

Invisible Cities:
COTTONOPOLIS

A critical reflection on the image of sustainability and
the promise of production

5134358
- Katherina Bruh -
Borders and Territories

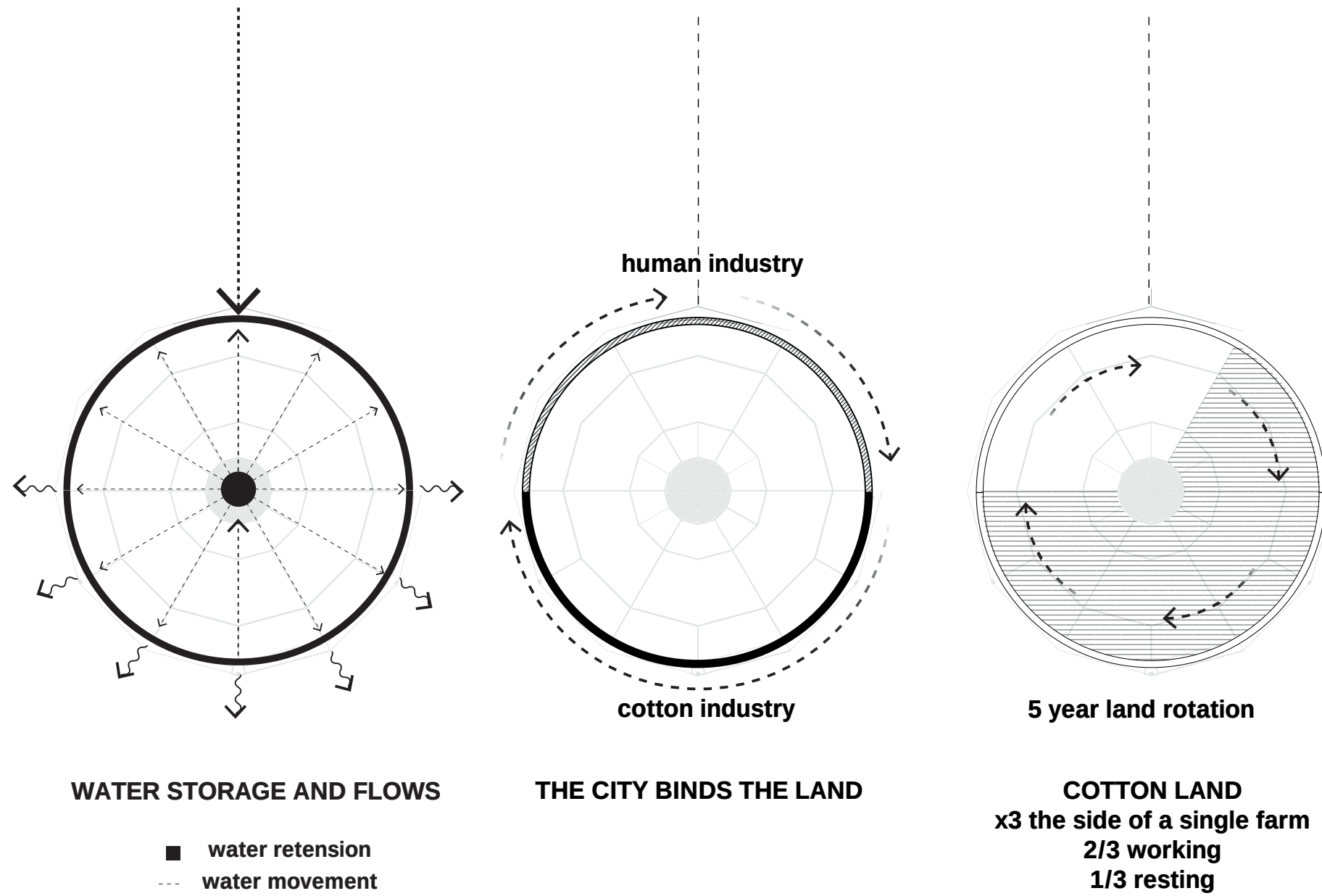
Narrative

network of invisible cities
A COTTONOPOLIS
and its negative production externalities.

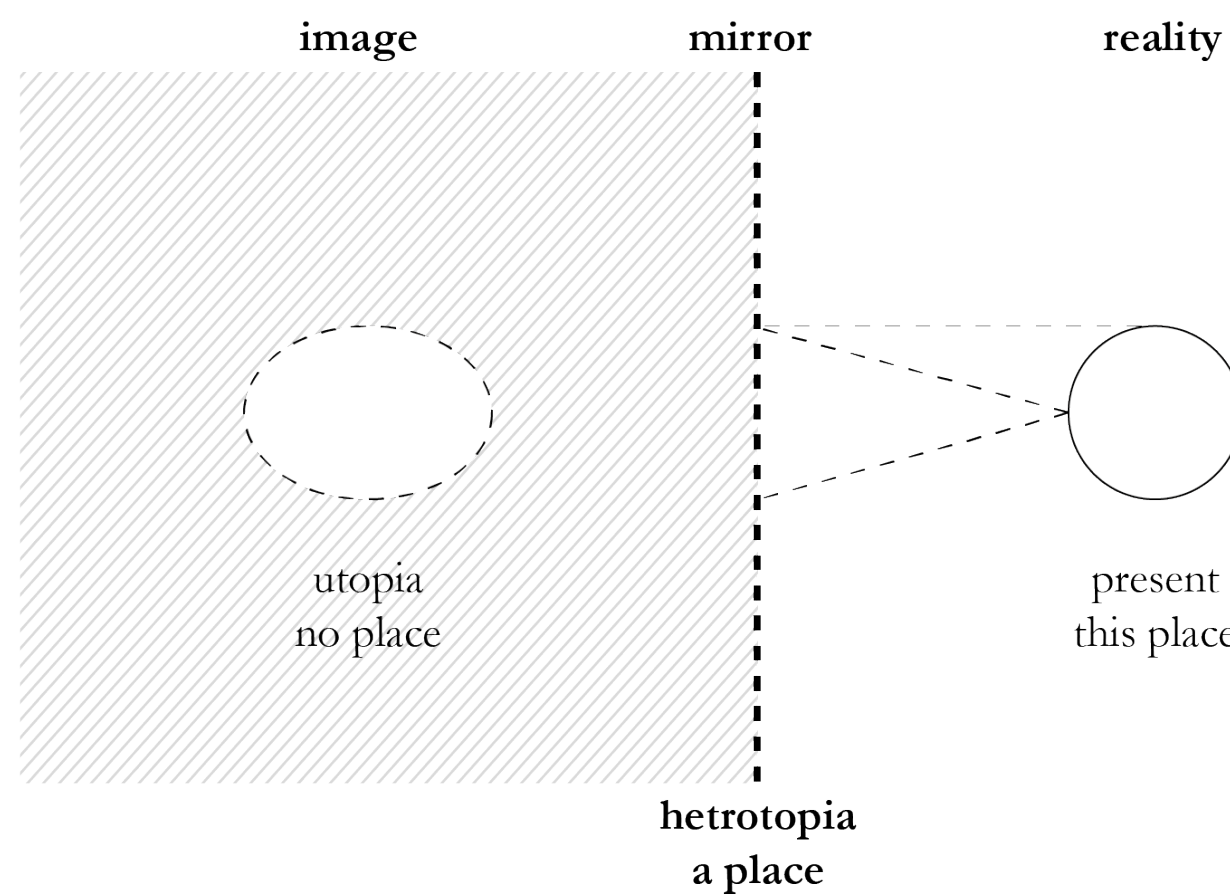
Narrative

network of invisible cities
A COTTONOPOLIS
its negative production externalities.

Narrative



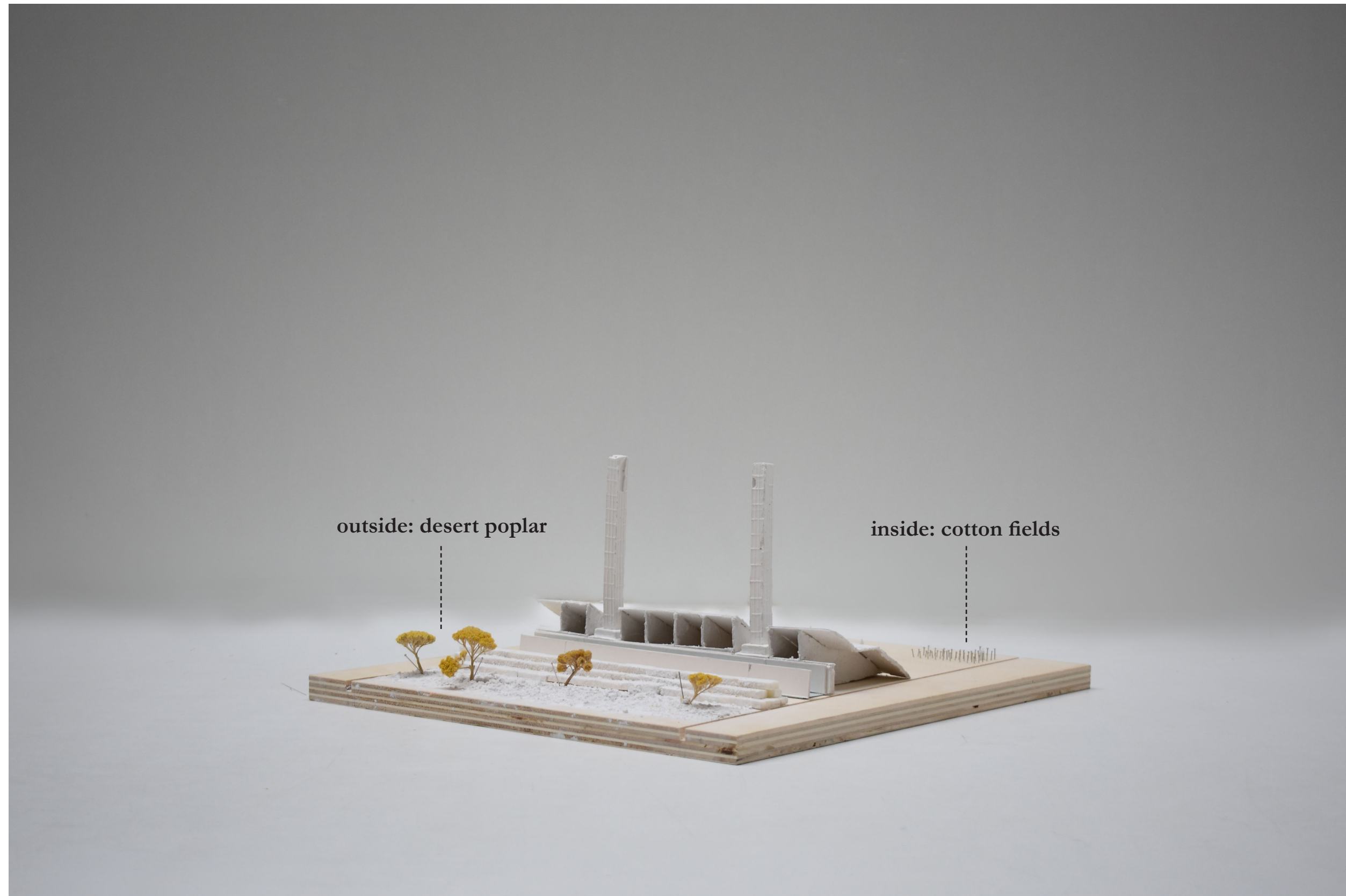
Narrative



The mirror as a heterotopia: "it makes this place that I occupy at the moment when I look at myself in the glass at once absolutely real, connected with all the space that surrounds it, and absolutely unreal, since in order to be perceived it has to pass through this virtual point which is over there."

Michel Foucault's "Of Other Spaces"

Narrative



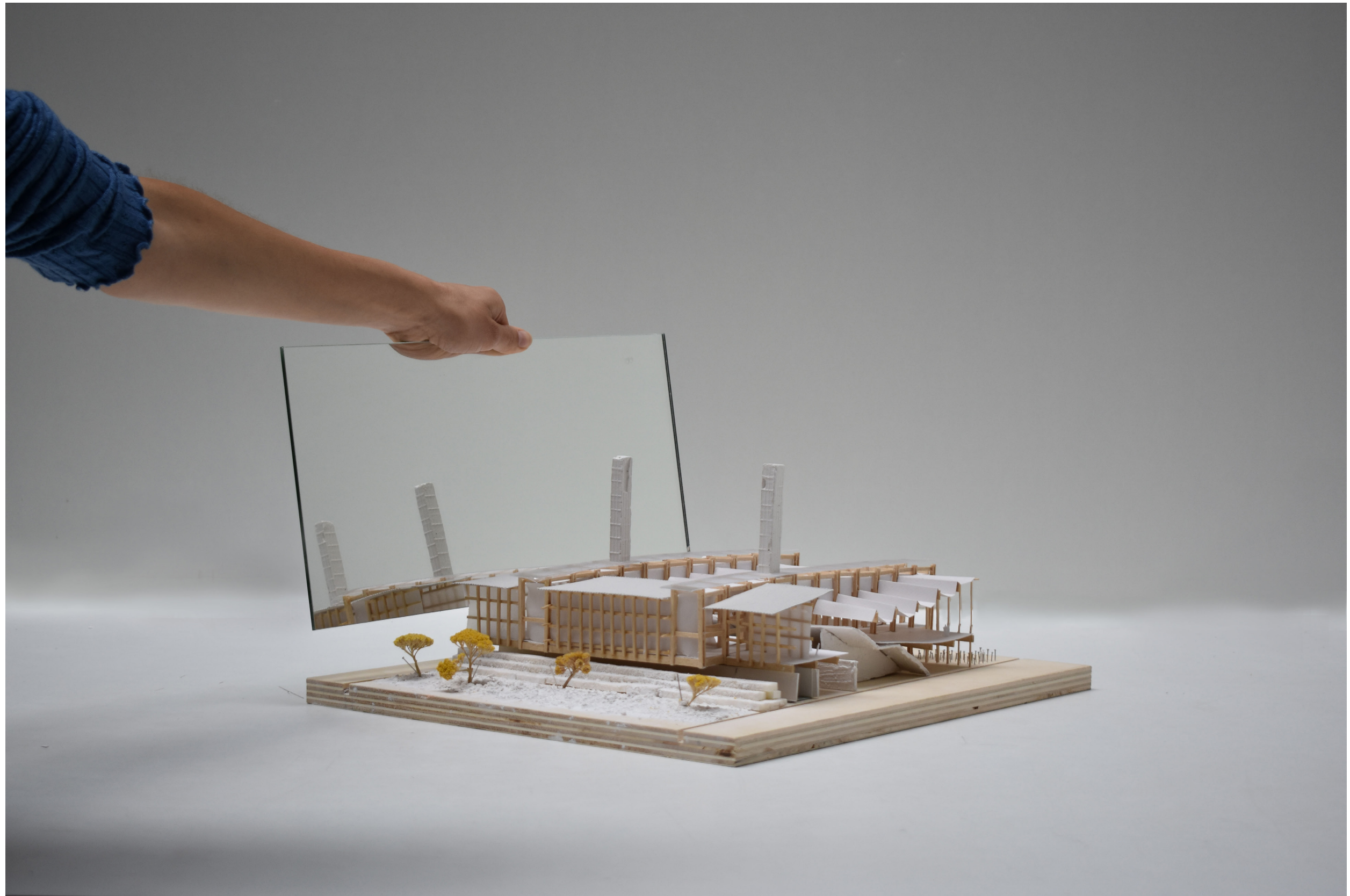
An artificial oasis, defined by two wind towers
1:200

