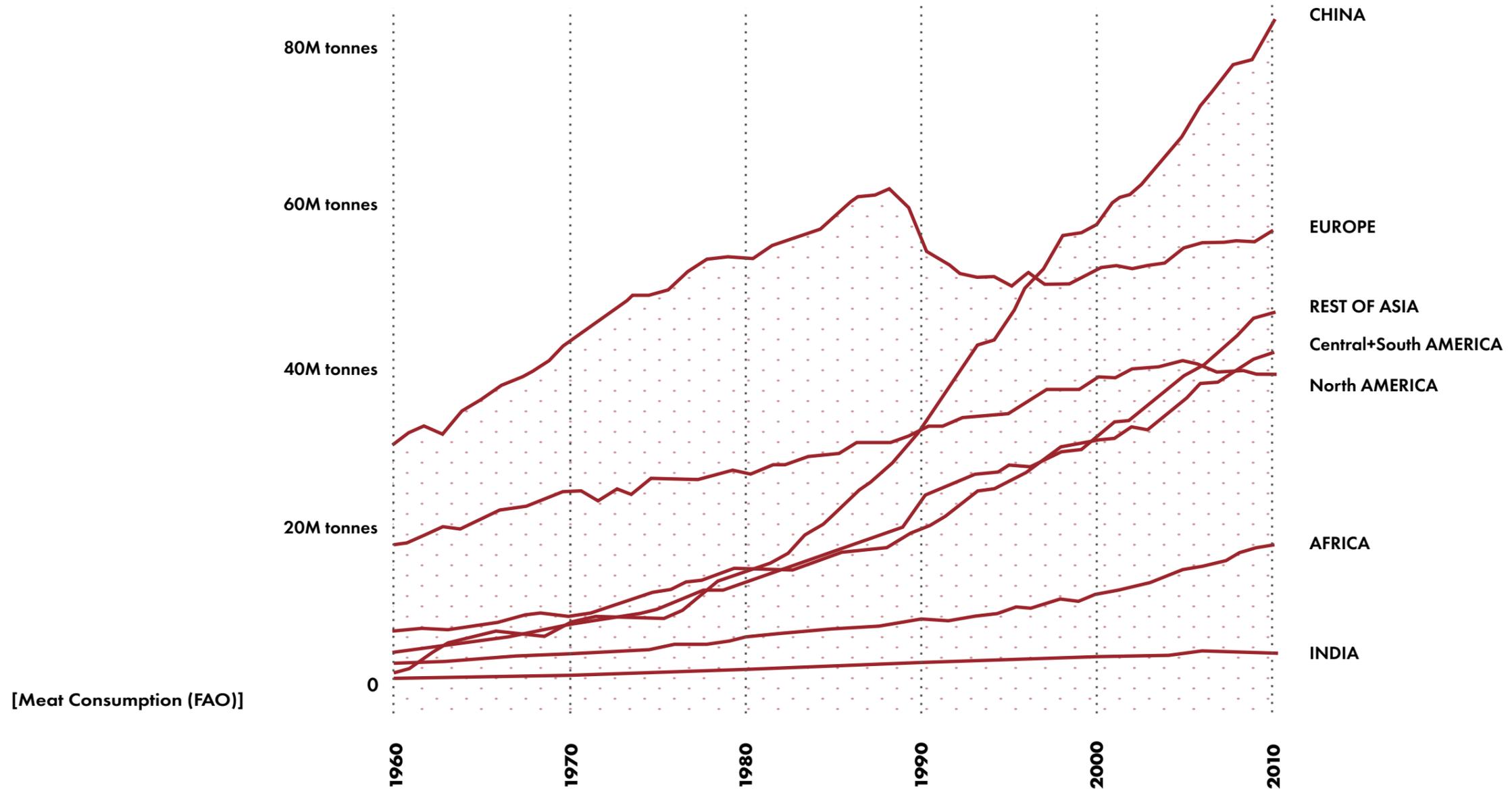
Livestock for meat use 30% of land and 8% of fresh water

Antibiotics Resistance. Almost 80% of all antibiotics in the US are given to livestock

Consumption of processed meat associated with heart disease, digestive tract cancer and diabetes

Livestock - major source of disease outbreaks

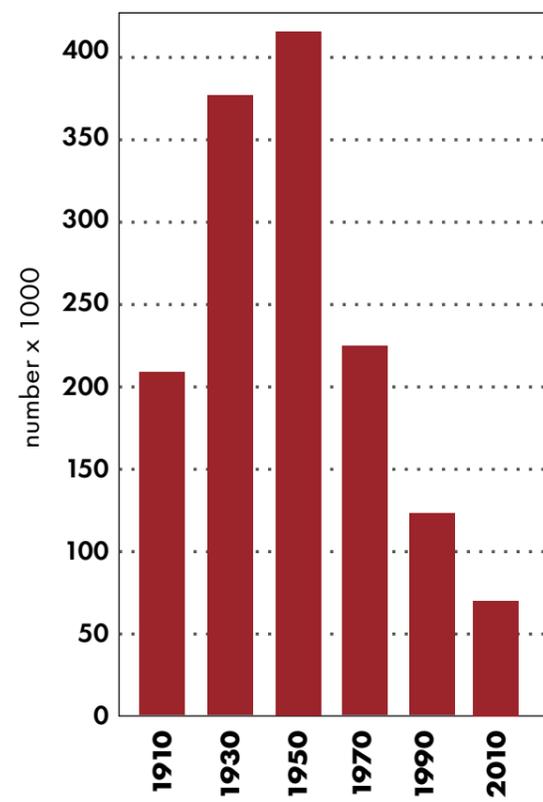
Meat Crisis



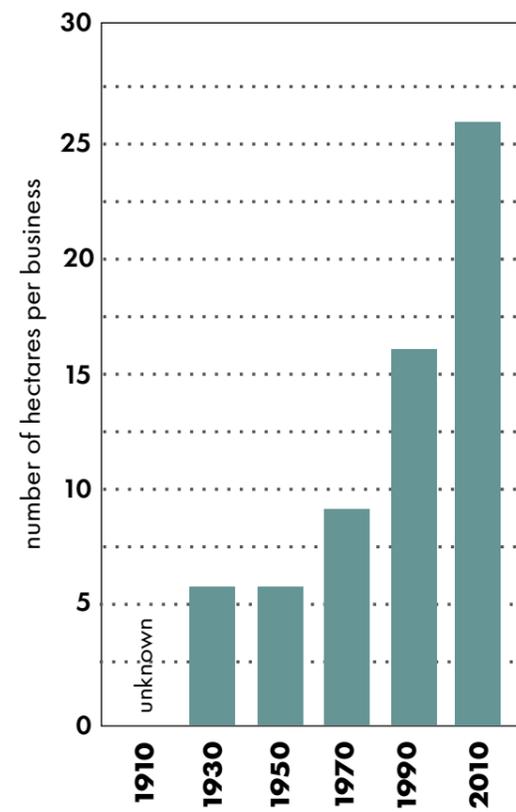
[Meat Consumption (FAO)]

Changes in Scale in Agriculture

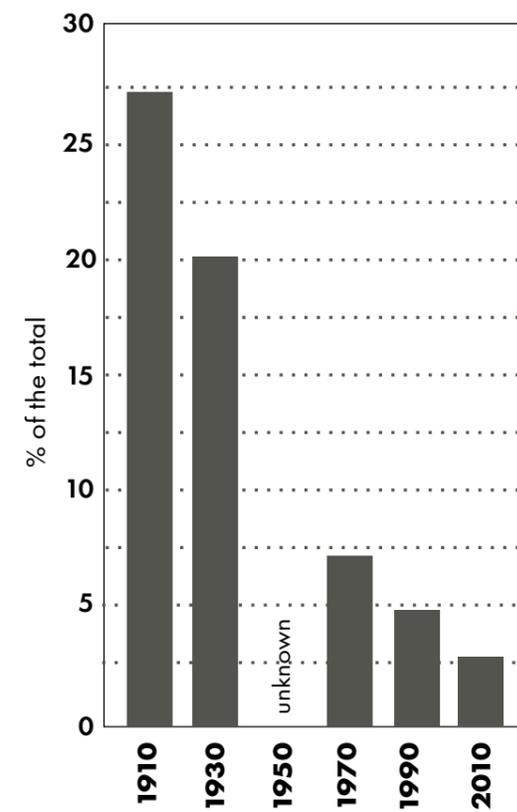
Number of agricultural businesses



Business size



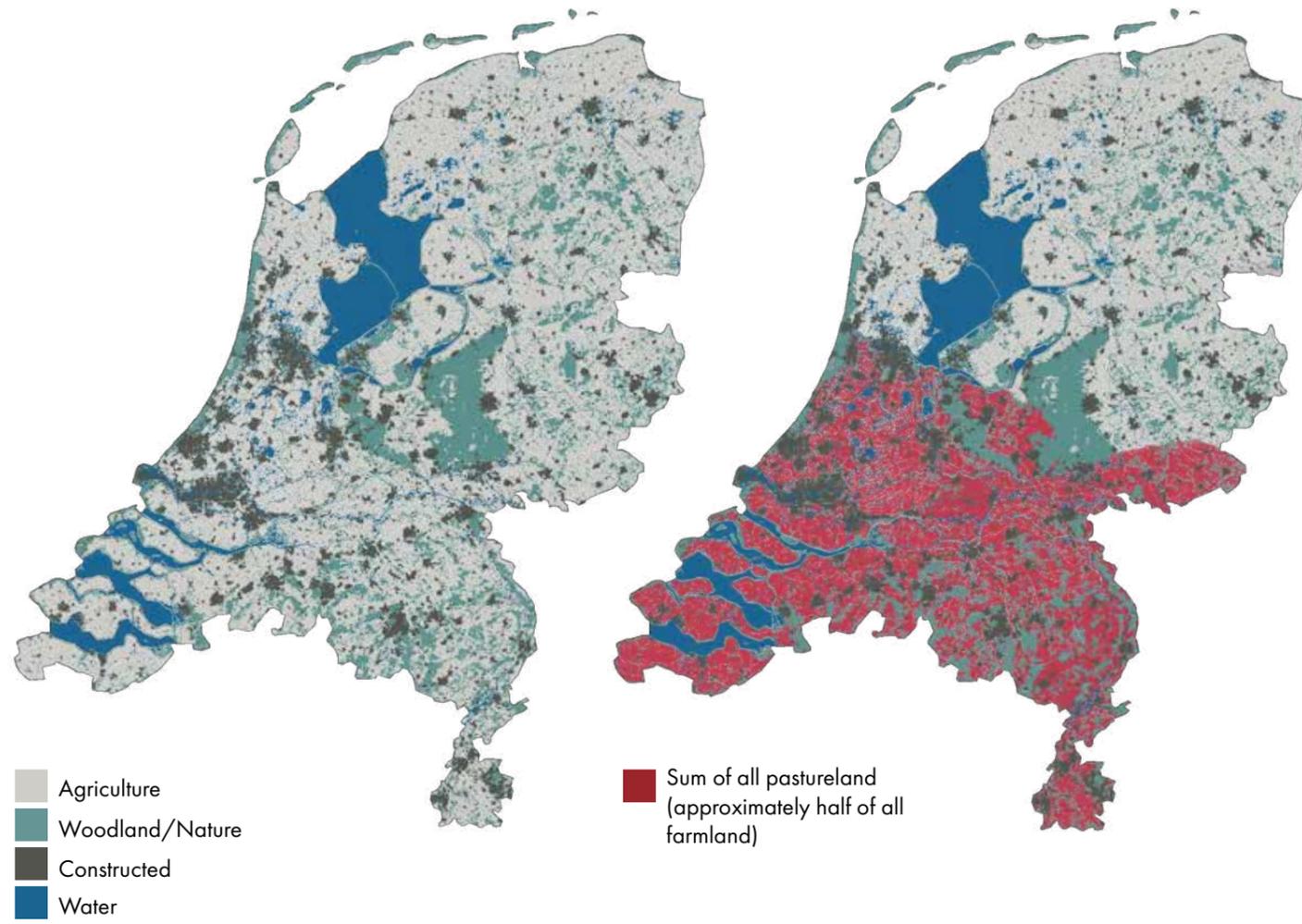
Agricultural workforce



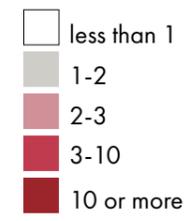
“Livestock farming is the main agricultural activity in the Netherlands. Approximately half of all farmland is used as pasture for dairy cows, sheep and goats, and farmers mainly grow the feed for these animals themselves. Dairy products and meat are the main produce.”

Food Atlas of The Netherlands

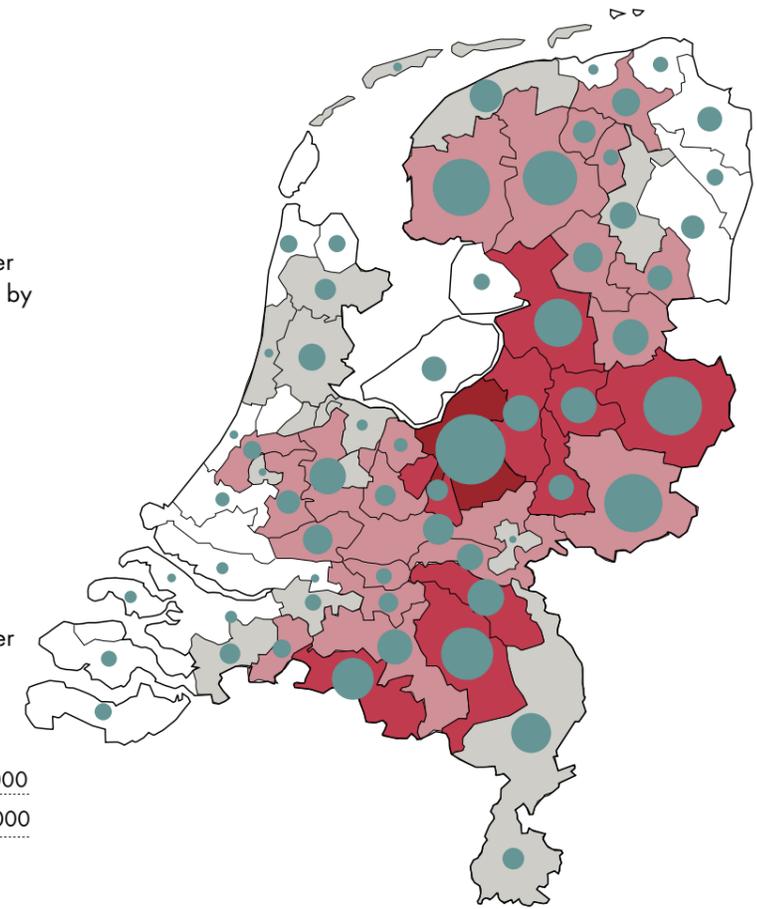
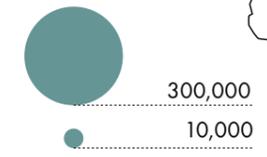
Meat Production in NL



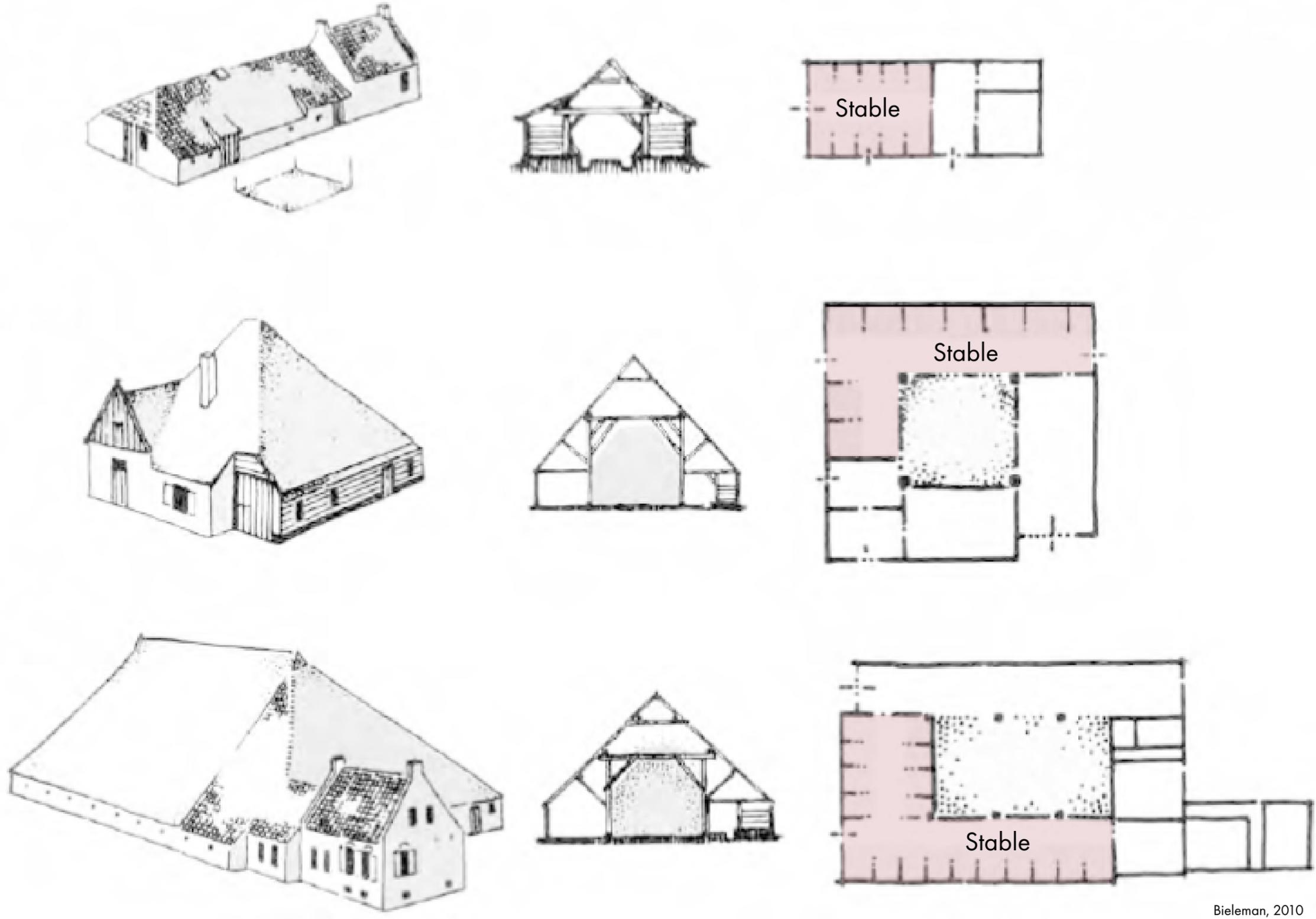
Number of cattle per hectare of farmland by agricultural region



Number of cattle per agricultural region



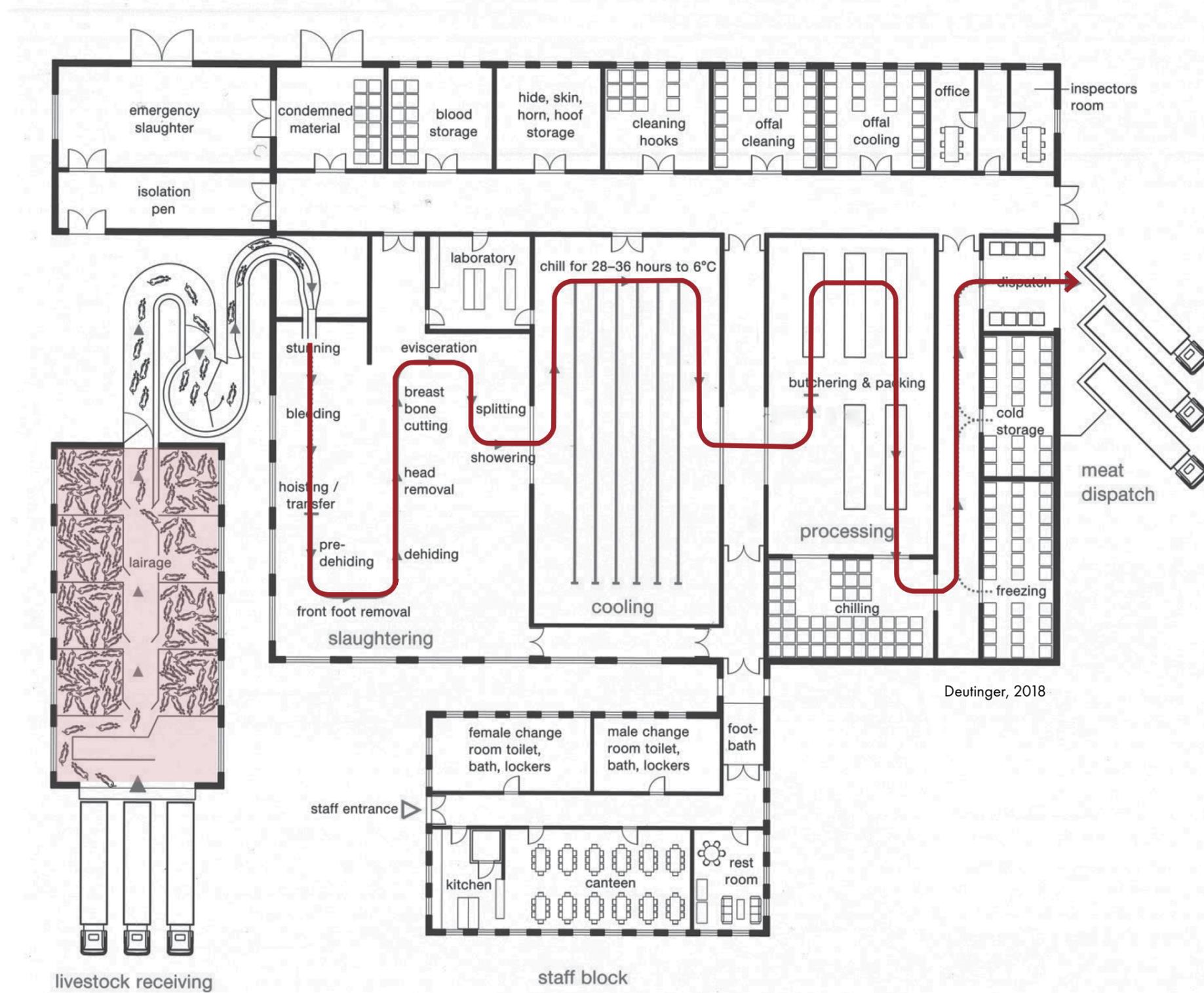
Paradigm Shift



Bieleman, 2010

_16th Century / Cohabitation

Paradigm Shift



_20th Century / Industrialization

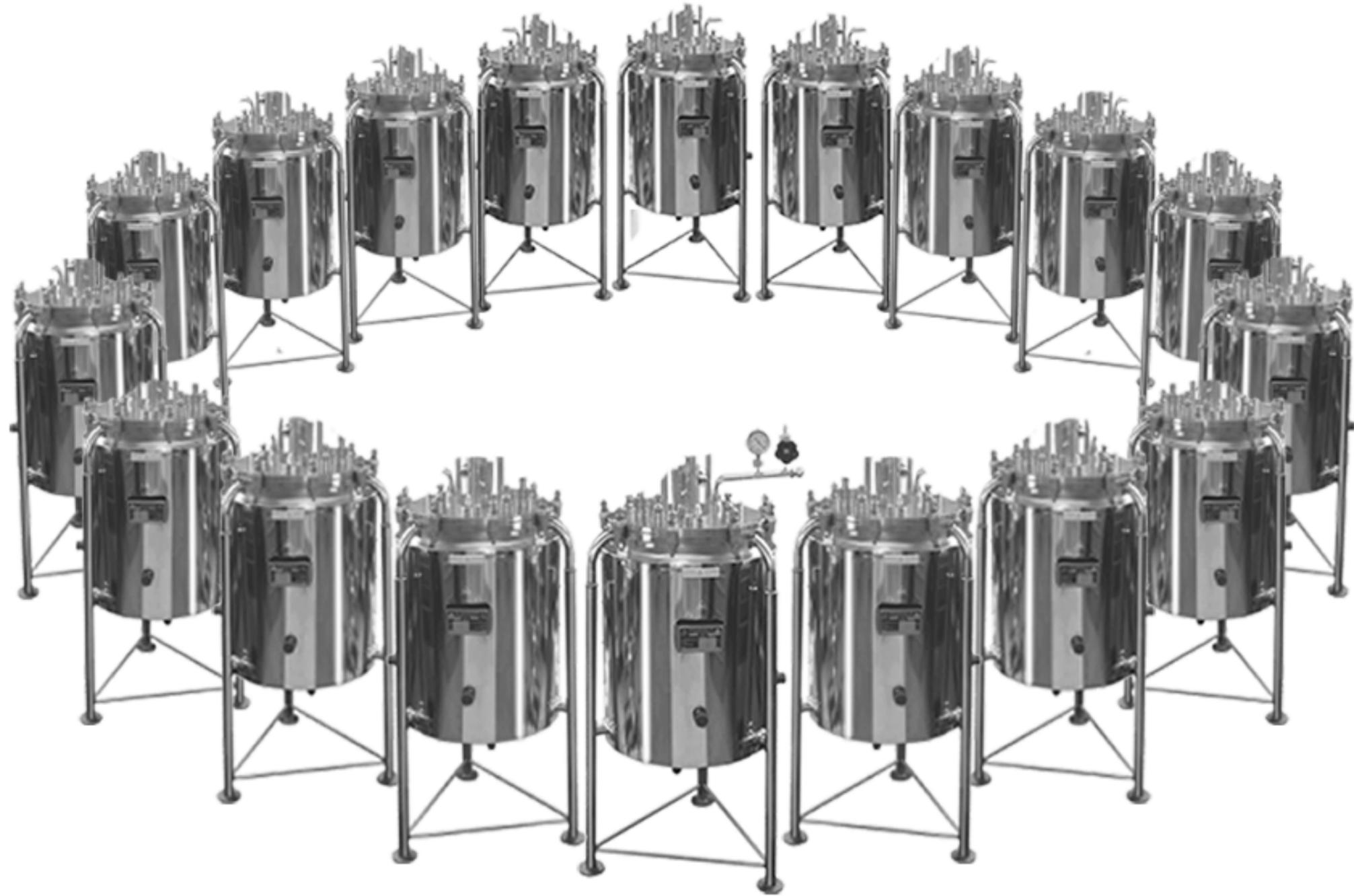
Paradigm Shift



DairyProQ, 2019

_21th Century / Automation

Paradigm Shift



_21th Century / Post-animal Automation?

Increasing Meat Consumption

Meat consumption will increase up to 144% by 2050

(FAO)

Animal Cruelty

Future generations are going to look back in revulsion at the ways in which we treated animals in our era. And they are going to wonder how could anyone have ever thought that it was acceptable?"

Paul Shapiro

Community Alienation from Production Process

The way meat is produced today is so problematic that People don't even want to know about it - they don't want to visit a slaughterhouse, they don't want to see a pig have their testicles cut without anesthesia, chicken crammed in small cages etc - current methods are unnatural and inhumane

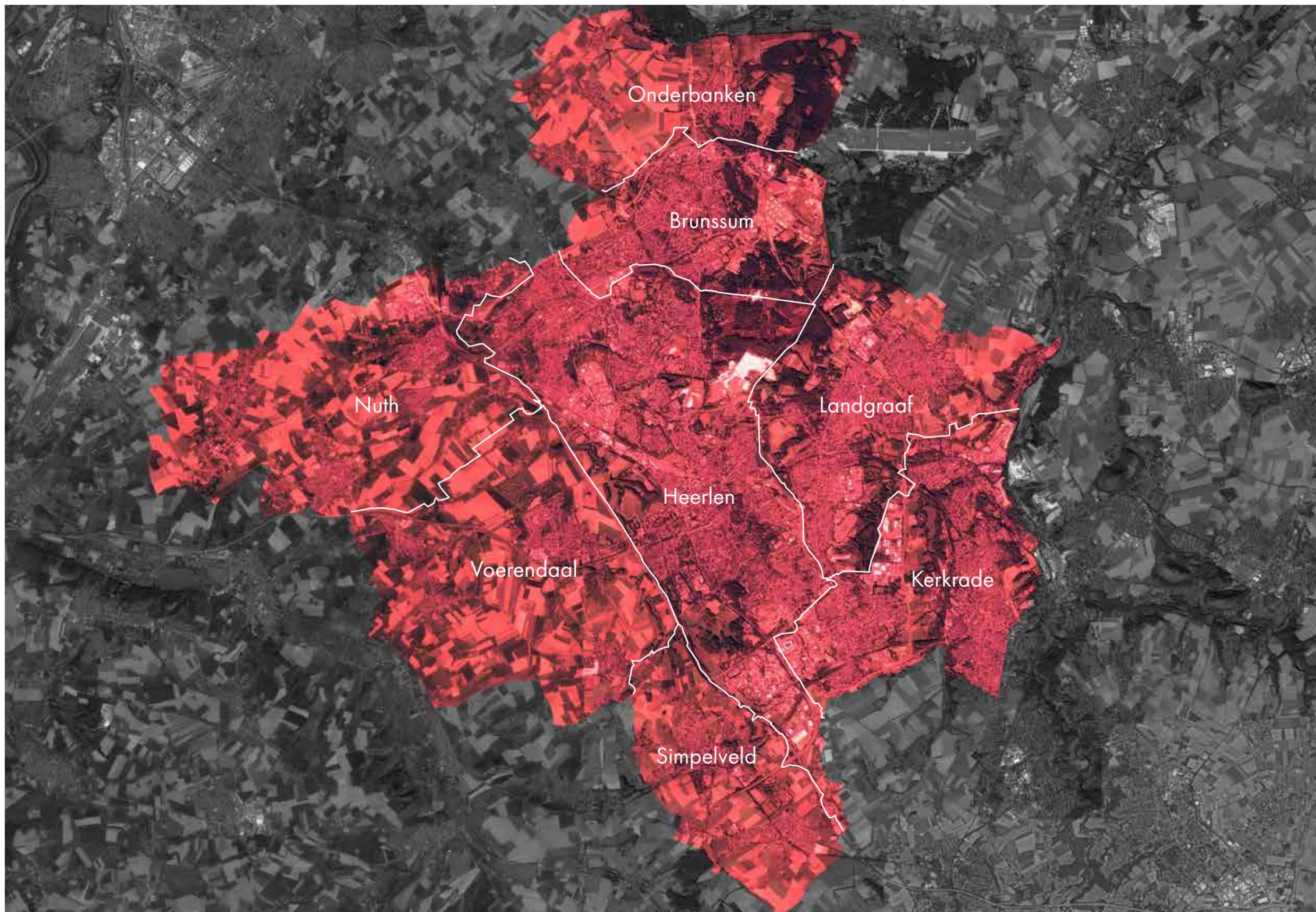
Paul Shapiro

Problem Statement - Local

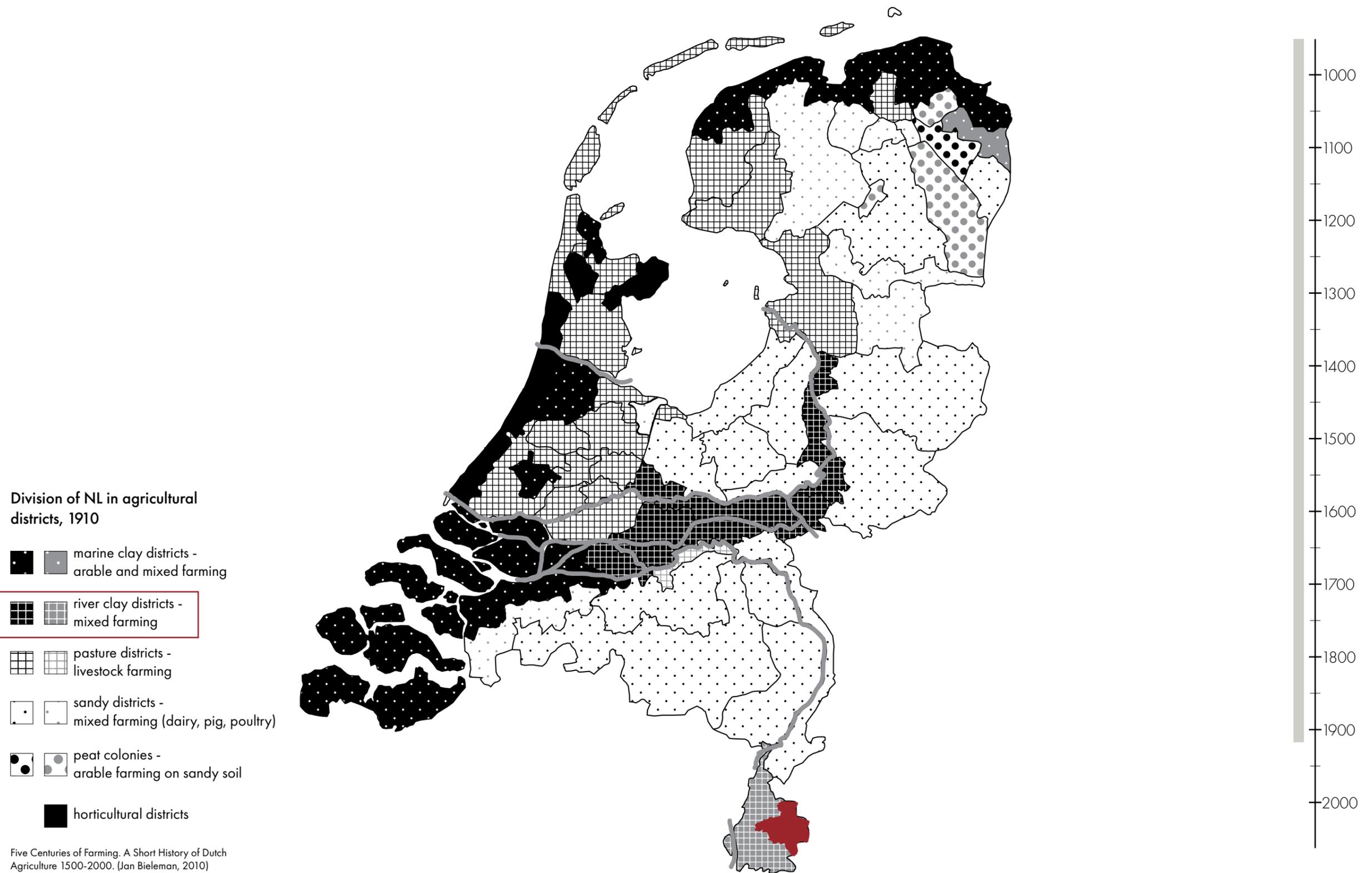
Parkstad



Parkstad

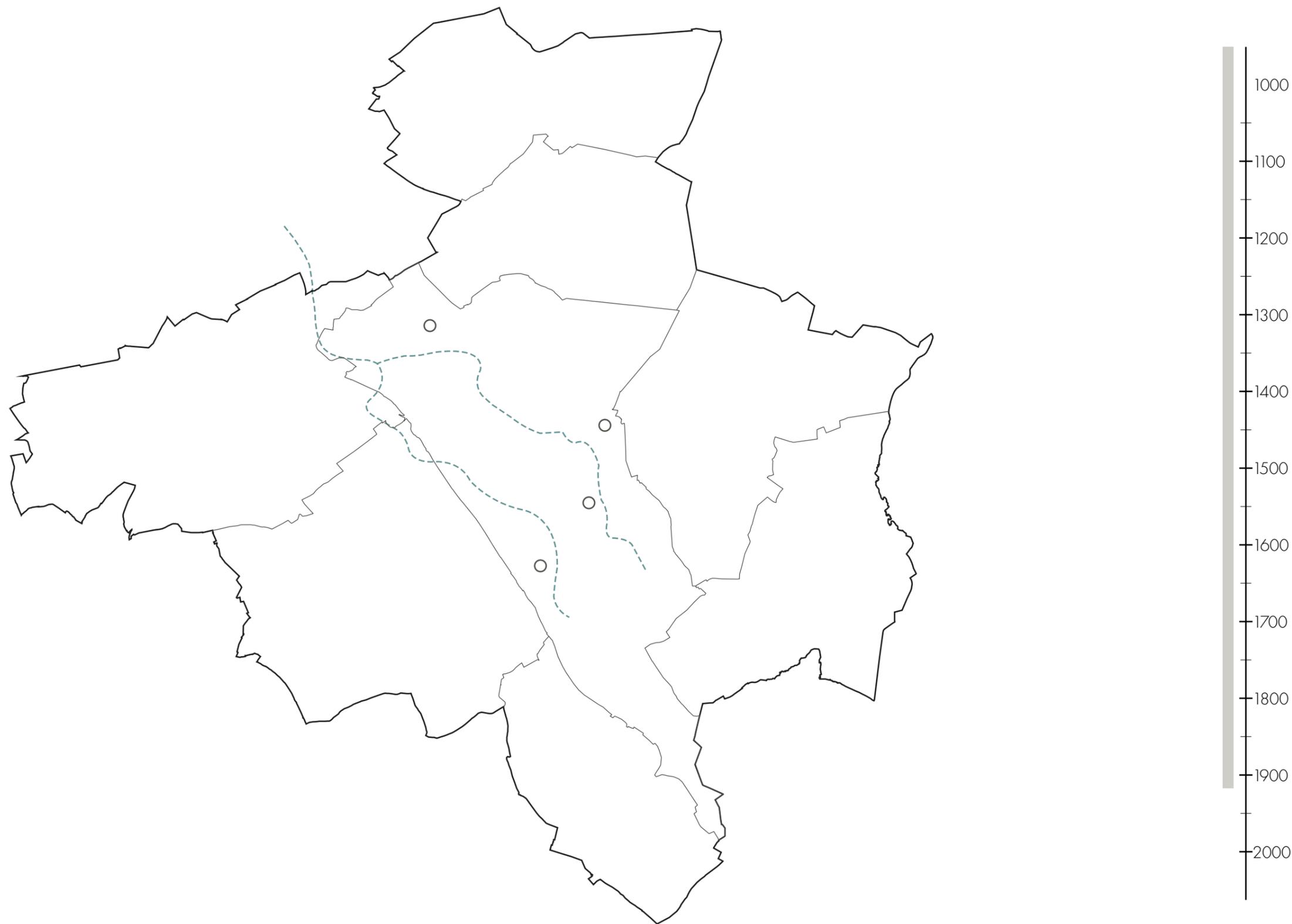


Parkstad



_Pre-Urban Phase (Villages)