Narrative



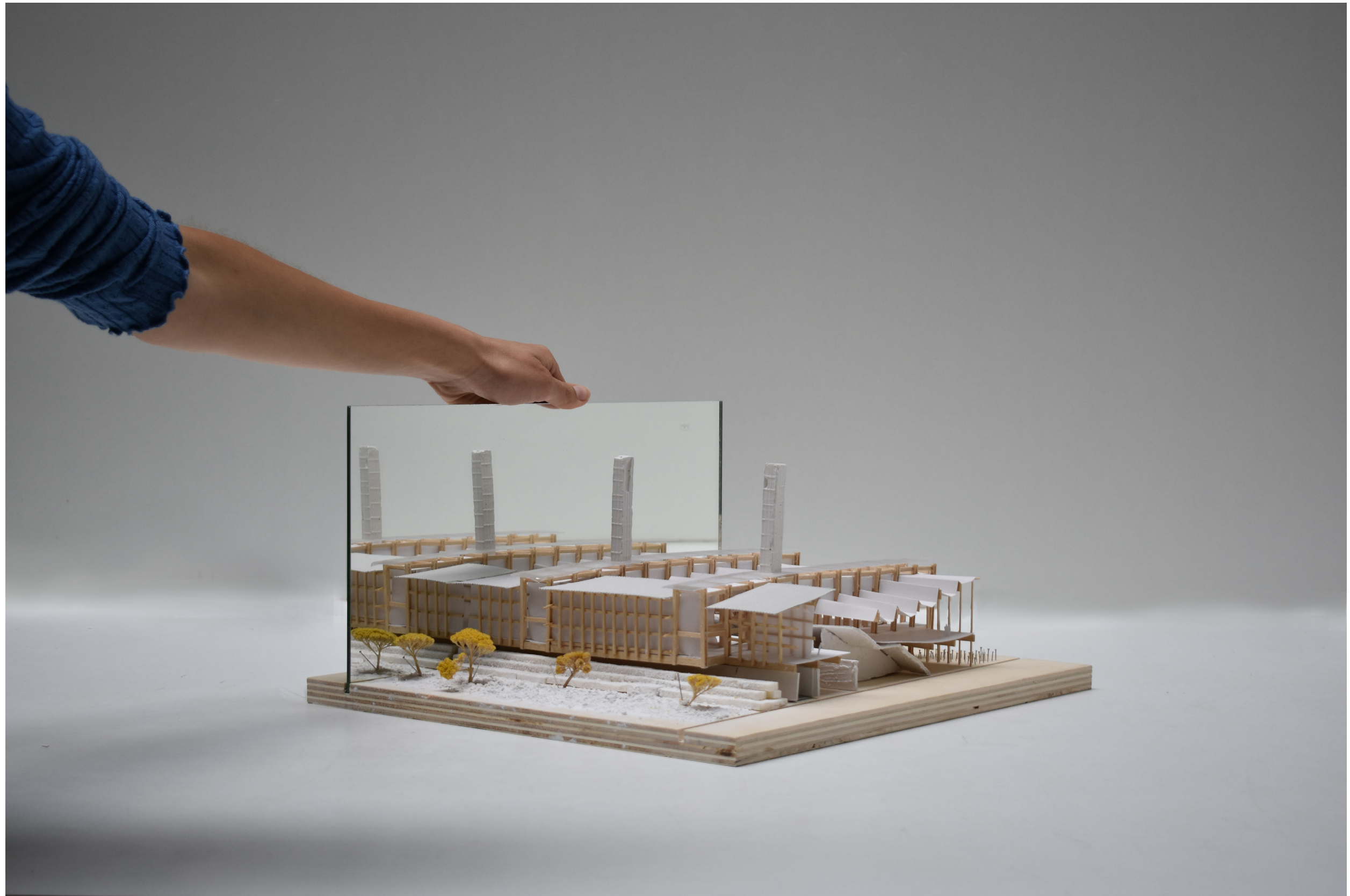
Industry sits on top of life itself
1:200

Narrative



An image repeated
1:200

Narrative



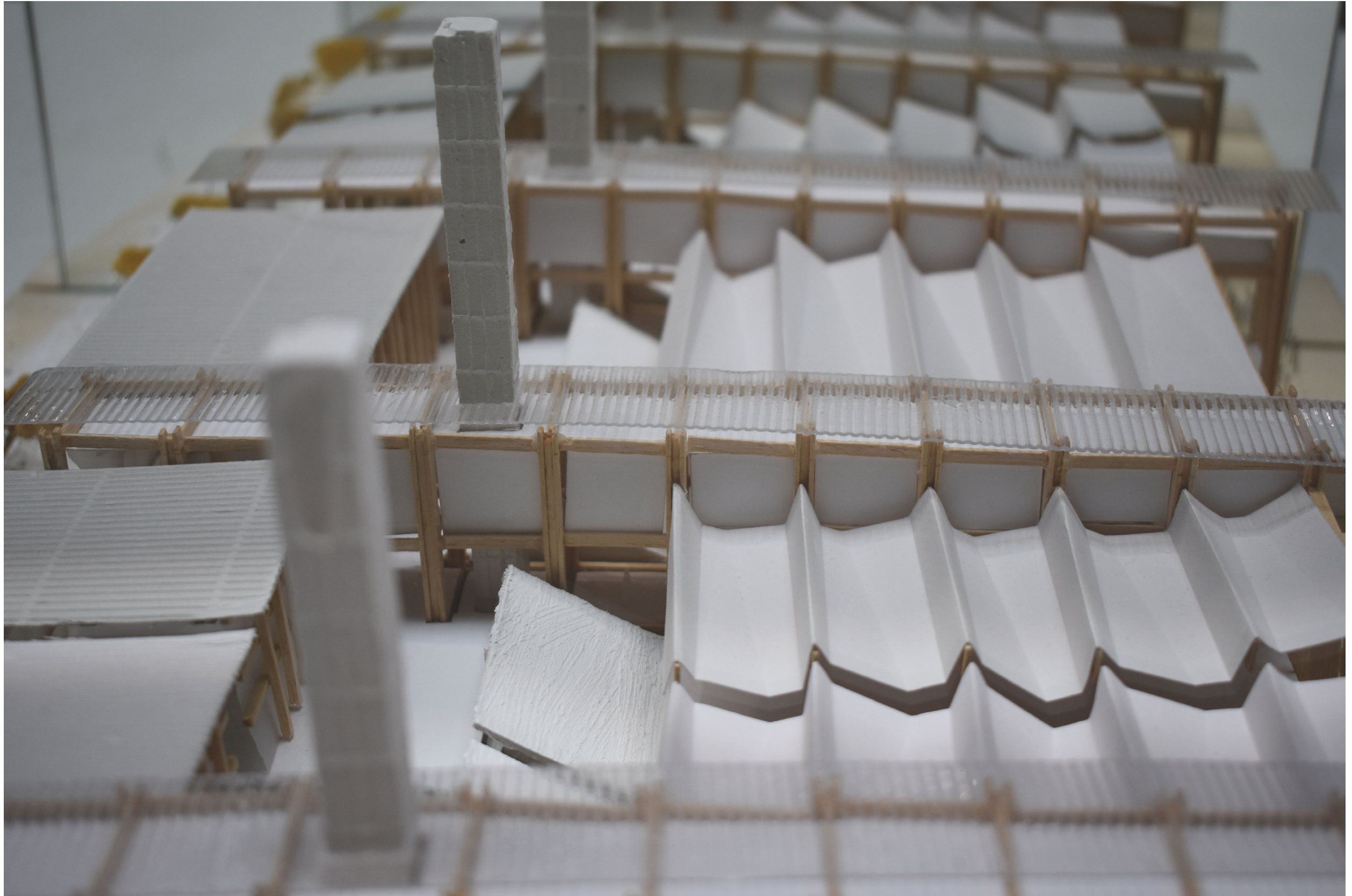
A image of reality
1:200

Narrative



A Heterotopia
1:200

Narrative



Of a seemingly infinite city
1:200

Narrative



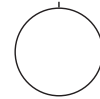
15km of timber creating a boundary
1:200



Research:

*Invisible cities:
Tracing Water,
Weaving Power,
Sewing Doubt*

1. Global Context
2. Tracing Water in Xinjiang
3. Weaving Powers of cotton
4. Sewing Doubt in practice



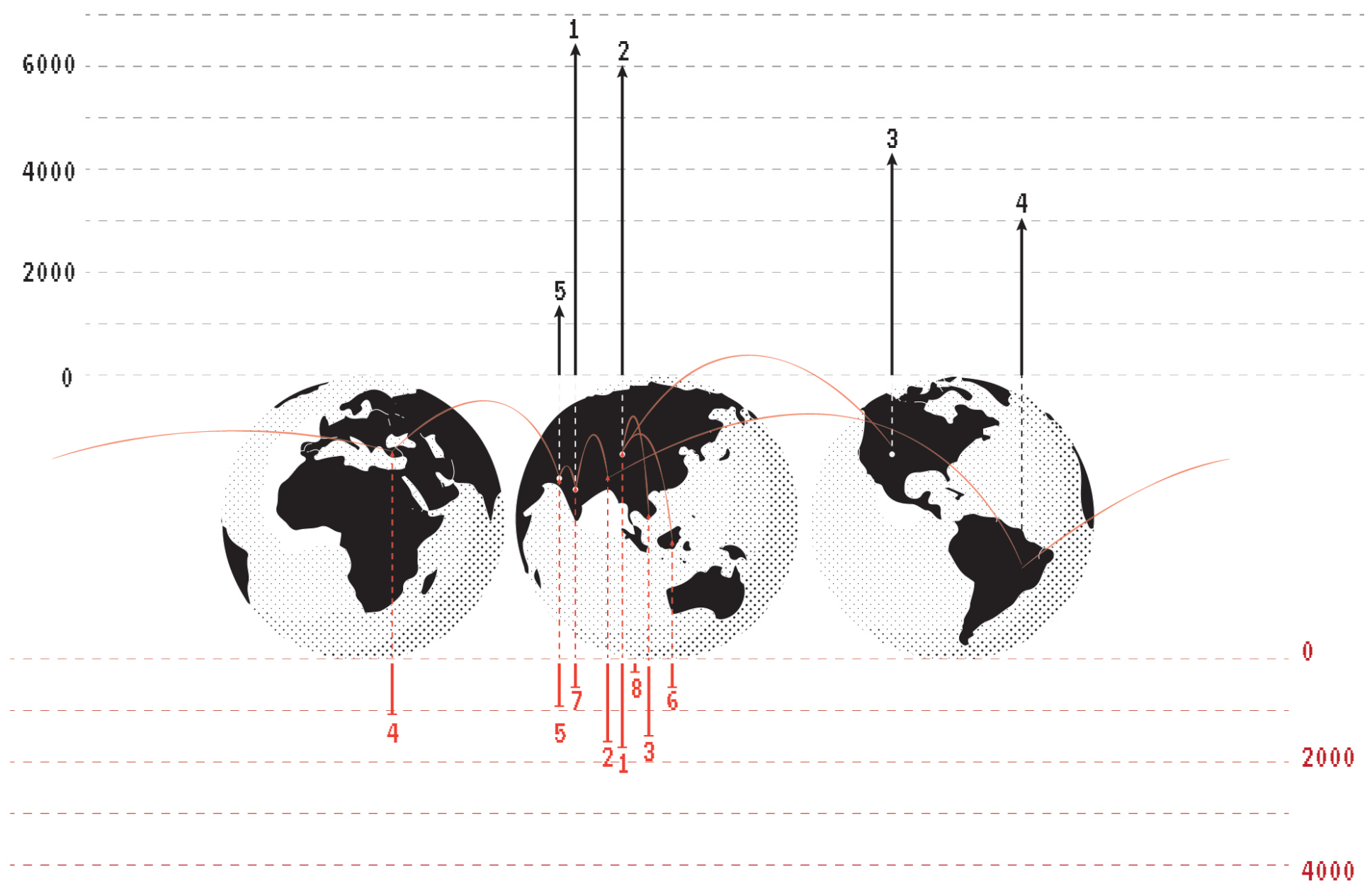
Design:

A Visible City

*The Image of Sustainability
Promise of production*

1. The city is visible
2. The city is the image of sustainability
3. The city is a kit of parts
4. The city is a factory line
5. The city is the promise of production

A Global Context



China's global cotton monopoly

A Global Context



T-shirt. PPE Masks. Sanitary Items. Makeup wipes. Pillow Covers. Duvet Covers.
Bed Sheets. Coffee Filters. Denim. Flannel. Canvas. Damask. Socks. Underwear.
Book Binding. Home Furniture. Curtains. Rugs. Upholstery. Cotton Seed. Fish Nets.
Medical wipes. Cotton ear buds. Cotton Balls. Hospital Gowns. Wound Dressing.
Insulation. Backpacks. Hats. Oven Mitts. Placements.

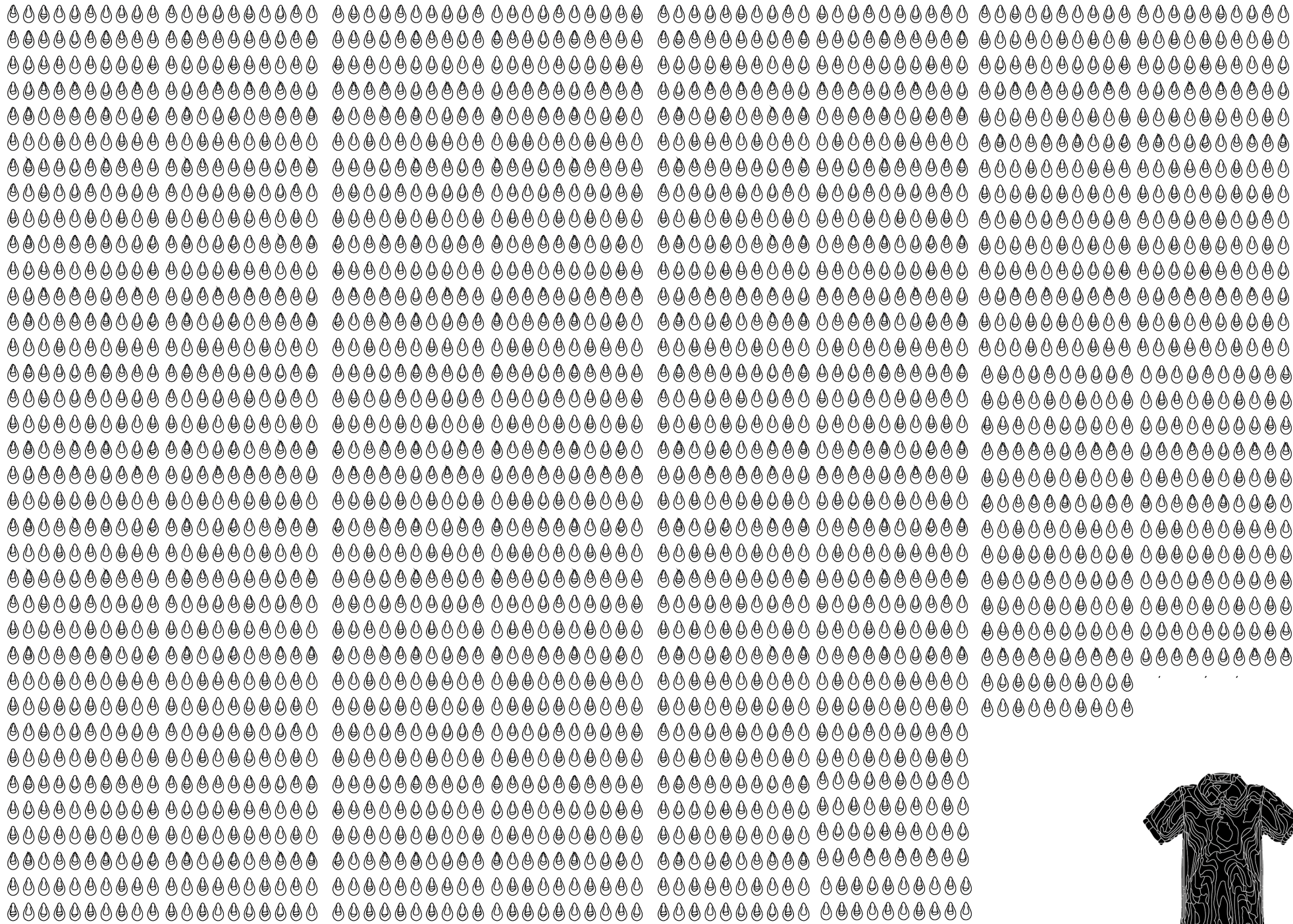
Pervasive and Insidious: 1 in 5 cotton products in the world can be traced to the production region of Xinjiang (GlobalData, 2020).

A Global Context



Boarders and Territory

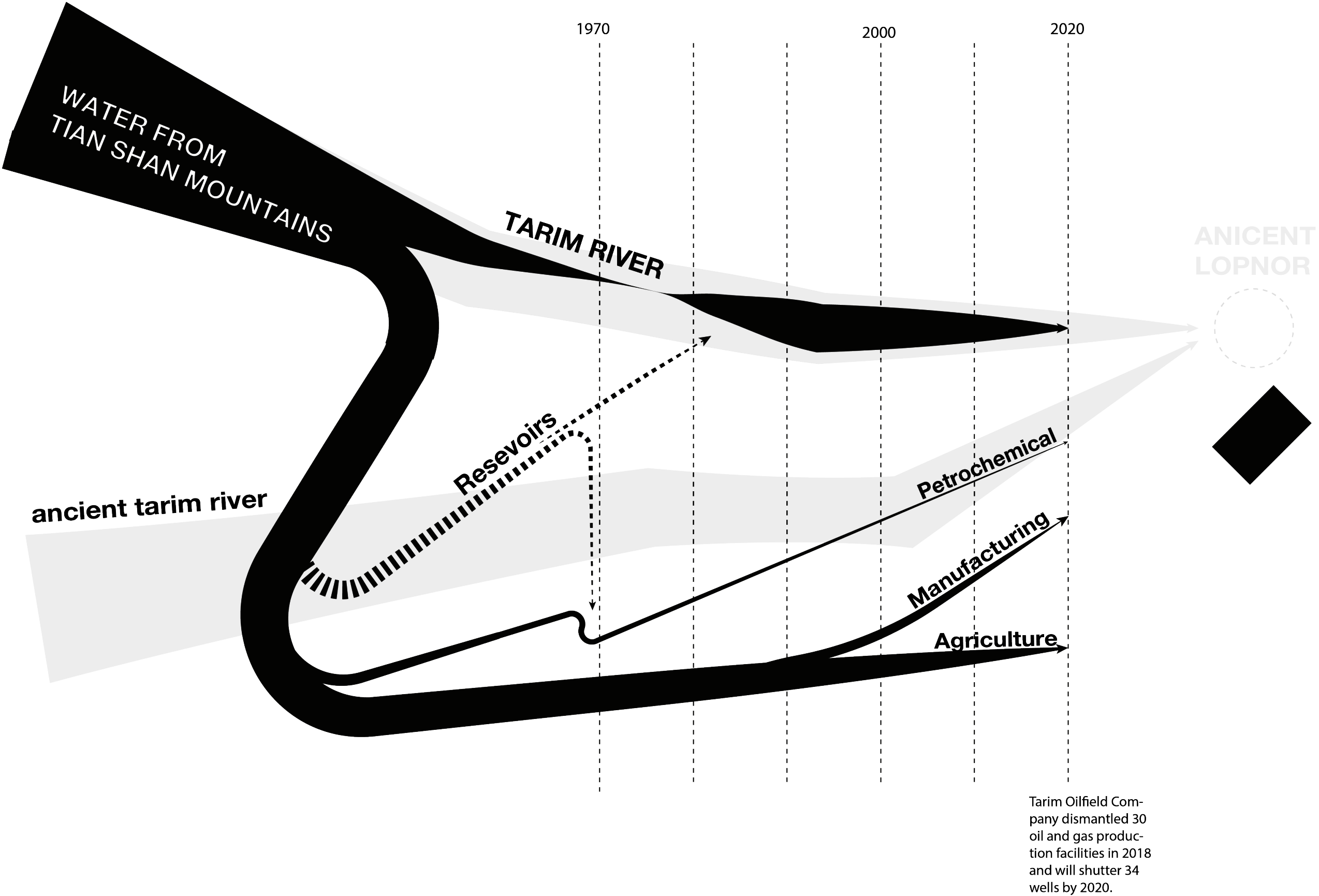
Tracing Water - Weaving Power - Sewing Doubt



1Tshirt = 2700 litres of water

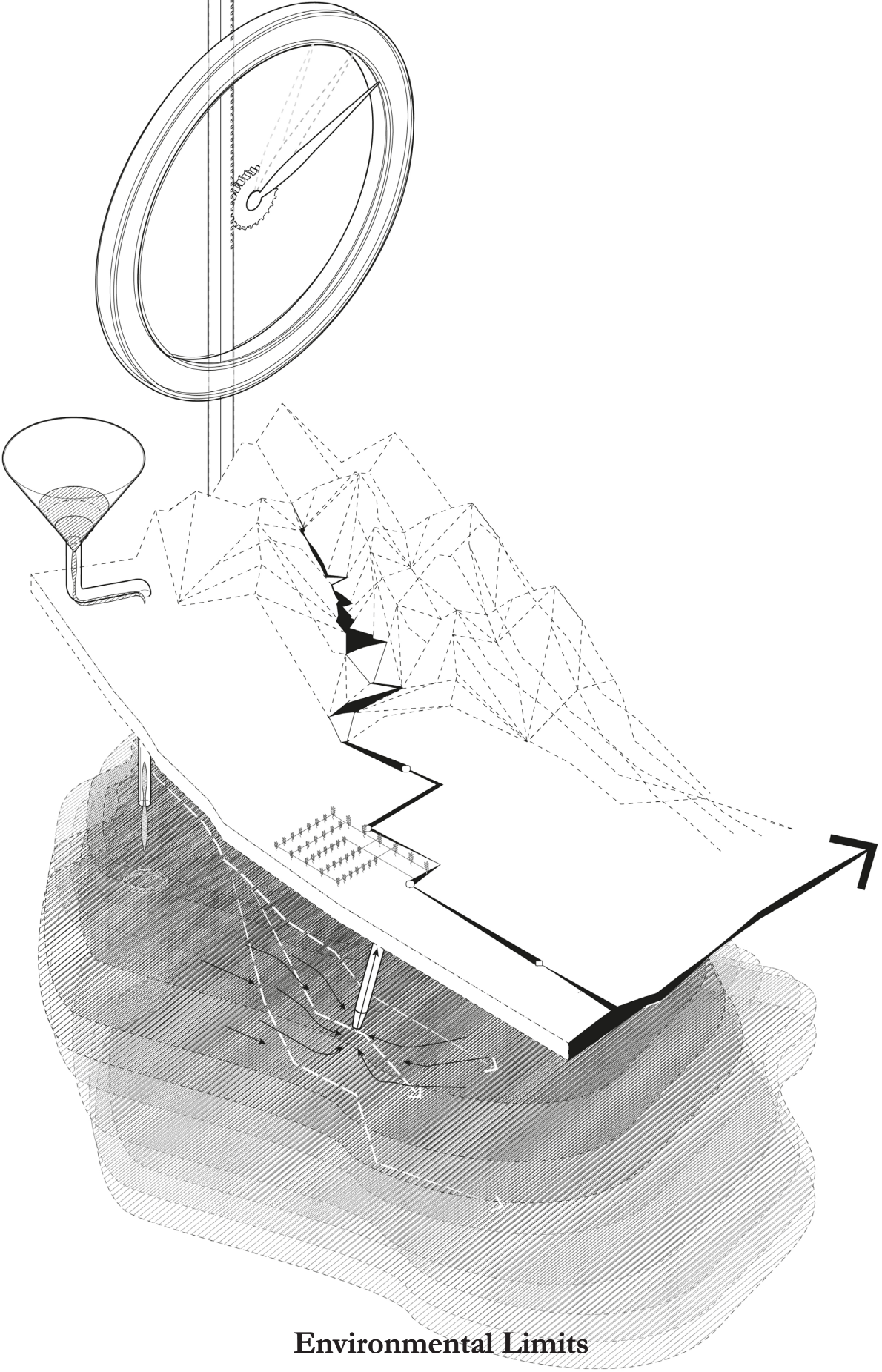
**Paradox: Over a third of the Tarim River Basin faces ‘extremely high’ water stress
(China Water Risk, 2017)**

Tracing Water - Weaving Power - Sewing Doubt



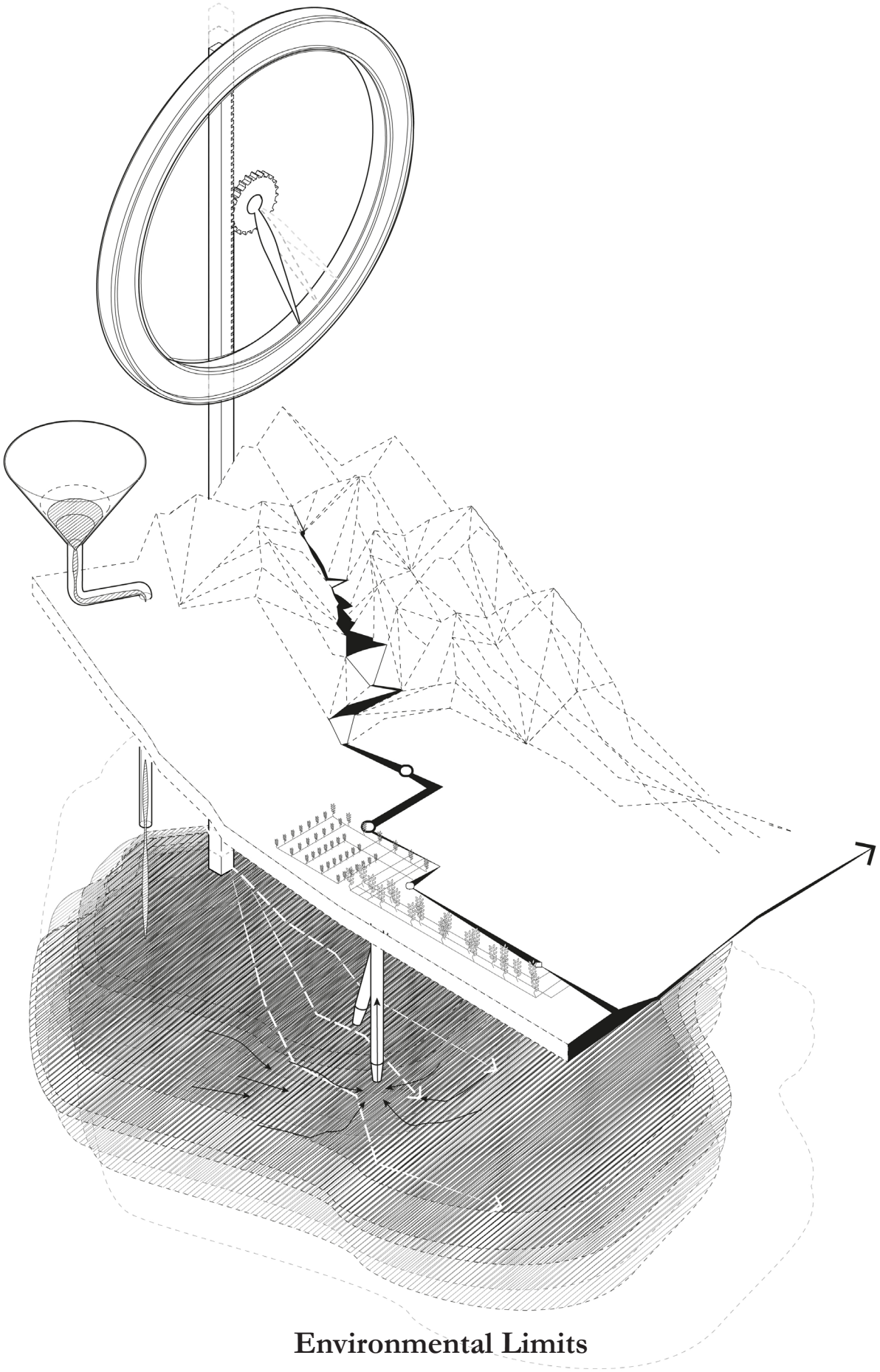
Modern History of the Tarim River

Tracing Water - Weaving Power - Sewing Doubt

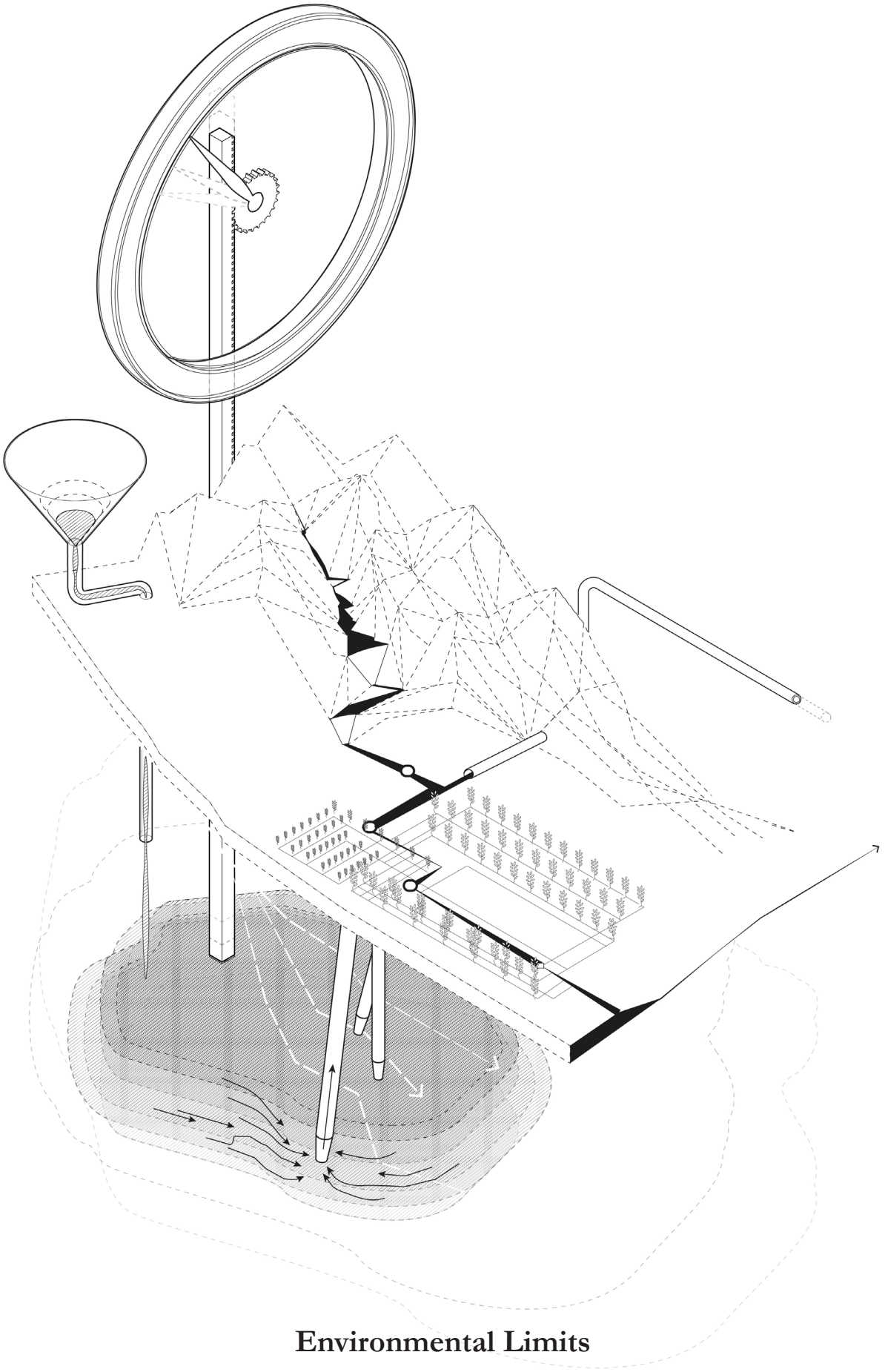


Environmental Limits

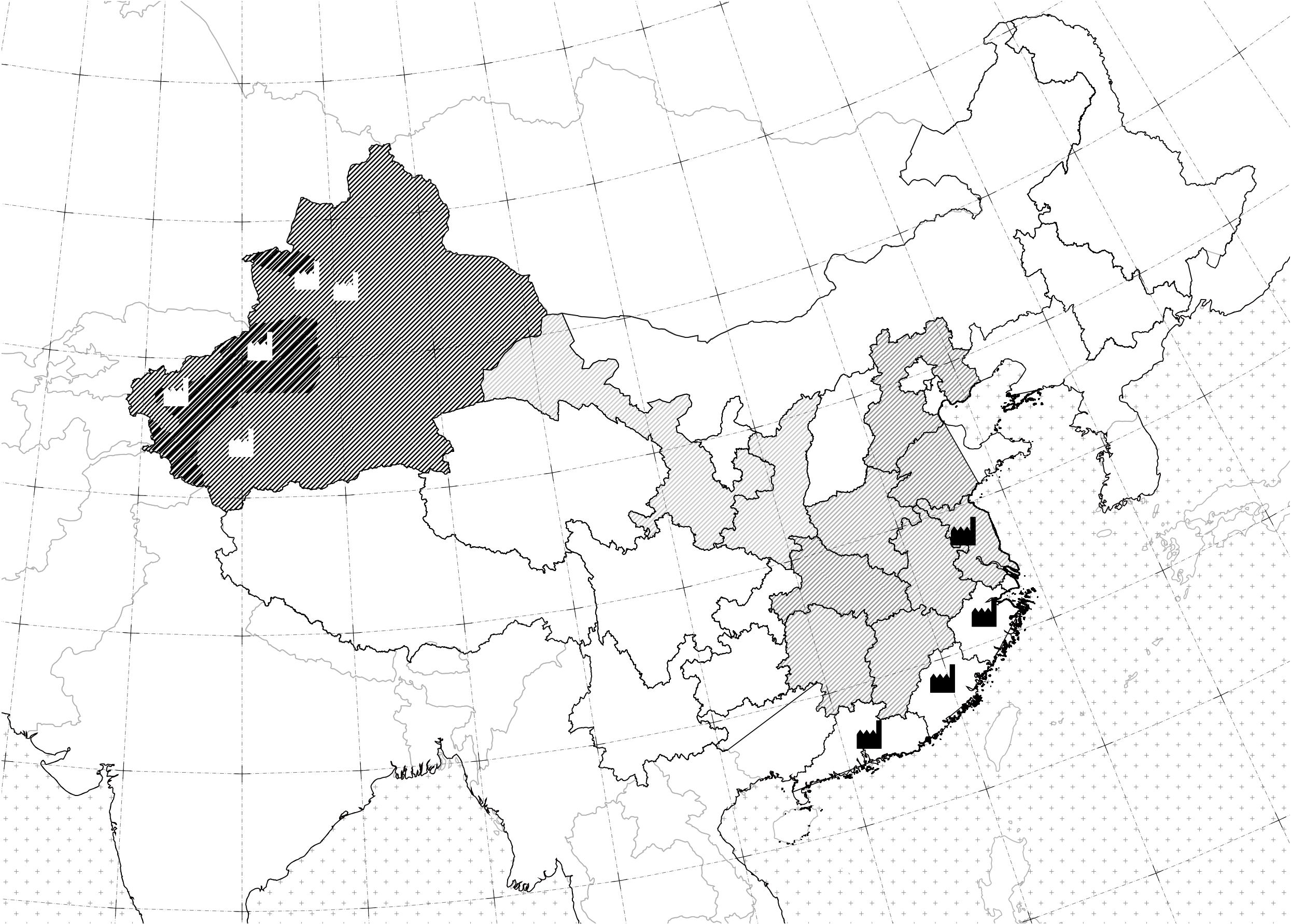
Tracing Water - Weaving Power - Sewing Doubt