Parkstad



_Pre-Urban Phase (Villages)

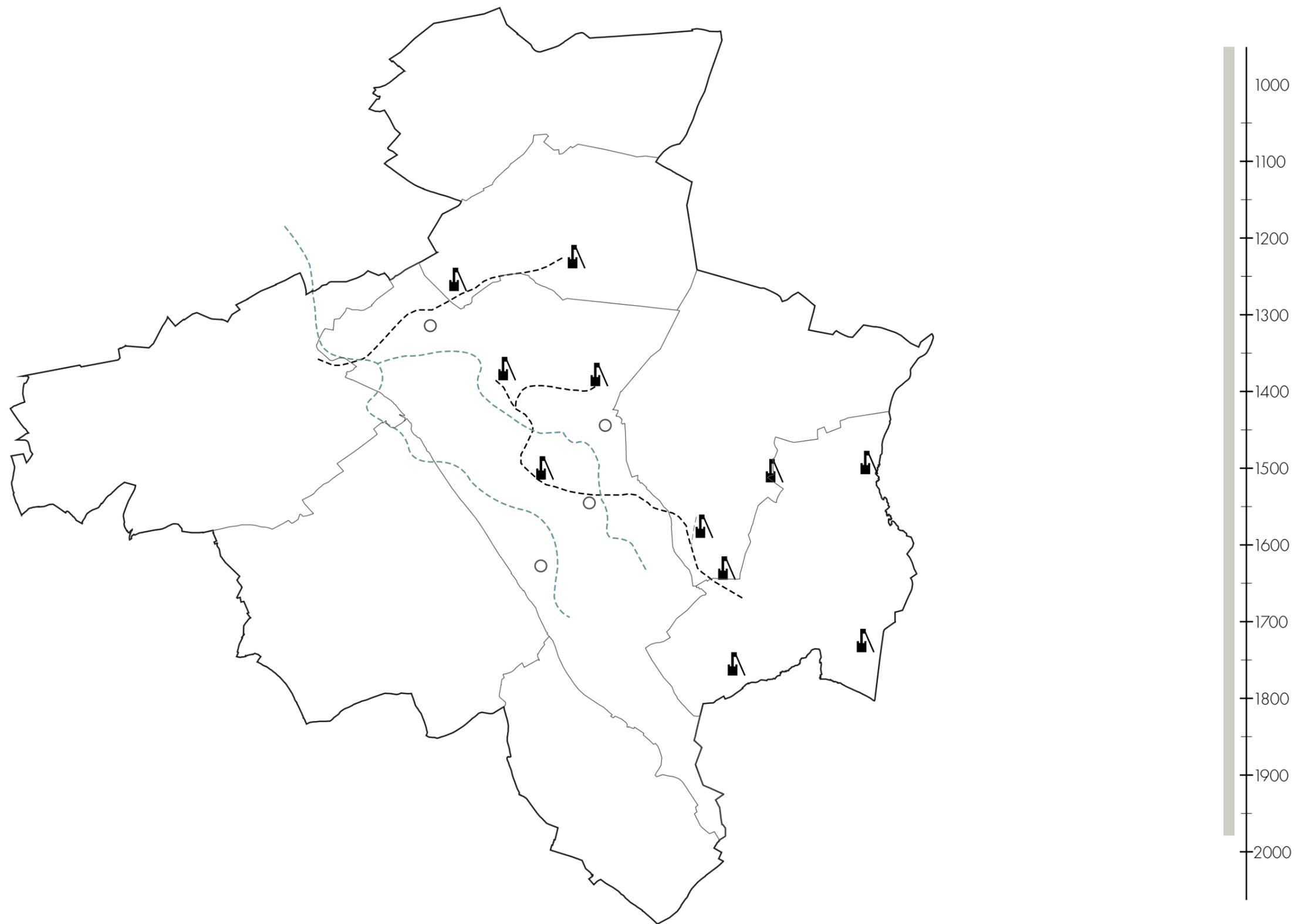
Parkstad



Mine Oranje-Nassau I, Heerlen, 1950s
(Rijckheyt Center for Regional History)

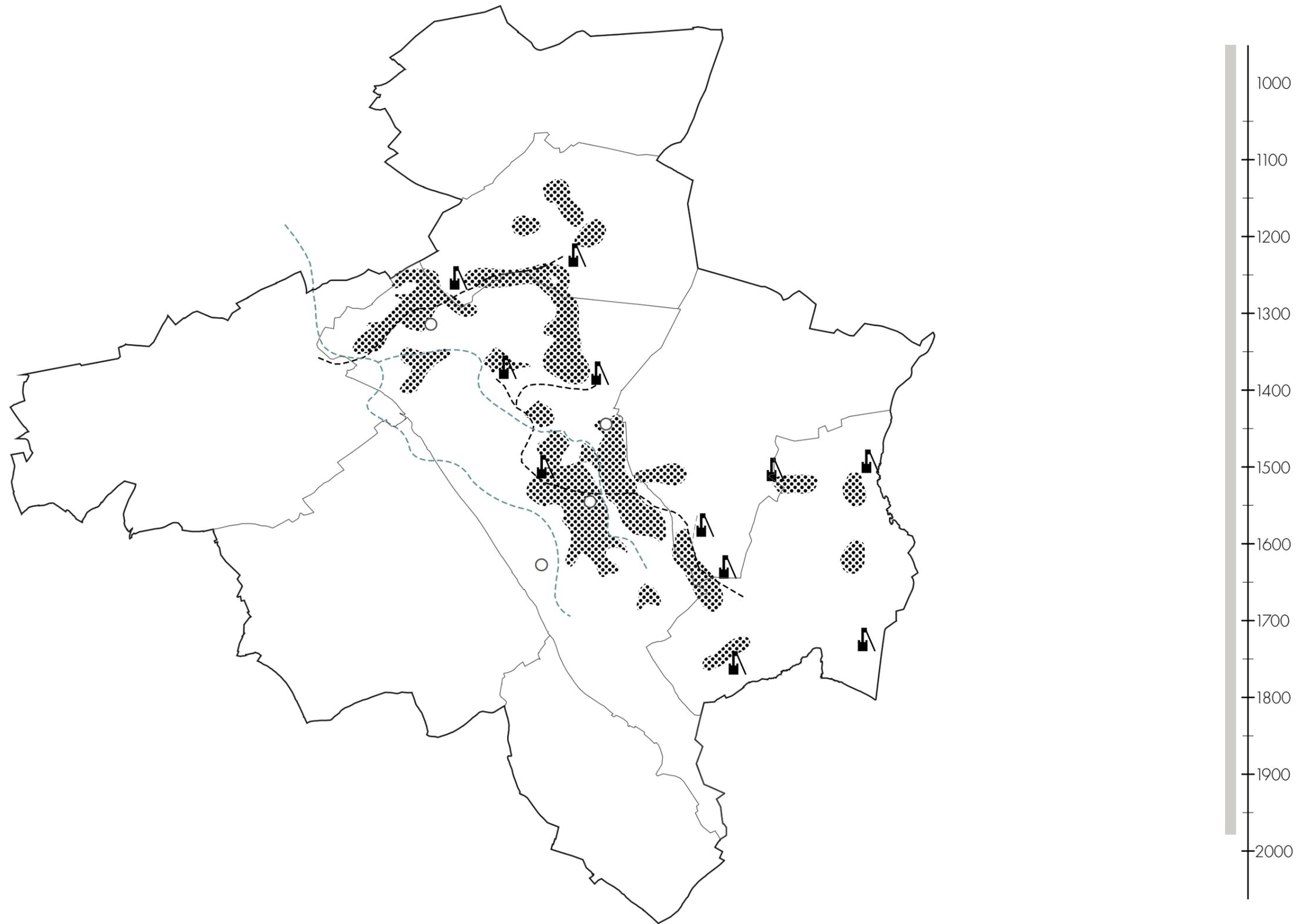
_Mines and Urbanization

Parkstad



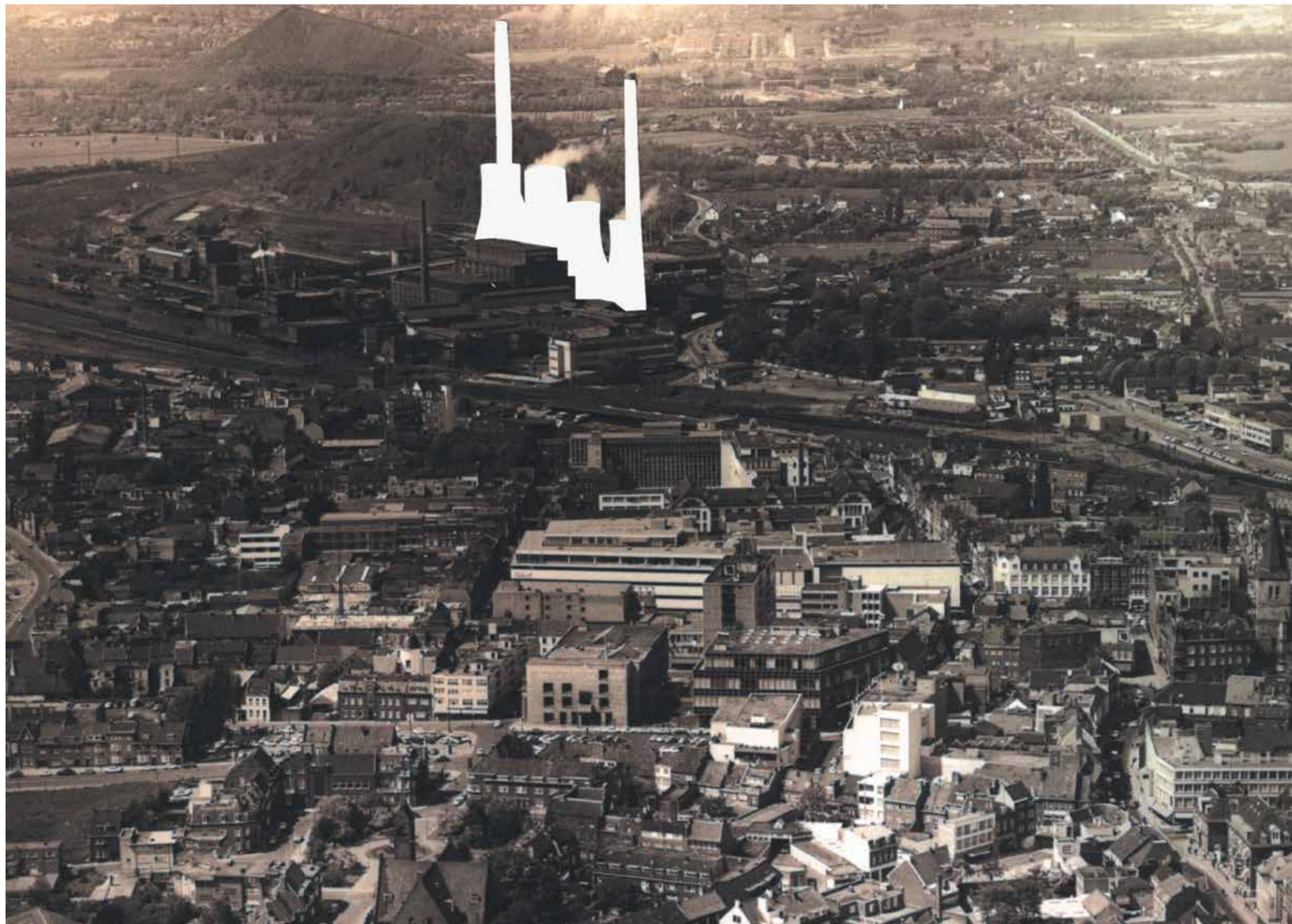
_Mines and Urbanization

Parkstad



_Mines and Urbanization

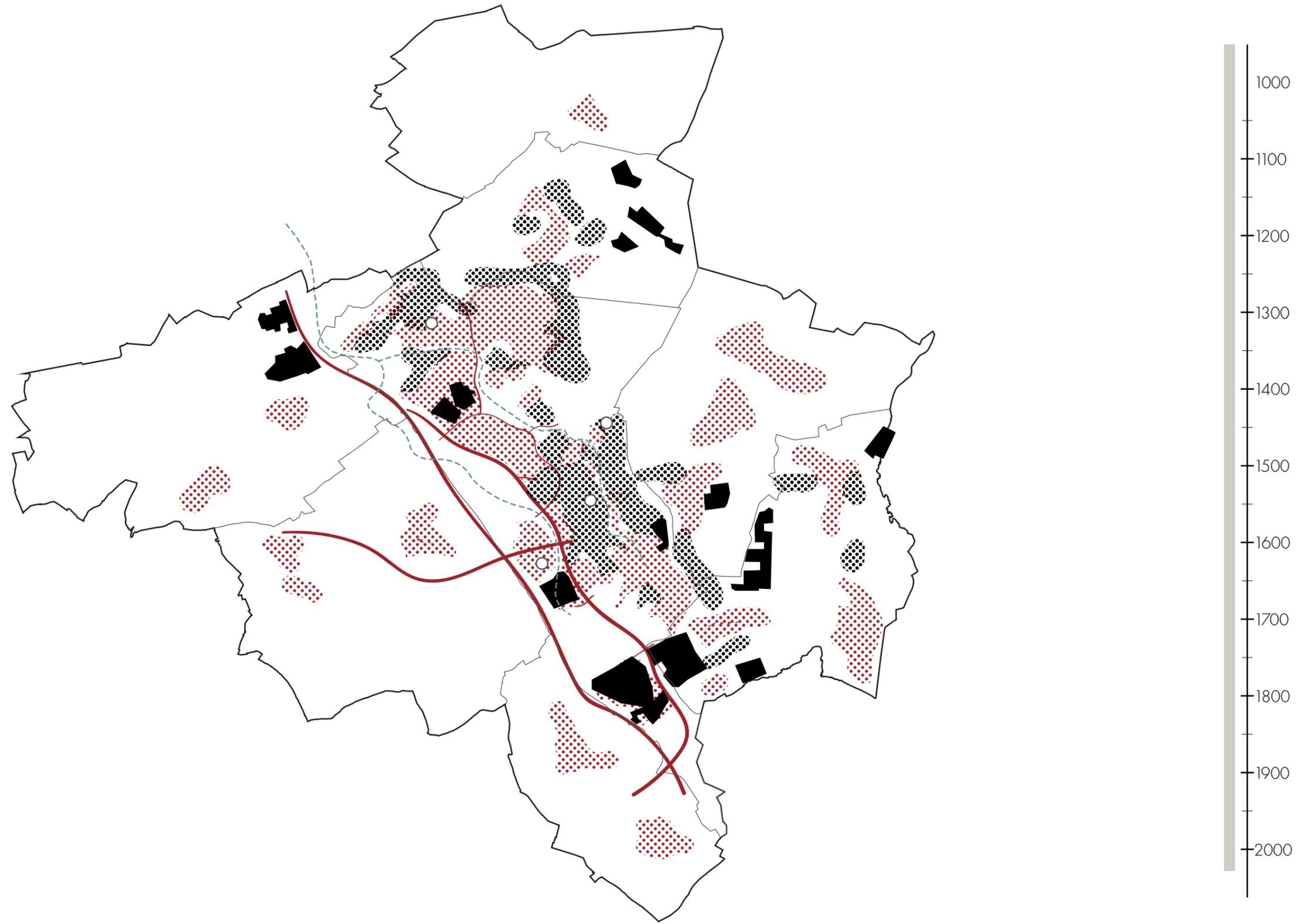
Parkstad



Mine Oranje-Nassau I, Heerlen, 1950s
(Rijkshet Center for Regional History)

_Mines Closure

Parkstad



_Mines Closure and Restructuring

Loss of Identity

Parkstad misses a strong identity. Together with the closure of the mines, the identity disappeared

(IBA Parkstad)

Shrinking Aging Population

Linked to the consequences of the Economic Crisis the drastic impact of a series of spatial mutations is daily visible in the lack of occupancy and tangible from the population decline

(IBA Parkstad)

Economic Stagnation

The Parkstad structure is not the only issue that needs to be dealt with. There is too little work, there is a gloomy atmosphere, too few active people

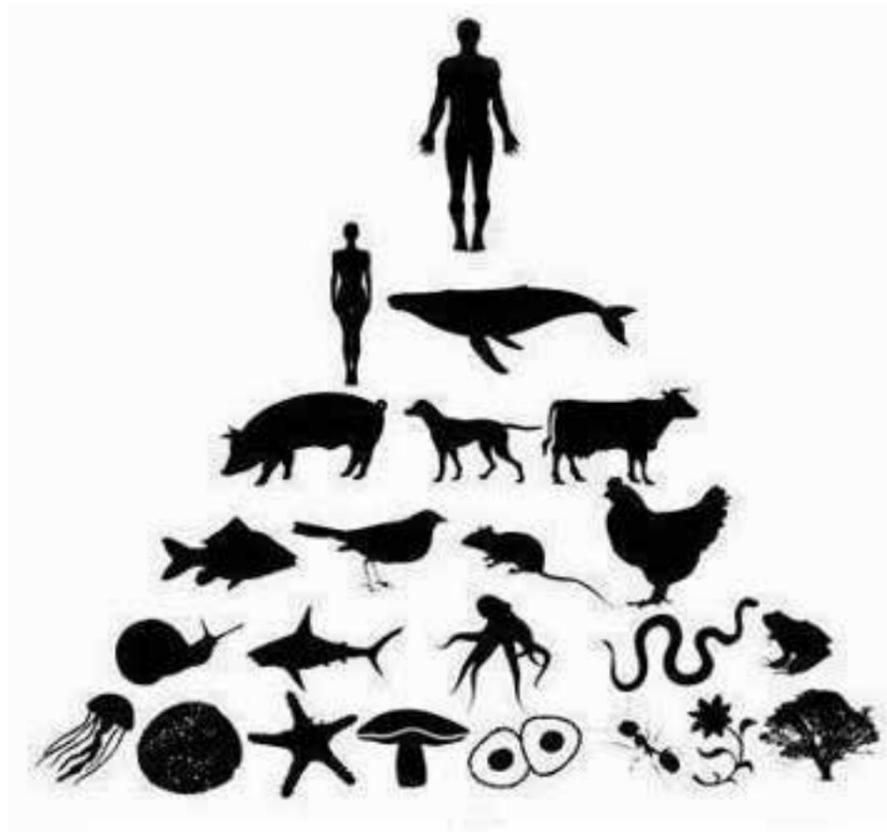
(IBA Parkstad)

Program Concept

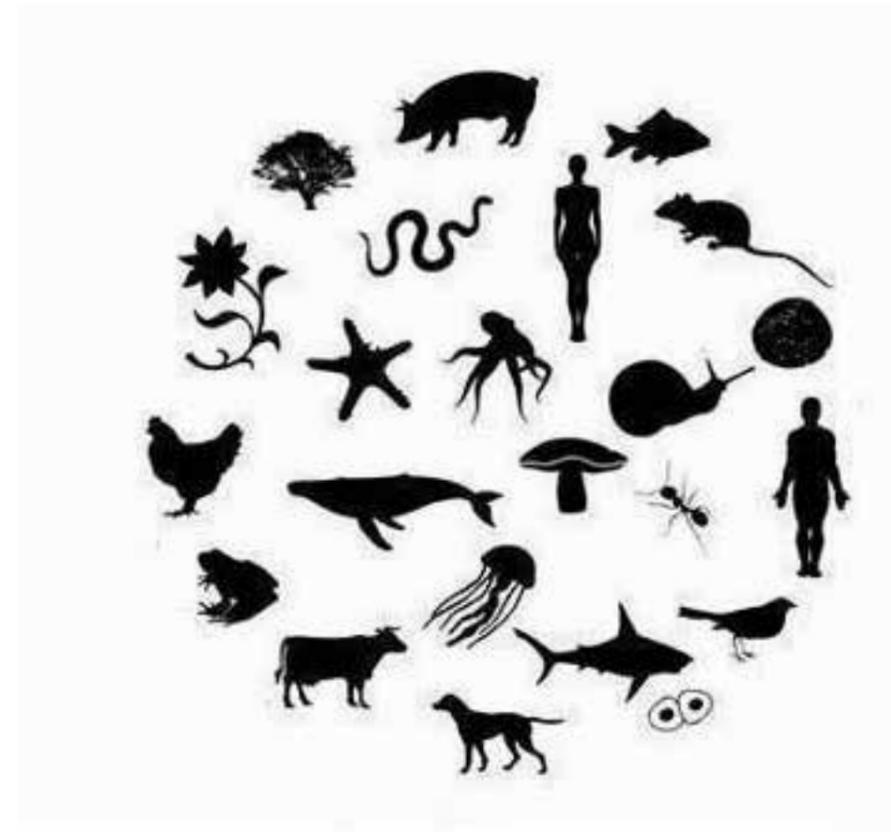


In vitro meat
Clean meat
Lab-grown meat
Cultured meat

Program Concept - Cultured Meat Factory



EGO



ECO

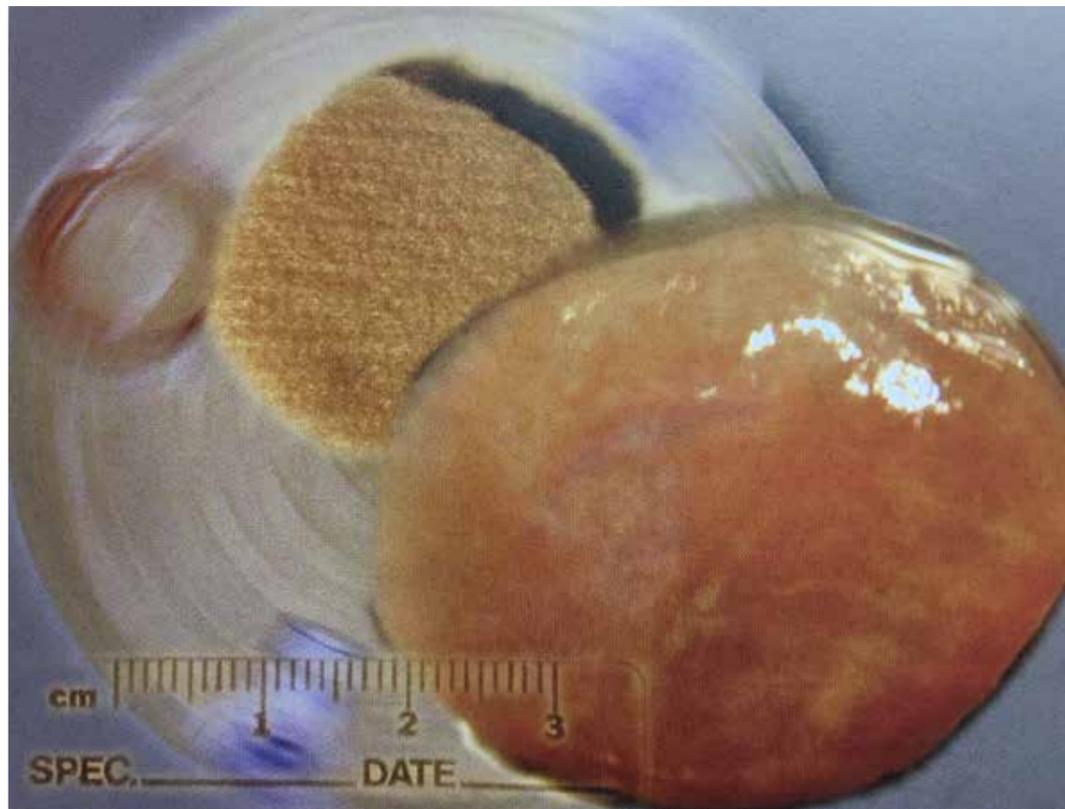


Technology

_Technology promoting ecological practices

2000:

Catts & Zurr's *Tissue Engineered Steak N°1*



2013:

Mark Post cultured meat hamburger



GLOBAL

**Increasing Meat
Consumption**

Animal Cruelty

**Community
Alienation from
Production Process**

LOCAL

Loss of Identity

**Shrinking Aging
Population**

**Economic
Stagnation**

GLOBAL

**Sustainable
Production**

Animal Cruelty

**Community
Alienation from
Production Process**

LOCAL

Loss of Identity

**Shrinking Aging
Population**

**Economic
Stagnation**

GLOBAL

**Sustainable
Production**

Animal-Free Meat

**Community
Alienation from
Production Process**

LOCAL

Loss of Identity

**Shrinking Aging
Population**

**Economic
Stagnation**

GLOBAL

**Sustainable
Production**

Animal-Free Meat

**Democratization of
Technology**

LOCAL

Loss of Identity

**Shrinking Aging
Population**

**Economic
Stagnation**

GLOBAL

**Sustainable
Production**

Animal-Free Meat

**Democratization of
Technology**

LOCAL

**Community
Monument**

**Shrinking Aging
Population**

**Economic
Stagnation**

GLOBAL

**Sustainable
Production**

Animal-Free Meat

**Democratization of
Technology**

LOCAL

**Community
Monument**

Hub for Creatives

**Economic
Stagnation**

GLOBAL

**Sustainable
Production**

Animal-Free Meat

**Democratization of
Technology**

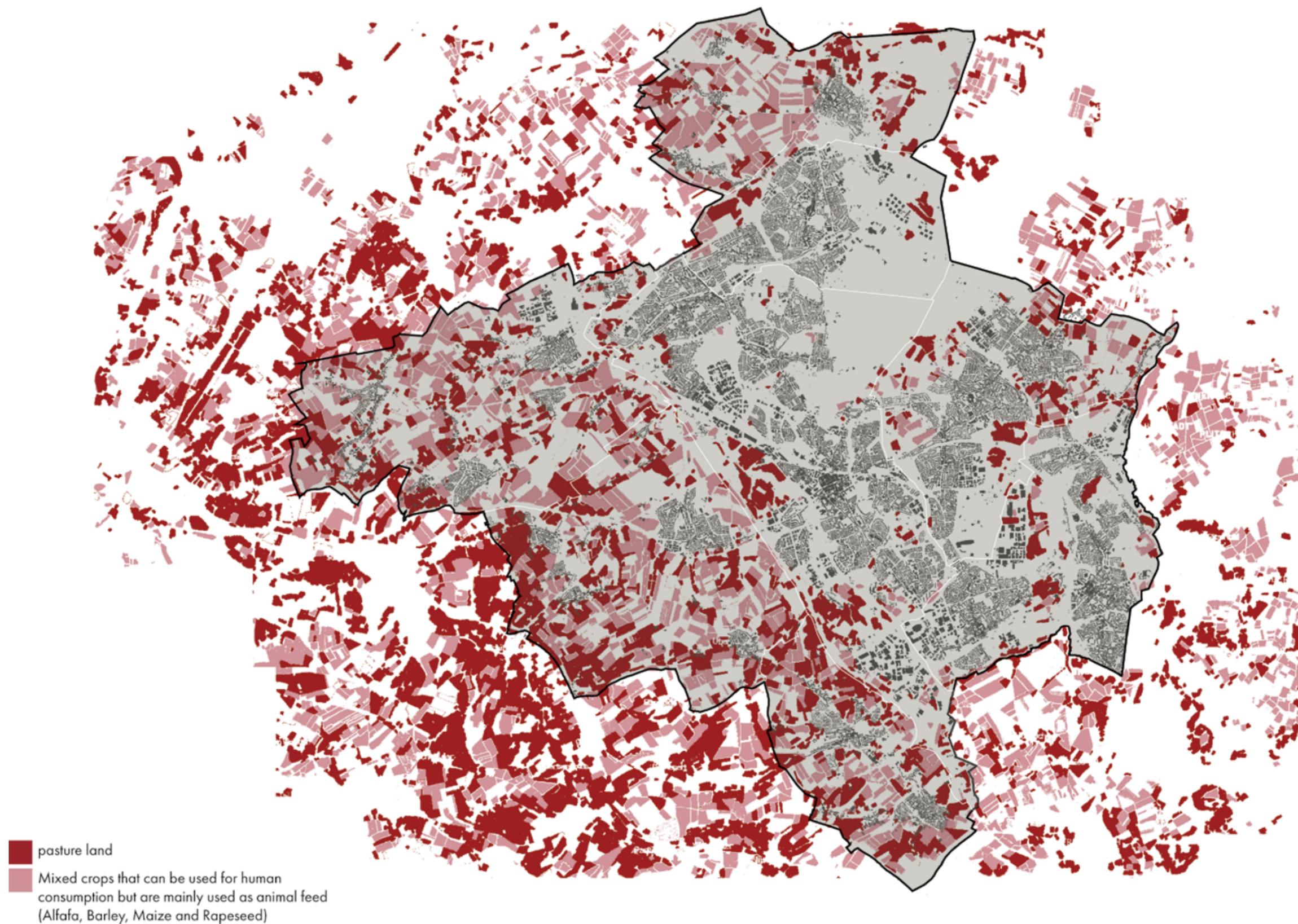
LOCAL

**Community
Monument**

Hub for Creatives

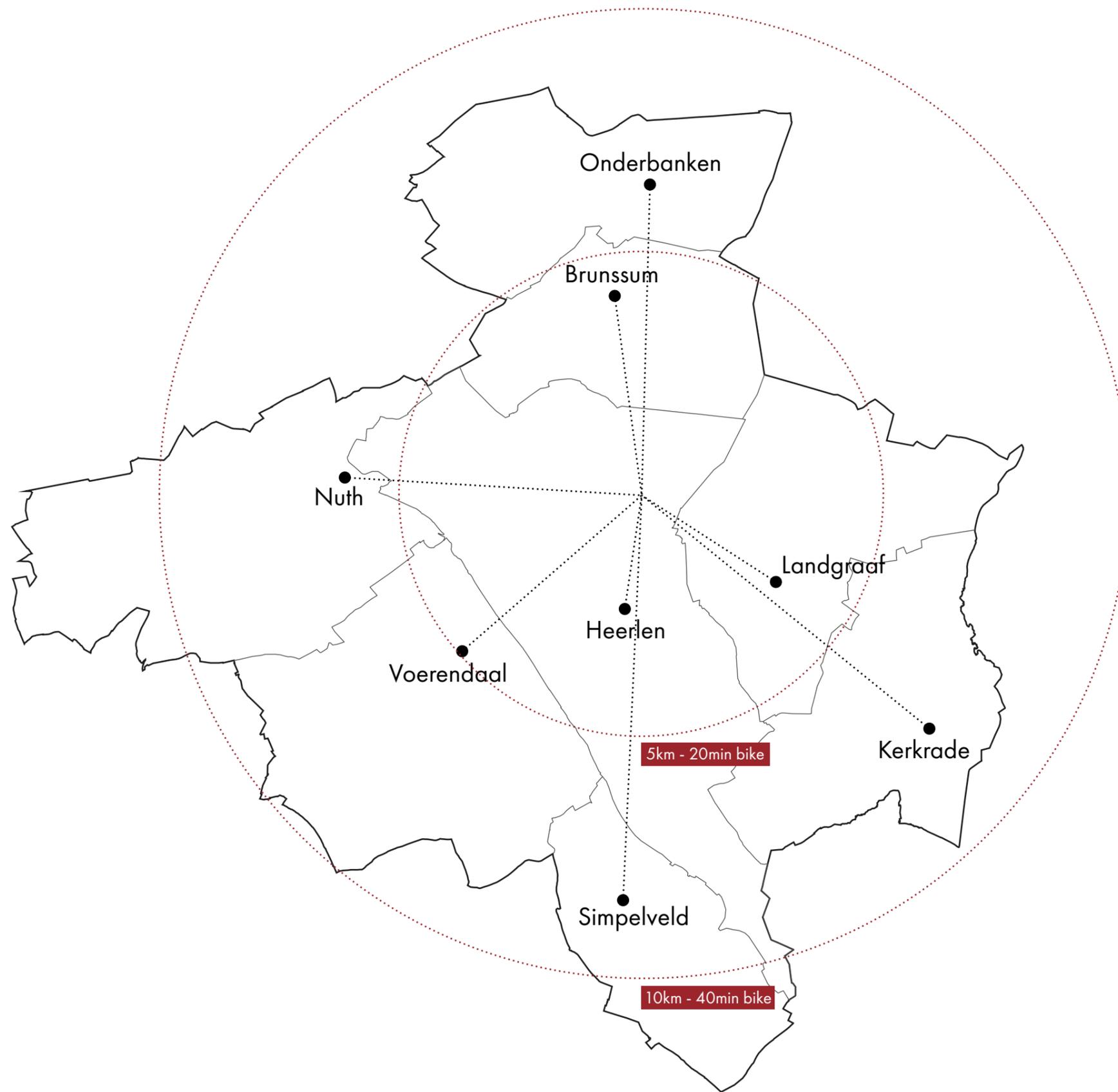
**Profitable
Industries**

Site Analysis



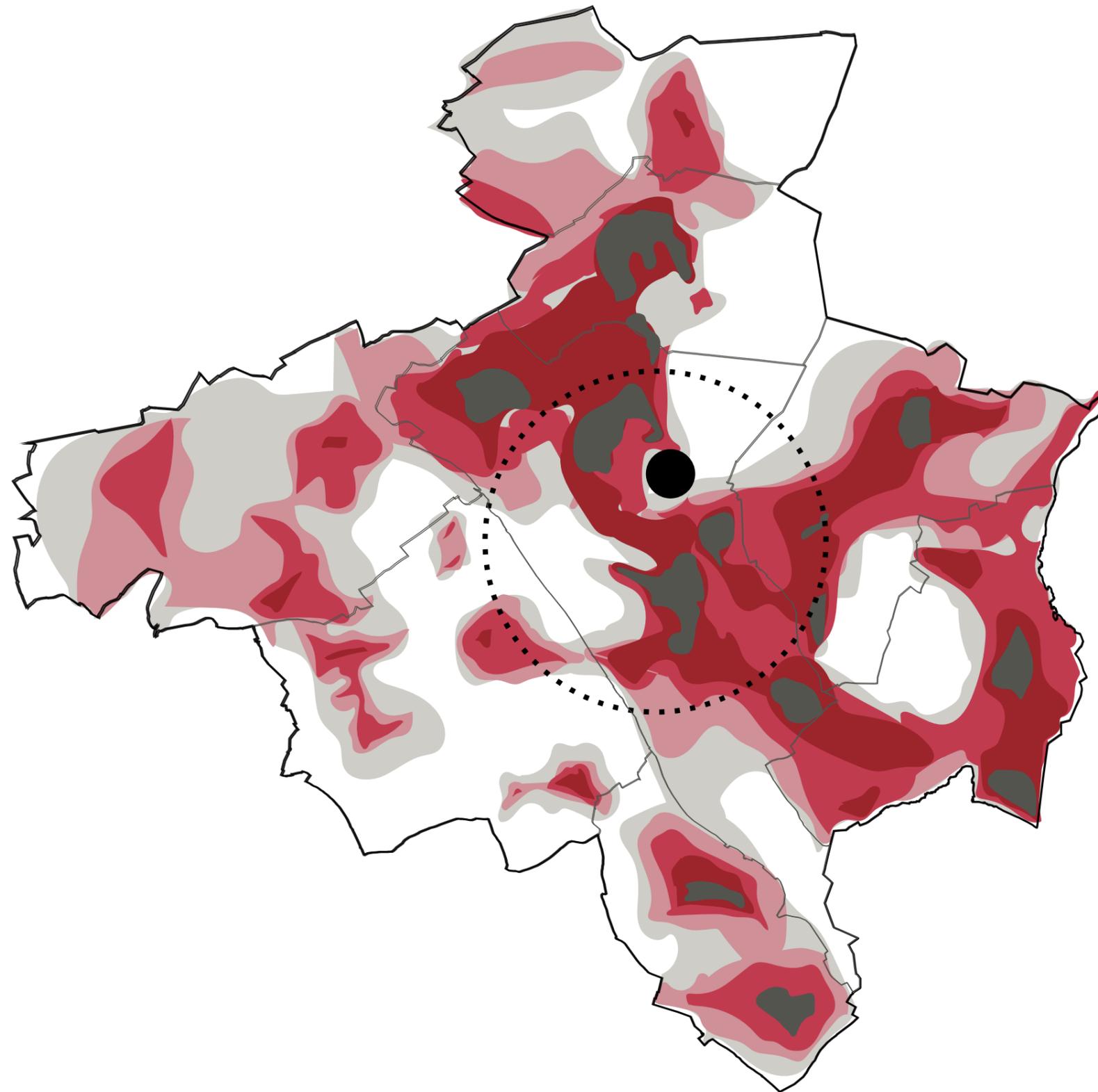
_Landscape Transition: From Pasture to Productive Land