Tracing Water - Weaving Power - Sewing Doubt

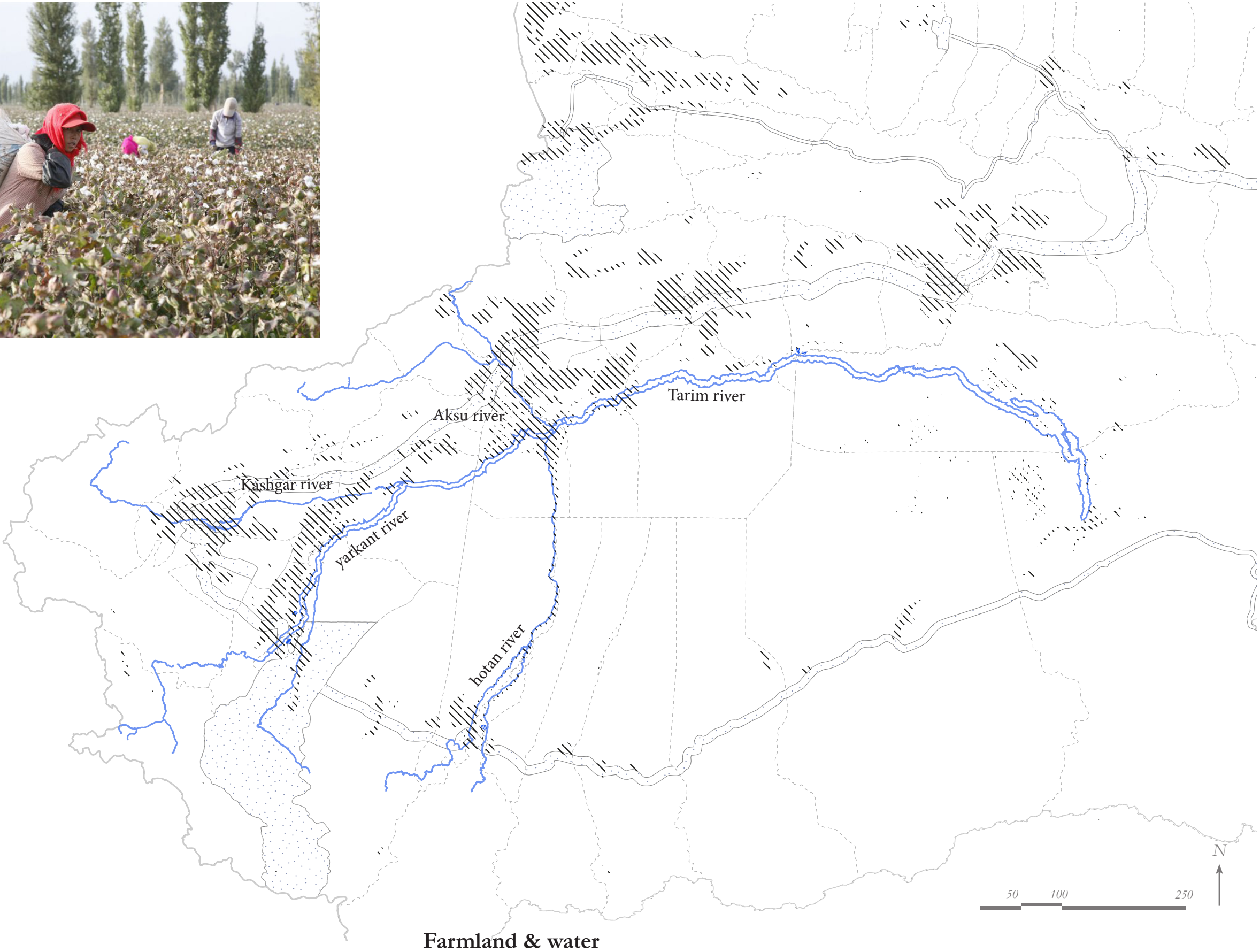


Tracing Water - Weaving Power - Sewing Doubt

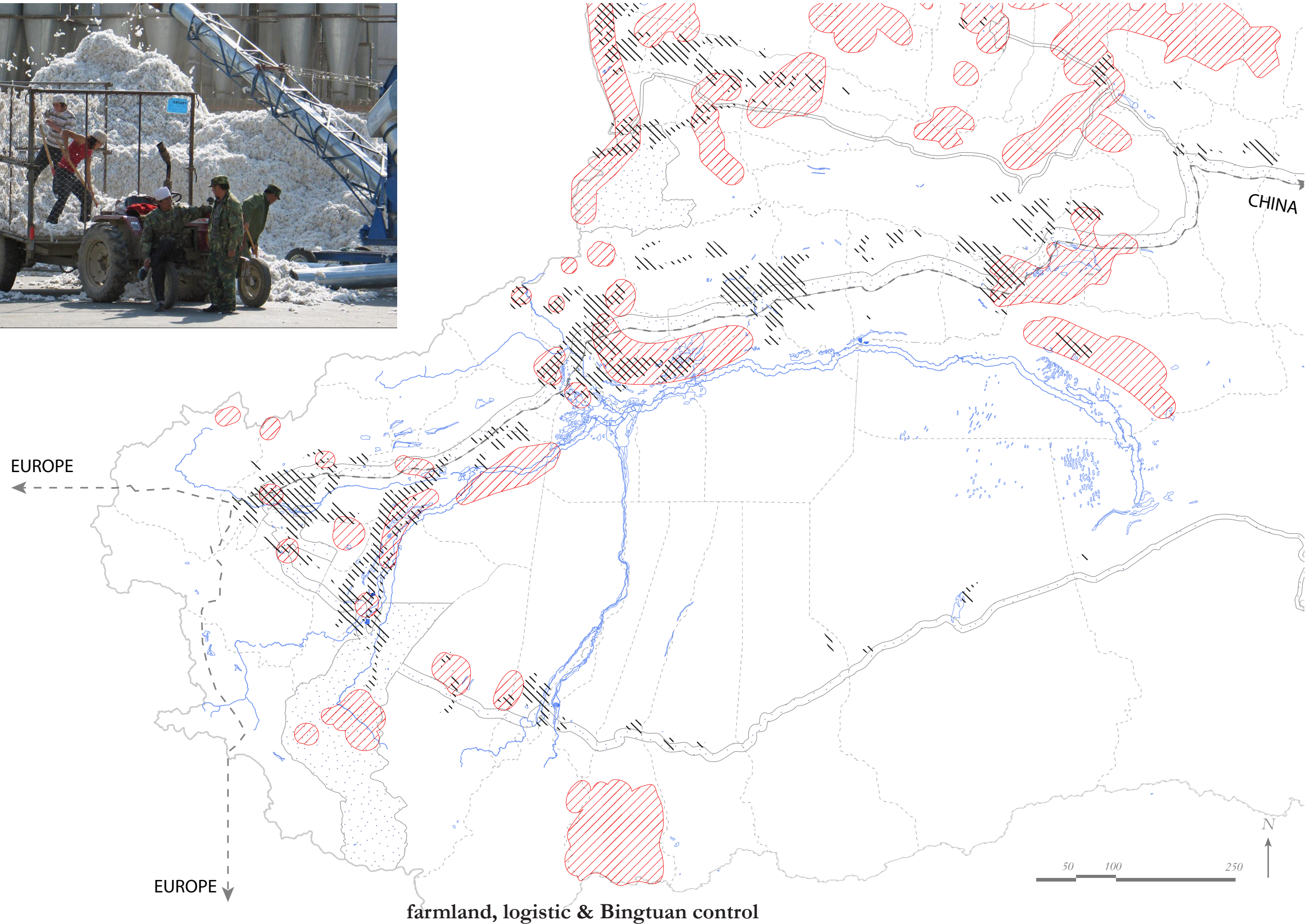


Following the Cotton: Factories move East to West

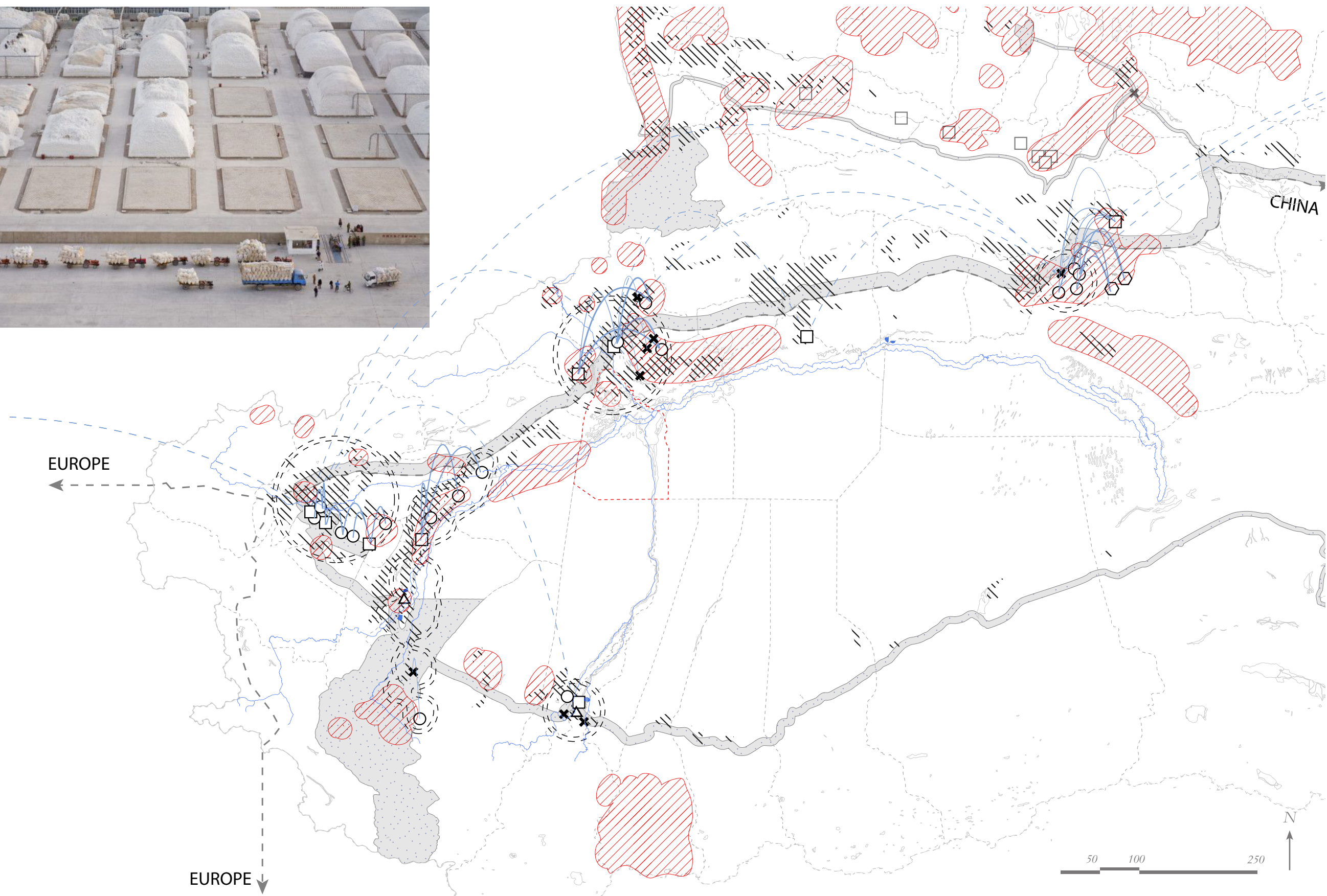
Tracing Water - Weaving Power - Sewing Doubt



Tracing Water - Weaving Power - Sewing Doubt



Tracing Water - Weaving Power - Sewing Doubt



Farmland, textile industry & bingtuan control

Tracing Water - Weaving Power - Sewing Doubt



farmland, textile industry & Bingtuan control



BBC BBC

UK business 'must wake up' to China's Uighur cotton slaves

UK business 'must wake up' to China's Uighur cotton slaves ... The call comes in the aftermath of a BBC investigation. ... do not use raw cotton from Xinjiang, while Burberry said they do not use any cotton from China at all.

16 Dec 2020



CD China Daily

West using lies to smear Xinjiang cotton - Chinadaily.com.cn

Falsely accusing the Chinese authorities of using "slave labor" for picking cotton in the Xinjiang Uygur autonomous region, some Western ...

4 weeks ago



Tracing Water - Weaving Power - Sewing Doubt

Lifting out of poverty



What does coerced labour look like ?

Programme to lift out of poverty

Narrative



Research:

*Tracing Water,
Weaving Power,
Sewing Doubt*

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Design:

A Visible City

*The image of Sustainability
Promise of production*

- 1.The city is visible
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Visible - Sustainable - Kit of parts - Factory line- Promise

The city is designed to be
VISIBLE

Visible - Sustainable - Kit of parts - Factory line- Promise



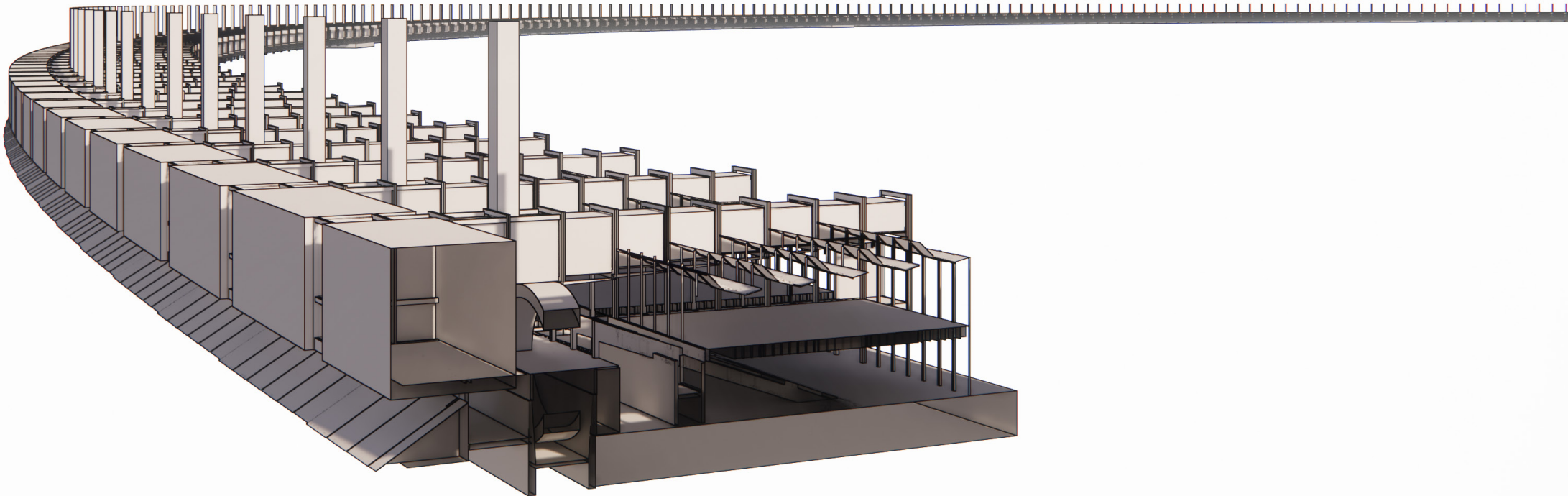
Industrial Production & (the Human Element)

Visible - Sustainable - Kit of parts - Factory line- Promise



Reassembled as a single city: A a single narrative

Visible - Sustainable - Kit of parts - Factory line- Promise

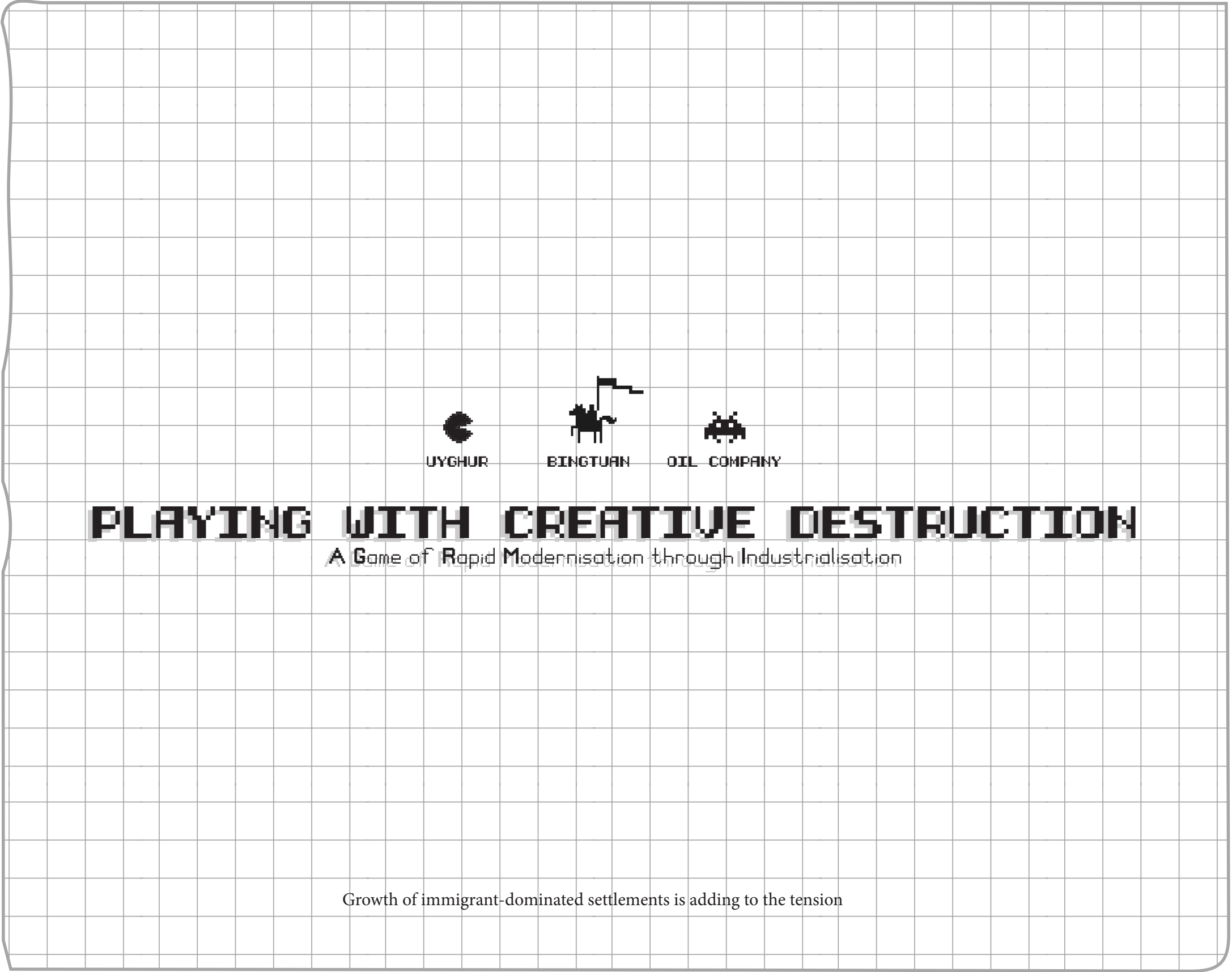


OPTIONS	Radius 1	Total Area	Acres	Hecres	Cotton kg	Water needed litres 180	water needed per day	Water needed m3	Cistern Area	Shirts and Jeans
1	1000	2356194	582	236	405024	3240194272	18001079	18001	9001	405
2	1700	8293805	2049	829	1425685	11405483838	63363799	63364	4224	1426
3	2500	18849556	4658	1885	3240194	25921554178	144008634	144009	9601	3240
1 FARM				870	1495530	11964240000	66468000	66468	5539	1496

15km of city encasing 3x cotton fields

Visible - Sustainable - Kit of parts - Factory line- Promise

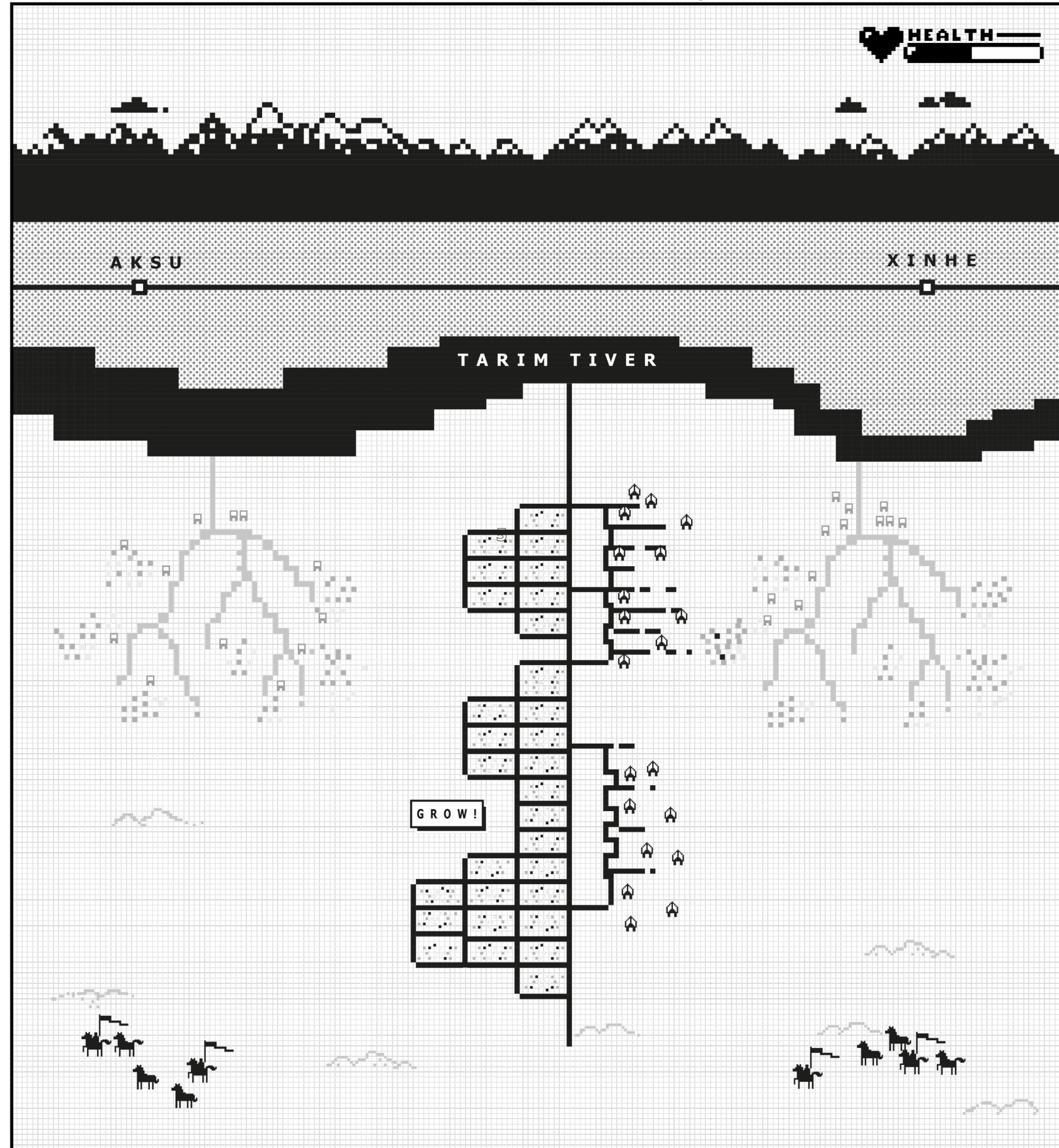
The city is designed as
THE IMAGE OF SUSTAINABILITY



Modernisation through water infrastructure

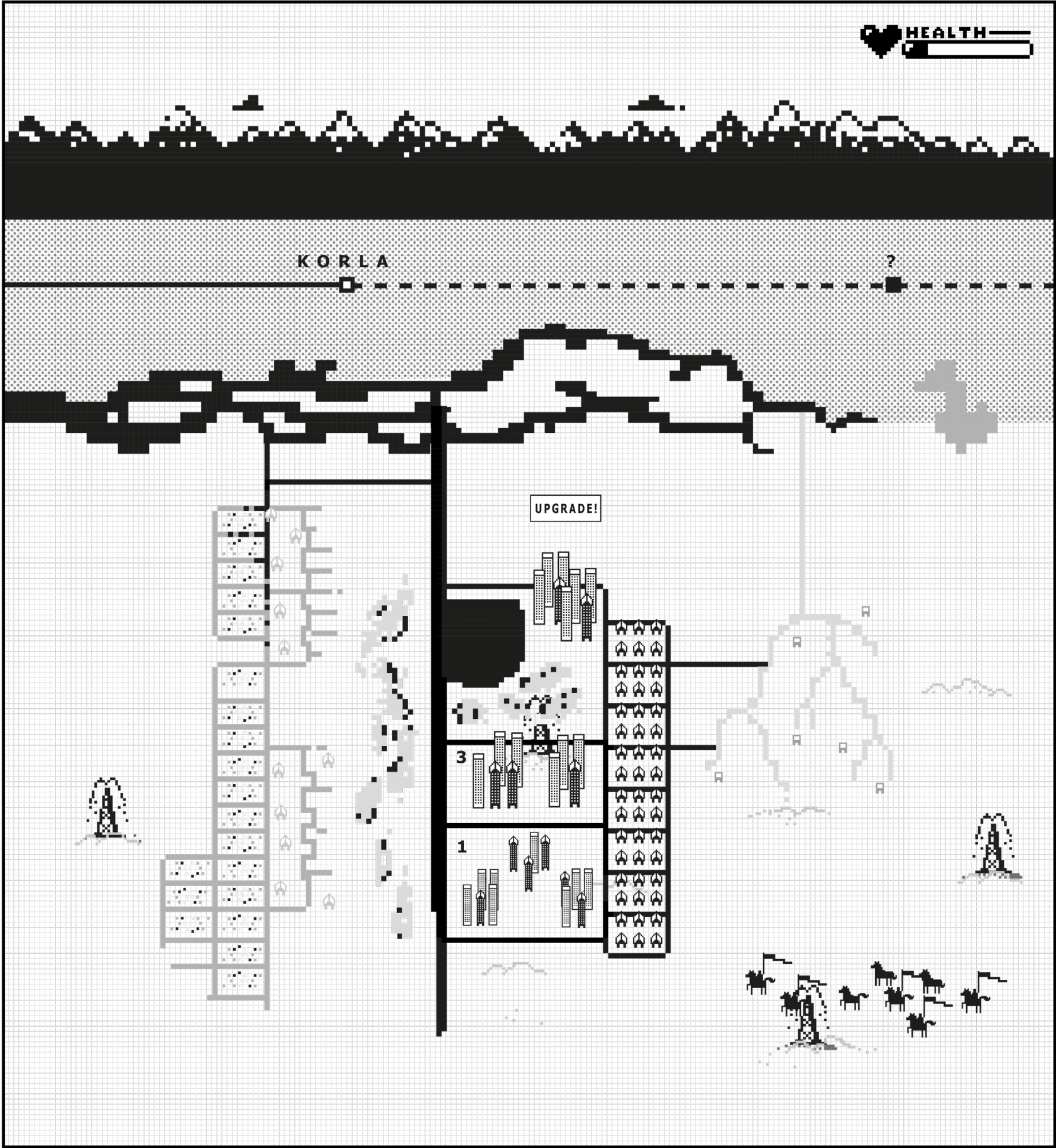


Visible - Sustainable - Kit of parts - Factory line- Promise



XPCC has embarked on a “developing the south” campaign to speed up building cities and factories in southern Xinjiang, where the population has been predominantly Uyghur

Visible - Sustainable - Kit of parts - Factory line- Promise



Visible - Sustainable - Kit of parts - Factory line- Promise



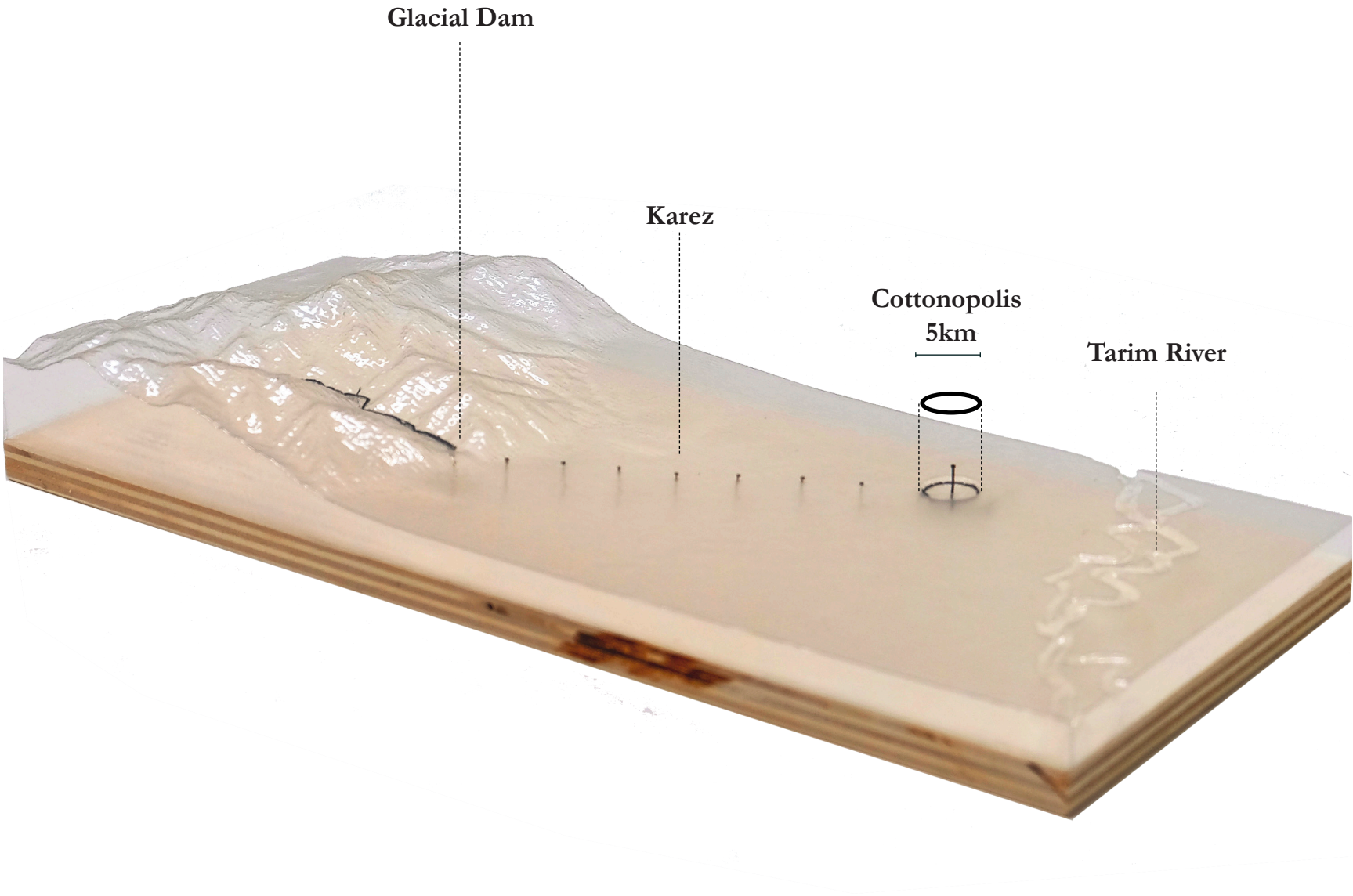
Glacial Dams

Visible - Sustainable - Kit of parts - Factory line- Promise



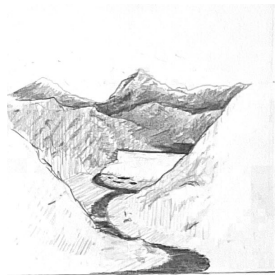
Inefficiently sustaining agricultural industry

Visible - Sustainable - Kit of parts - Factory line- Promise

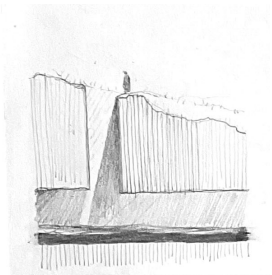


Modernise the Karez System
Model 1: 250,000

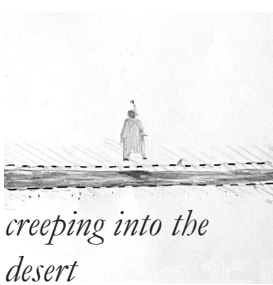
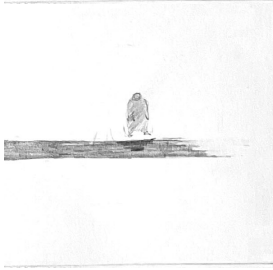
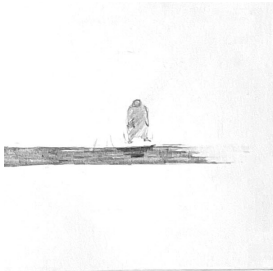
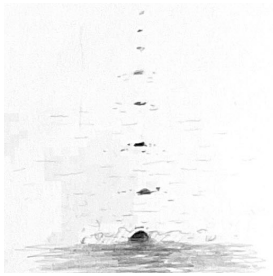
Narrative