Parkstad

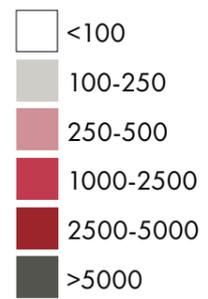


_Site Choice: Central

Parkstad



Inhabitants per km2
Source: IBA Parkstad



_Site Choice: Higher Population Density



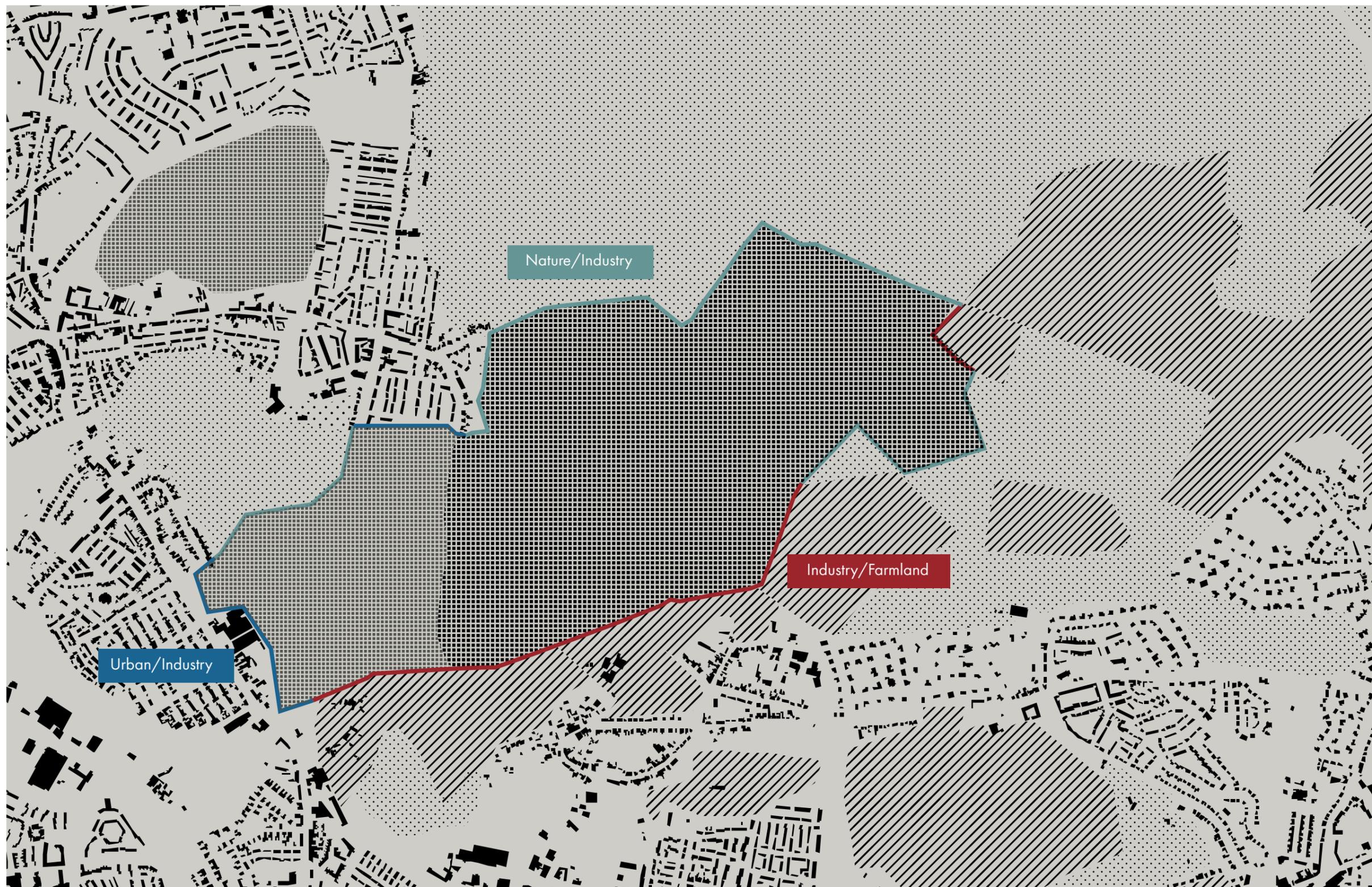
"It is expected that exploitations will continue up to 2030, this area will be extended and a very large recreational and natural area can be created here. The size and the location at the inner circle provide opportunities for regional functions, which attract a large audience. An obvious option is to develop especially the northern side, connected to the Brunsummerheide, into a natural area and to concentrate mass recreation at the southern side. Large-scale facilities which also attract public outside the summer season are indispensable for economic exploitation." (IBA Parkstad)

Parkstad

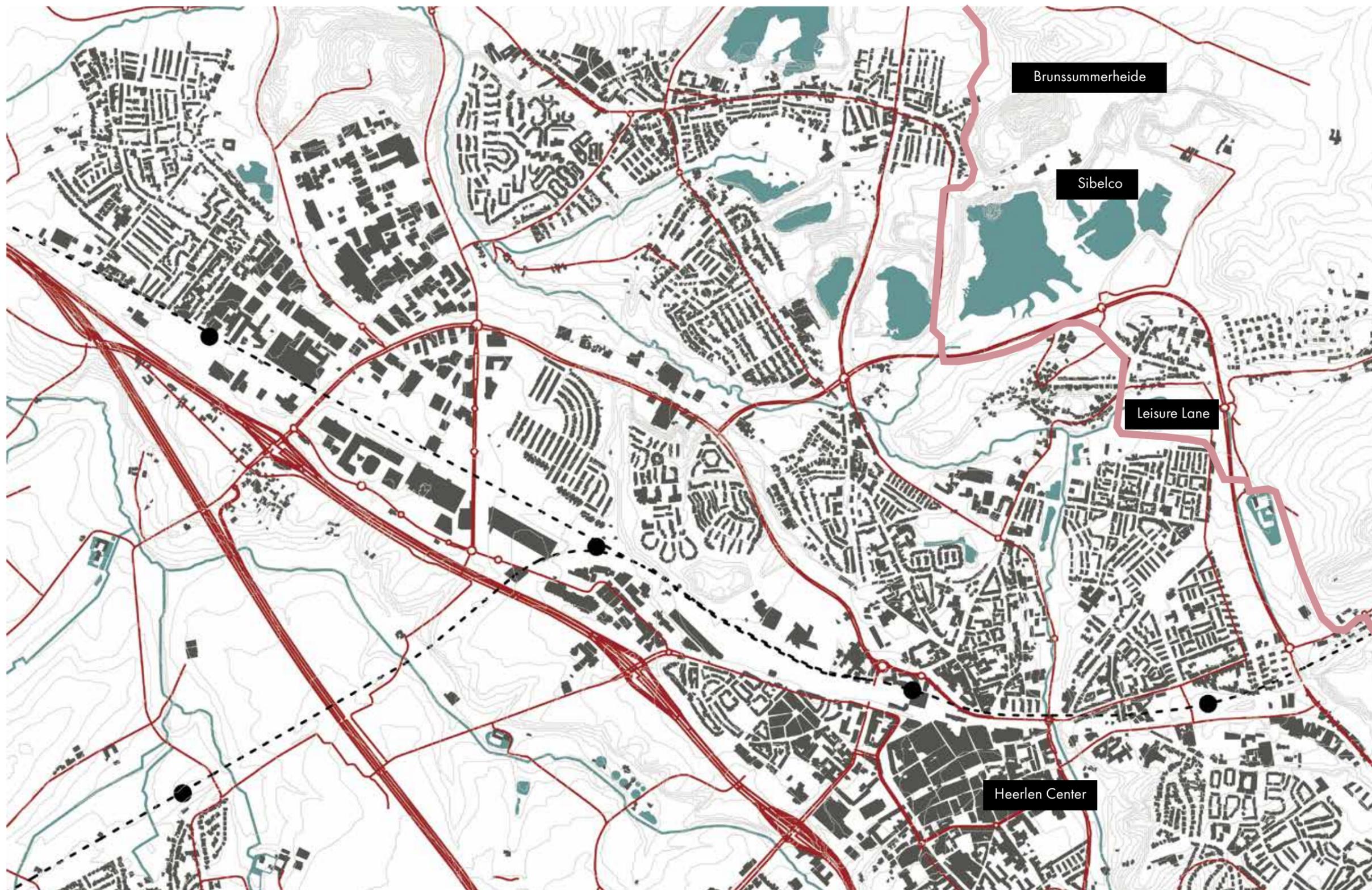


_Sibelco

Parkstad



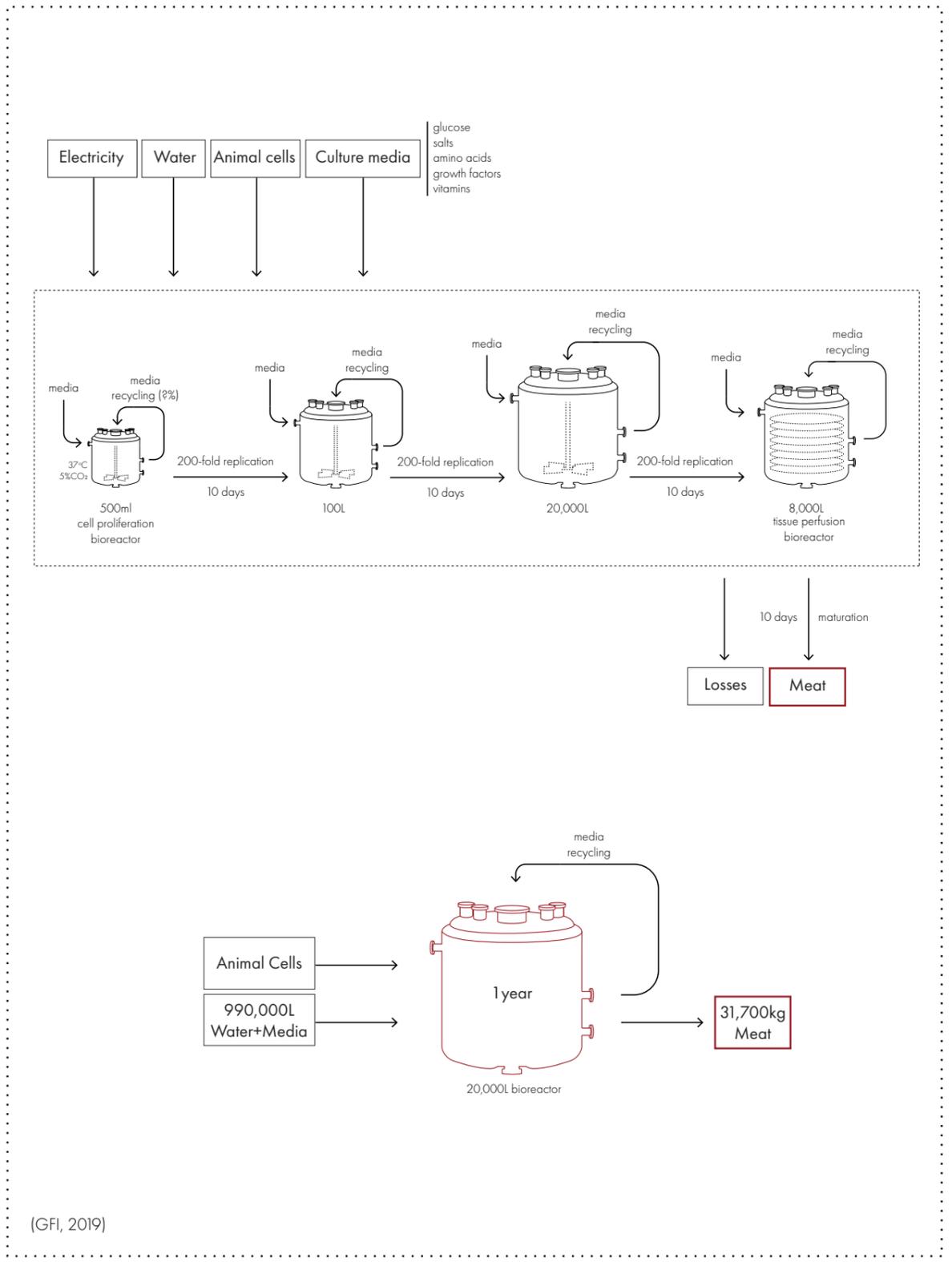
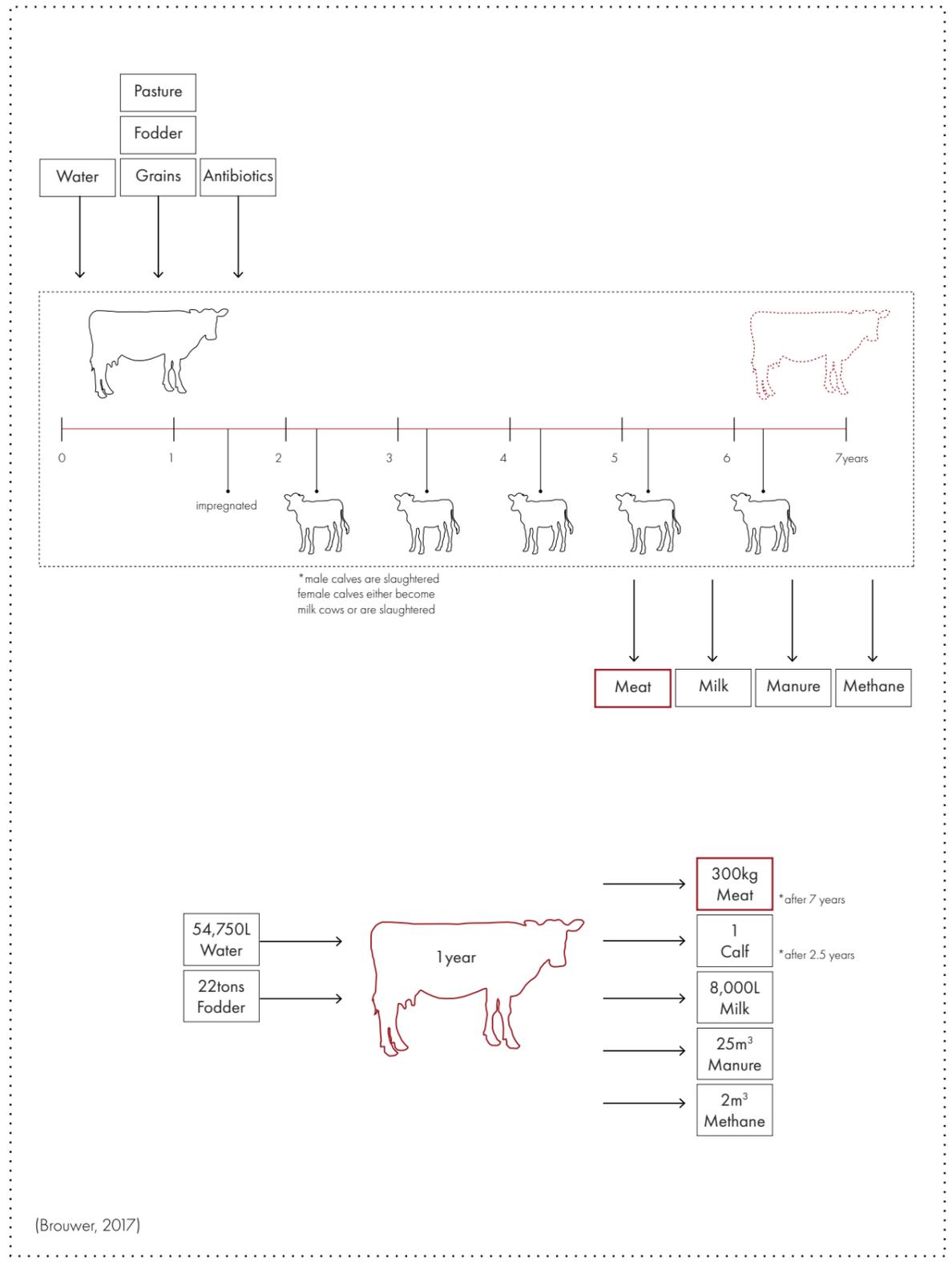
Parkstad



_Sibelco

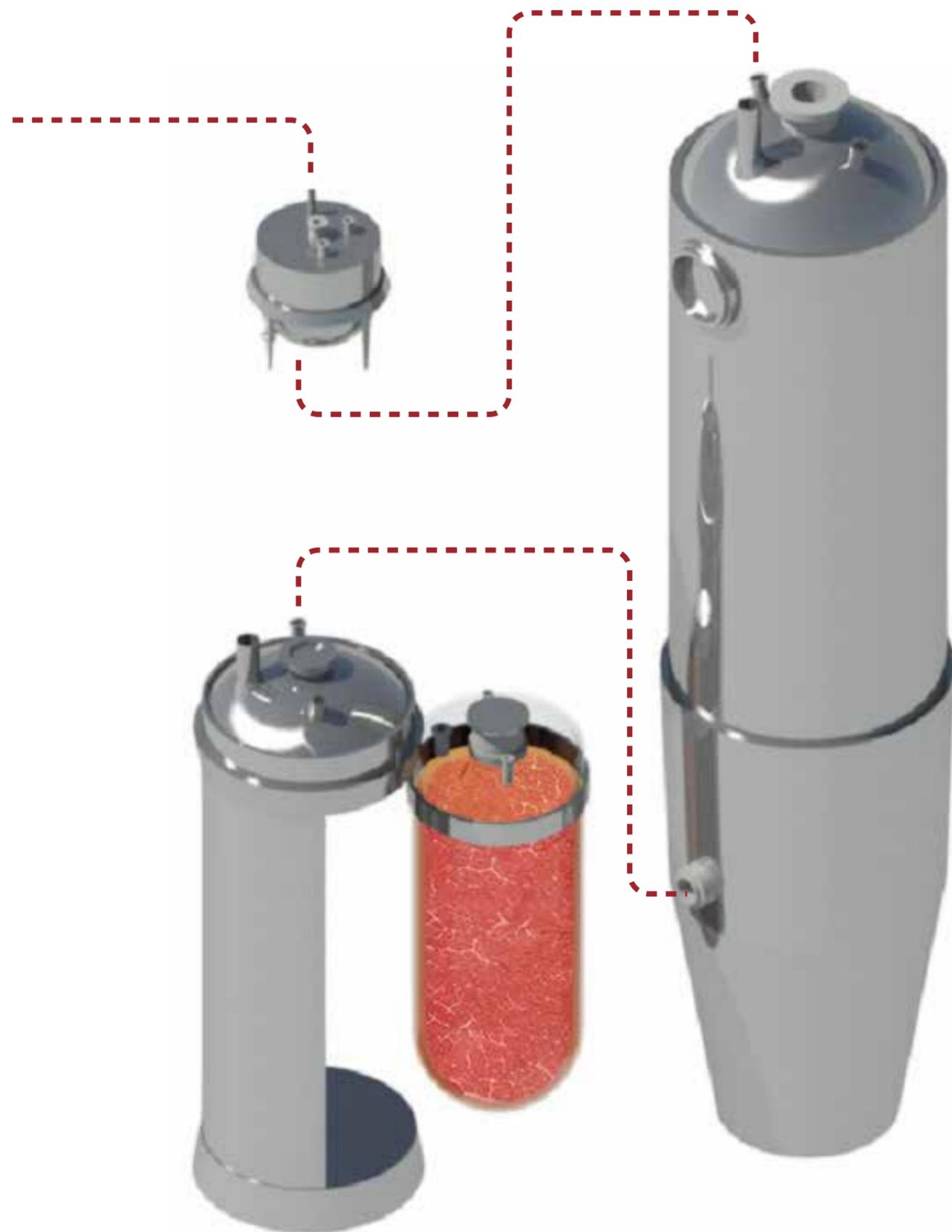
Research + Design

Conventional vs. Cultured

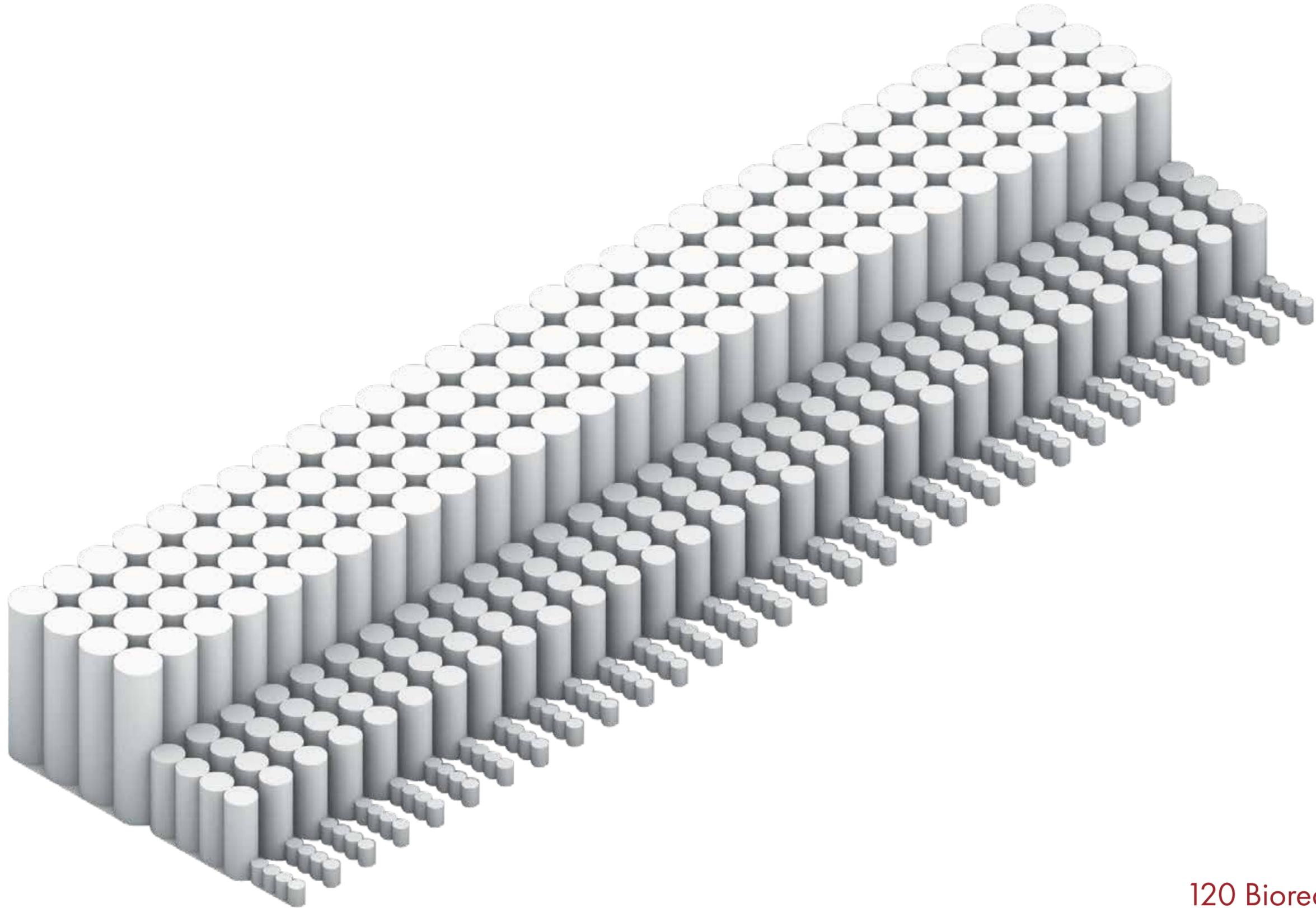


Cultured meat: 45% lower energy use, 96% lower GHG emissions, 99% lower land use and 96% lower water use Tuomisto & Roy, 2012

Bioreactors

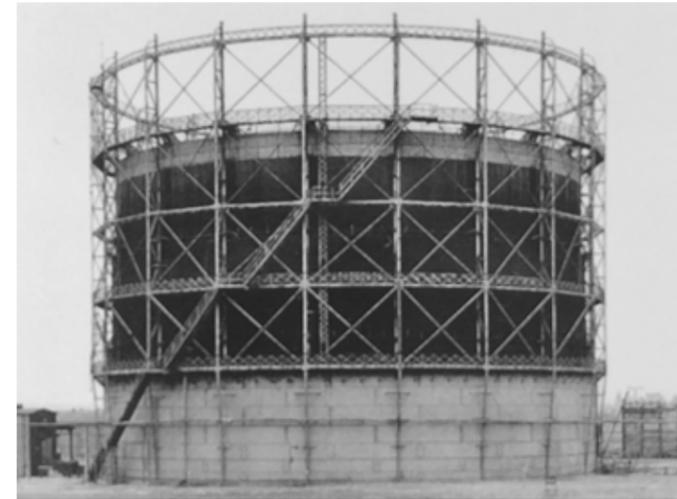
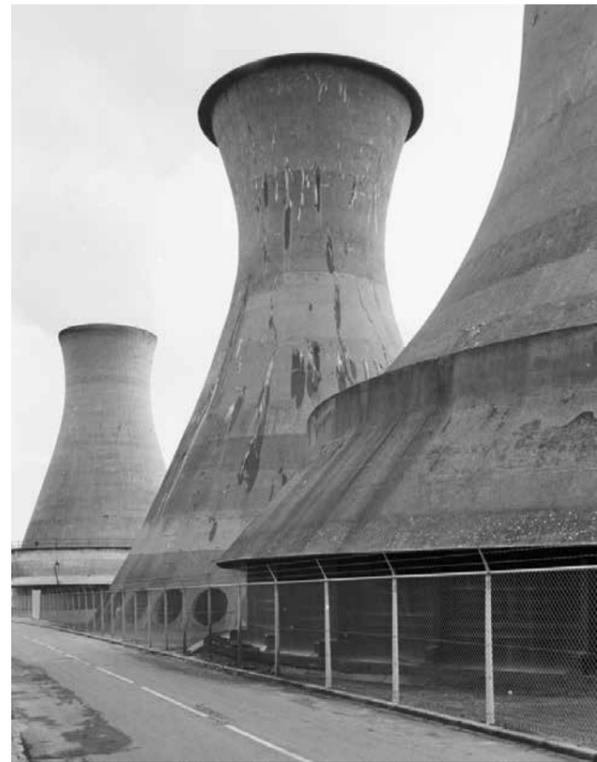
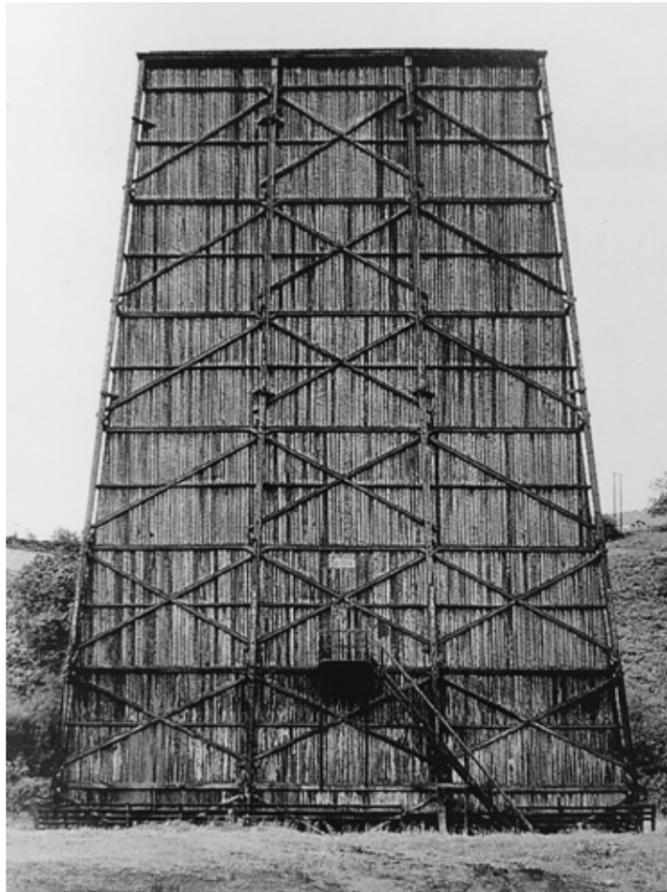