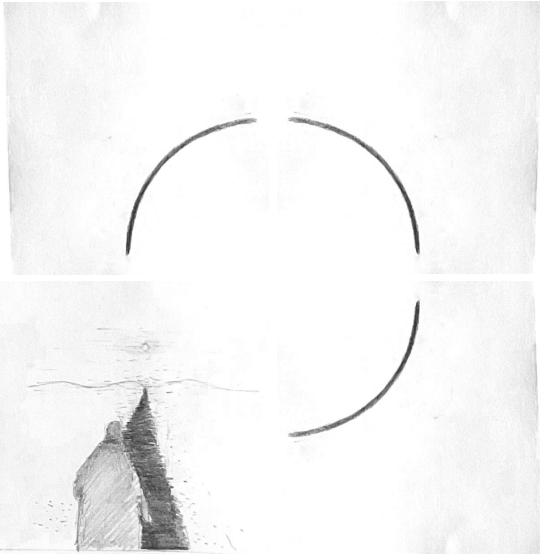
*glacier melt water
held in reservoirs*



*recharges into karez,
so once more water
flows through the
undergorund system*

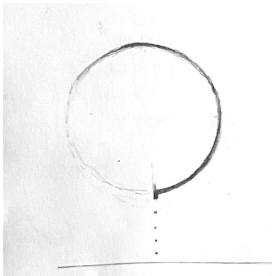


*creeping into the
desert*

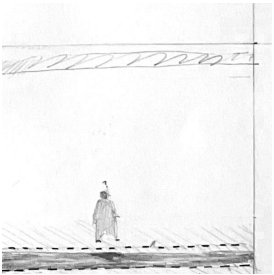


*it looked like it
would have gone on
forever...*

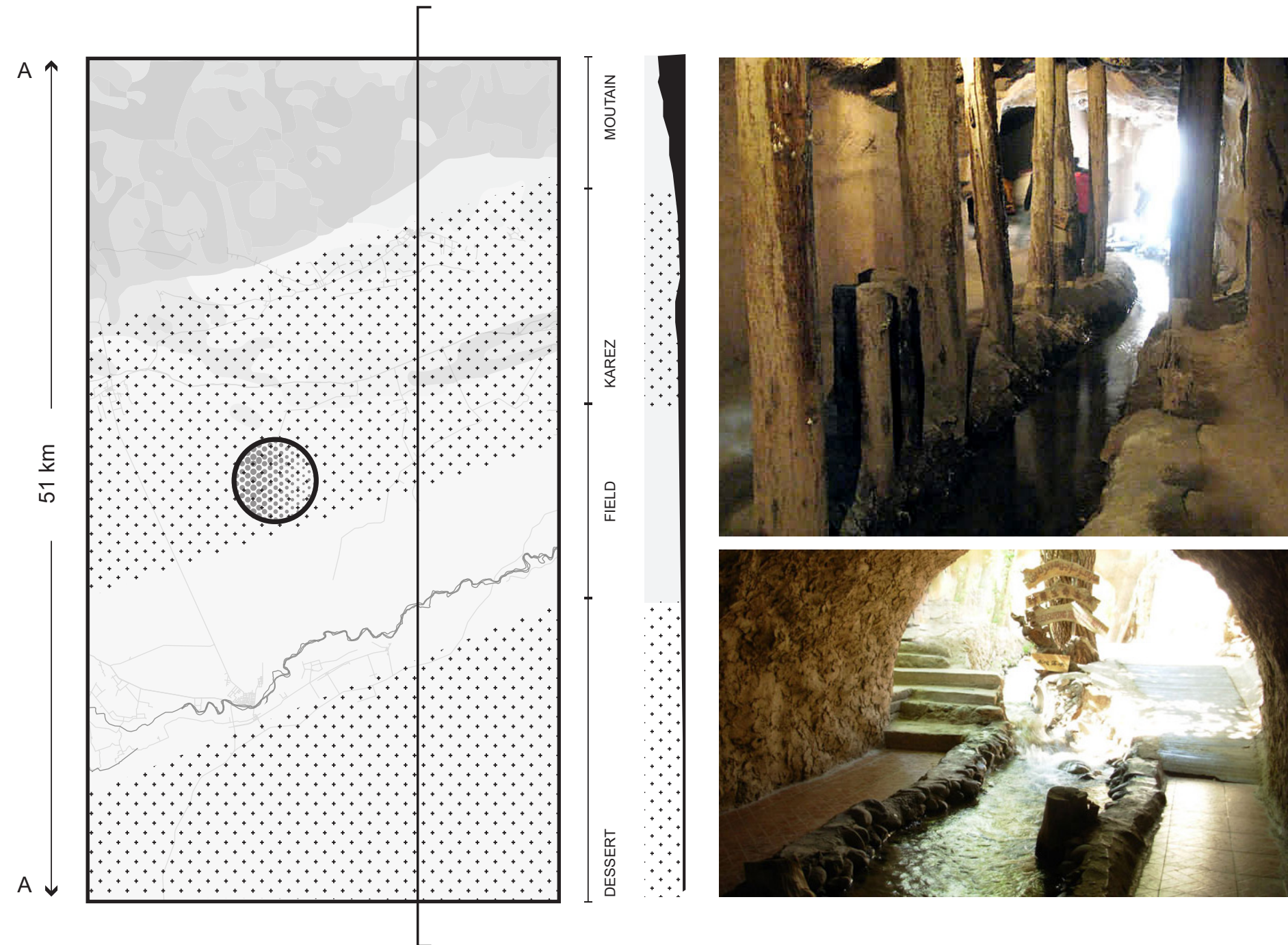
*but flying above the
desert, you could see
its true form circling
back on itself*



*a circle of water
encased by city*



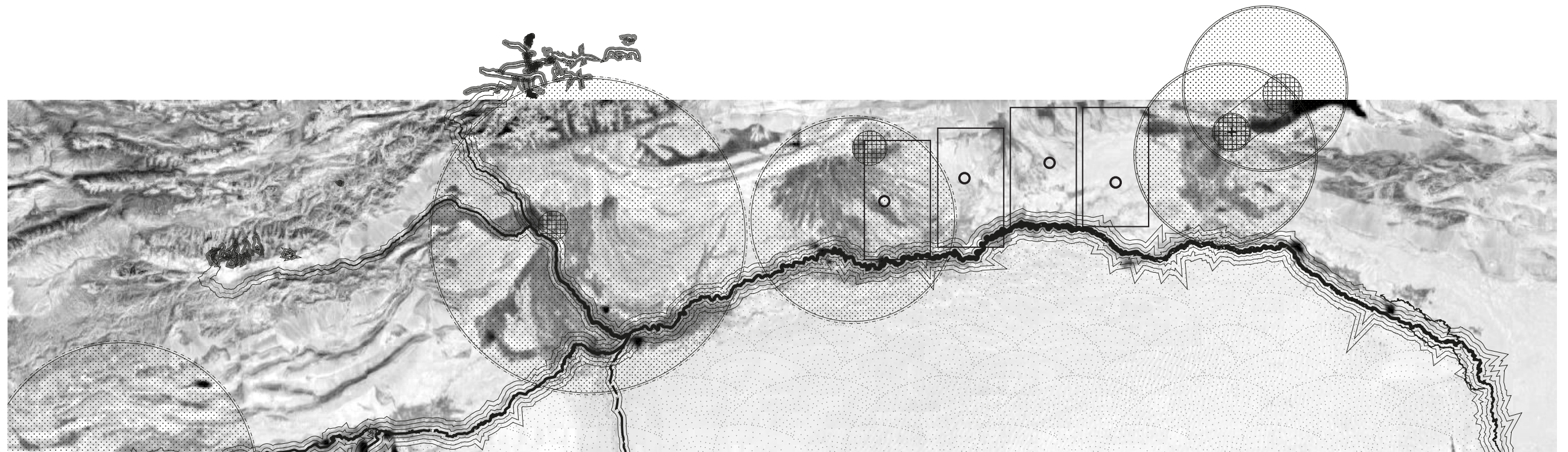
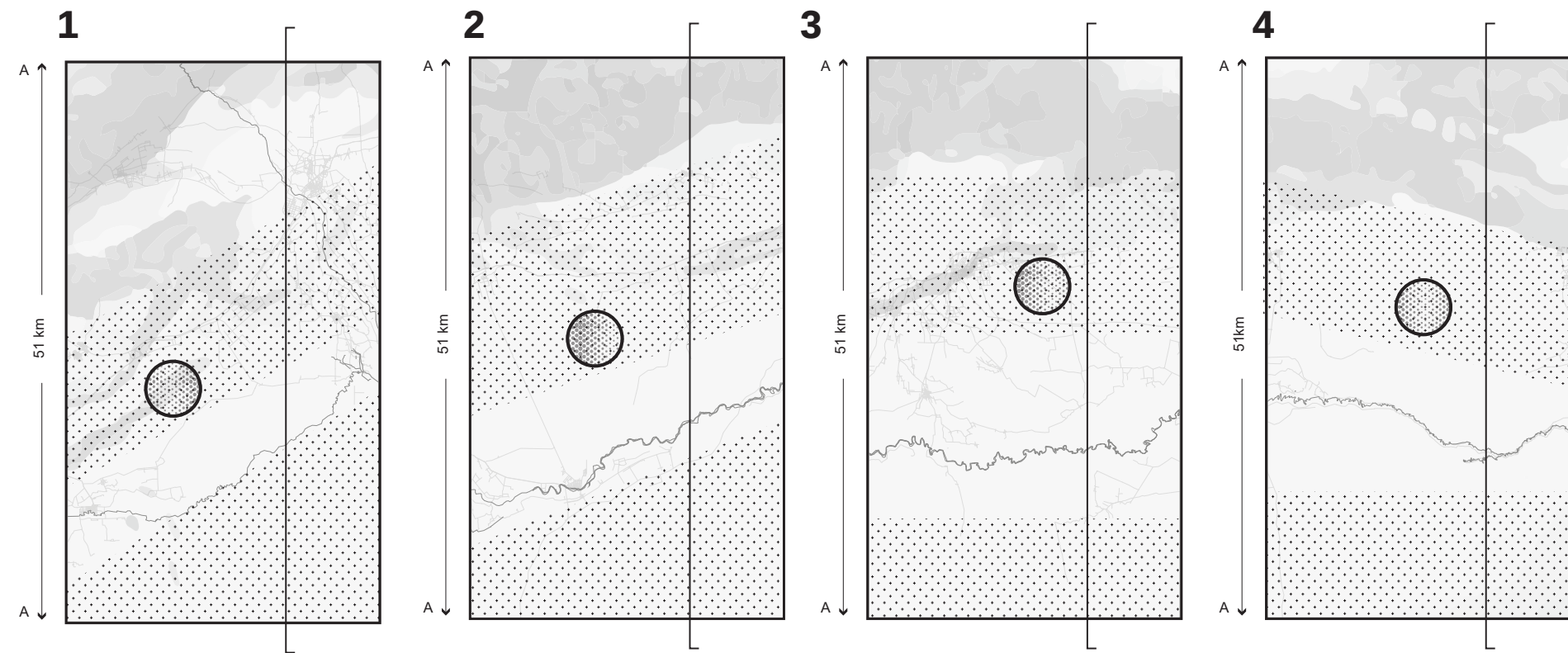
Visible - Sustainable - Kit of parts - Factory line- Promise



1:10000

Utilise the ancient Karez system

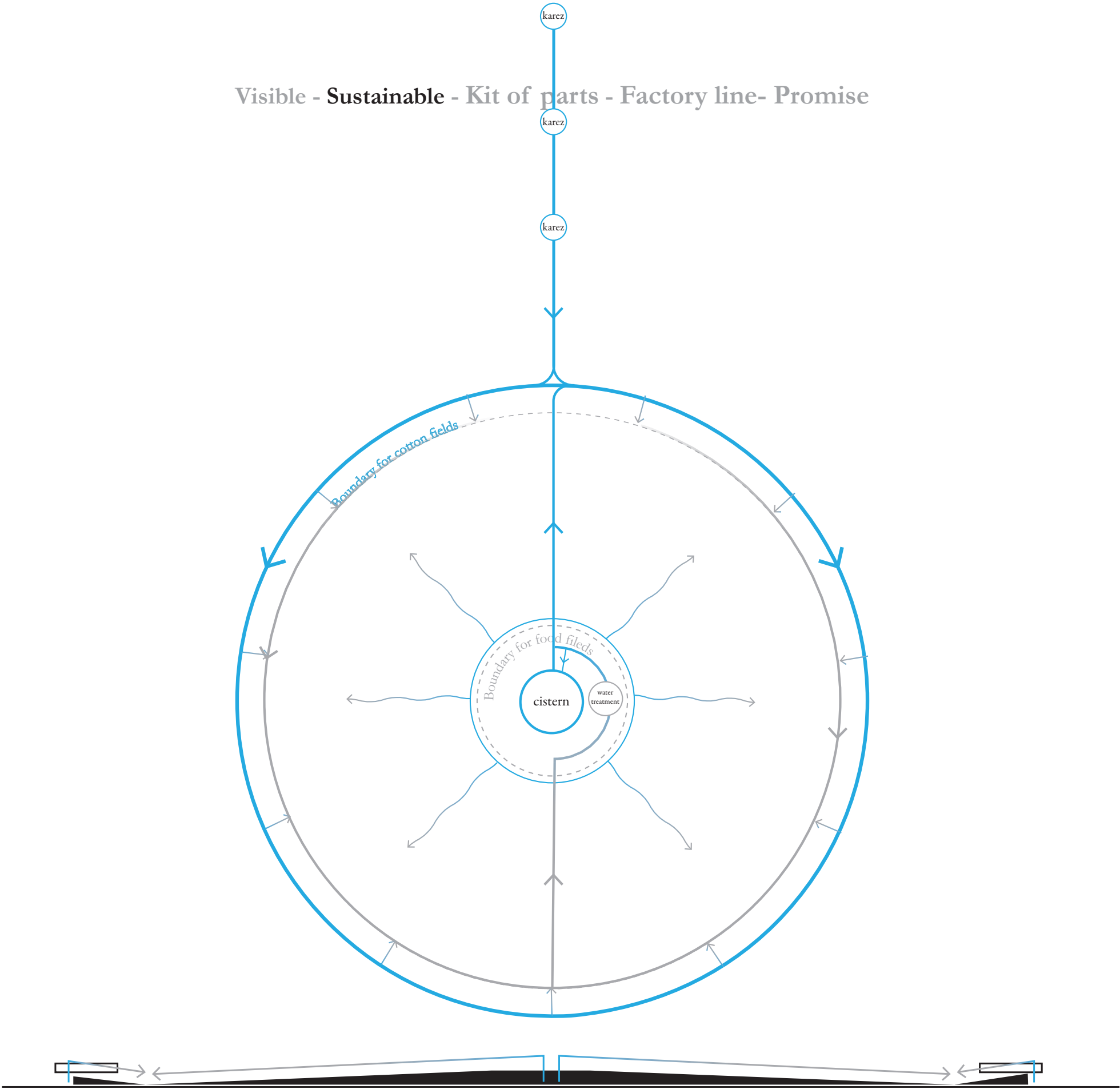
Visible - Sustainable - Kit of parts - Factory line- Promise