Bioreactors

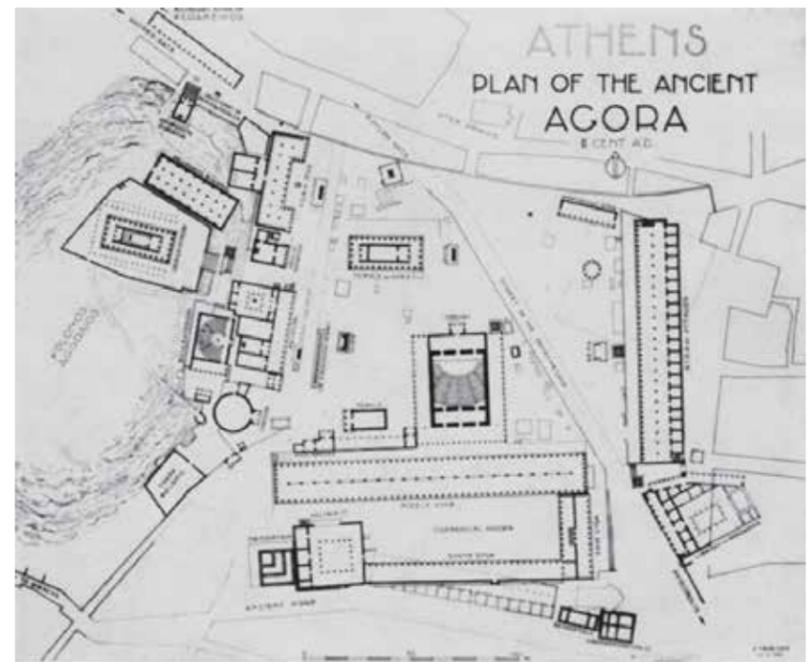
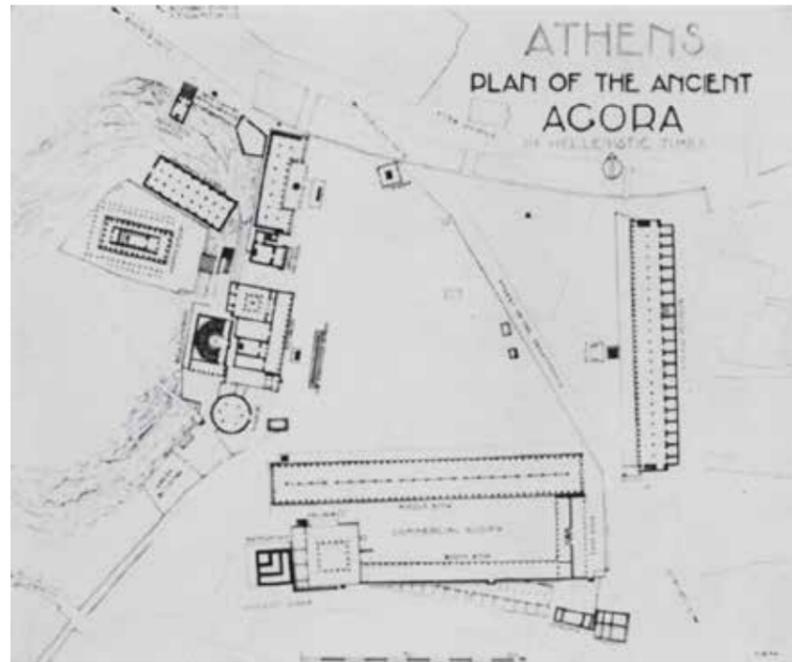
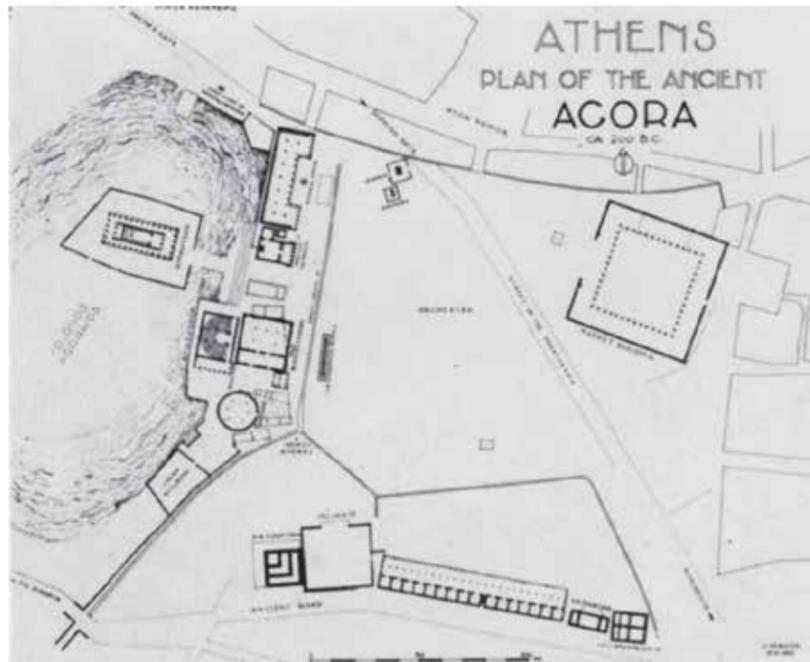


120 Bioreactors
30.000kg meat/day

Design Concept



Case Study - The Greek Agora

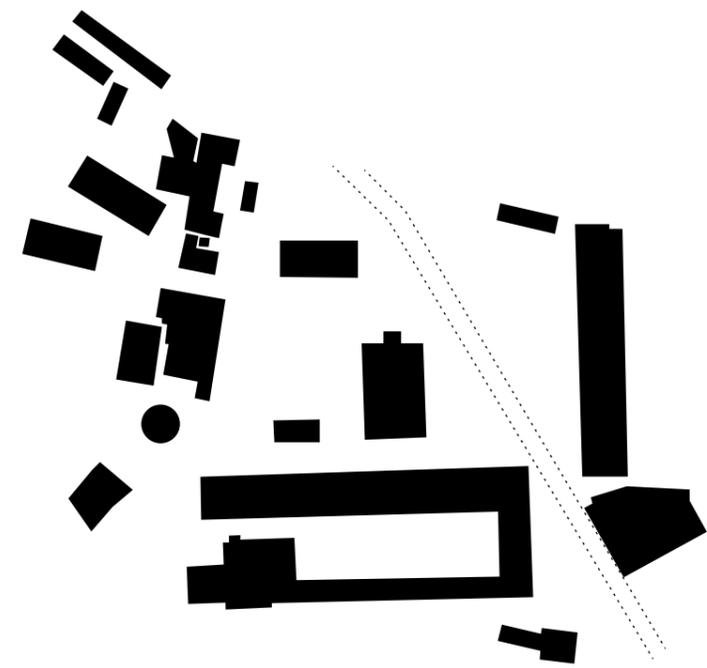
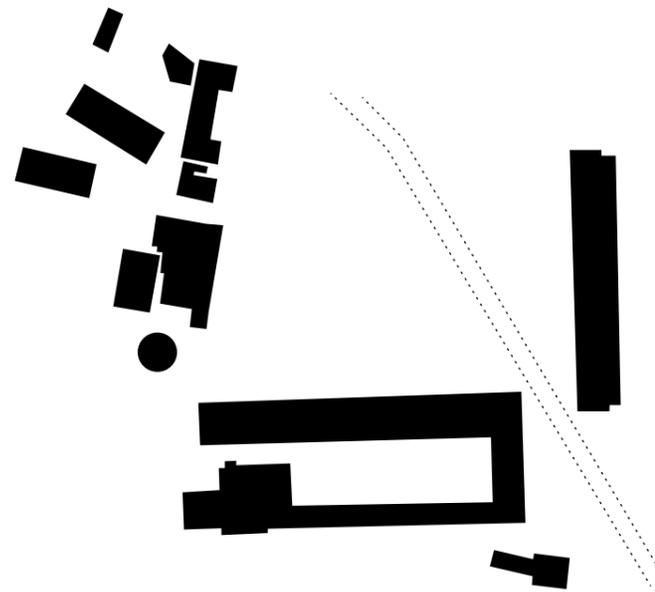
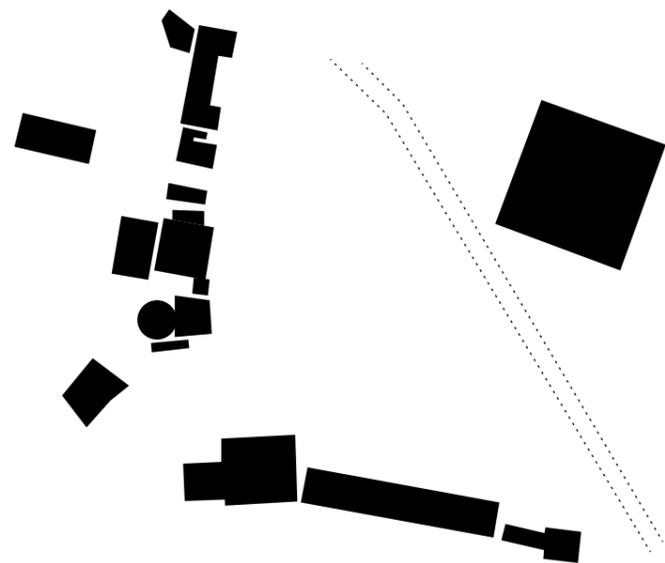


[https://www.jstor.org/stable.987633](https://www.jstor.org/stable/987633)

200BC

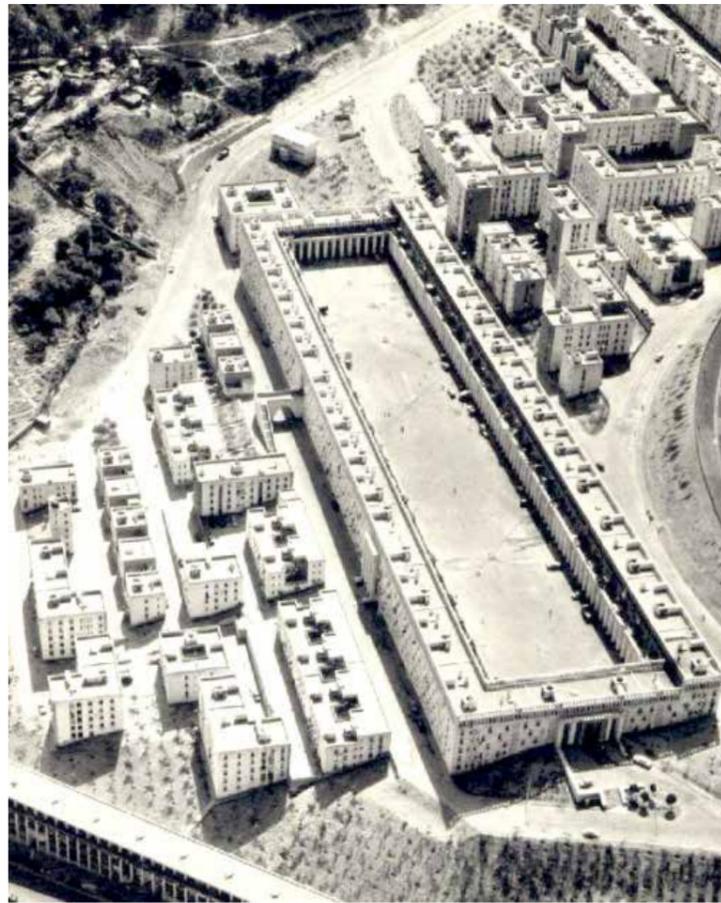
100BC

2AD

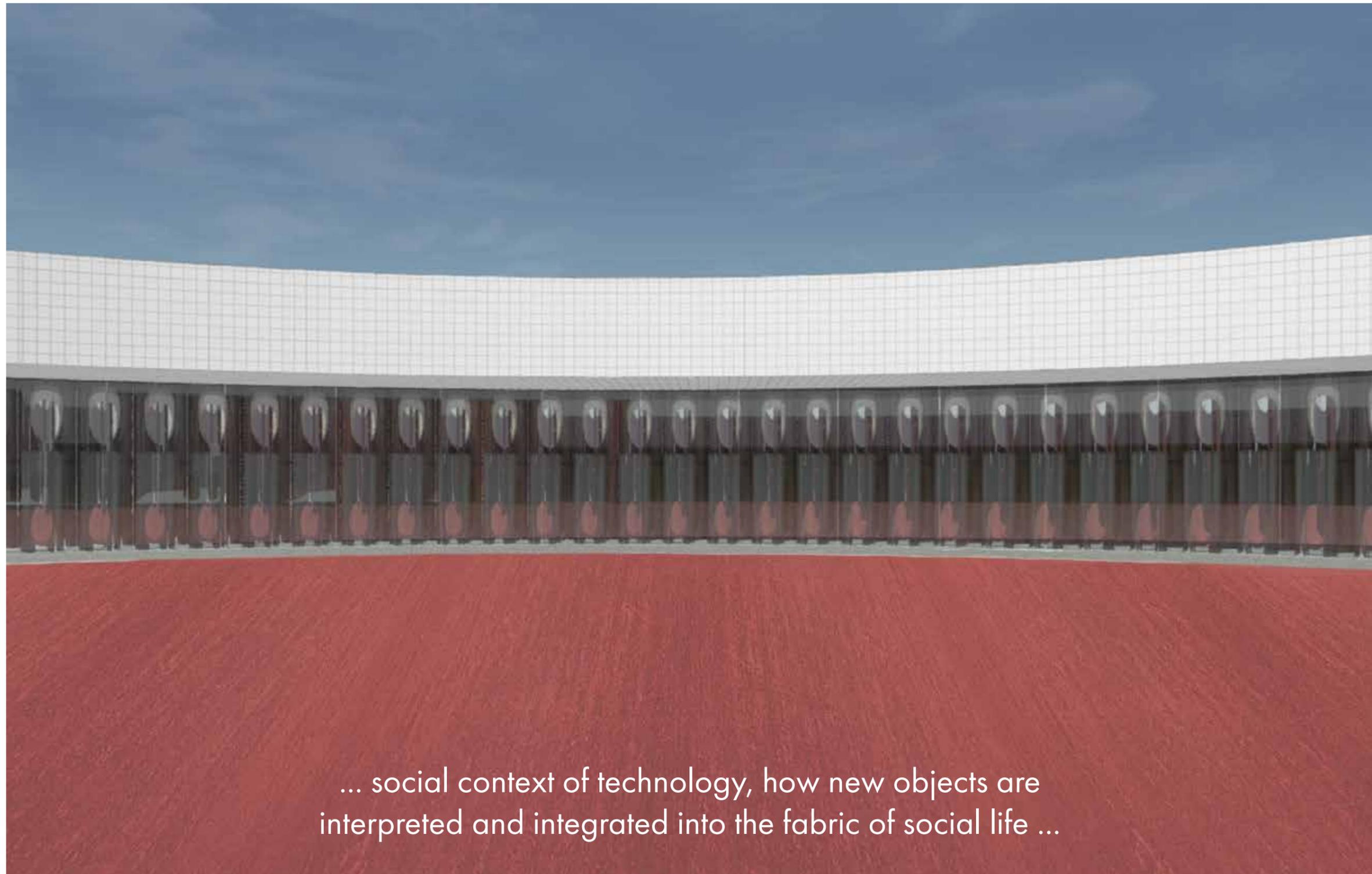


_"The Gathering Place"

Case Study - Inhabited Monument

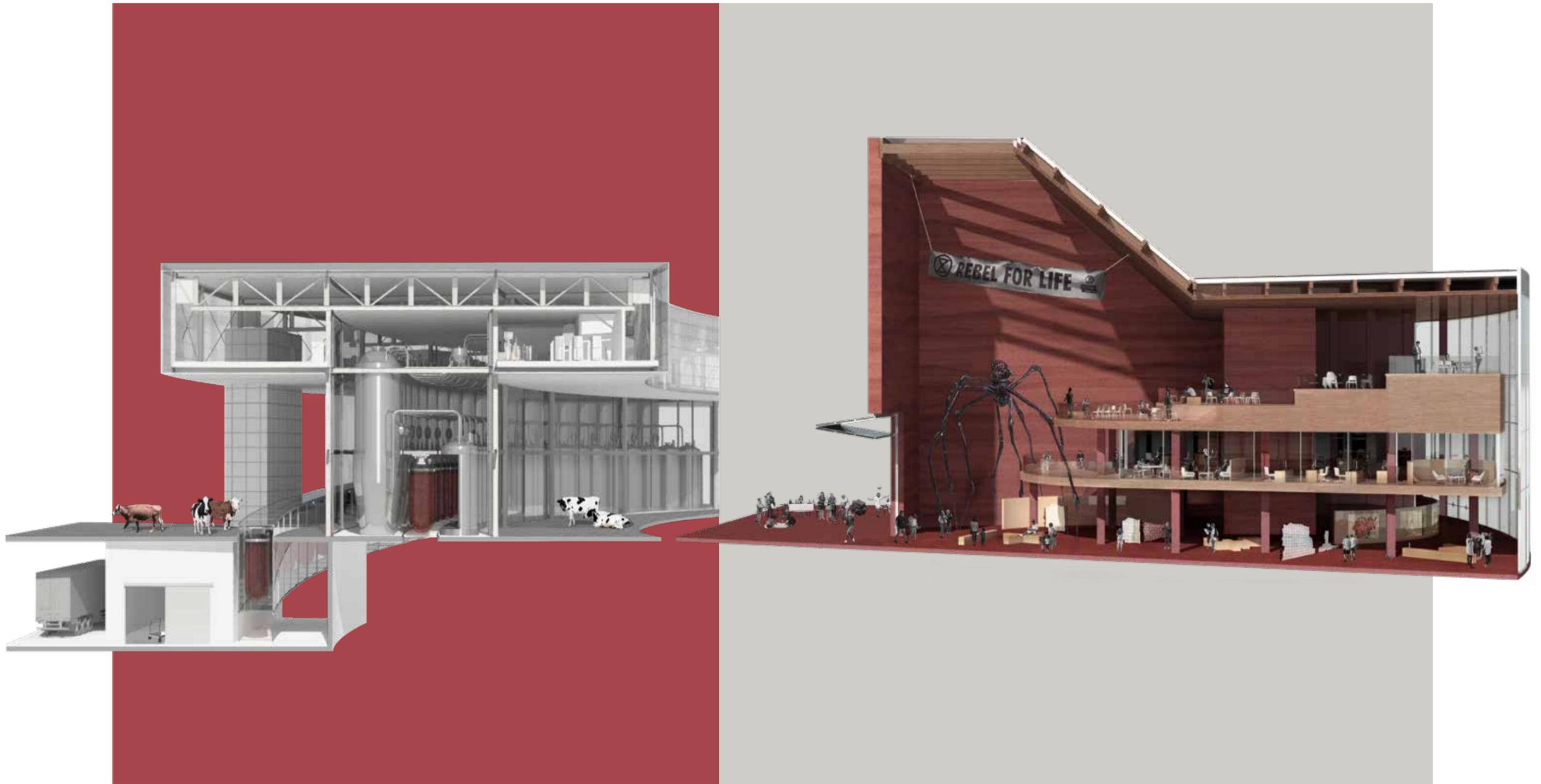


_Climat de France Housing Estate Fernand Pouillon 1954-1957



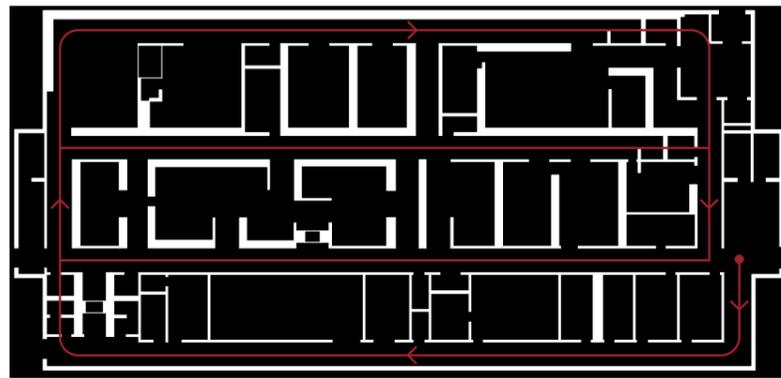
... social context of technology, how new objects are interpreted and integrated into the fabric of social life ...