Many possible sites

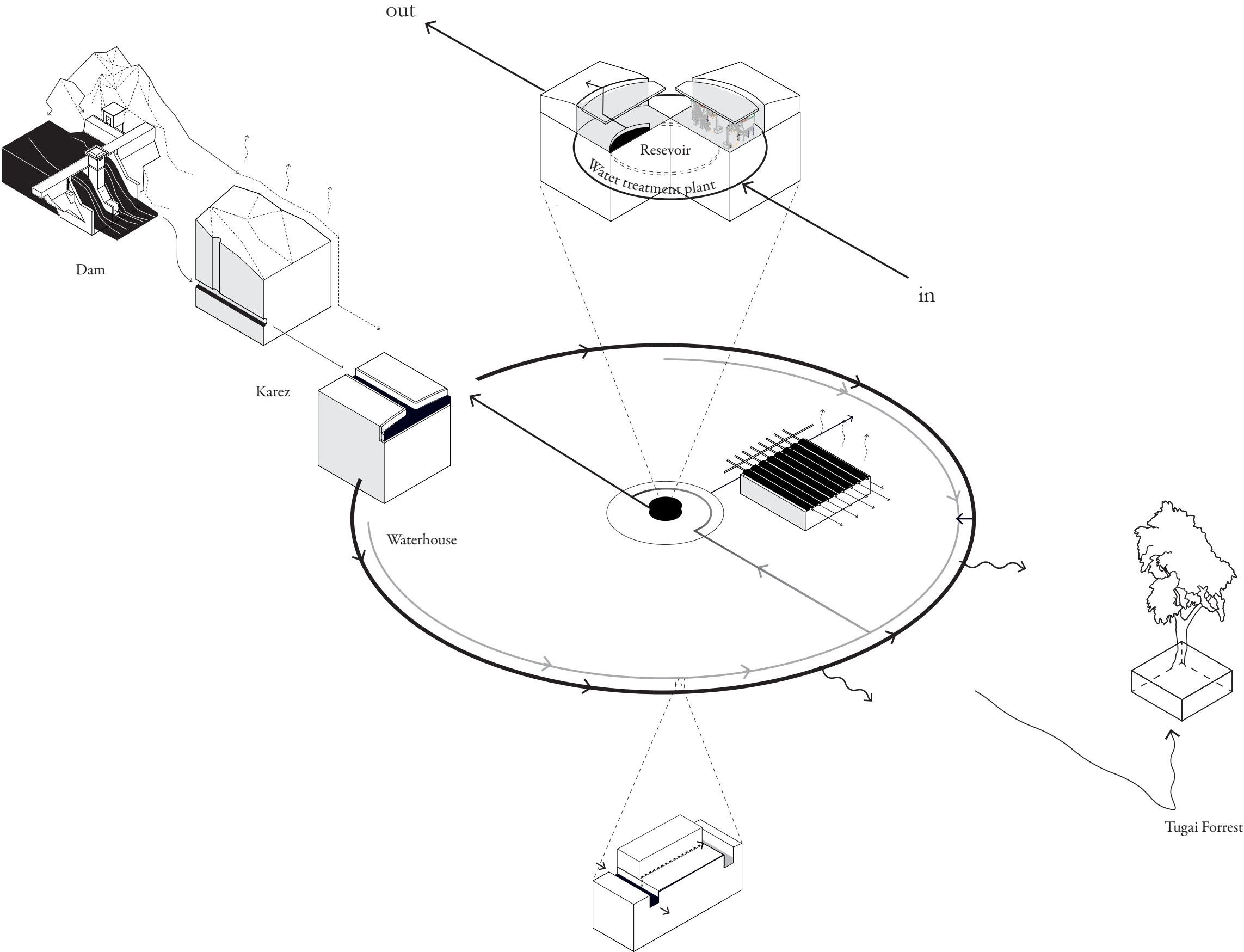
50km

Visible - Sustainable - Kit of parts - Factory line- Promise



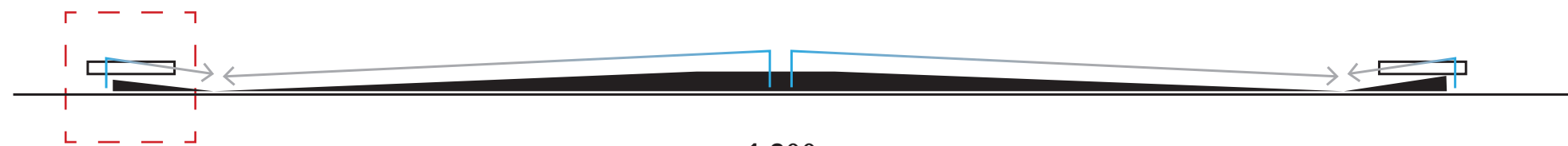
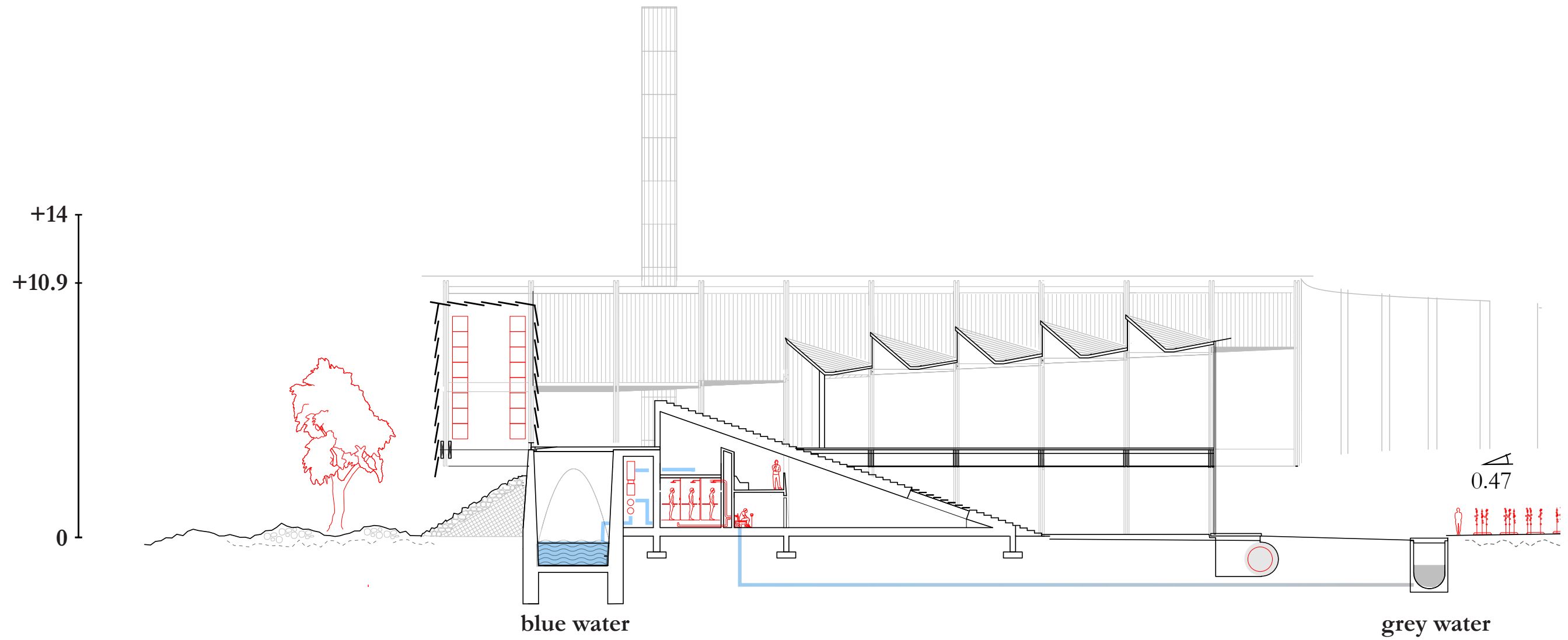
City is bound by water

Visible - Sustainable - Kit of parts - Factory line- Promise



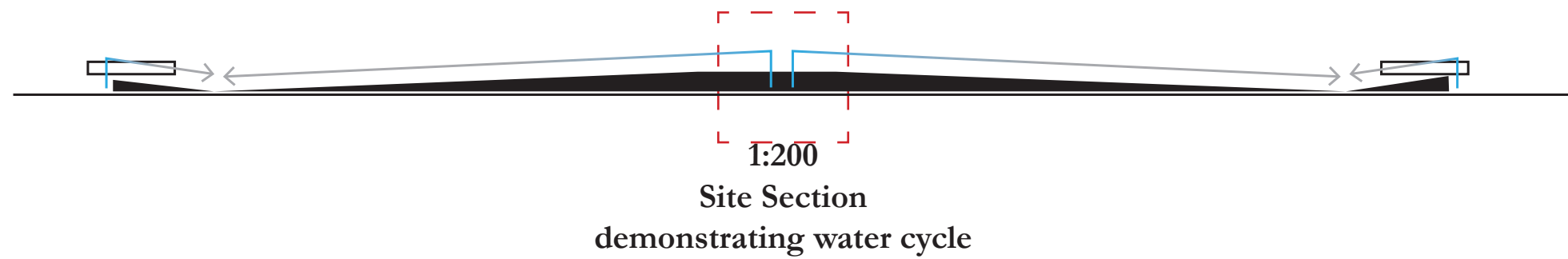
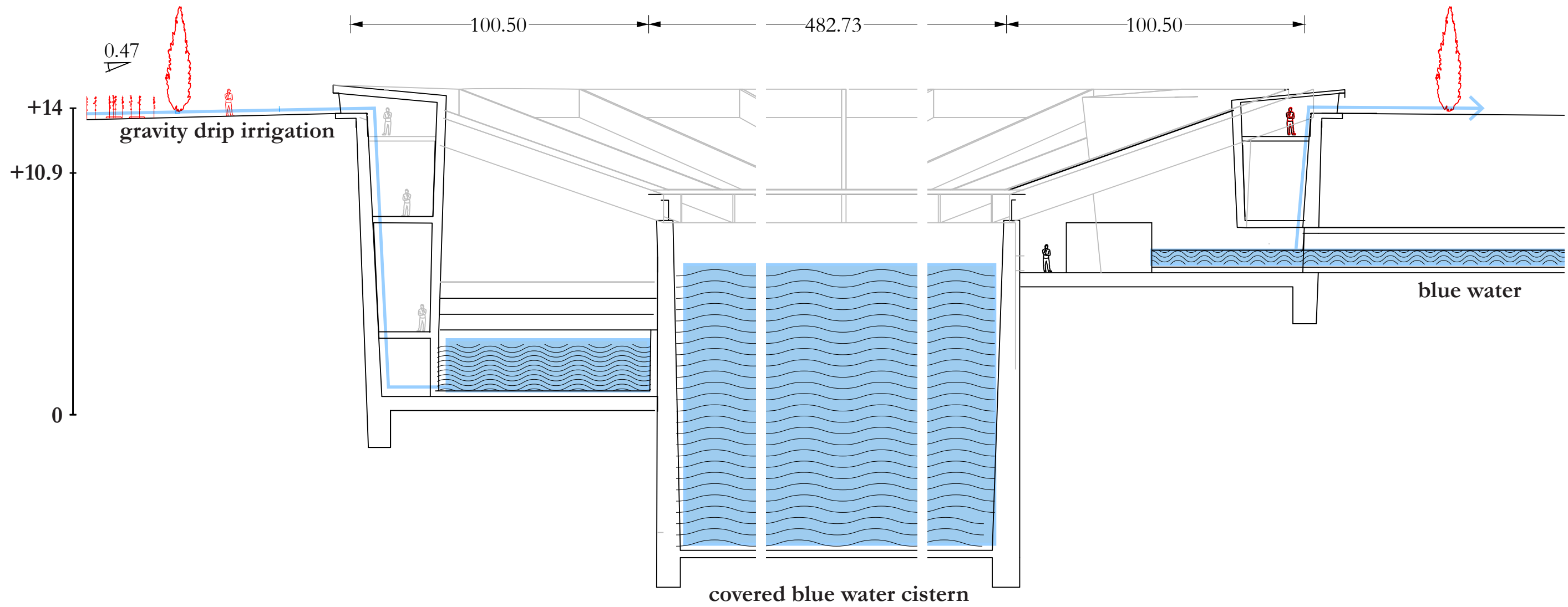
Retains, Recycles, Releases

Visible - Sustainable - Kit of parts - Factory line- Promise

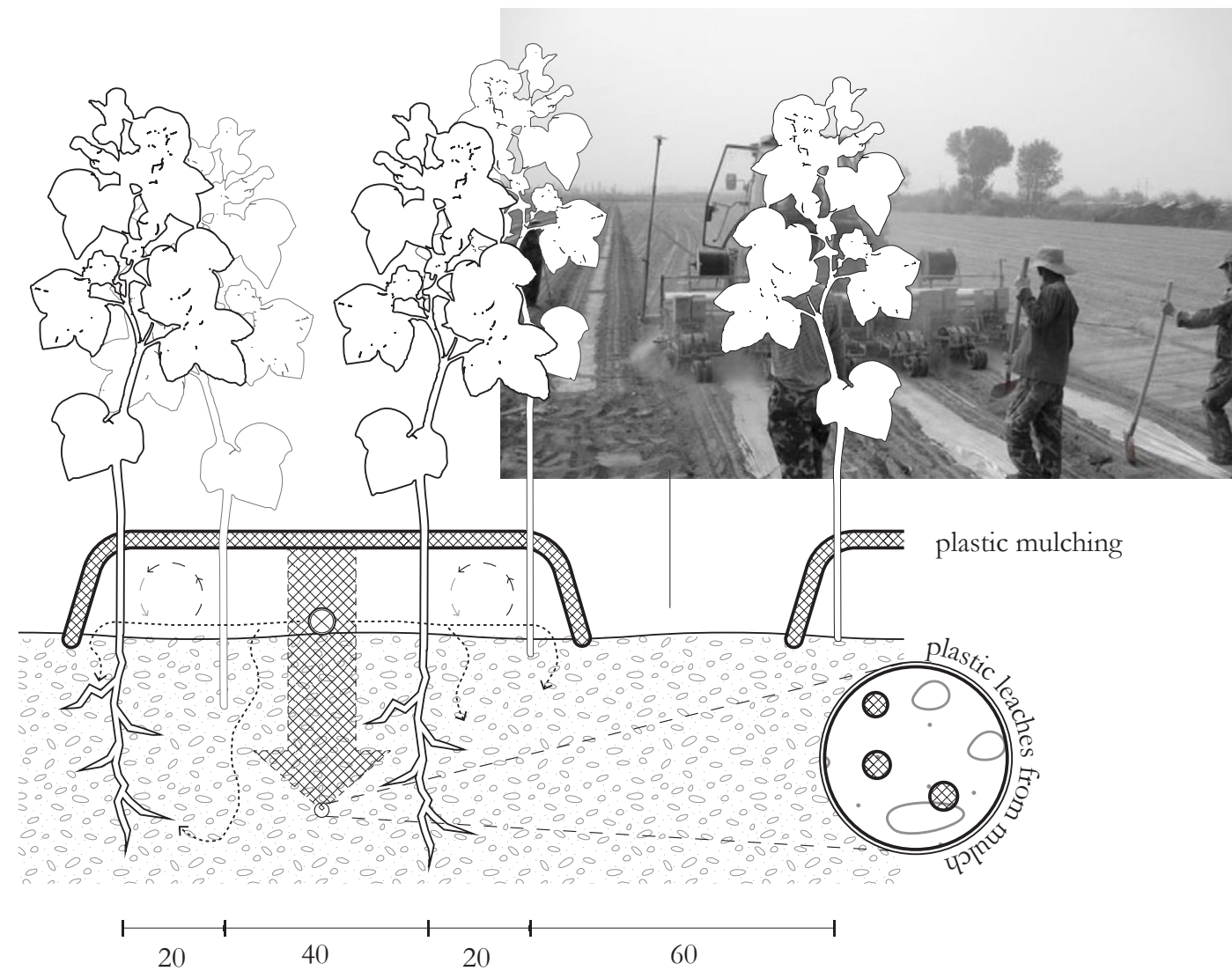


1:200
Site Section
demonstration water cycle

Visible - Sustainable - Kit of parts - Factory line- Promise



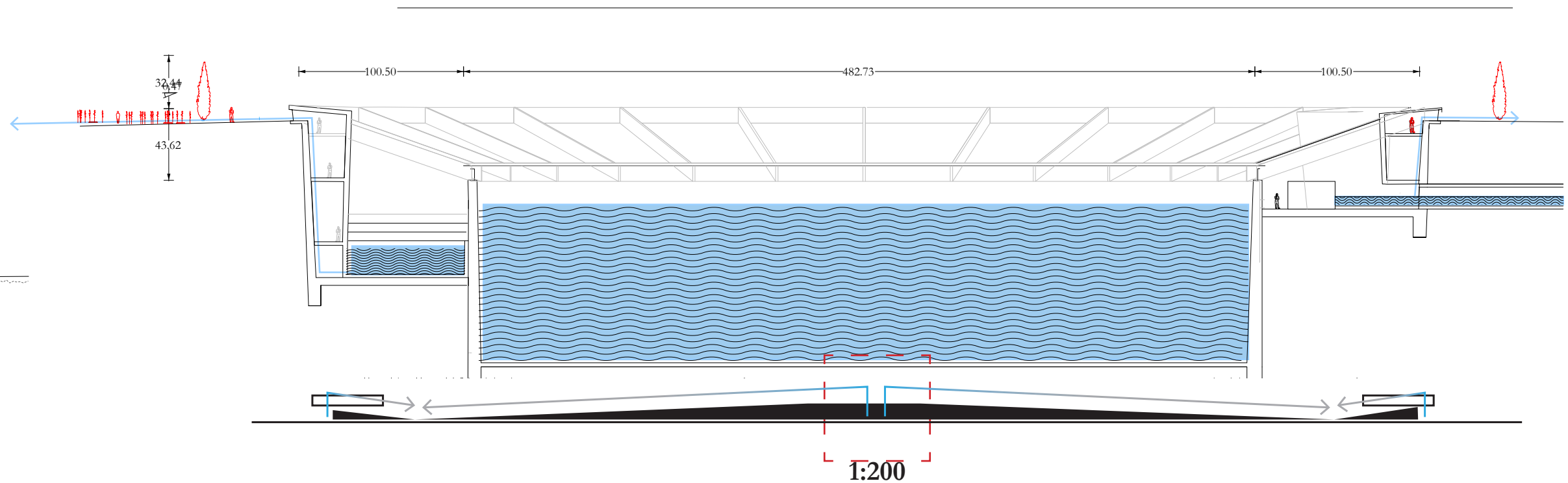
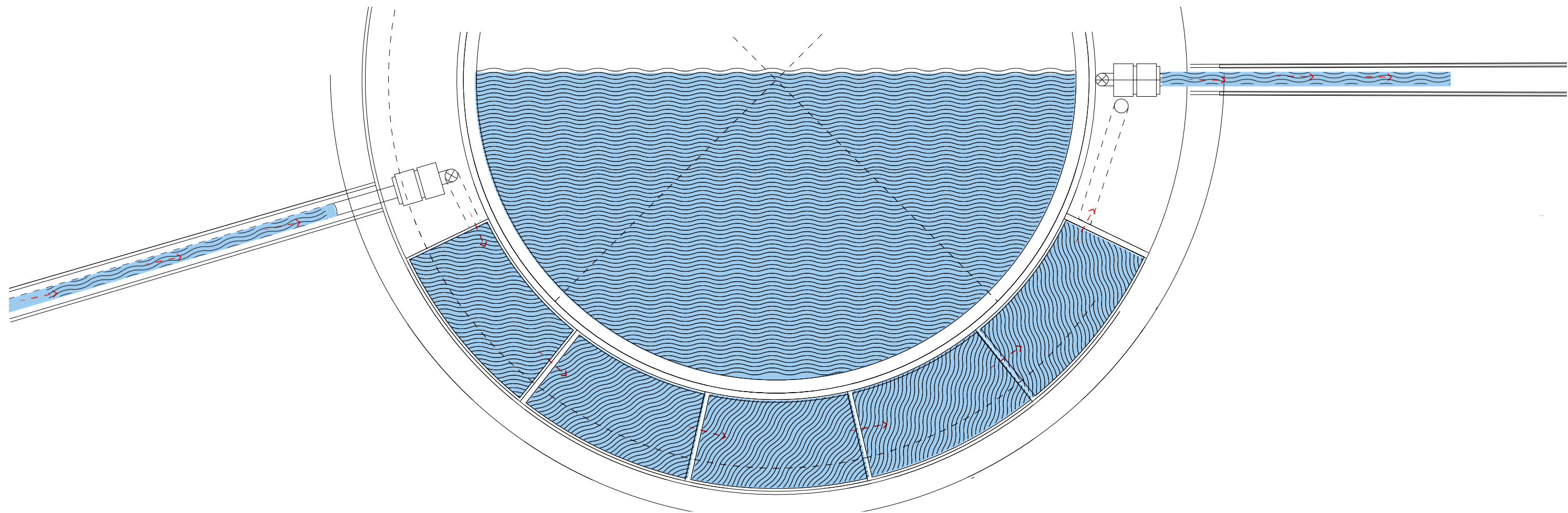
Visible - Sustainable - Kit of parts - Factory line- Promise



The Chinese producer group reported the use of drip irrigation and a reduced water use from around 12,000 m³ to 150 m³ per ha (a saving of 79 percent).