Design Concept

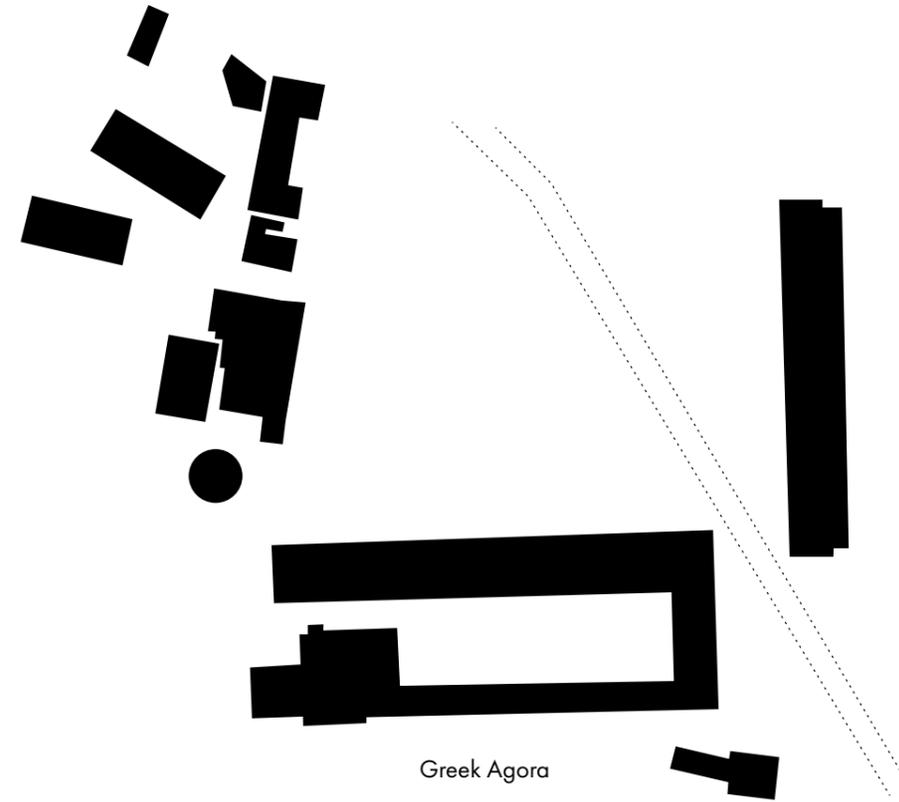


Role of Technology in Changing Morality's Horizon

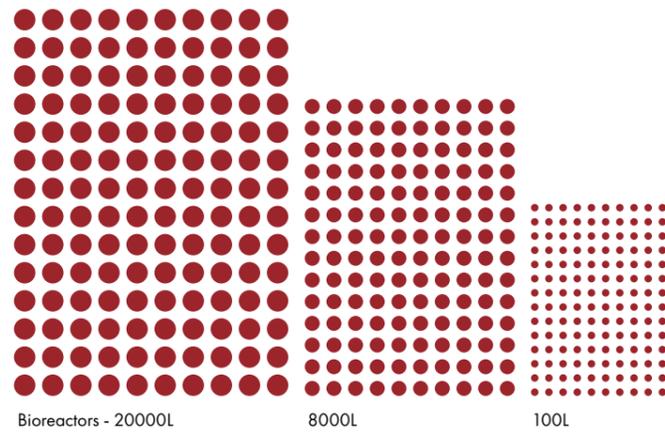
Design Concept



Vaccine Manufacturing



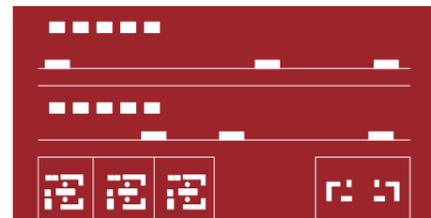
Greek Agora



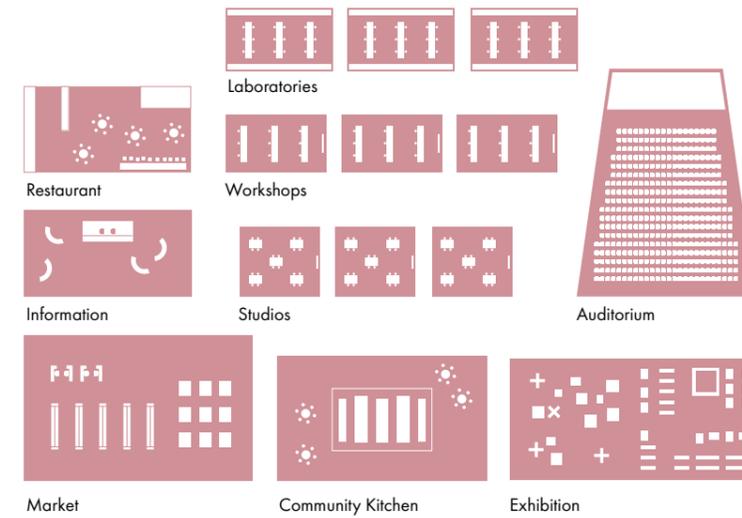
Bioreactors - 20000L

8000L

100L



Supporting functions



Restaurant



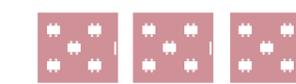
Laboratories



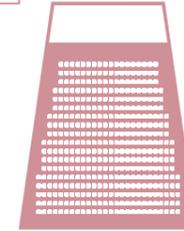
Workshops



Information



Studios



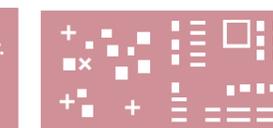
Auditorium



Market

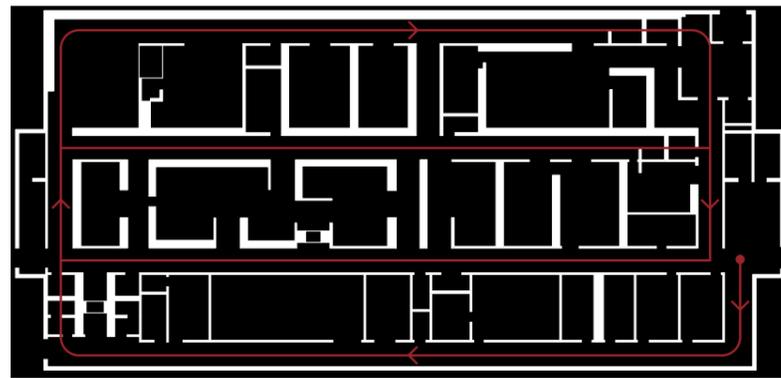


Community Kitchen

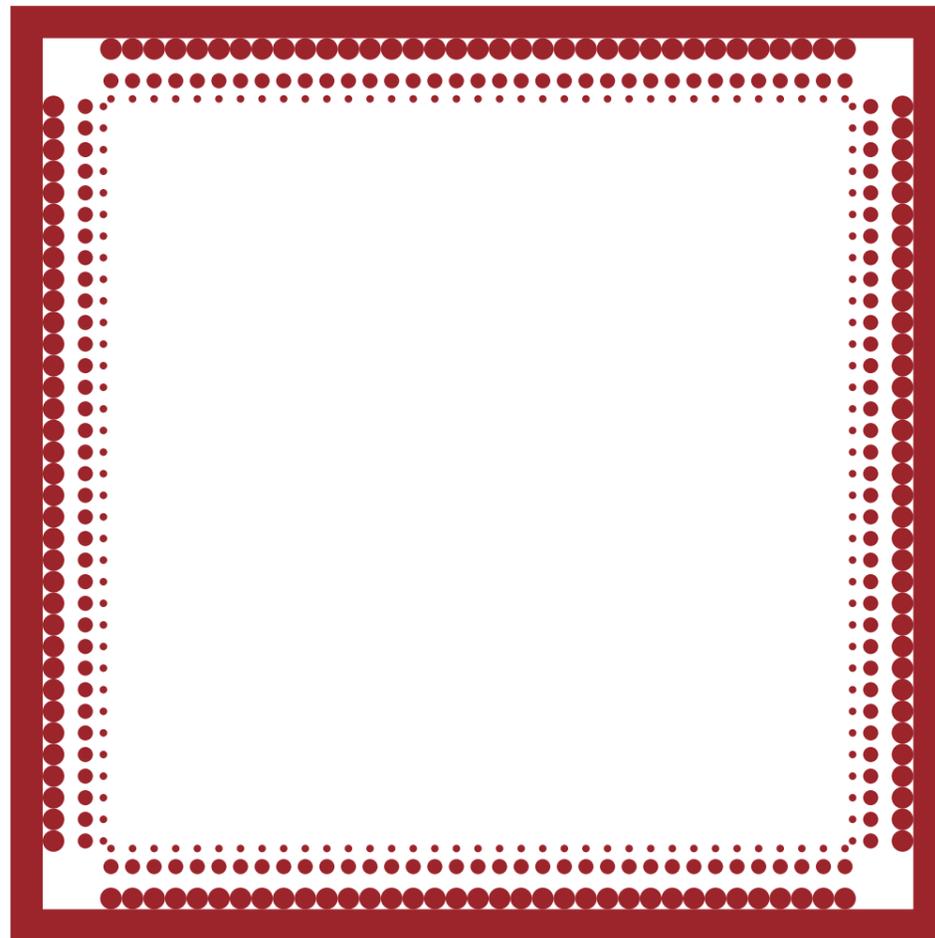


Exhibition

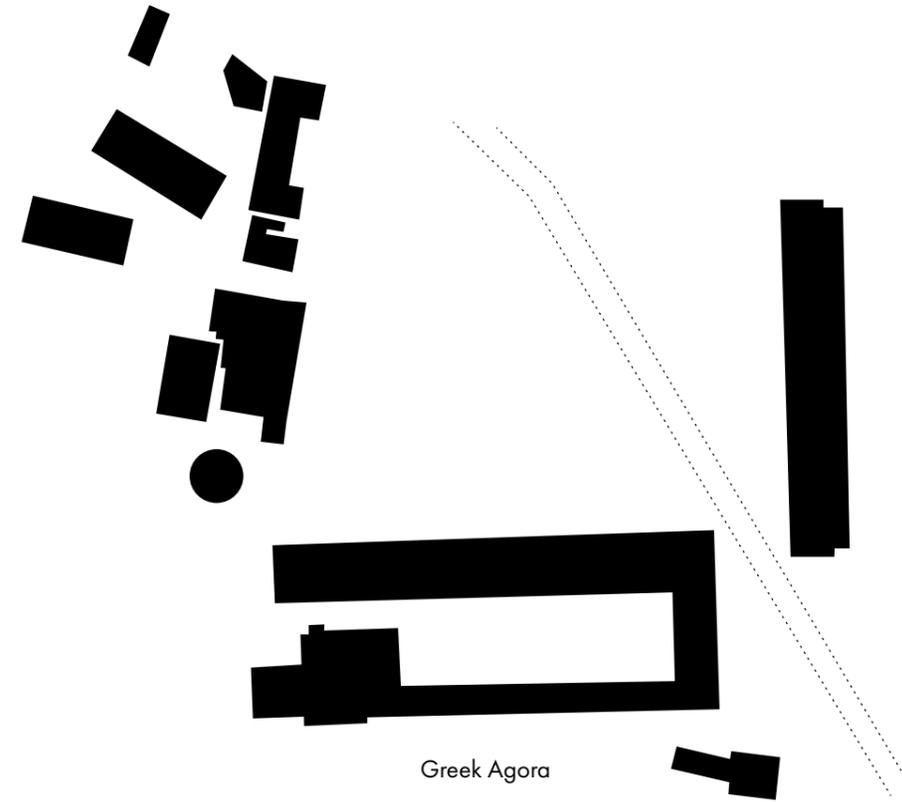
Design Concept



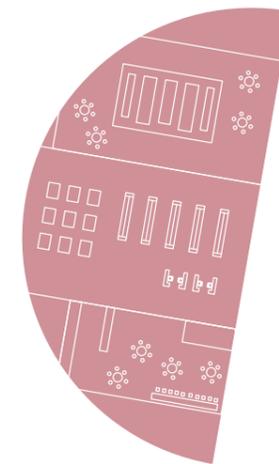
Vaccine Manufacturing



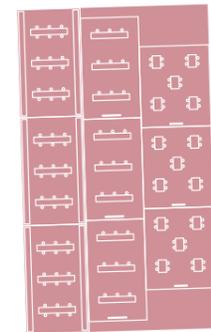
Meat Factory



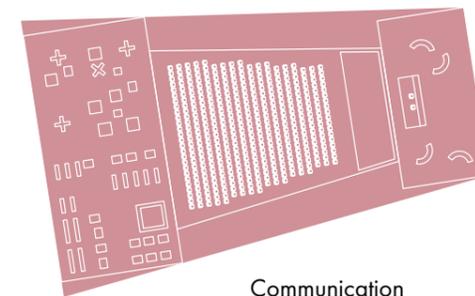
Greek Agora



Commercial

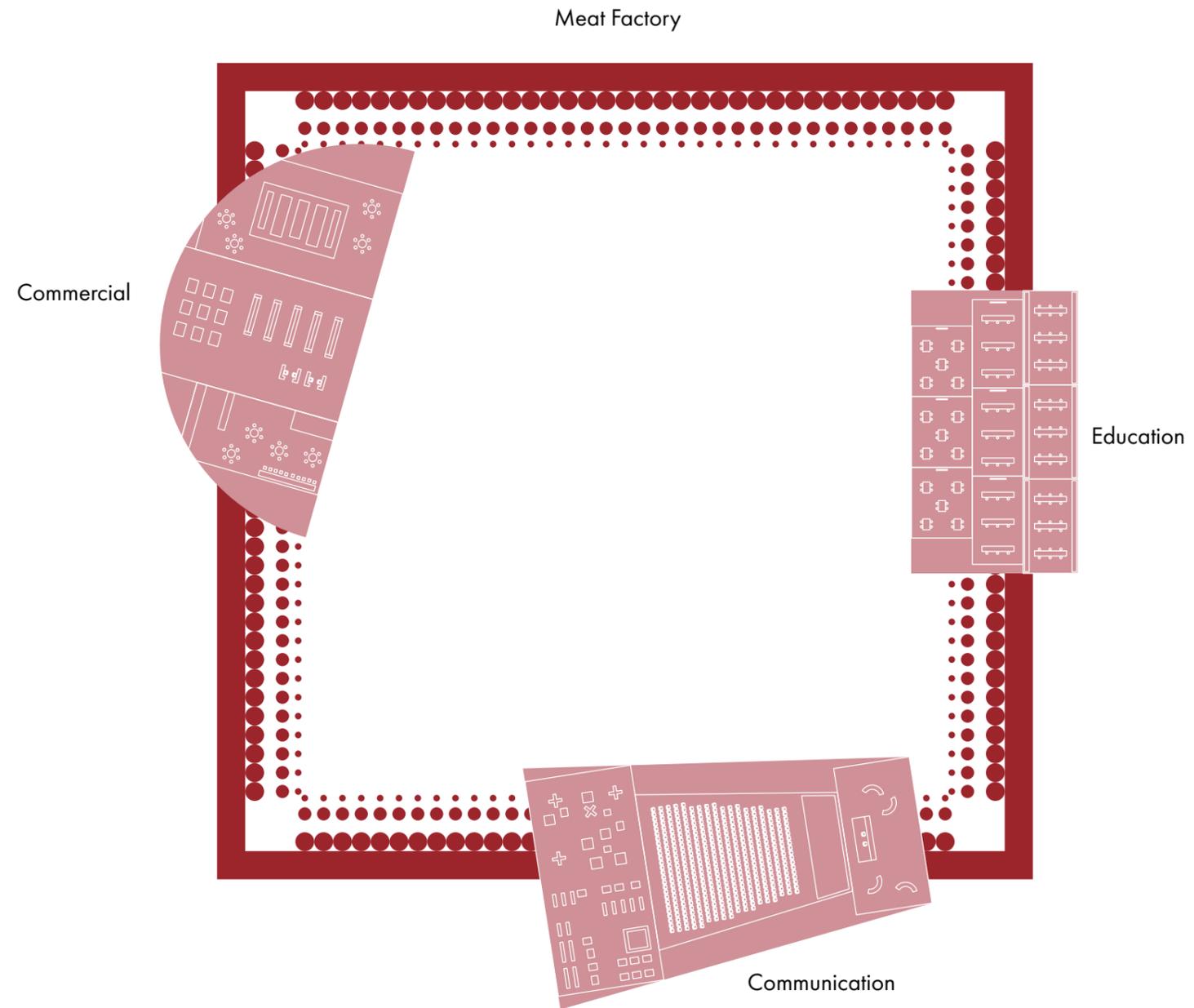


Education

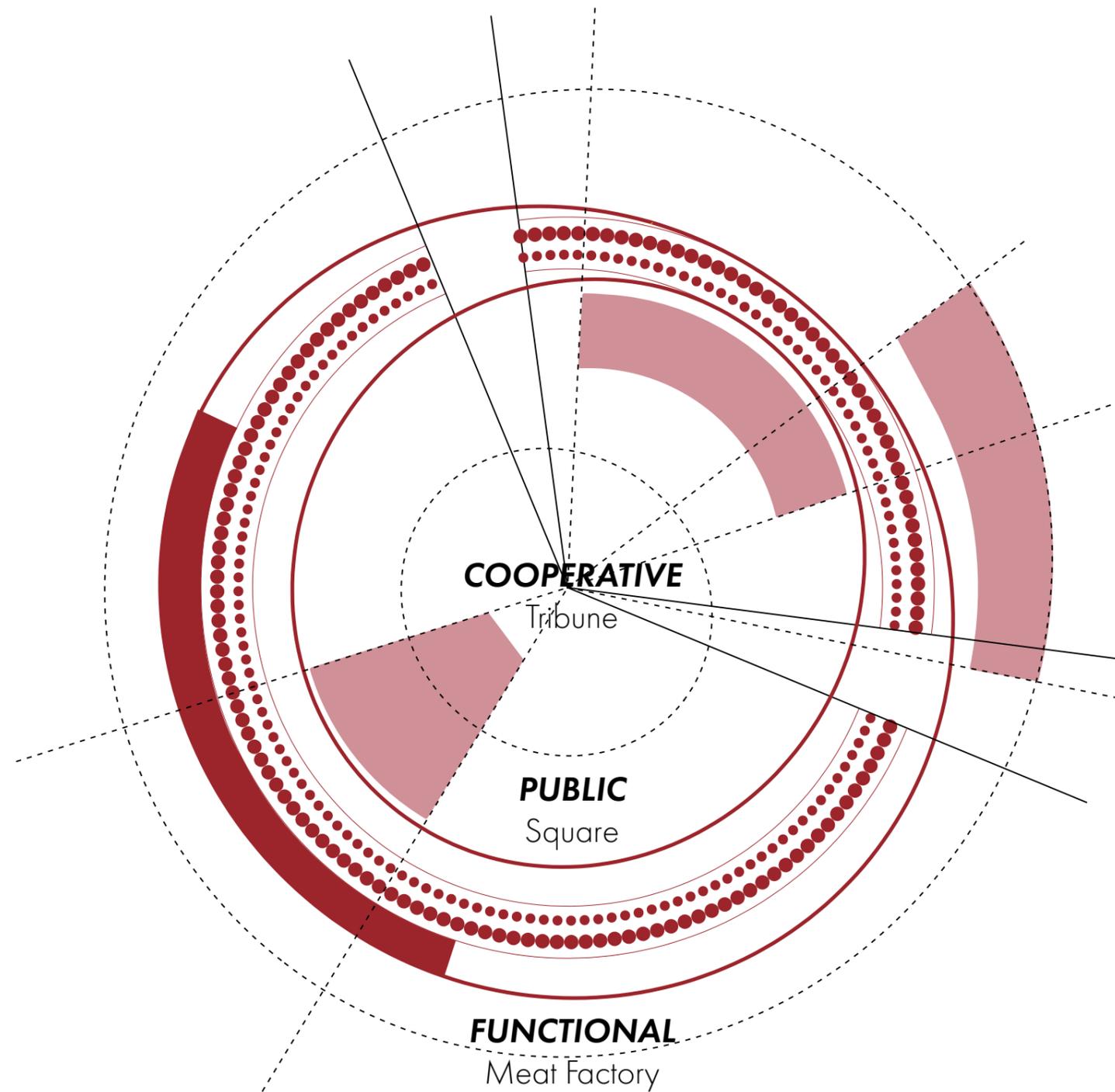


Communication

Design Concept



Design Concept

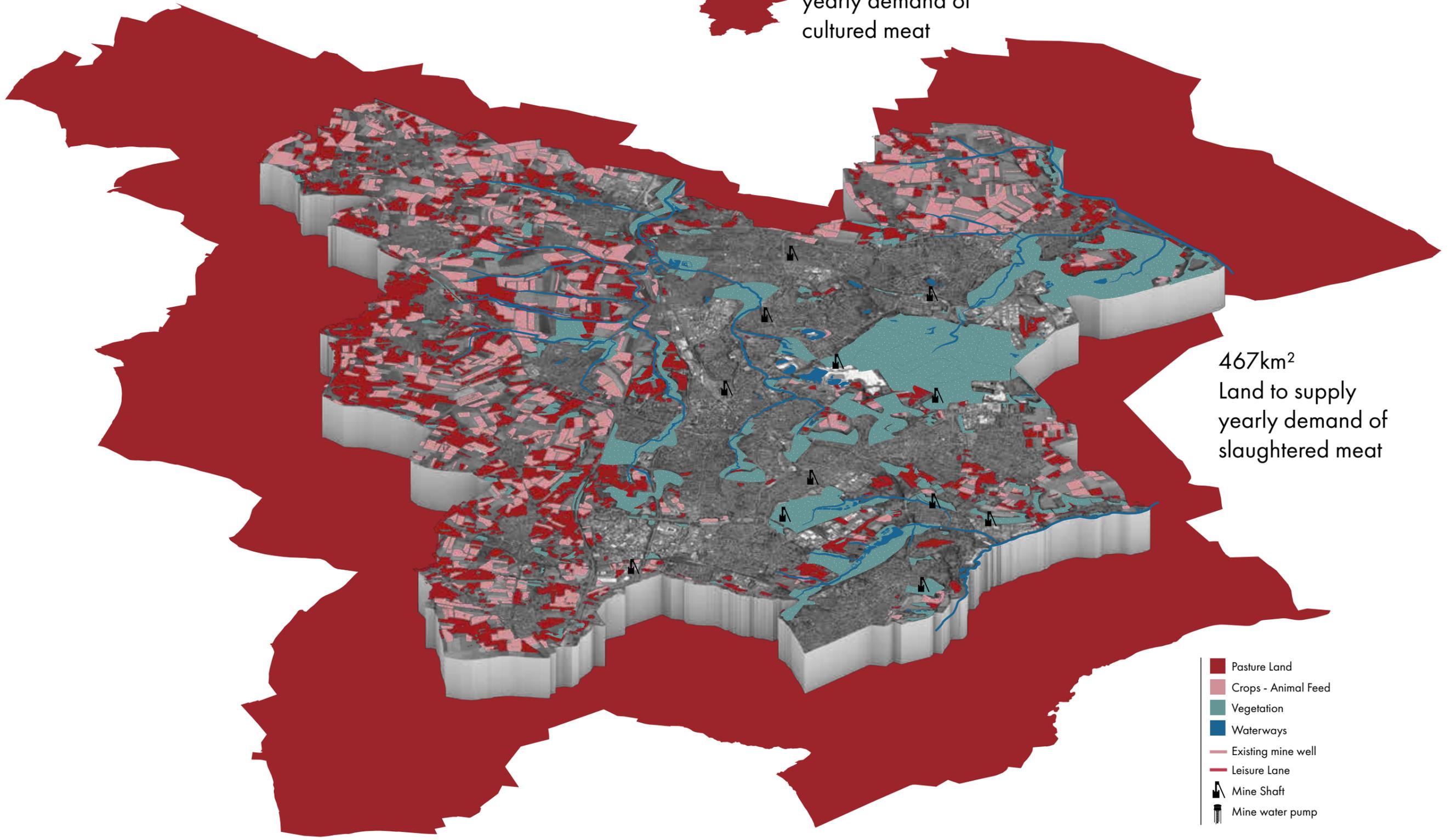


Design Concept



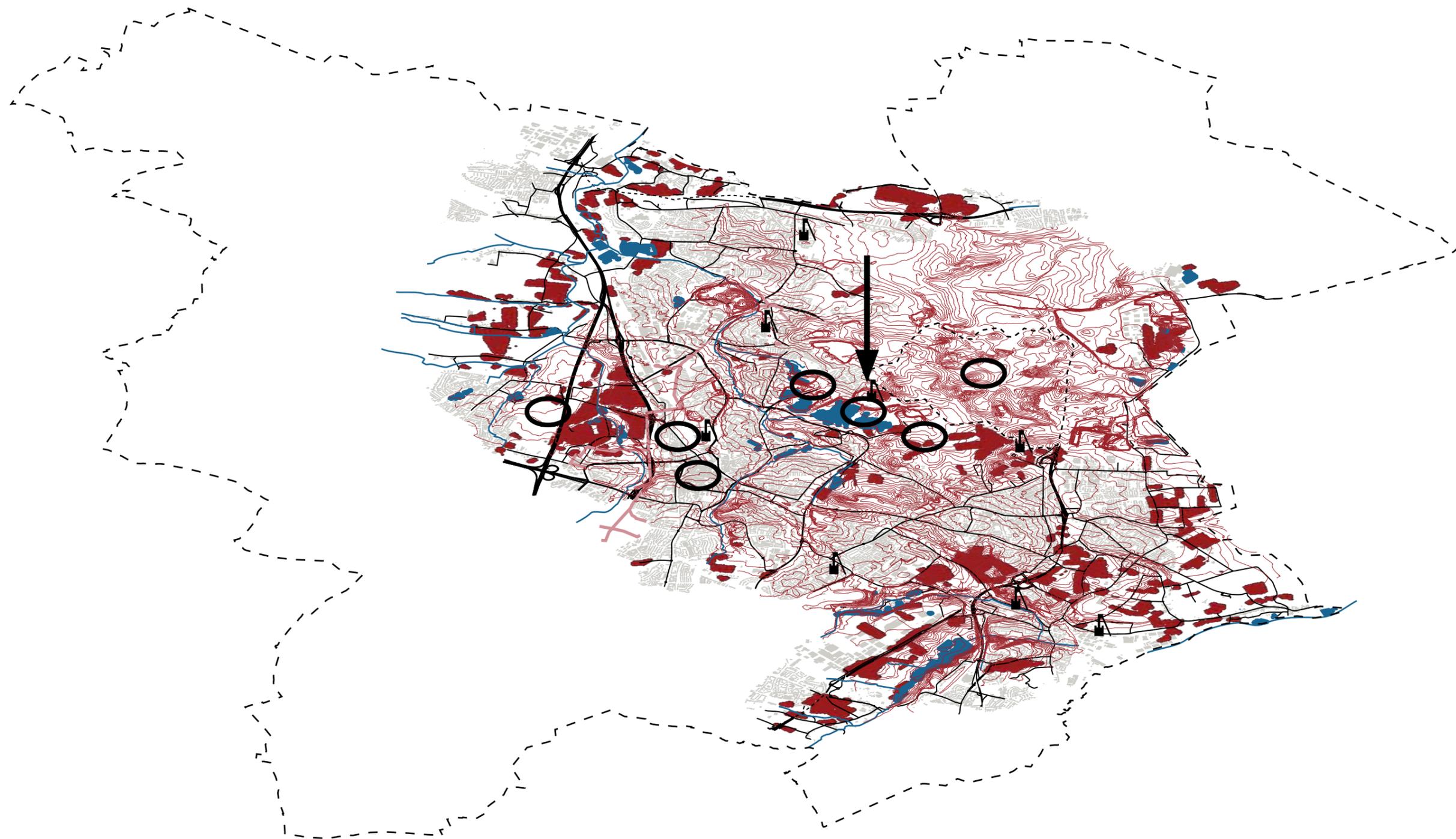
Conventional vs. Cultured

2km²
Land to supply
yearly demand of
cultured meat



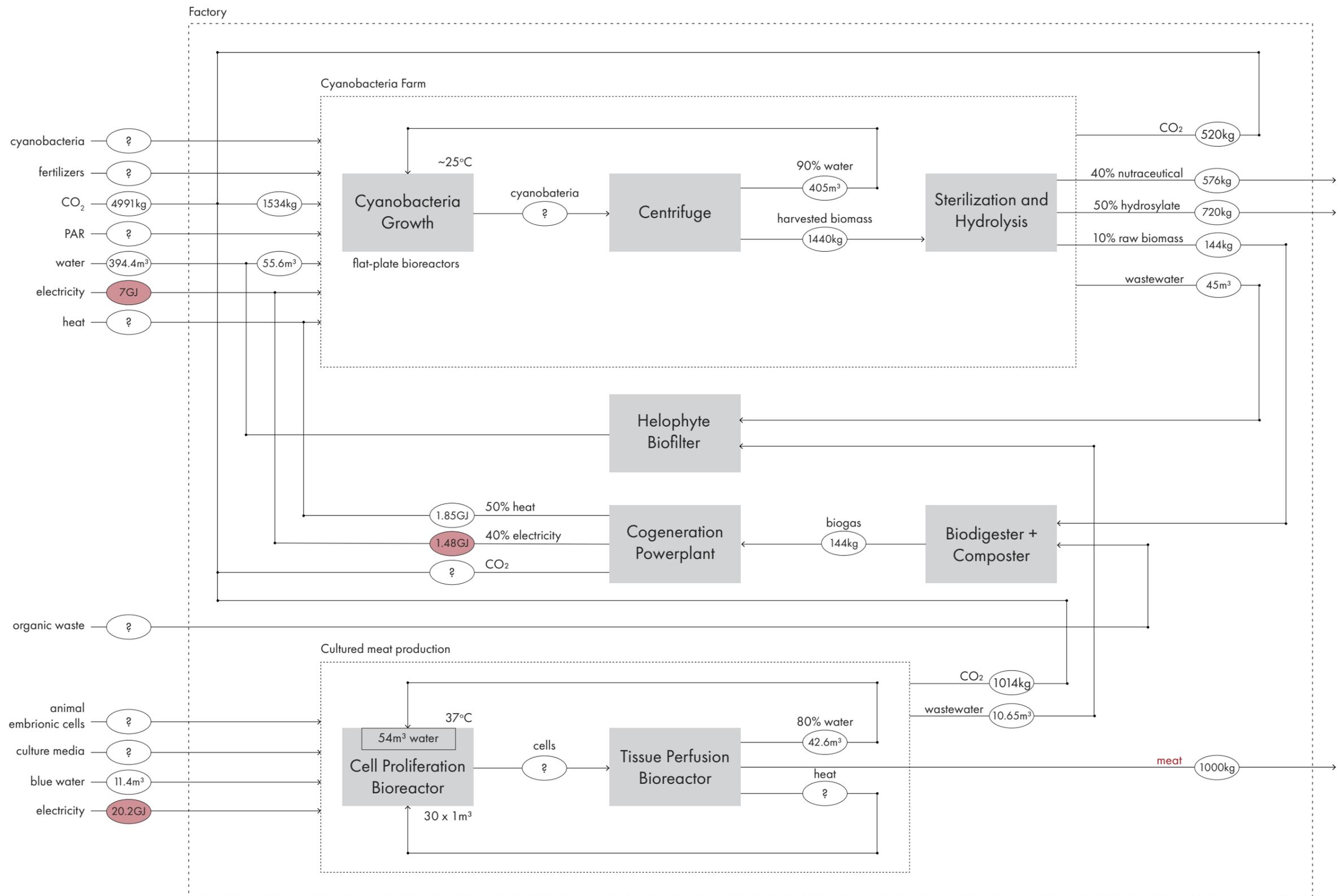
_Slaughtered Meat Land

Connecting Flows - Expanded

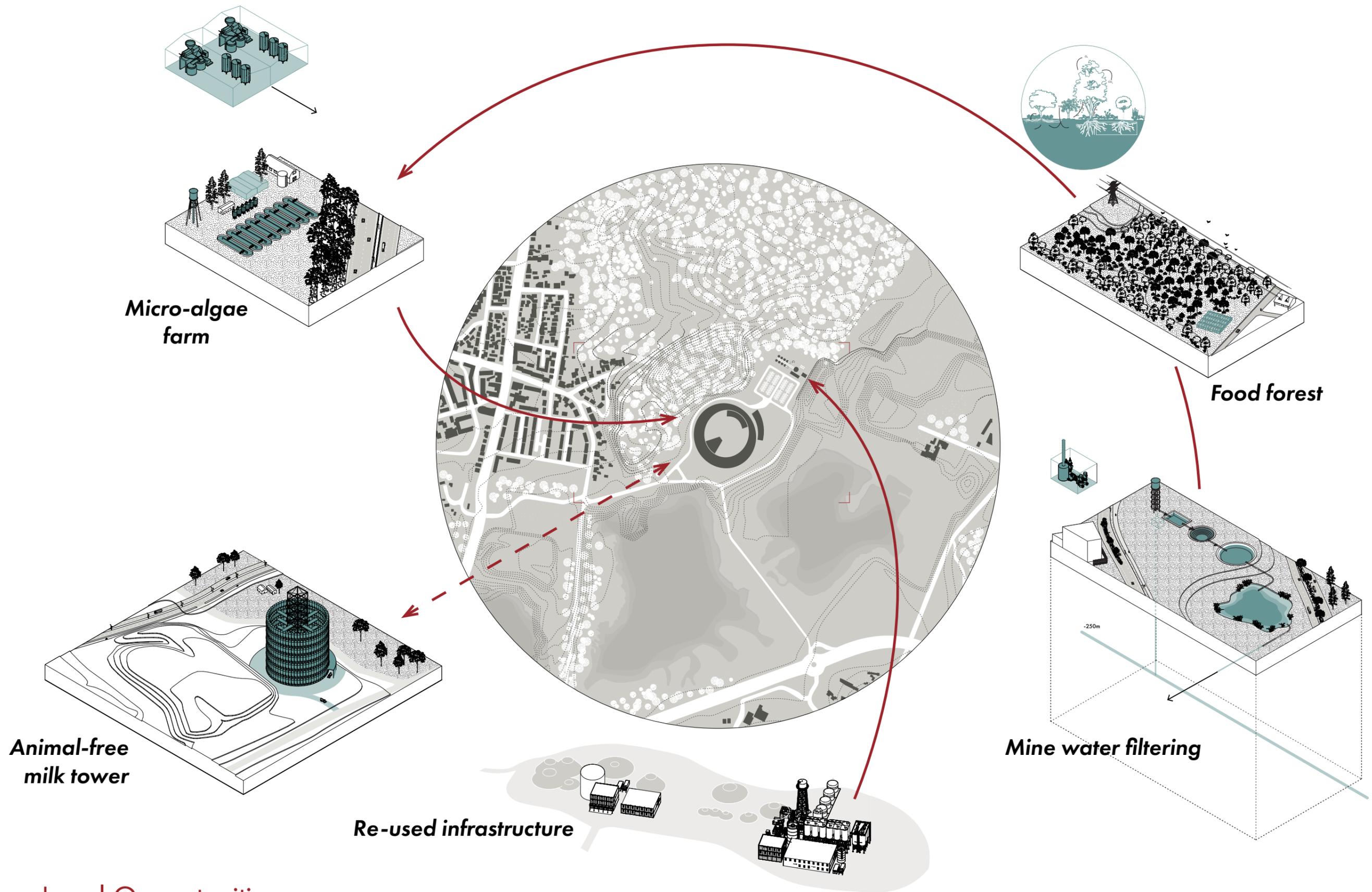


_Local Opportunities

Flow Analysis

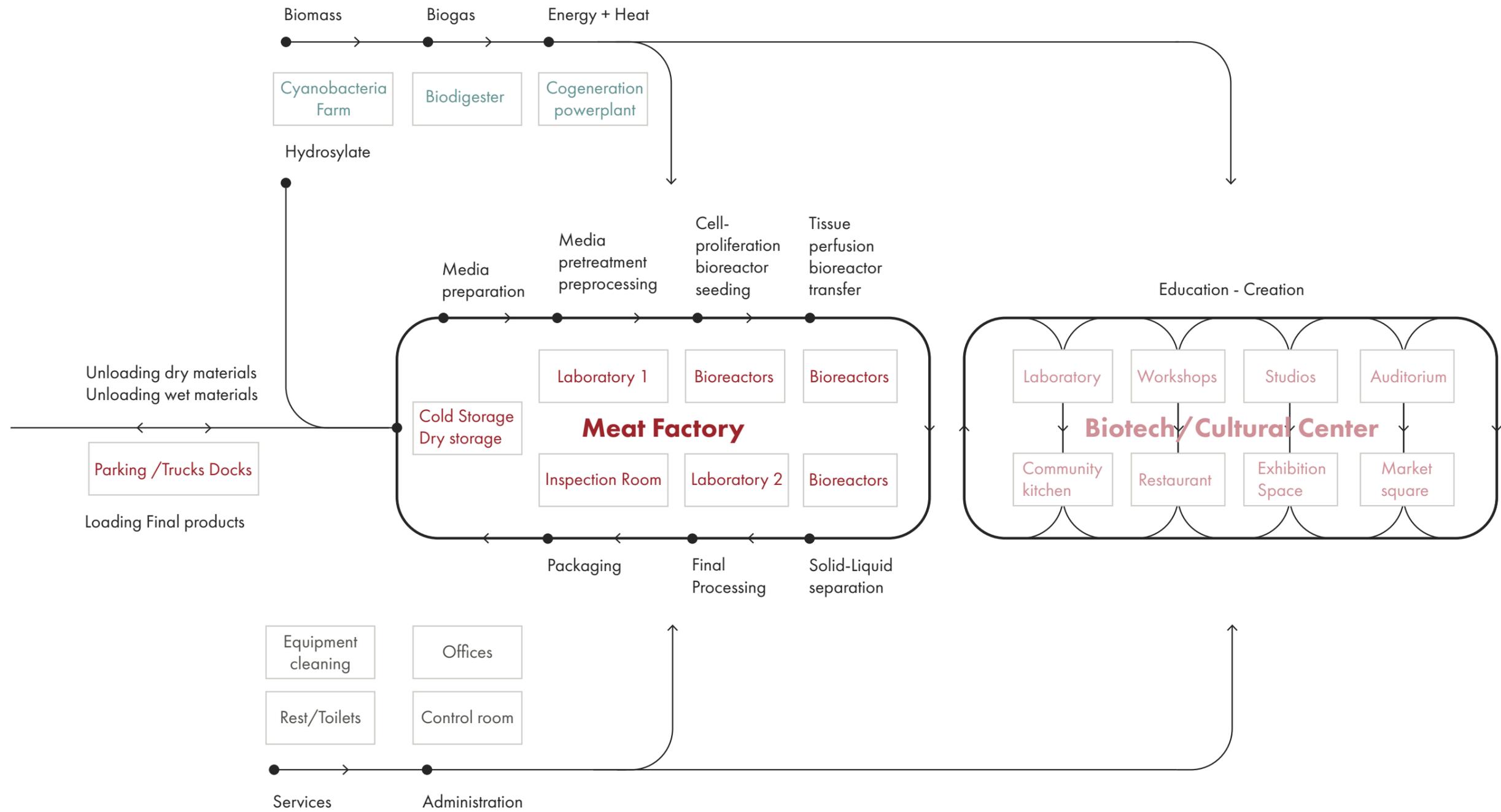


Connecting Flows - Expanded

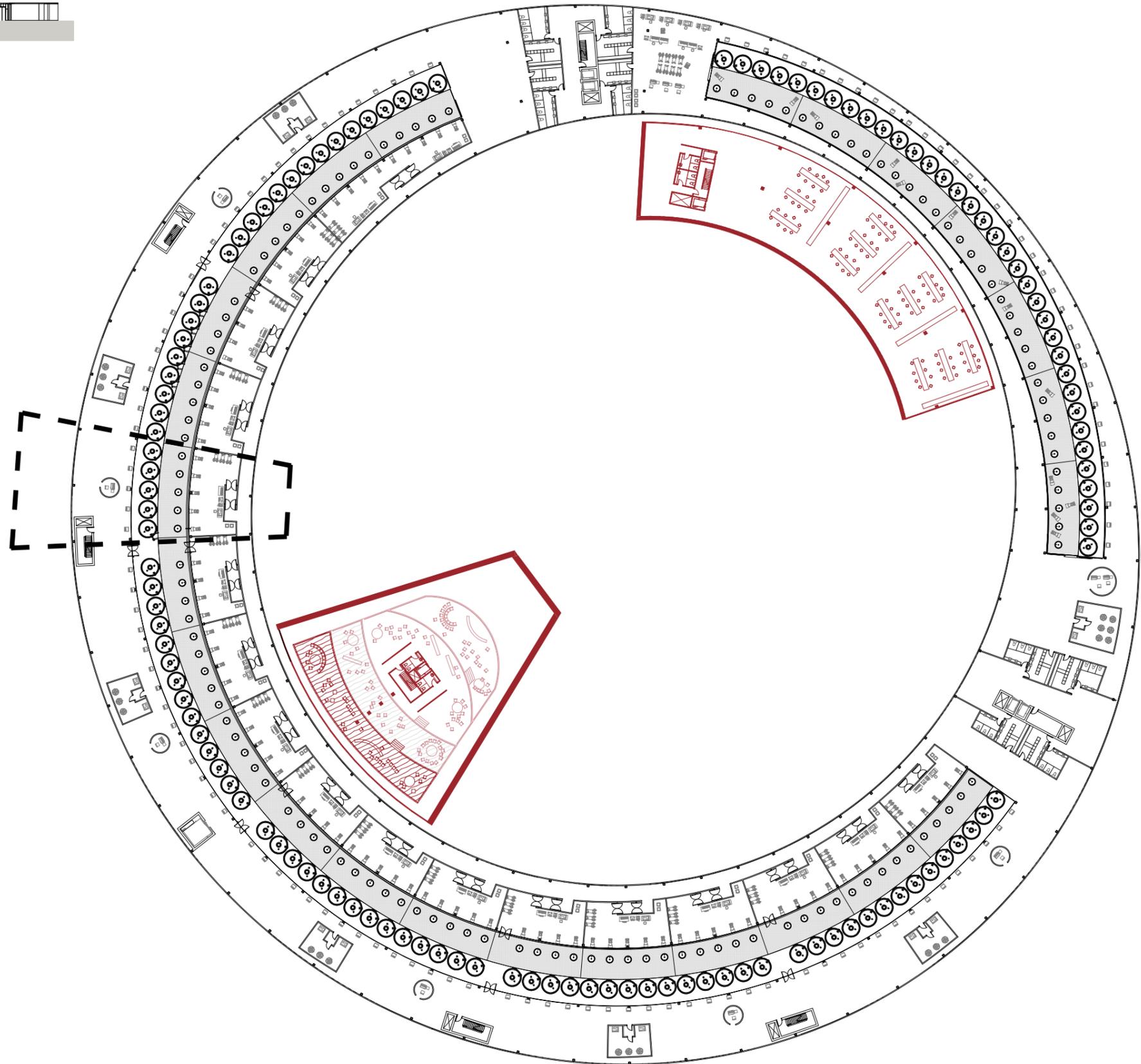
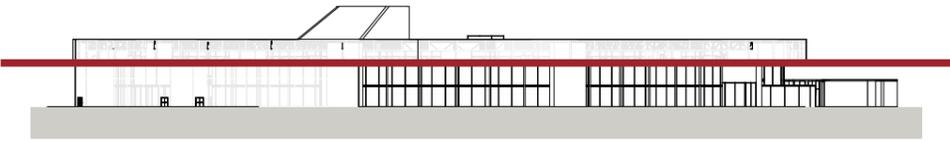


_Local Opportunities

Connecting Flows - Factory

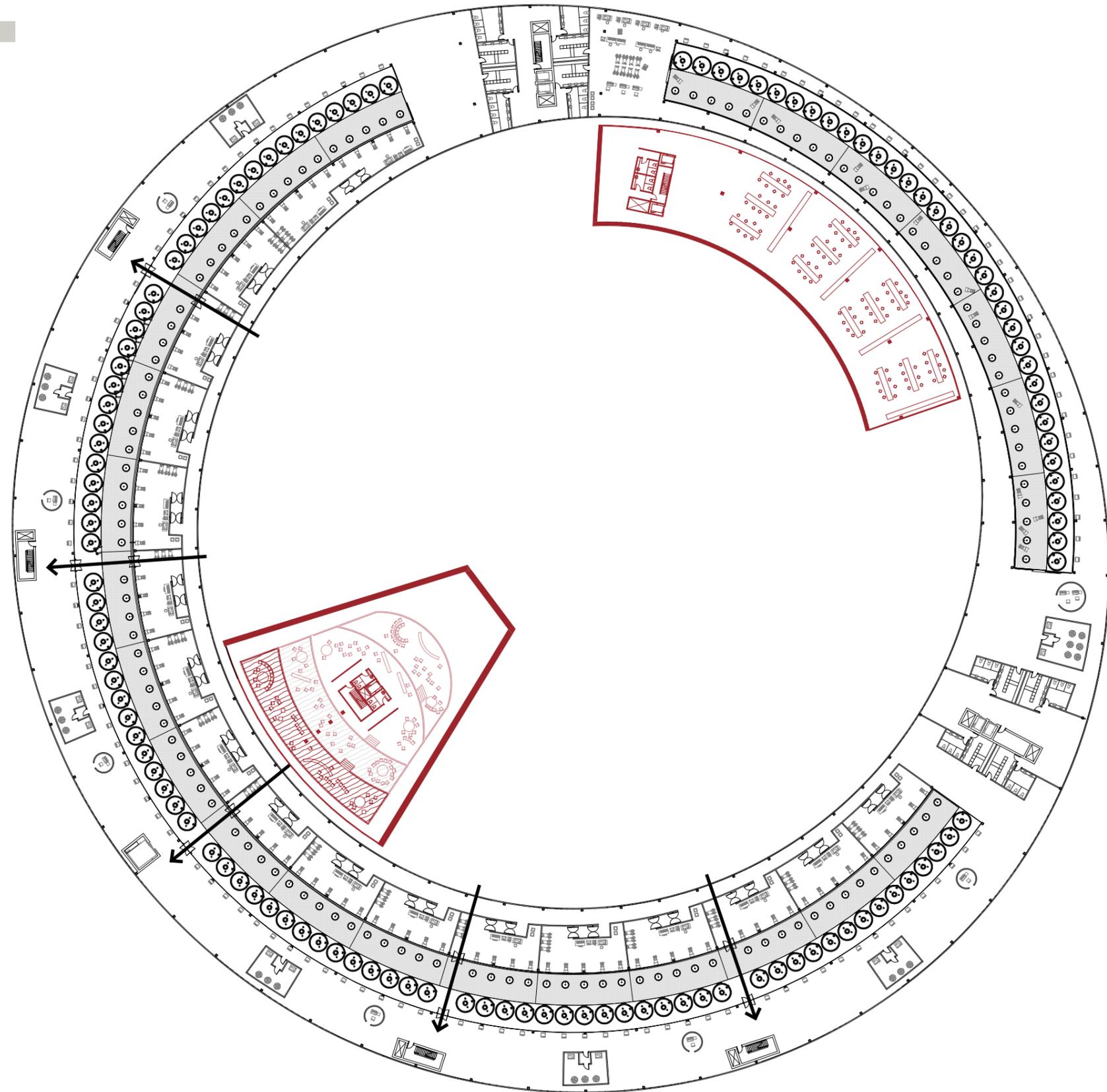
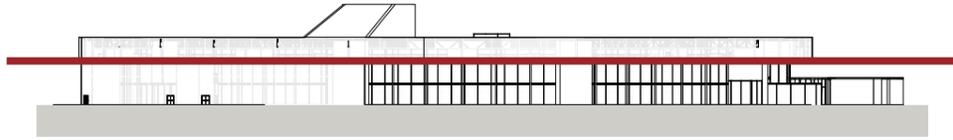


Program

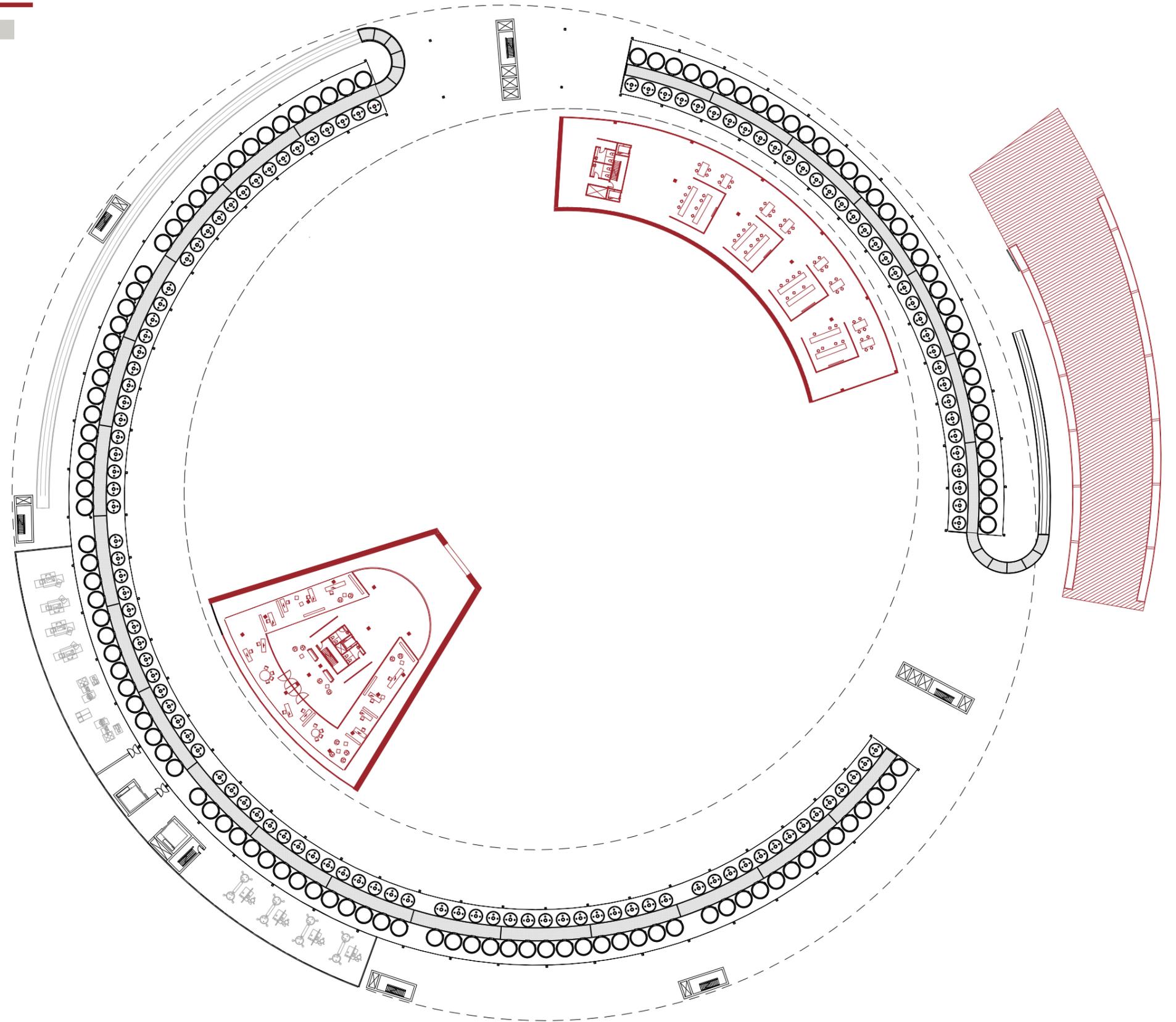


_Functional Unit

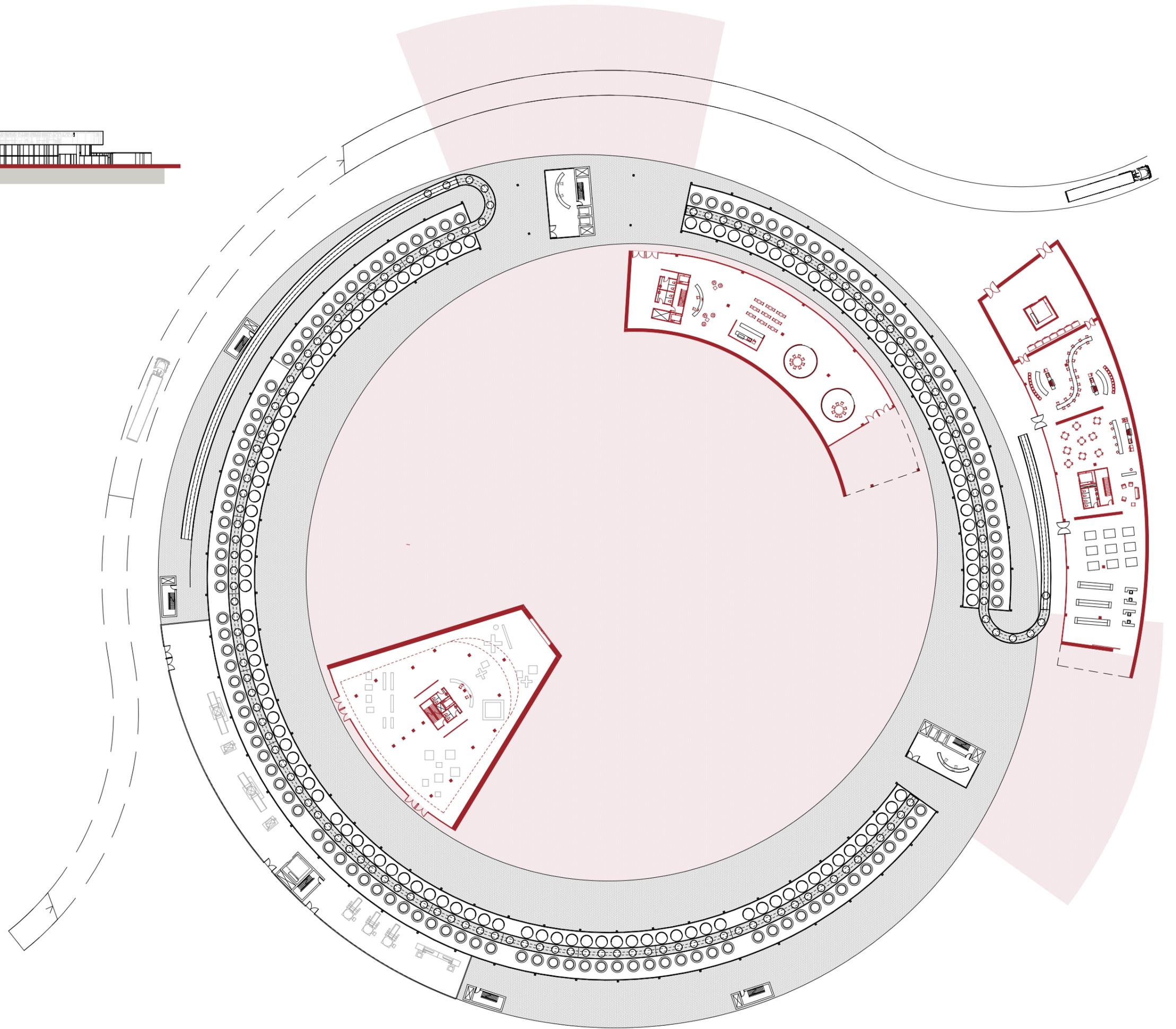
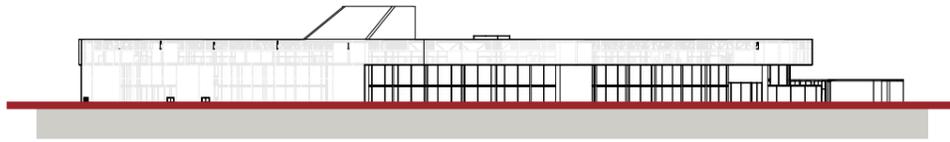
Program



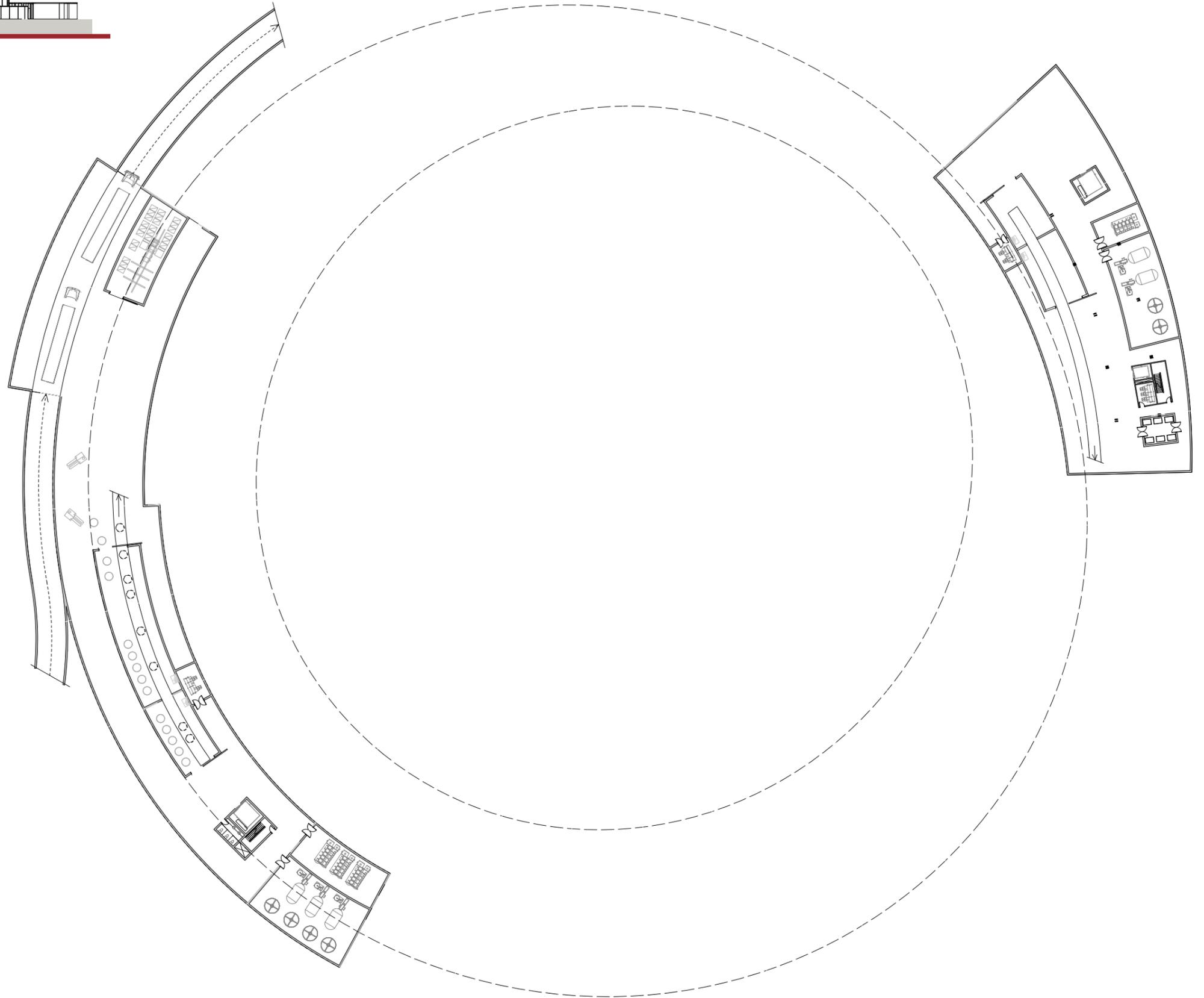
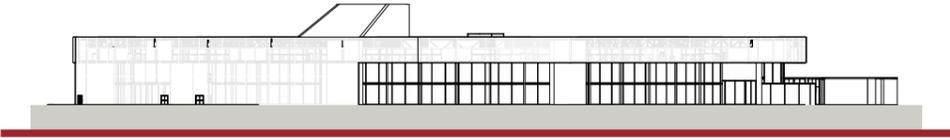
Program



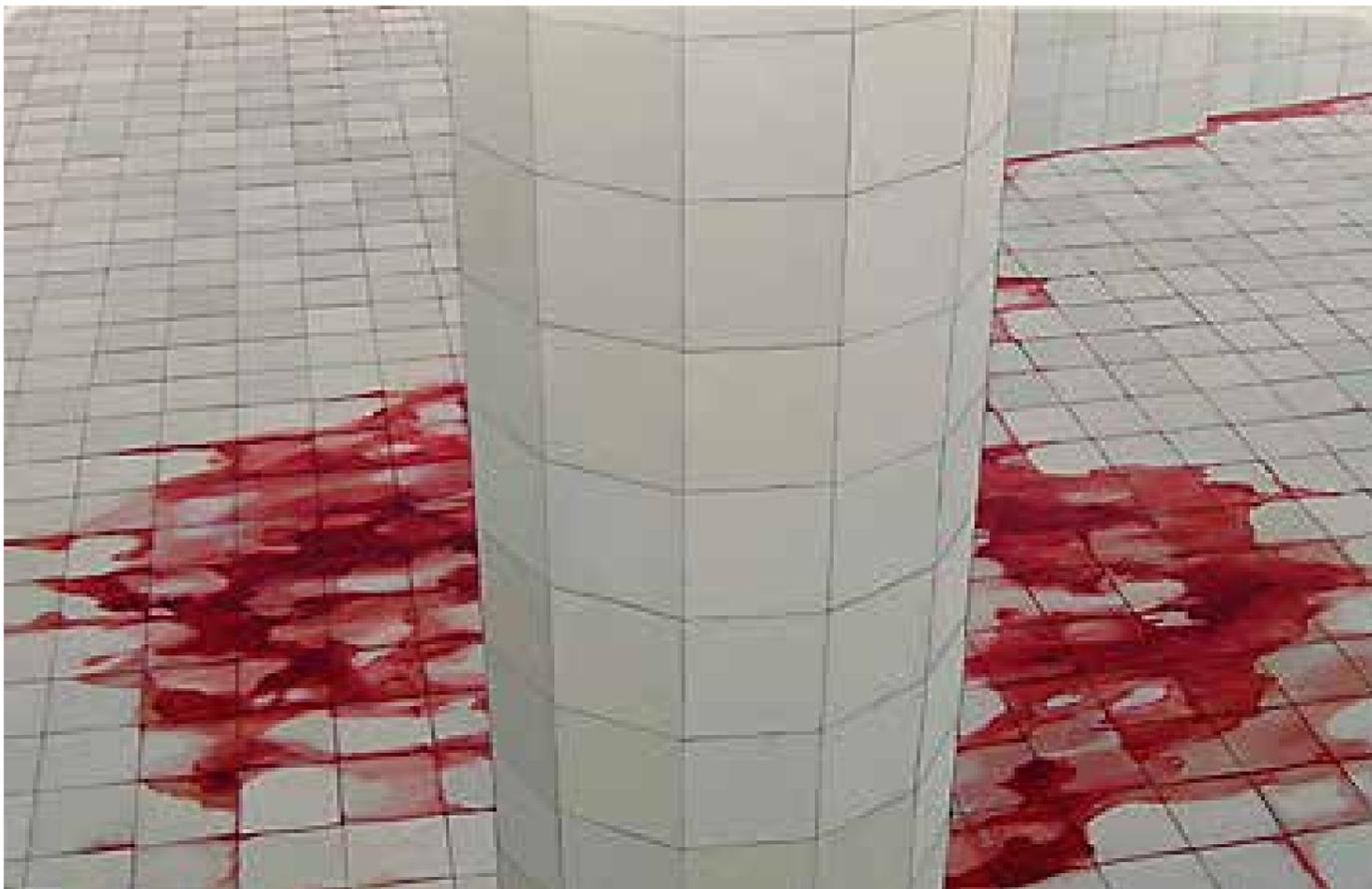
Program



Program



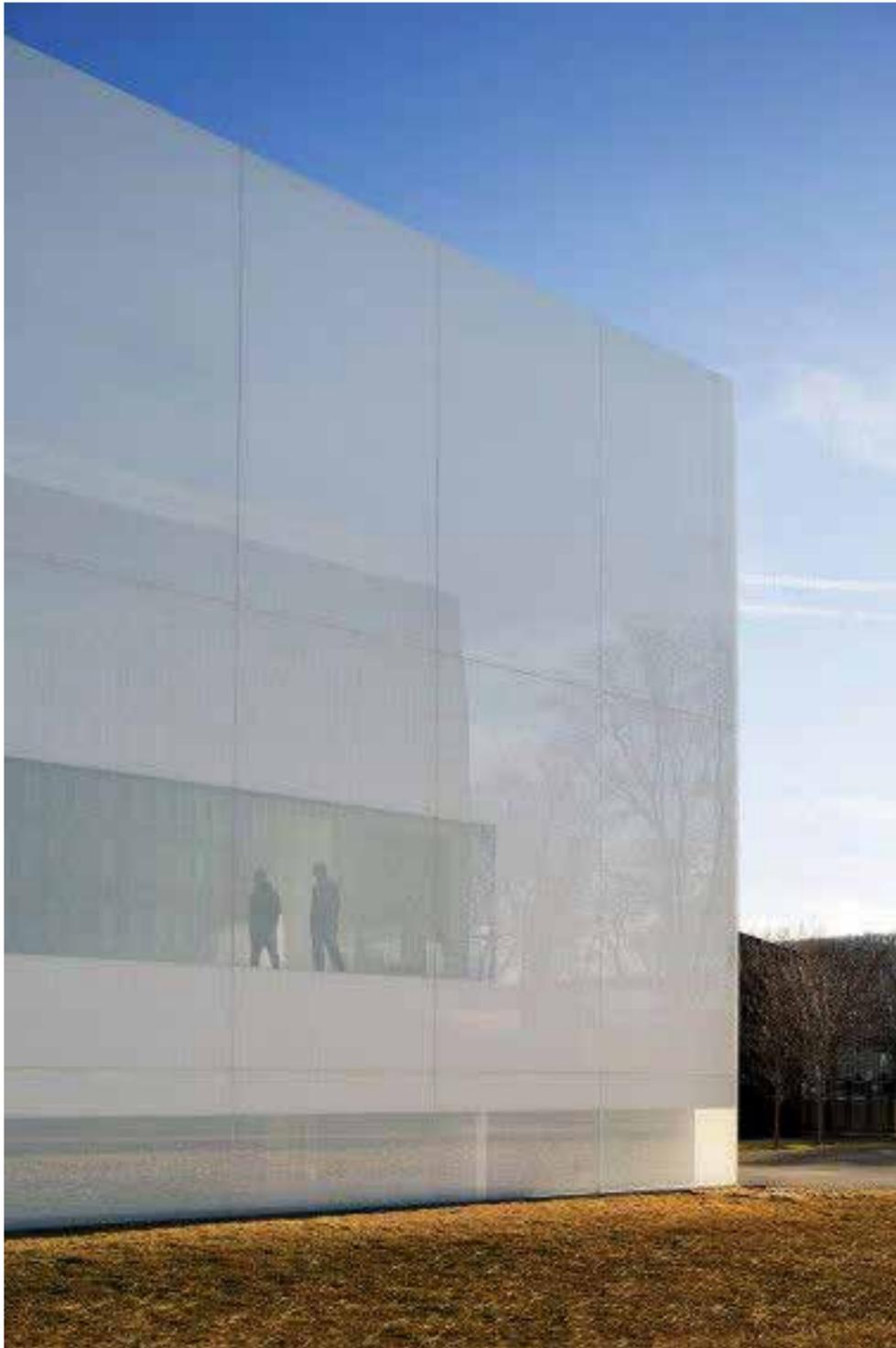
Materiality



Adriana Varejão

_The Slaughterhouse Inside-out

Materiality

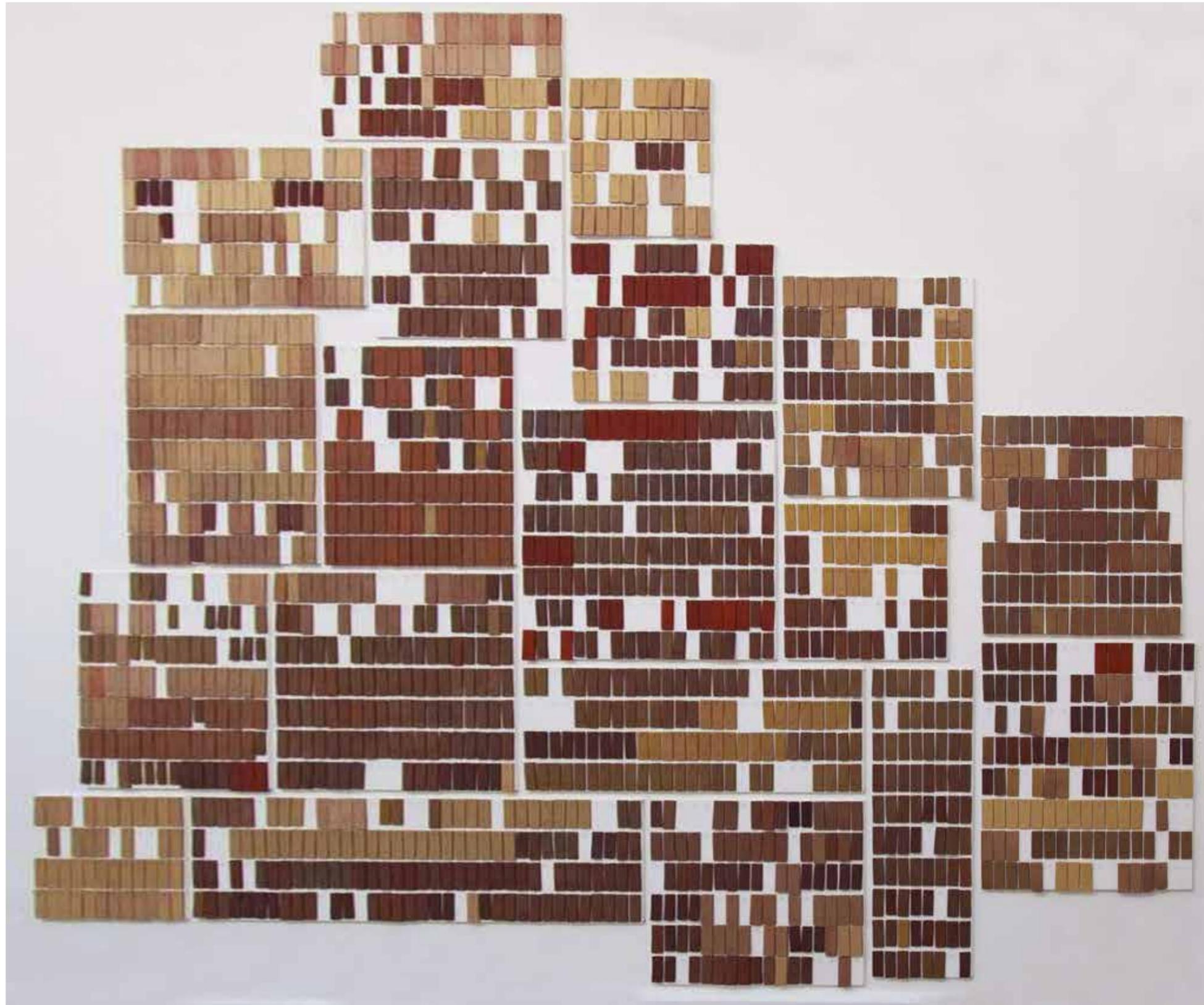


Corning Museum

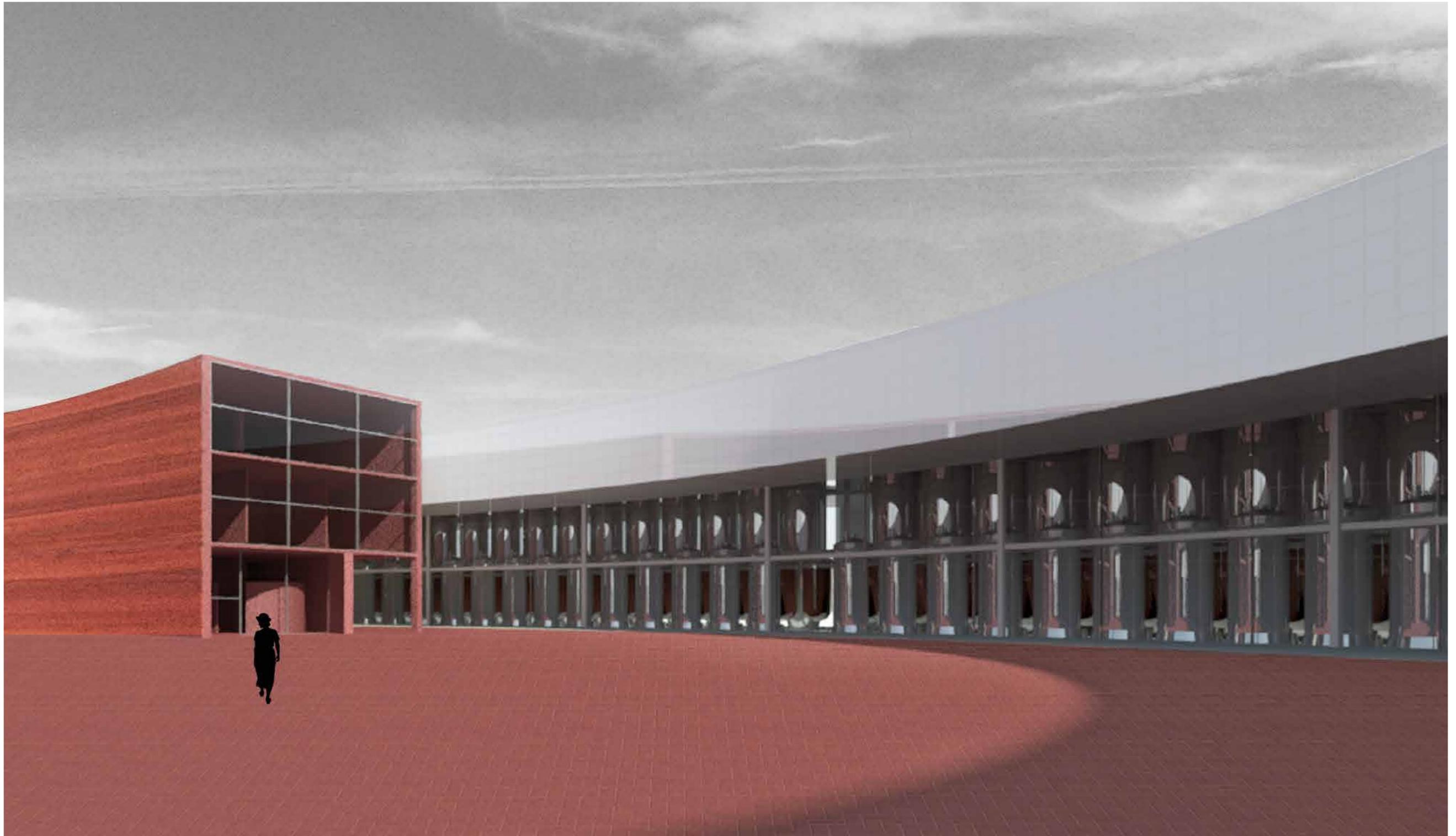
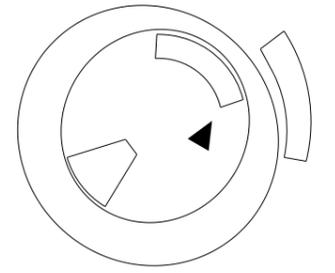


NK'Mip Cultural Center

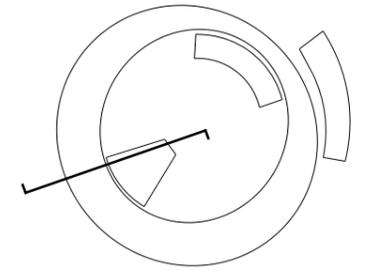
Materiality



_Soil from Dutch Farms



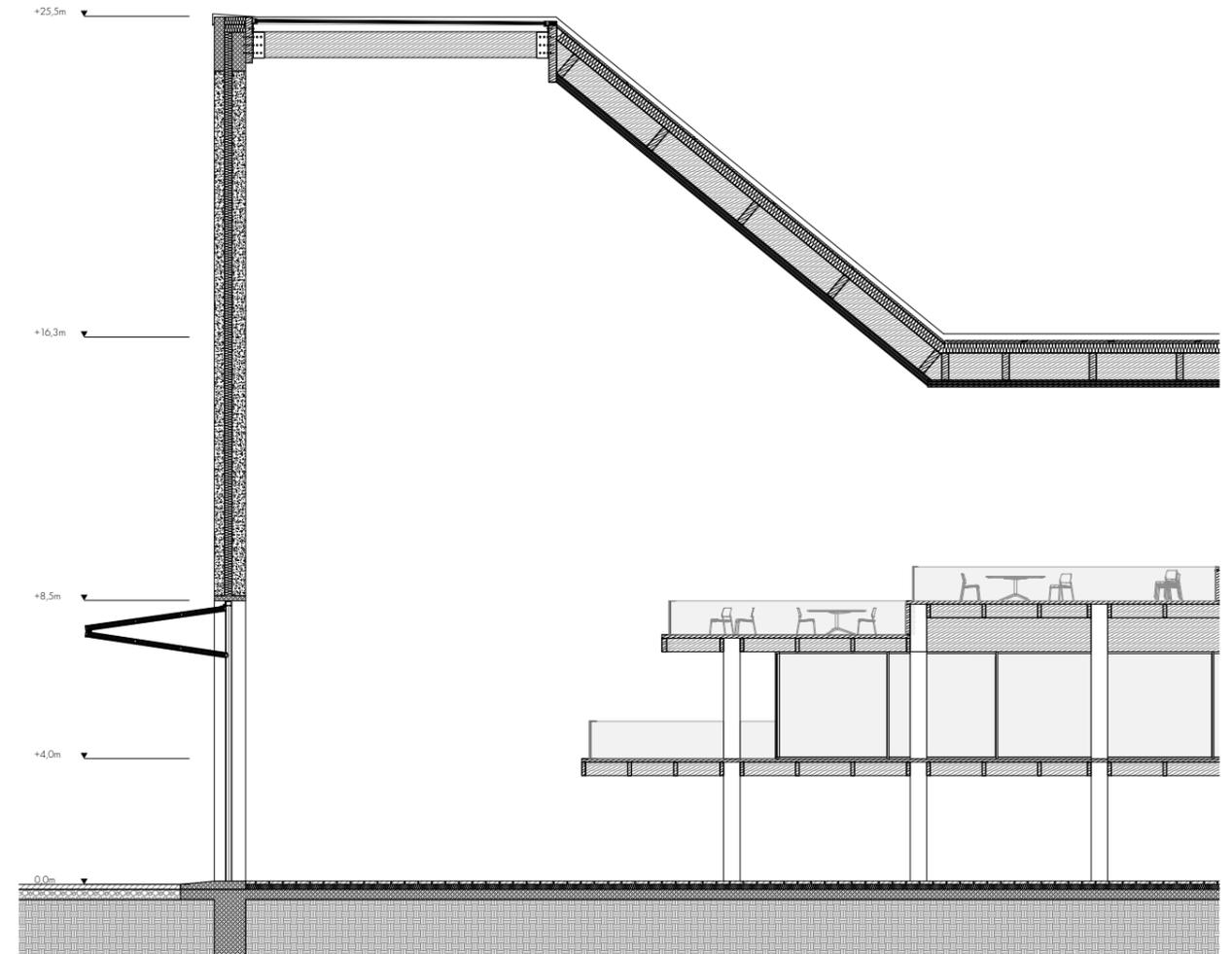
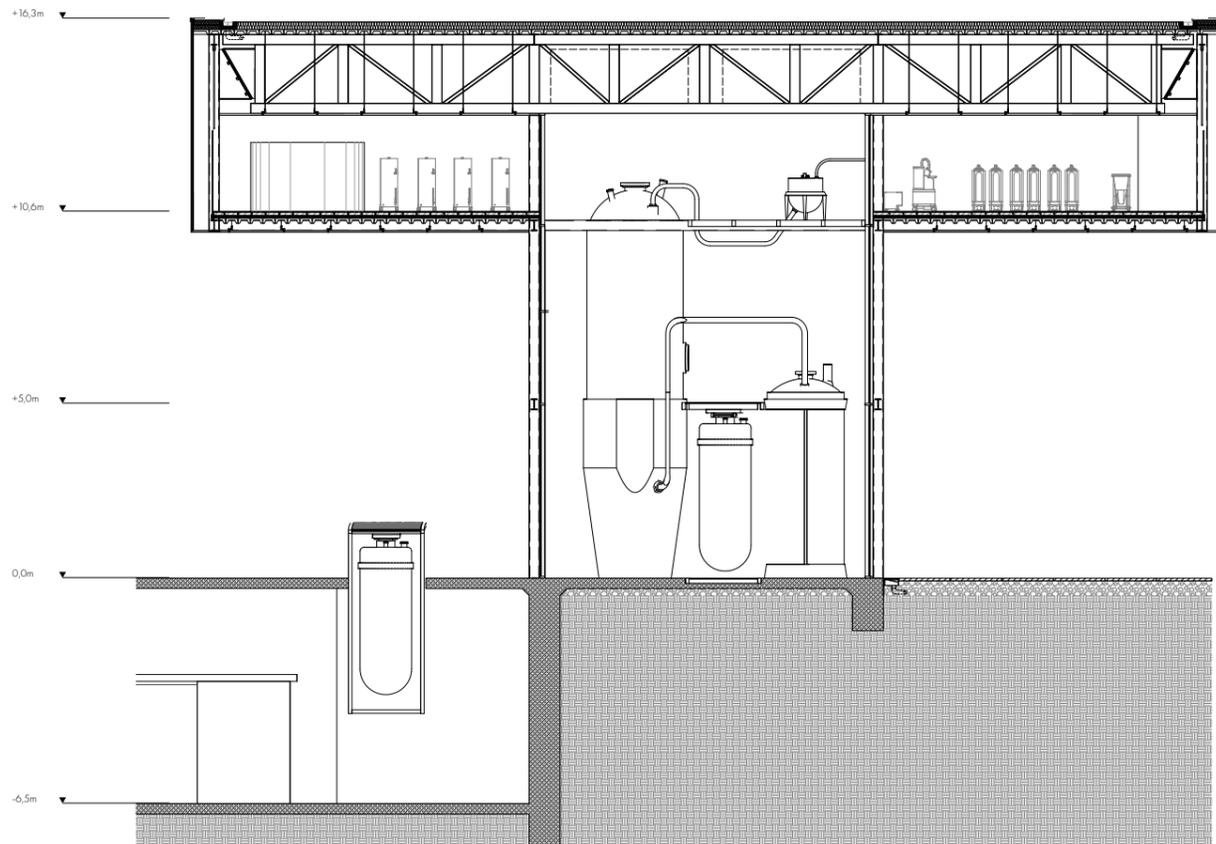
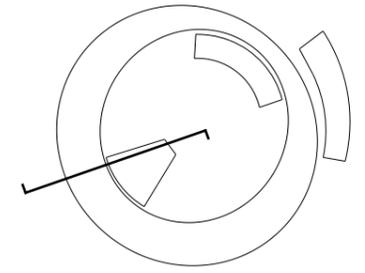
_Material Dualities



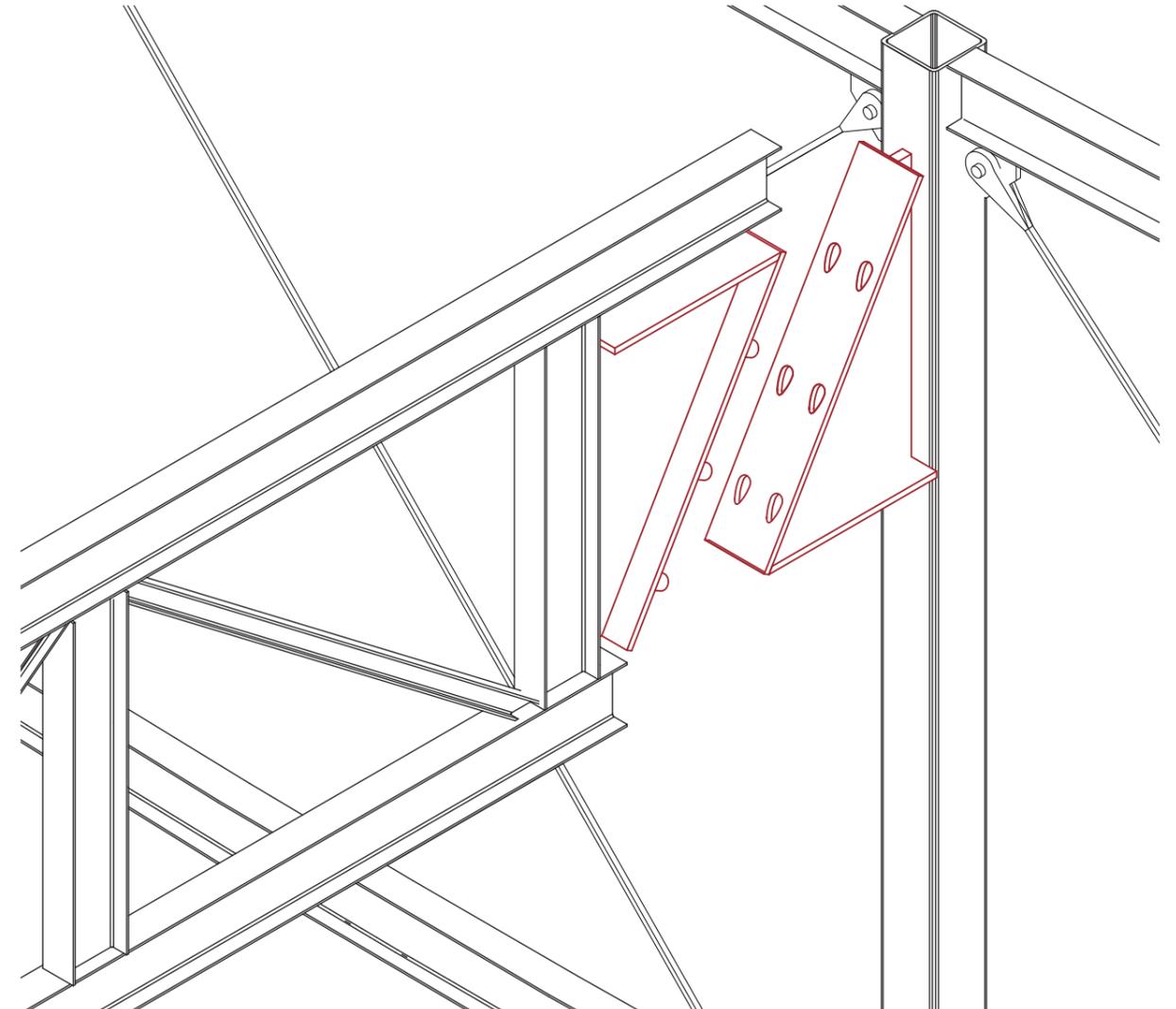
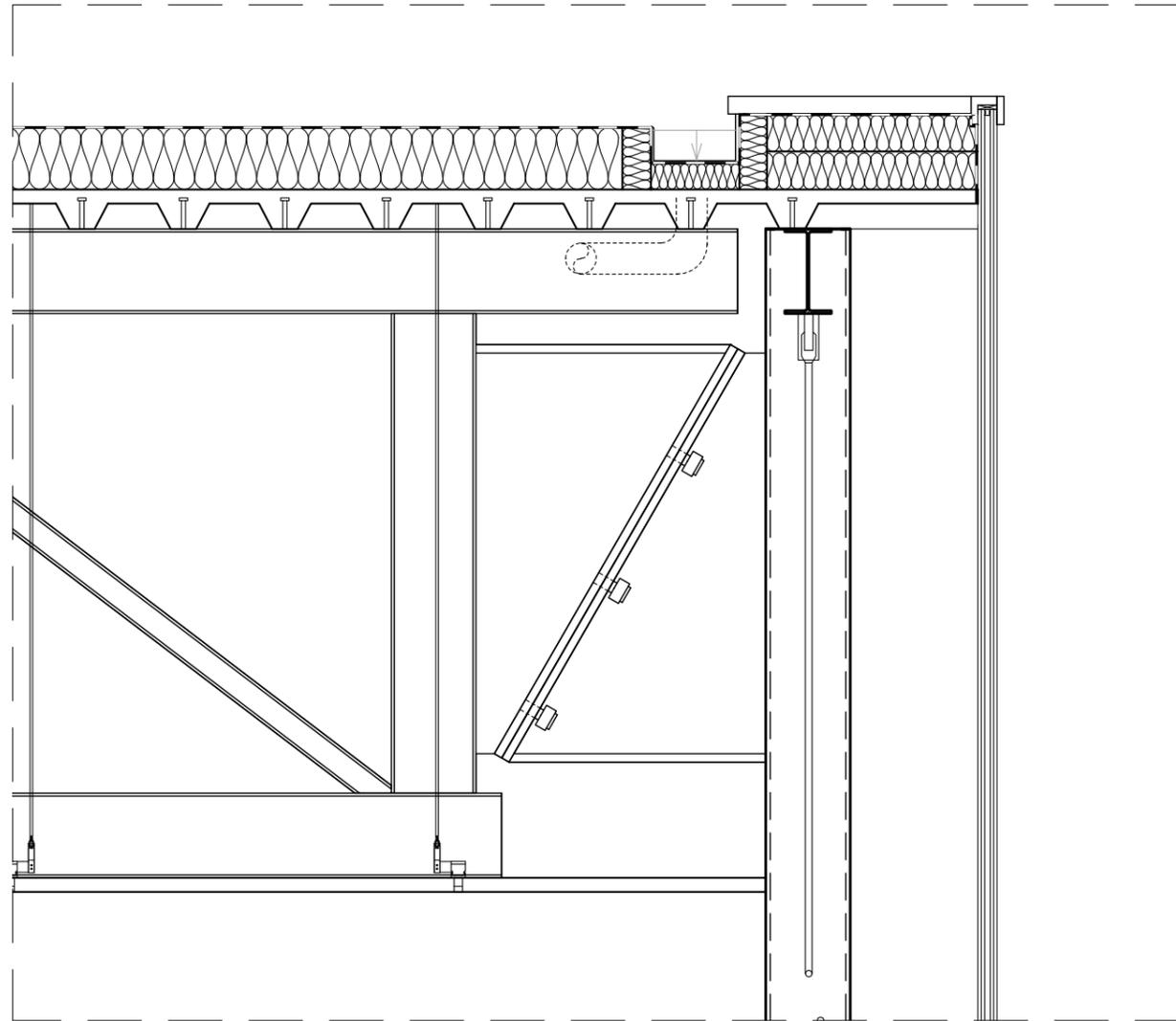
Factory Tribune



Structure

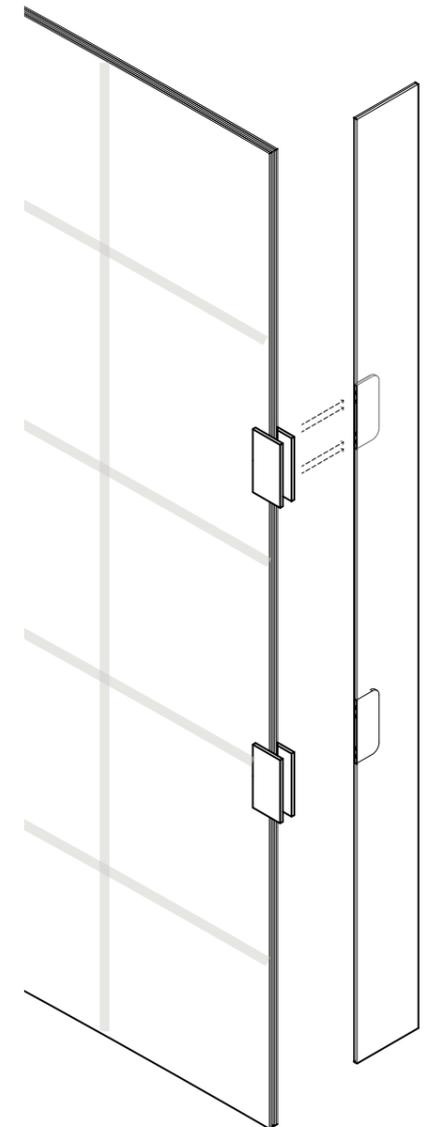
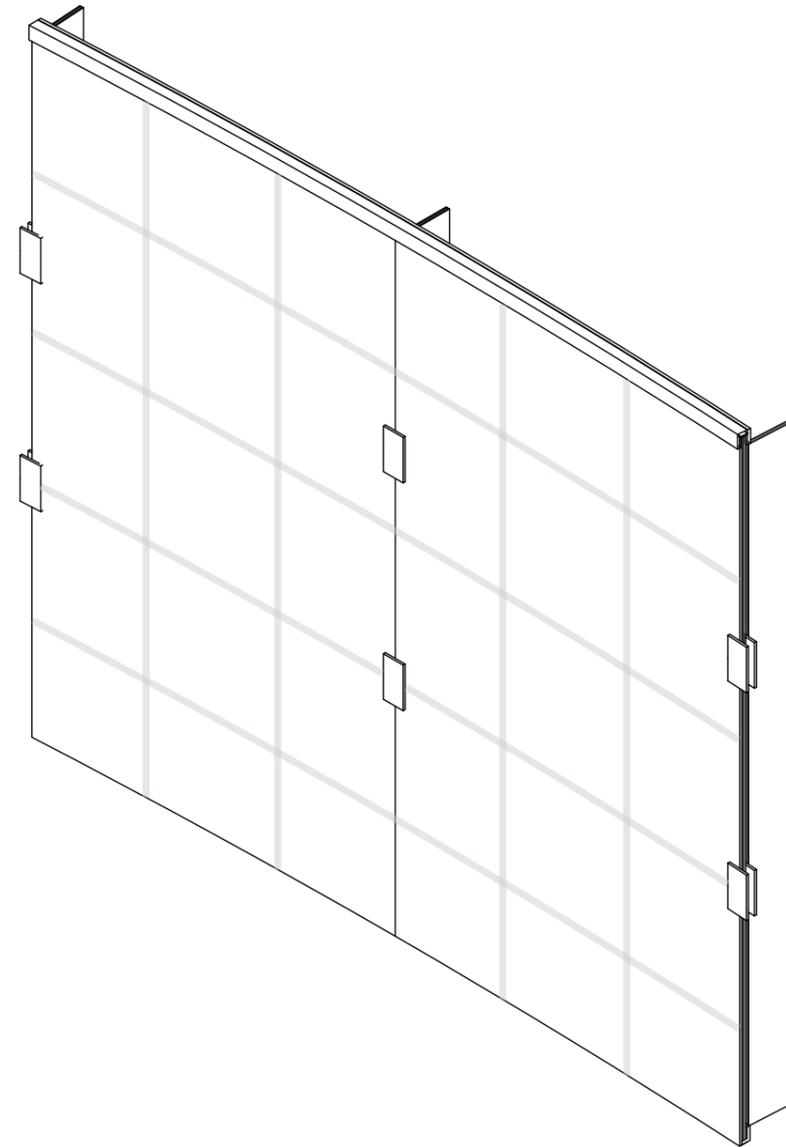
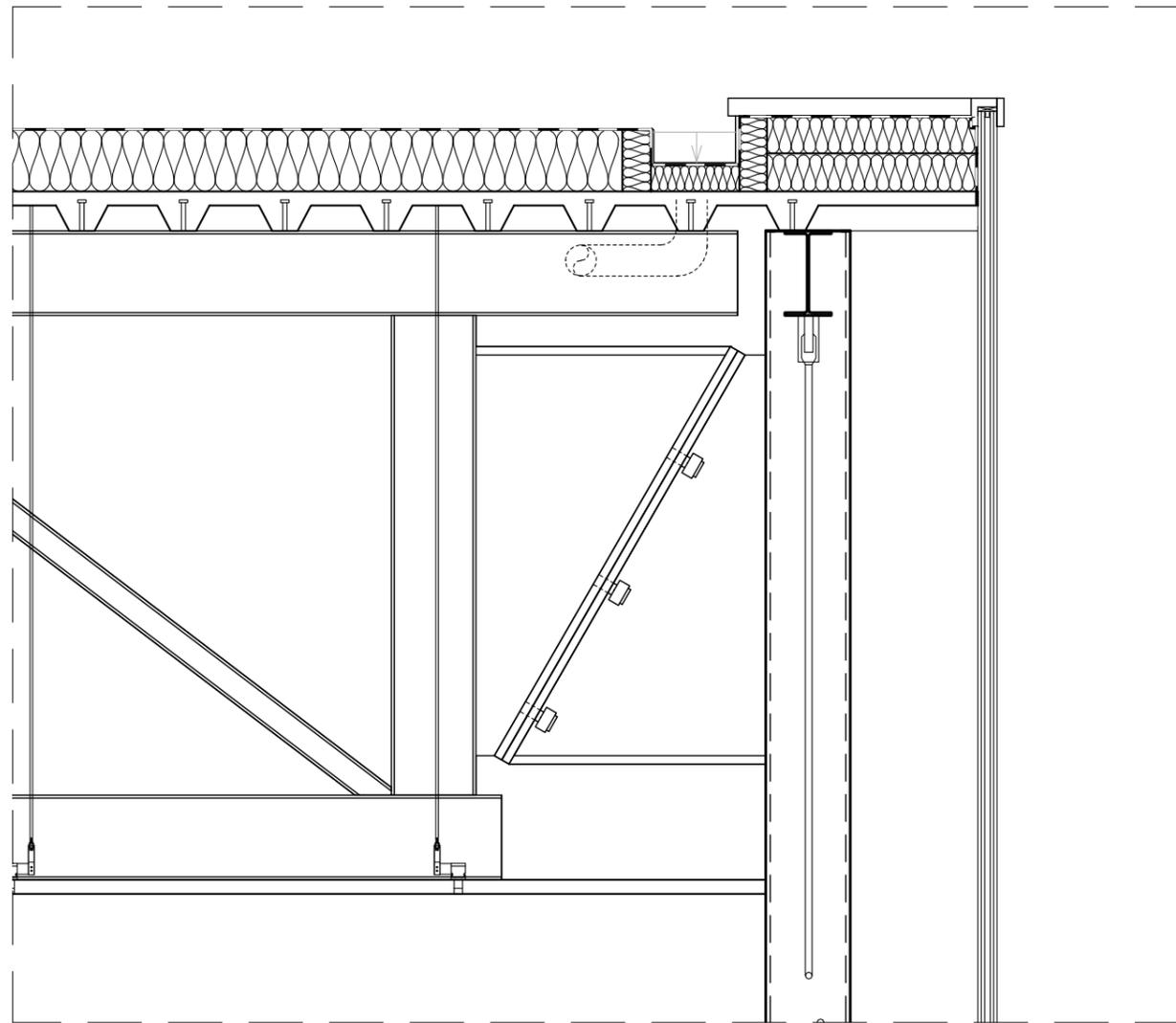


_Demountable vs. Permanent



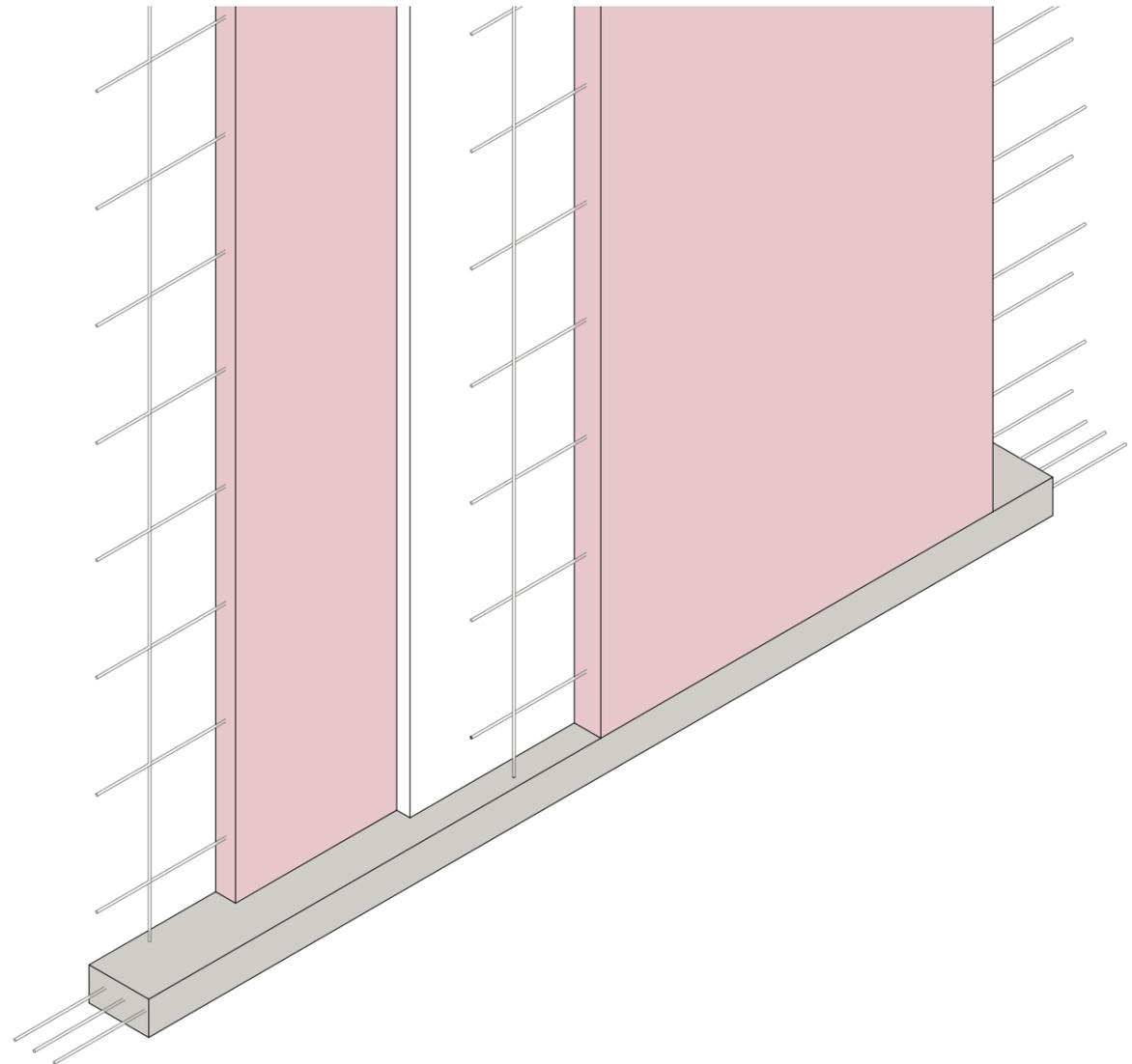
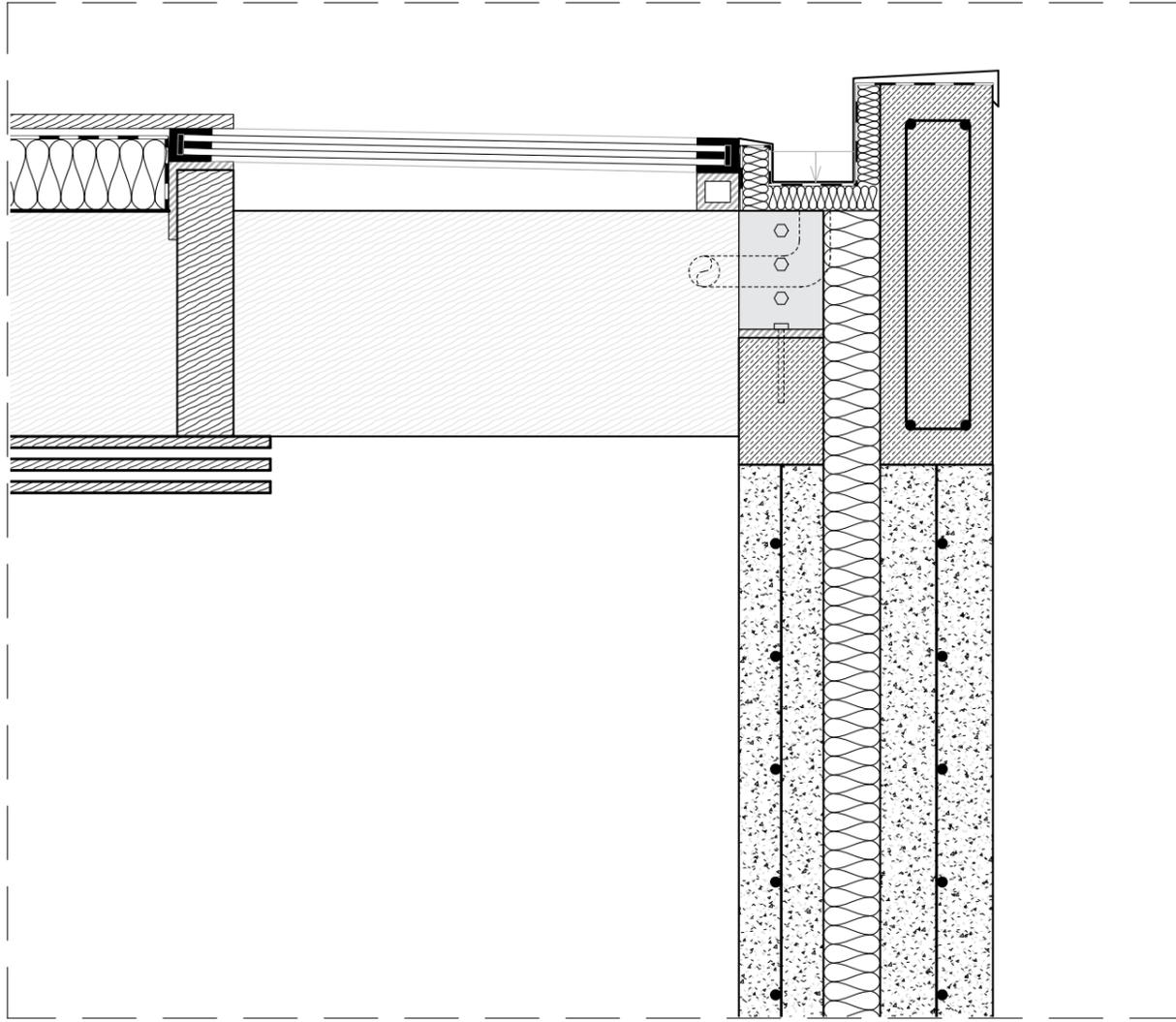
Girindra Maheninggalih

Structure



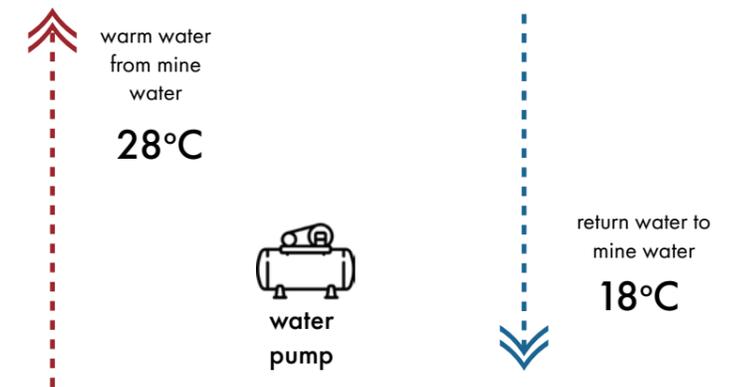
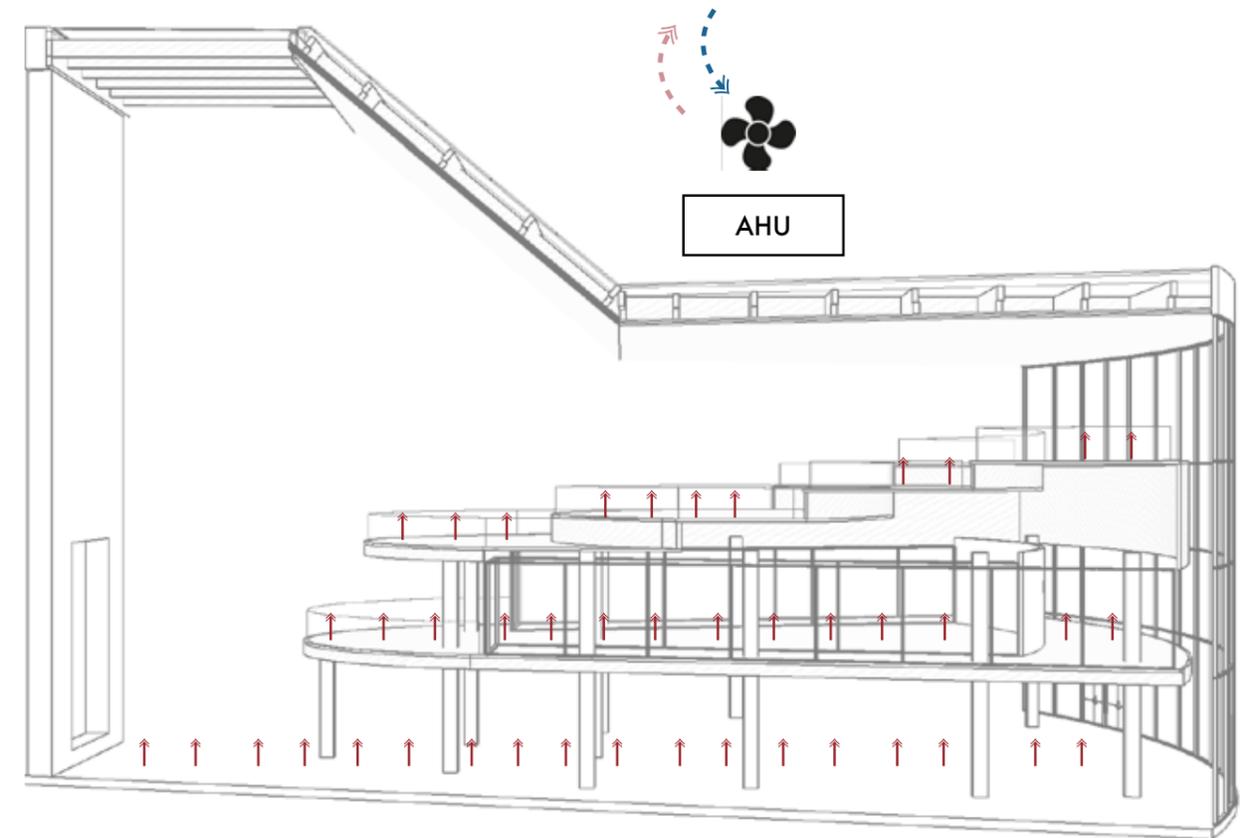
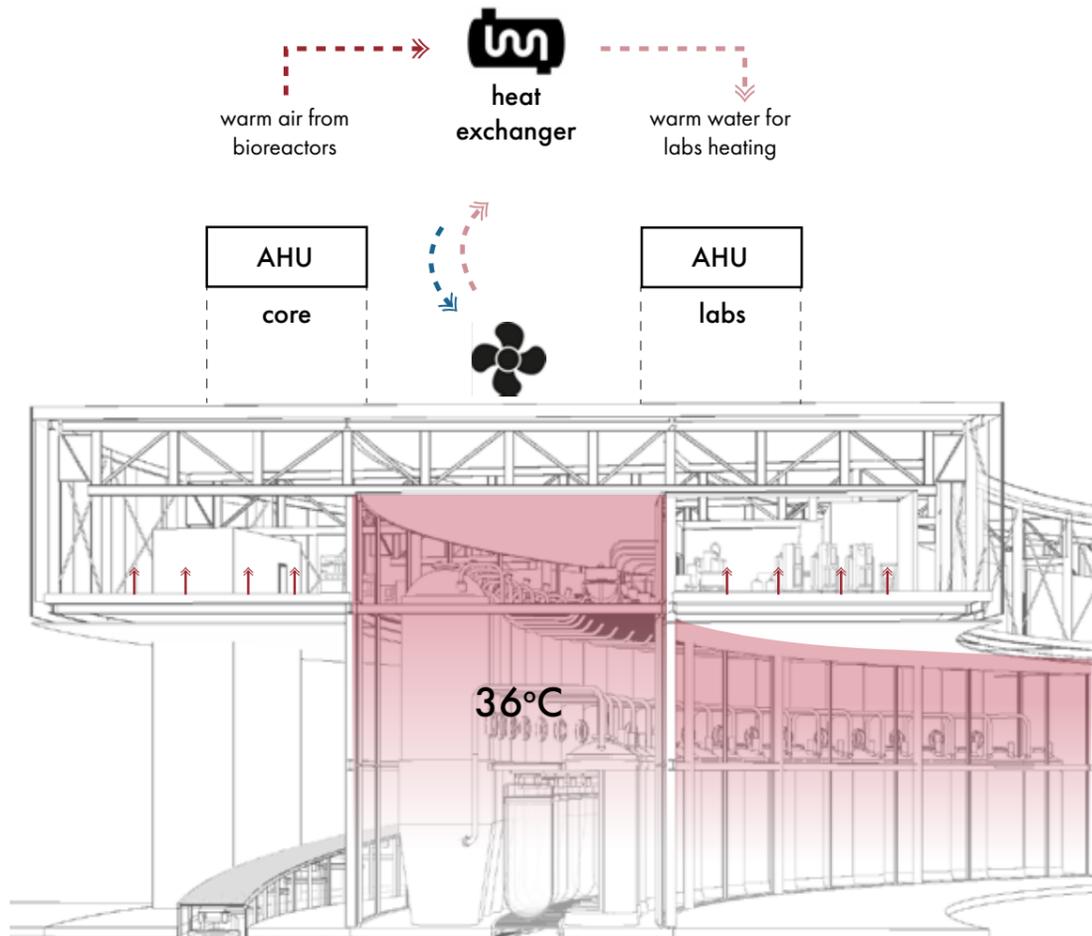
_Fritted glass panels + Glass embedded connections

Structure



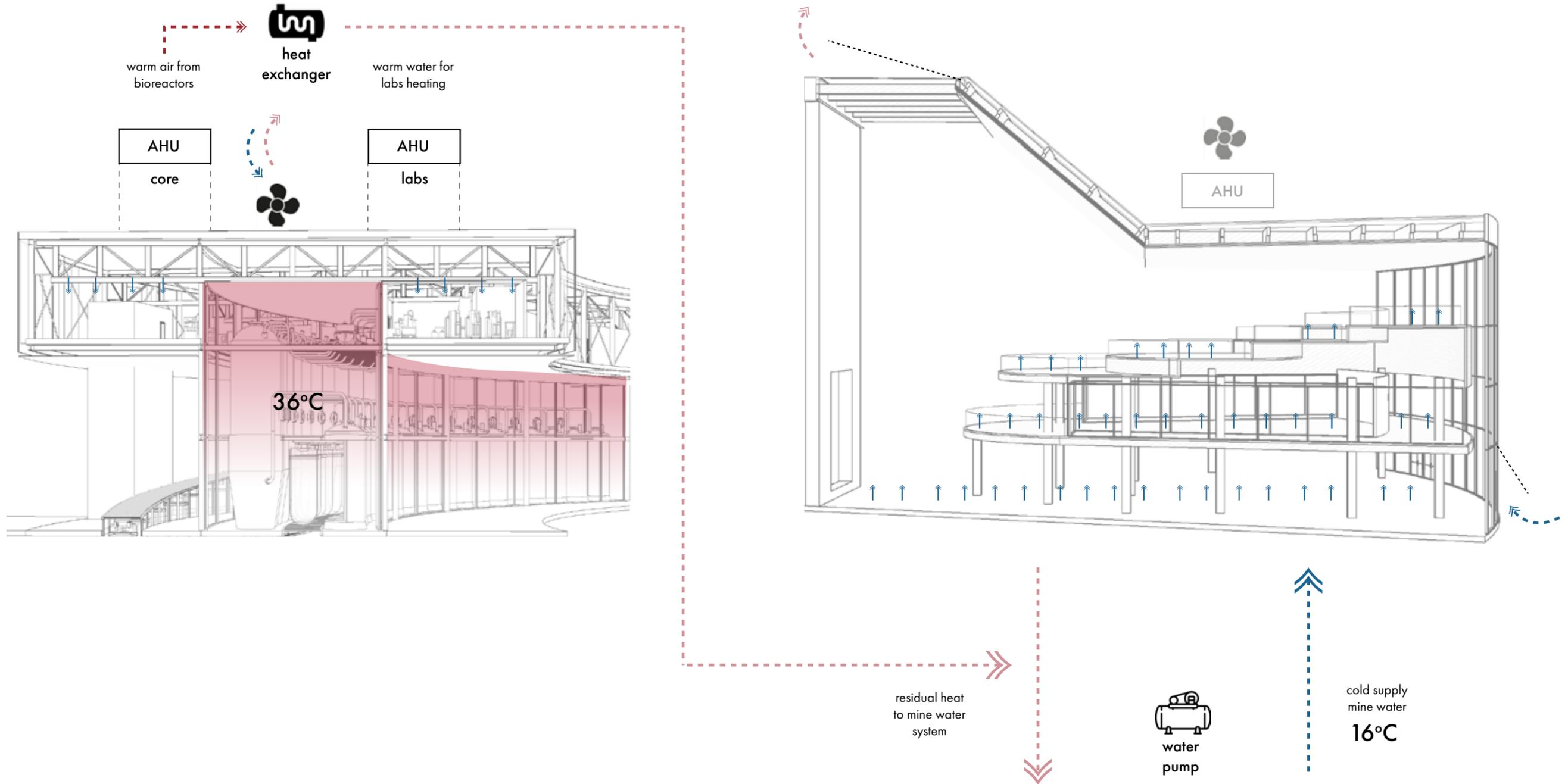
_Engineered rammed earth

Climate

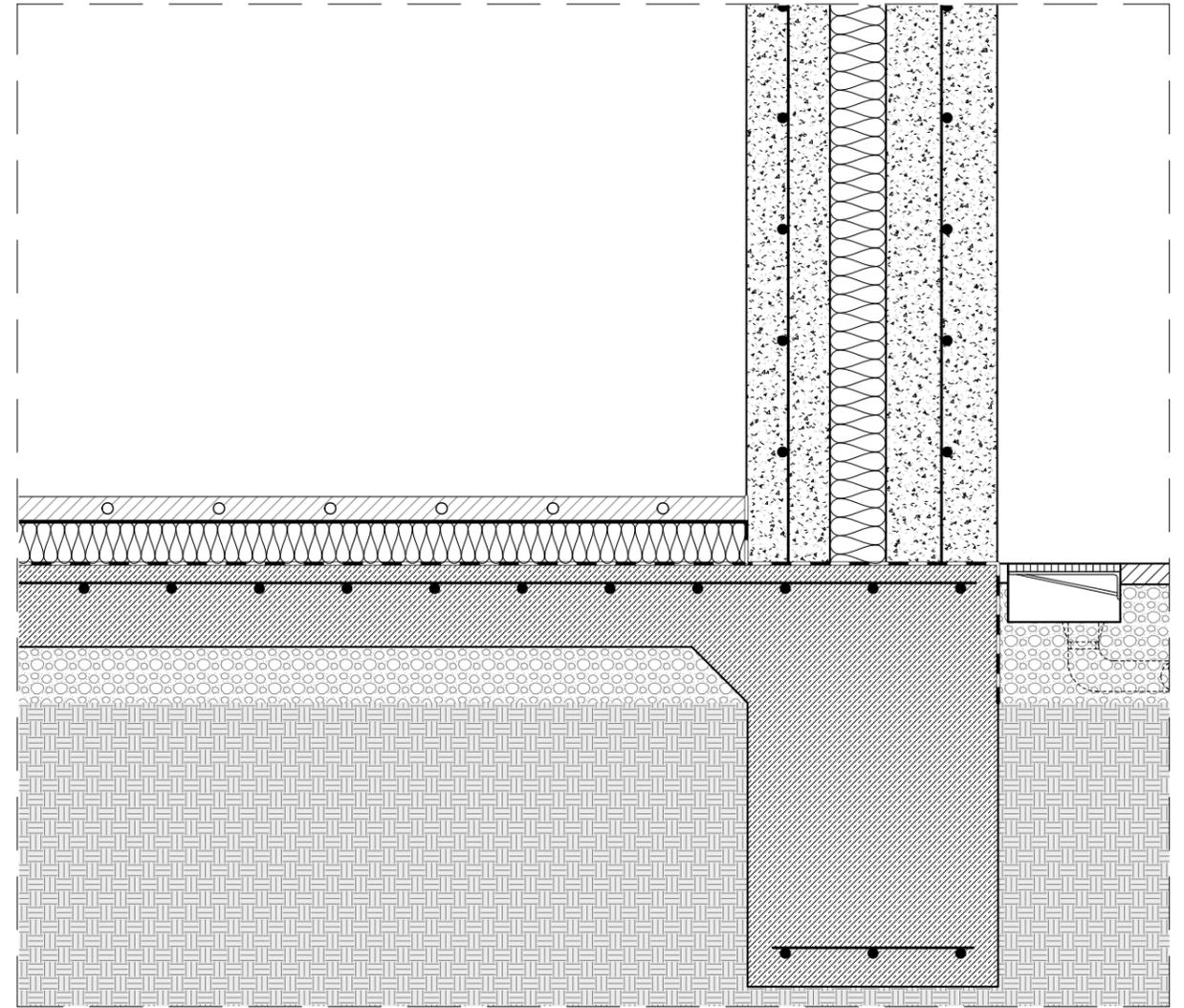
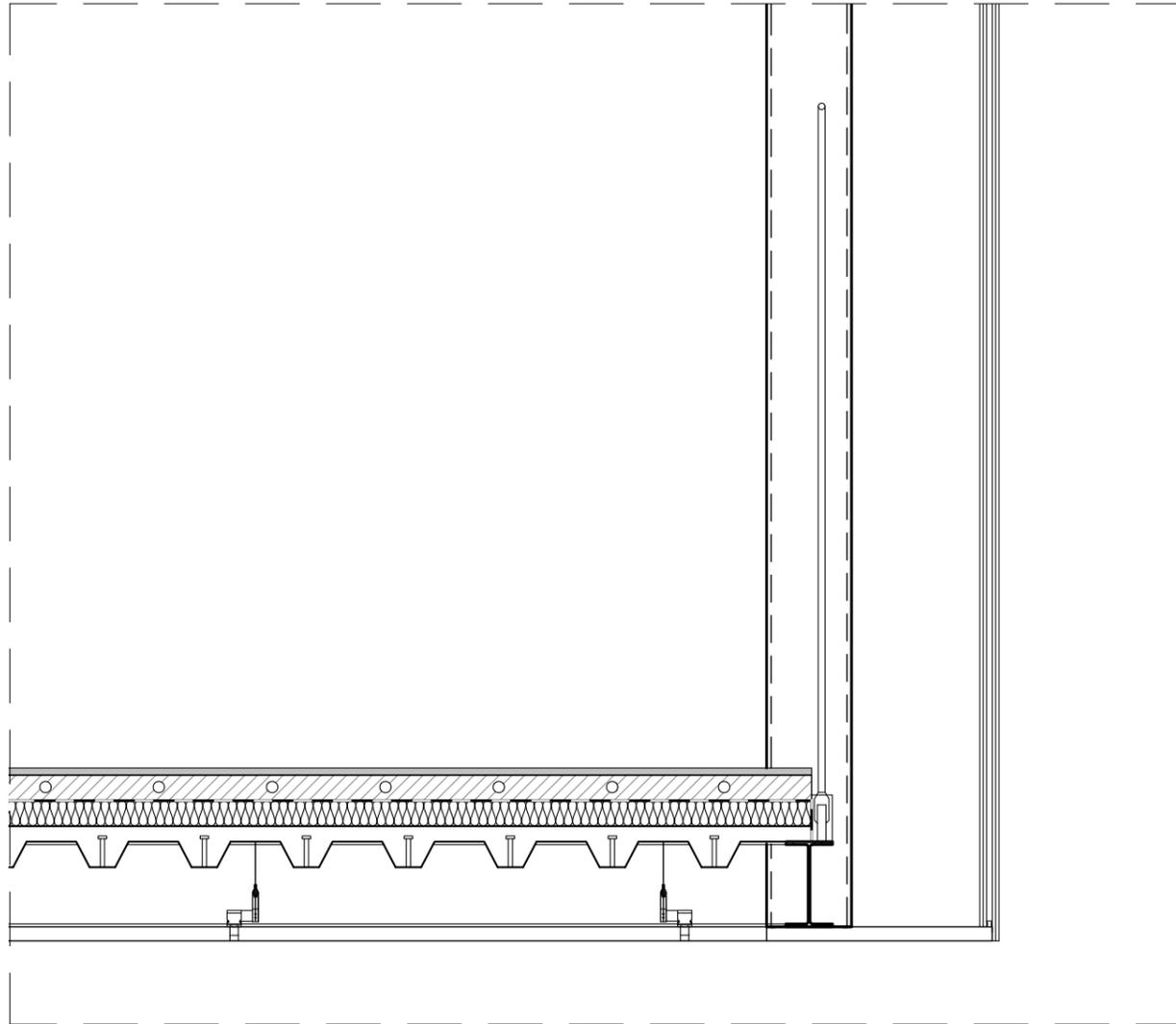


_Strategies from existing potentials

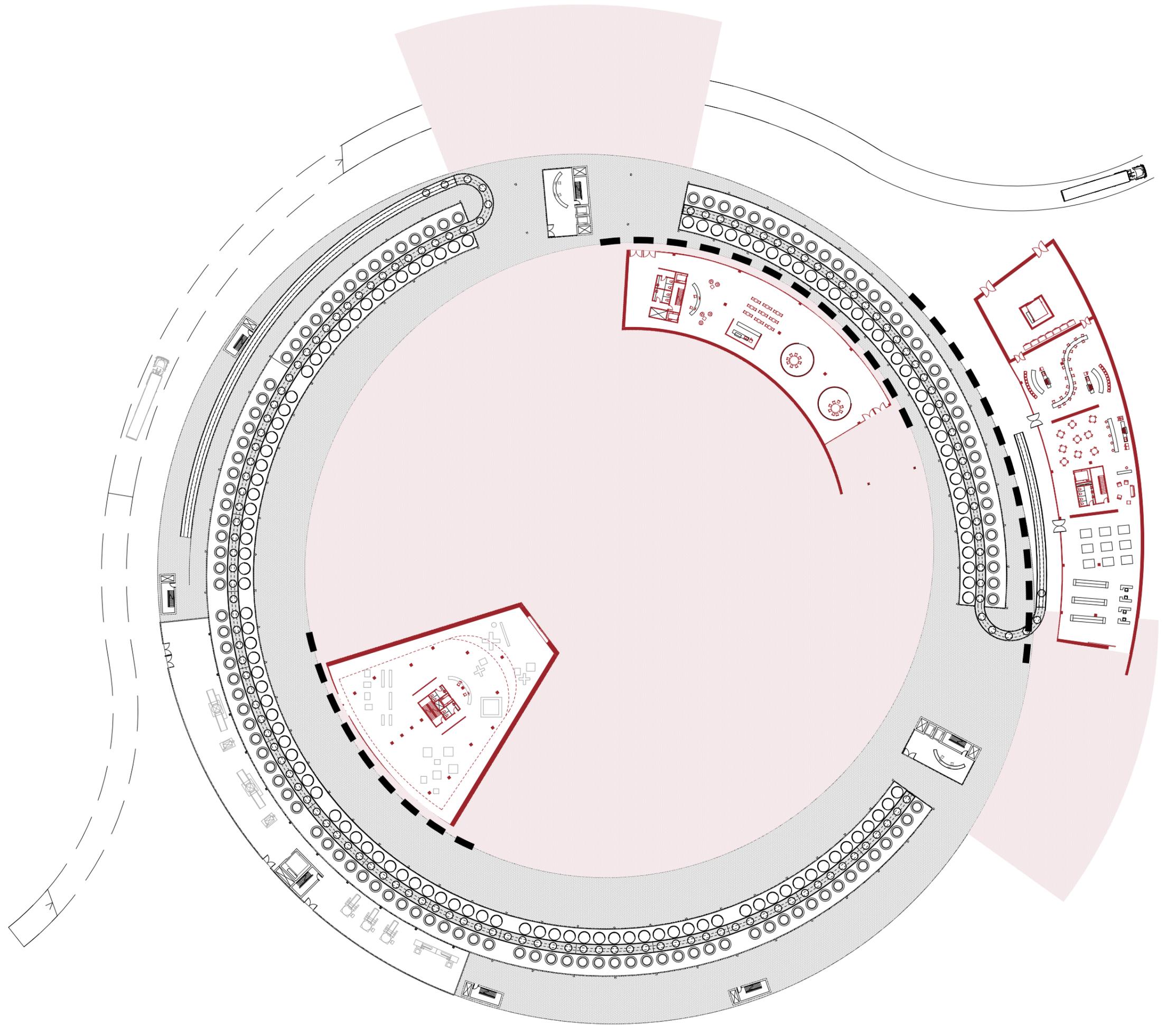
Climate



_Strategies from existing potentials

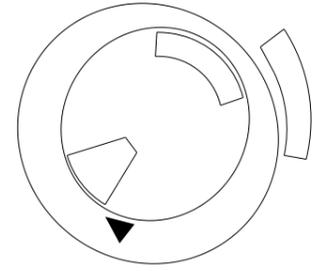


Facade

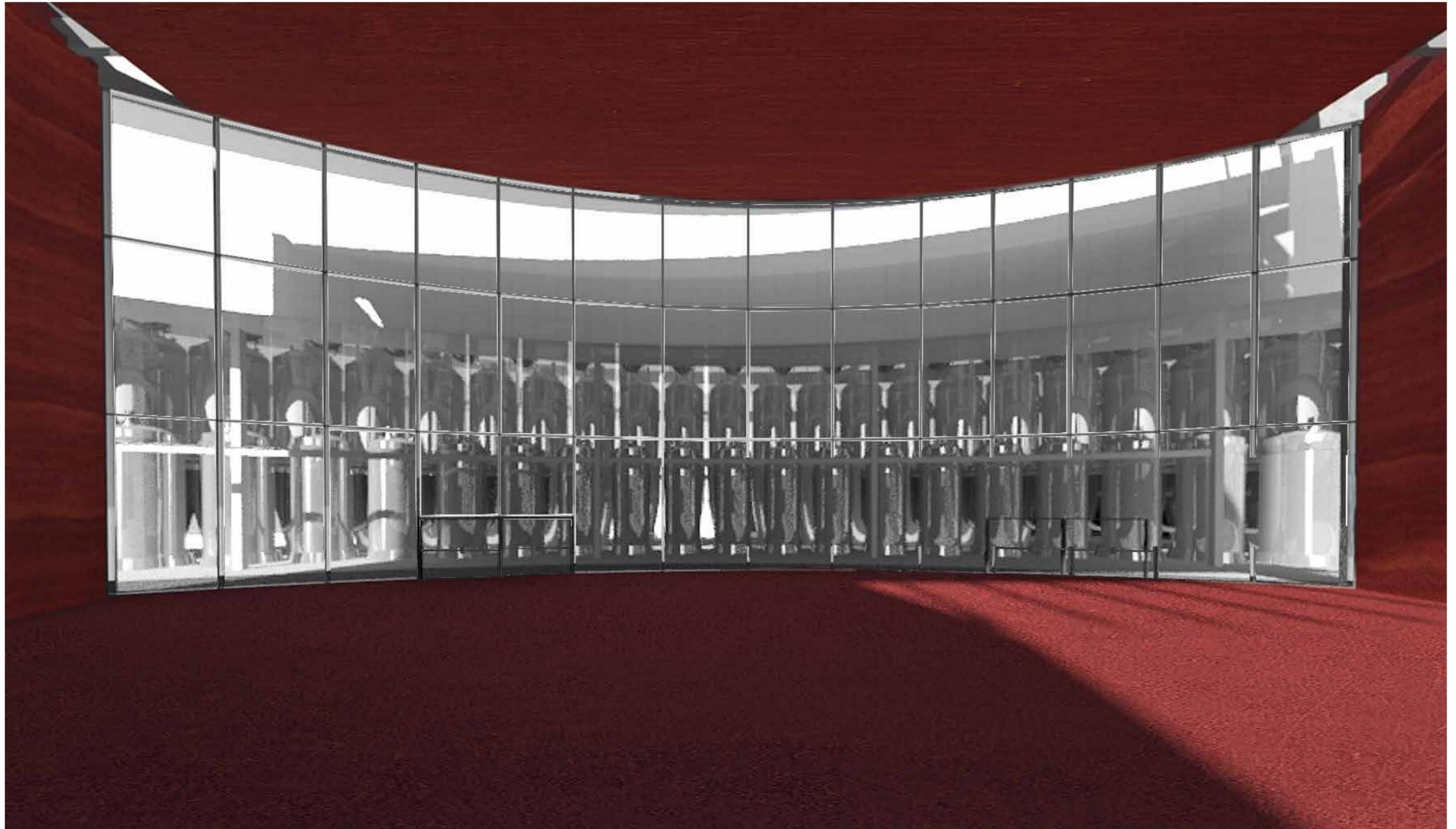
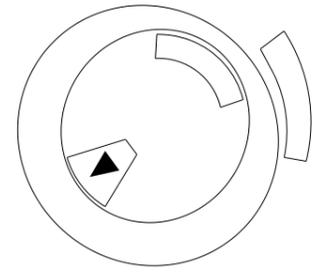


_Narrow dialogue

Facade

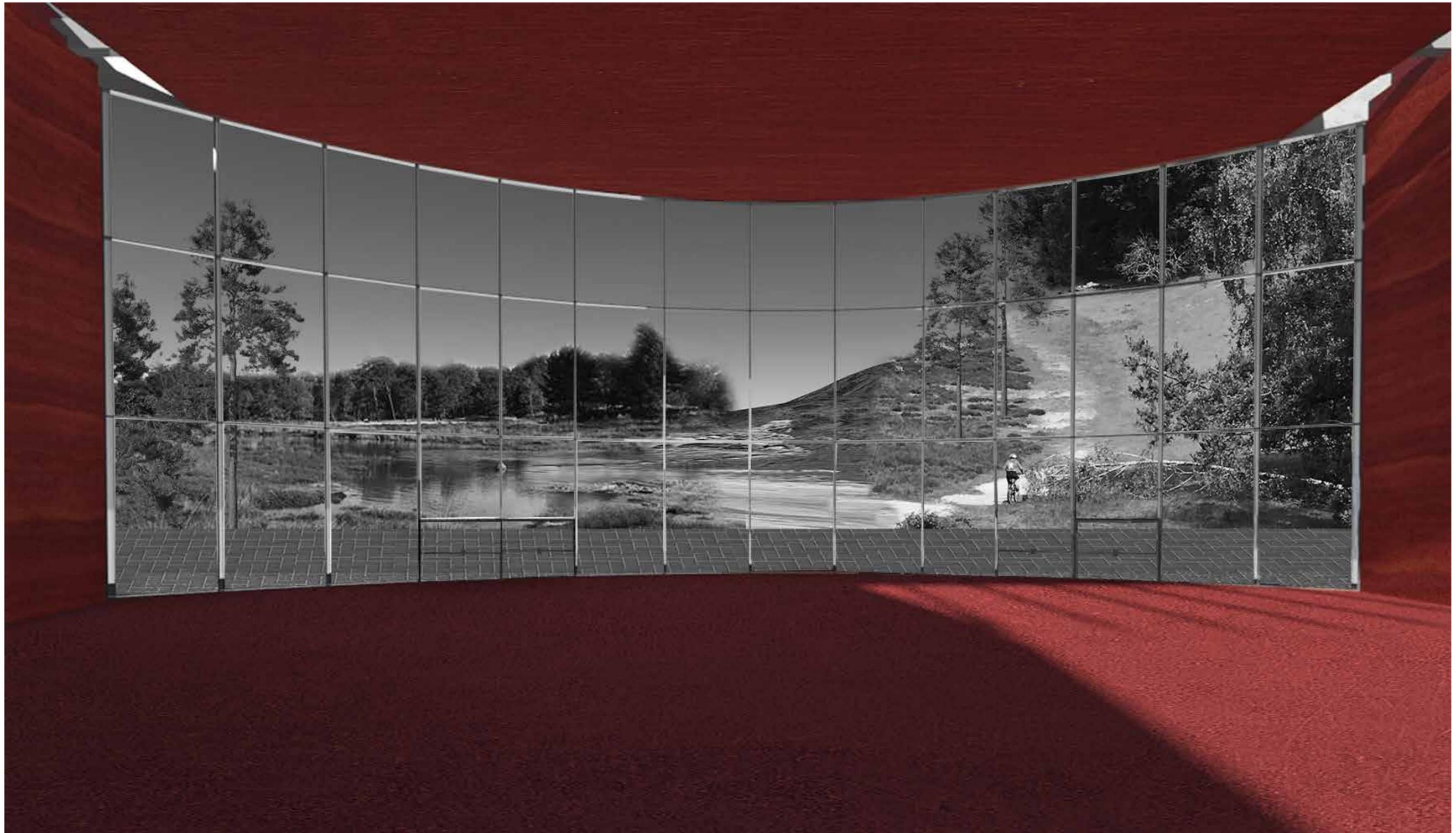
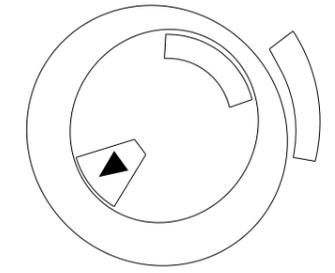


_In-between space



_Dialogue with Factory / Nature

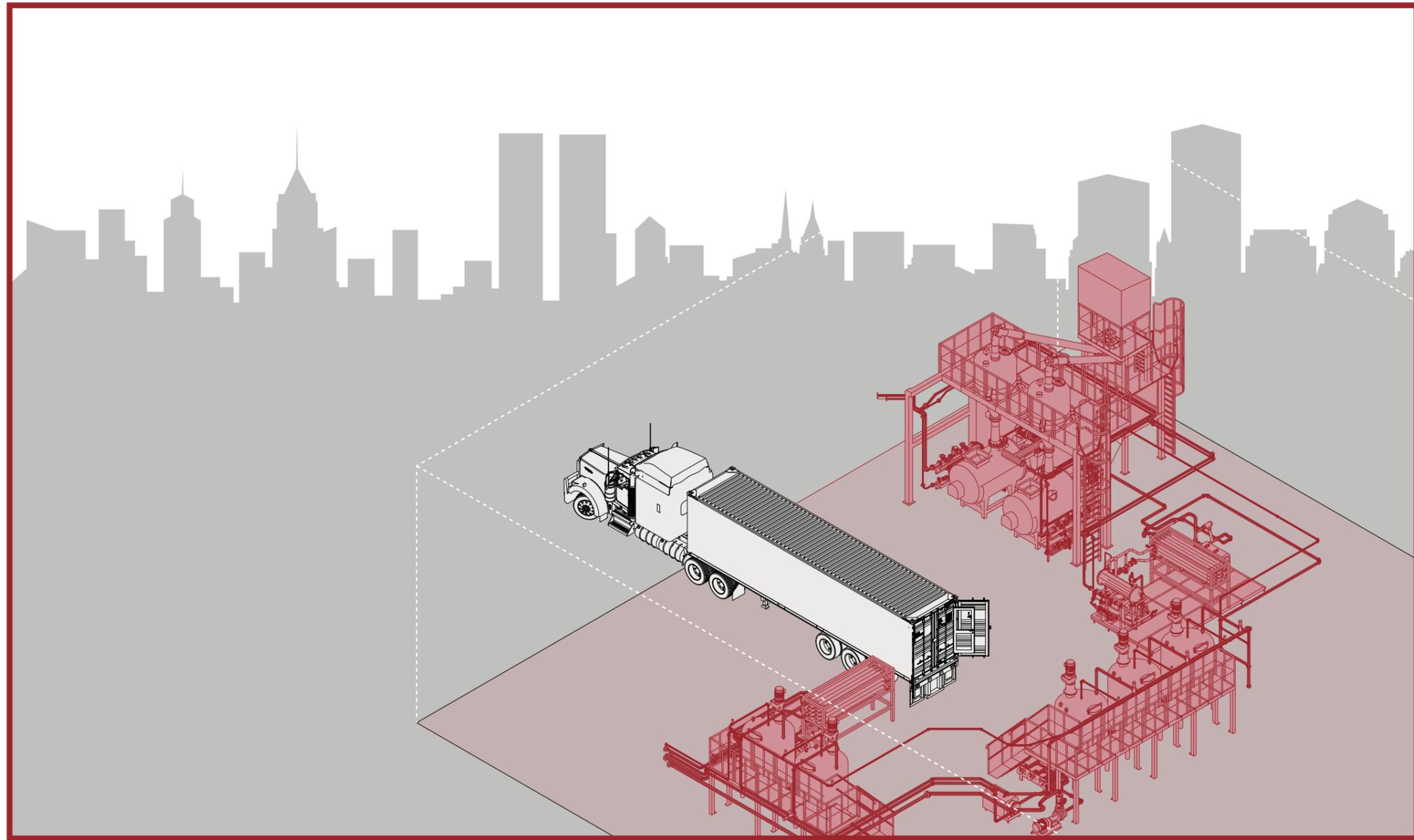
Facade



_Dialogue with Factory / Nature

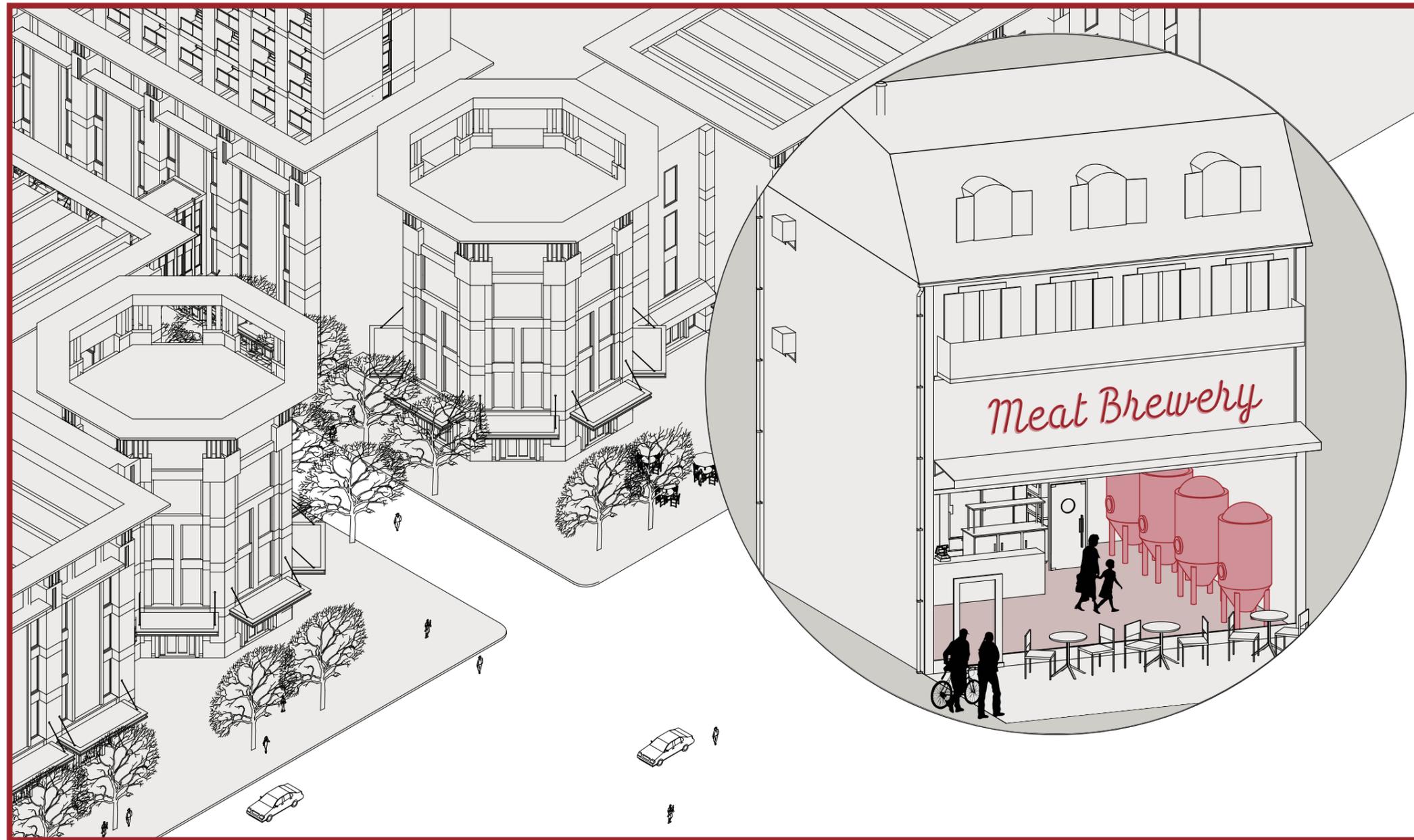
Conclusion

Cultured Meat Technology Evolution/Portability



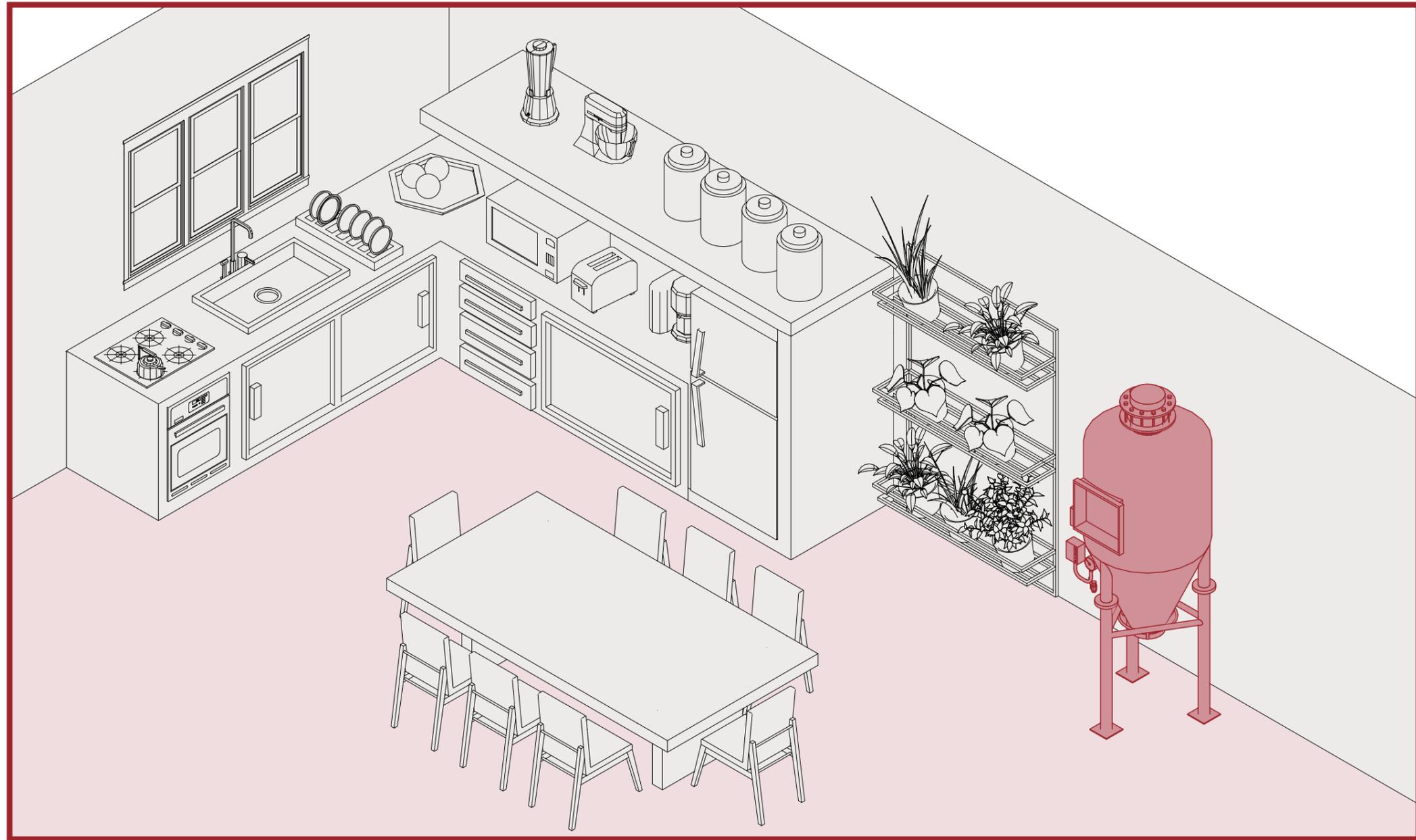
_National / Factory

Cultured Meat Technology Evolution/Portability



_Regional / Meat Brewery

Cultured Meat Technology Evolution/Portability



_Home - Local /Kitchen Appliance

From Extractive Landscape to Natural reserve



From Extractive Landscape to Natural reserve



From Extractive Landscape to Natural reserve



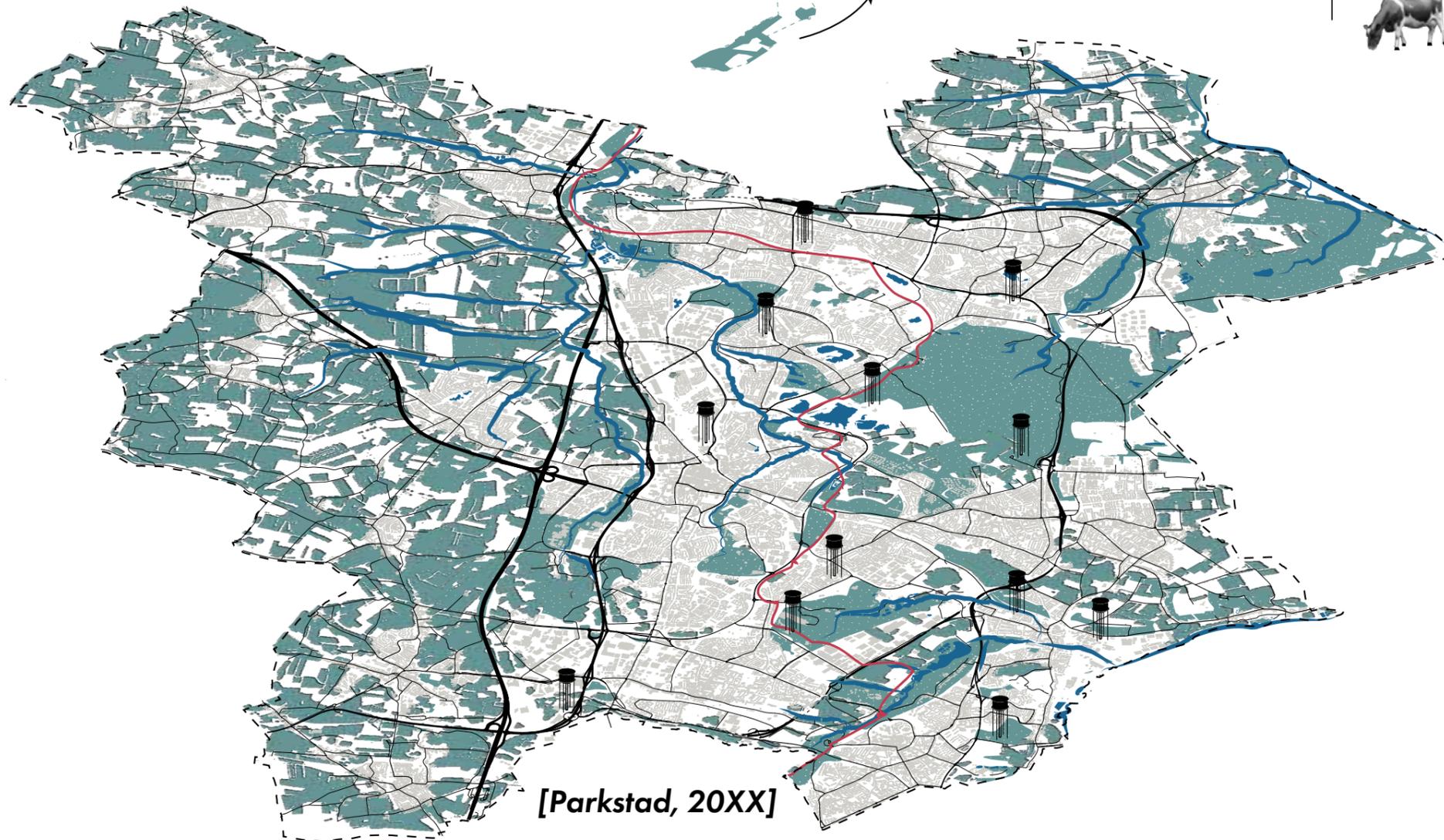
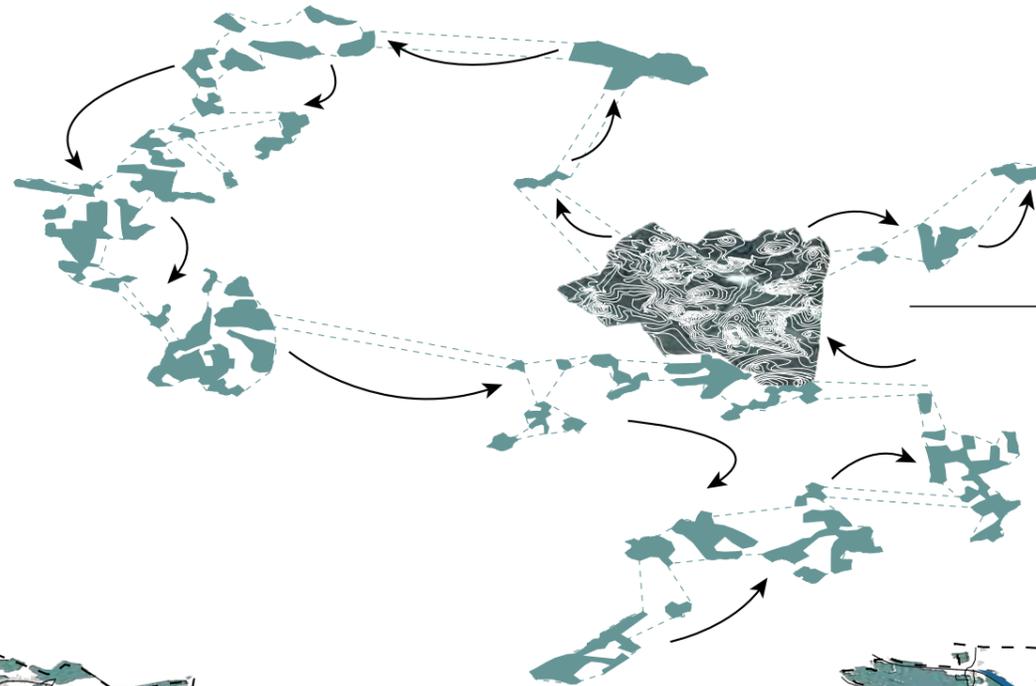
From Extractive Landscape to Natural reserve



Parkstad Garden City

Endangered Cow Breeds
 "The Dutch government wants to reduce dairy livestock numbers in order to cut down phosphate production. Dairy farmers will then get rid of their less productive cows, a move which puts Dutch heritage cattle breeds at risk. These breeds are already a rare sight in the meadows of the Netherlands."

Source: WUR



Meuse-Rhine-IJssel
 Status: normal
 Trend: falling
 Numbers: 15.567



Groningen White-Headed
 Status: threatened
 Trend: stable
 Numbers: 2.190



Dutch Friesian
 Status: threatened
 Trend: falling
 Numbers: 1.621



Dutch Belted
 Status: threatened
 Trend: stable
 Numbers: 1.600



Deep-Red Cattle
 Status: threatened
 Trend: growing
 Numbers: 941



Red and White Friesian
 Status: threatened
 Trend: growing
 Numbers: 520

Source: WUR

Thank you