<https://www.veronicabateskassatly.com/read/shaking-hands-with-the-devil-sustainable-cotton-and-the-xinjiang-production-and-construction-corp>

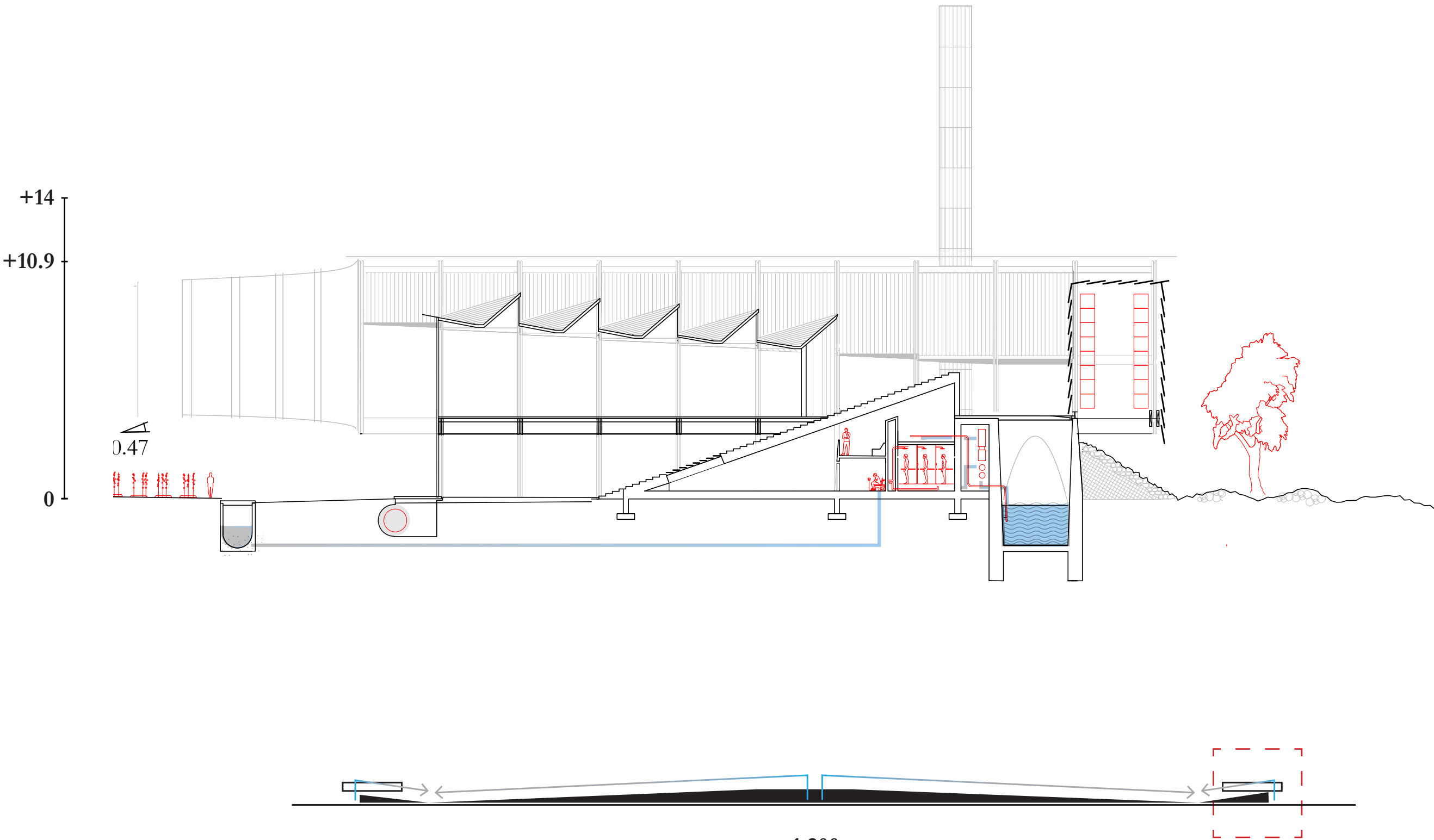
Visible - Sustainable - Kit of parts - Factory line- Promise



Site Section and Plan of Cistern
demonstrating water cycle

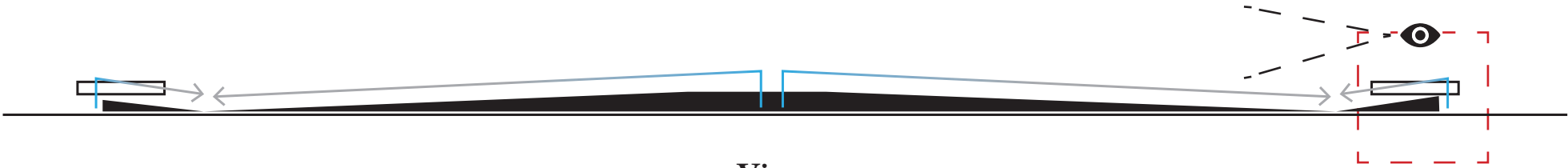


Visible - Sustainable - Kit of parts - Factory line- Promise



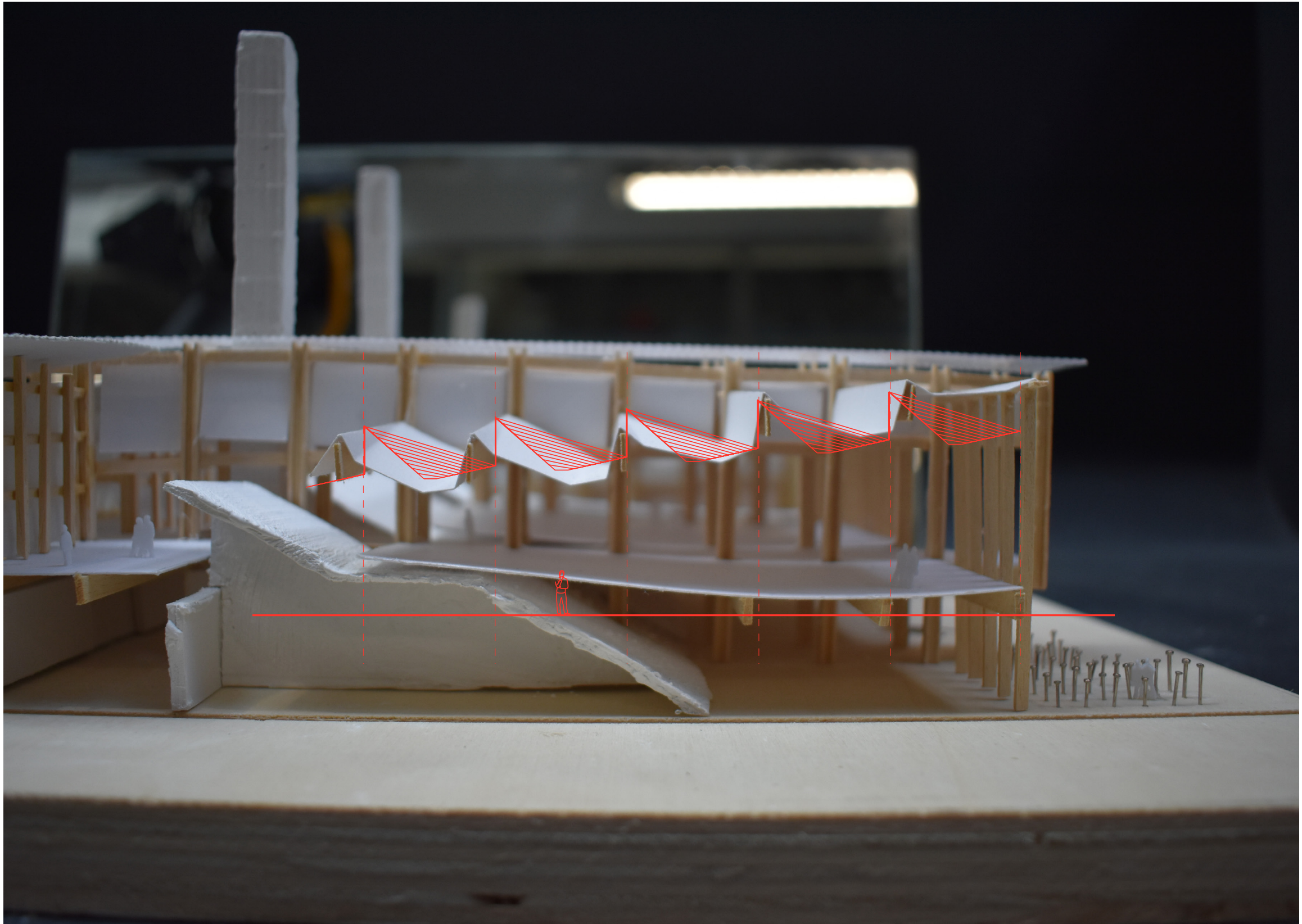
1:200
Site Section
demonstrating water cycle

Visible - Sustainable - Kit of parts - Factory line- Promise



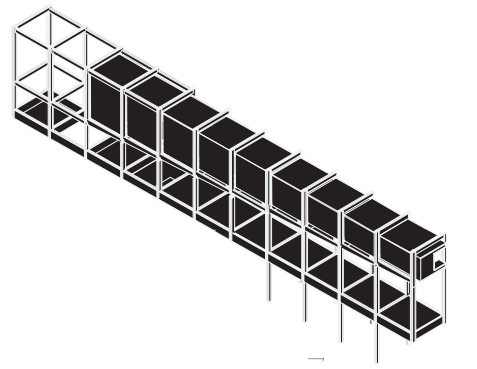
View
From the bay into cotton fields

Visible - Sustainable - Kit of parts - Factory line- Promise

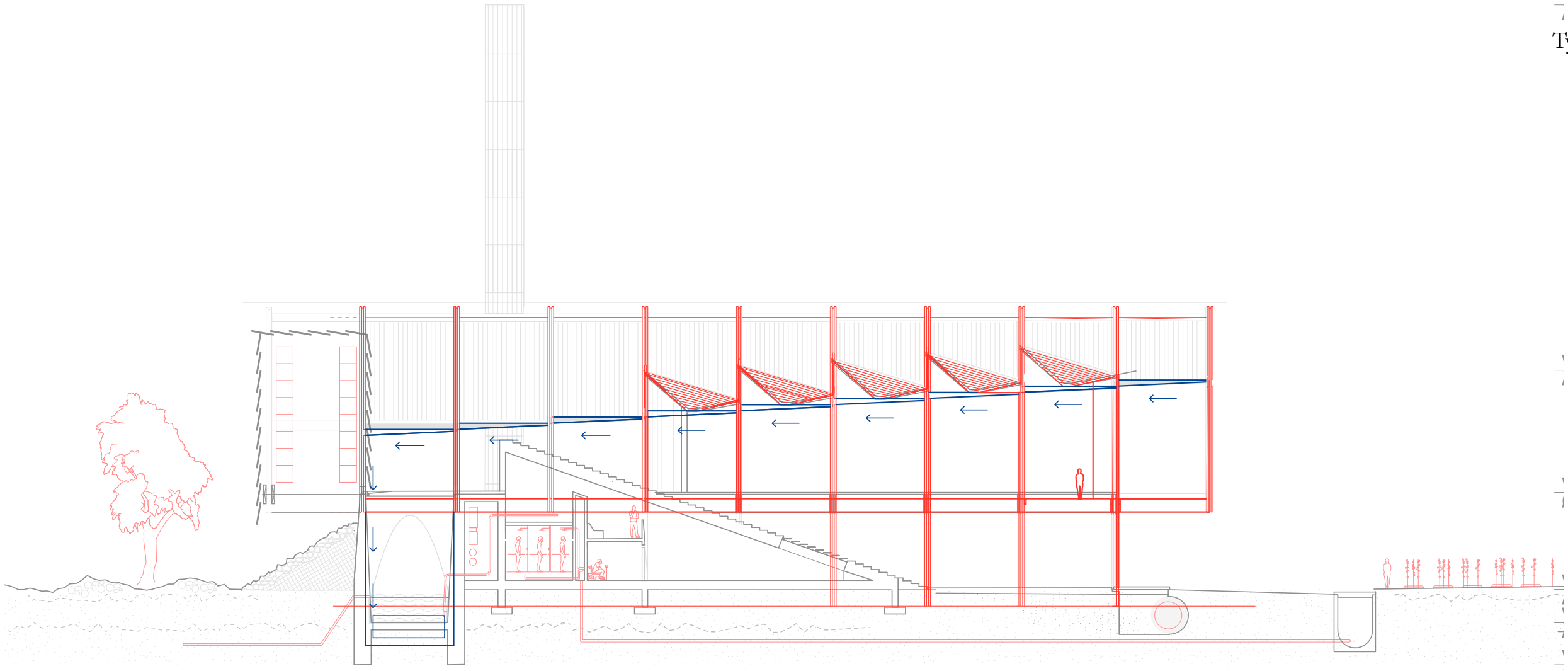


1:200
Water Influence
on the architecture

Visible - Sustainable - Kit of parts - Factory line- Promise



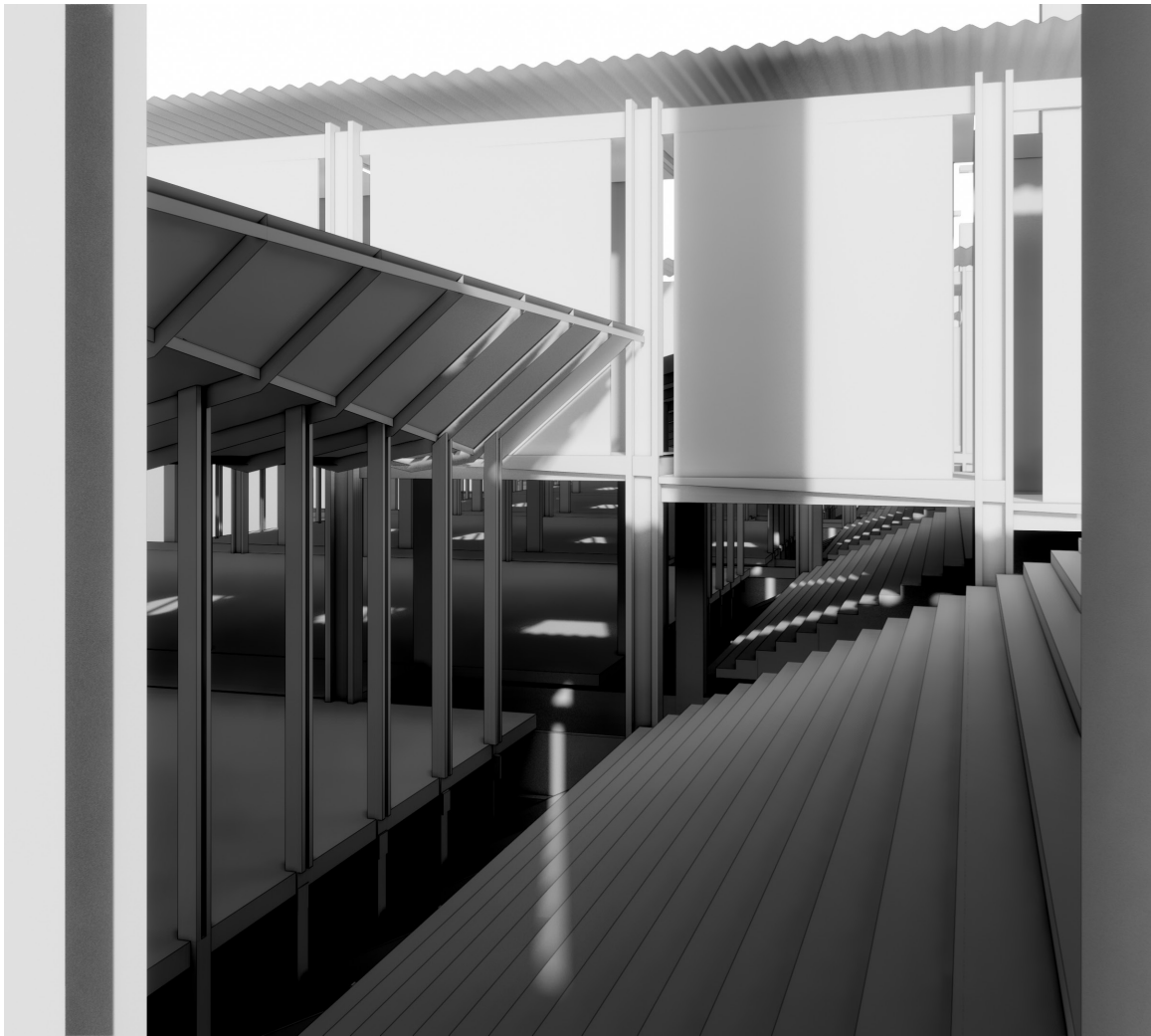
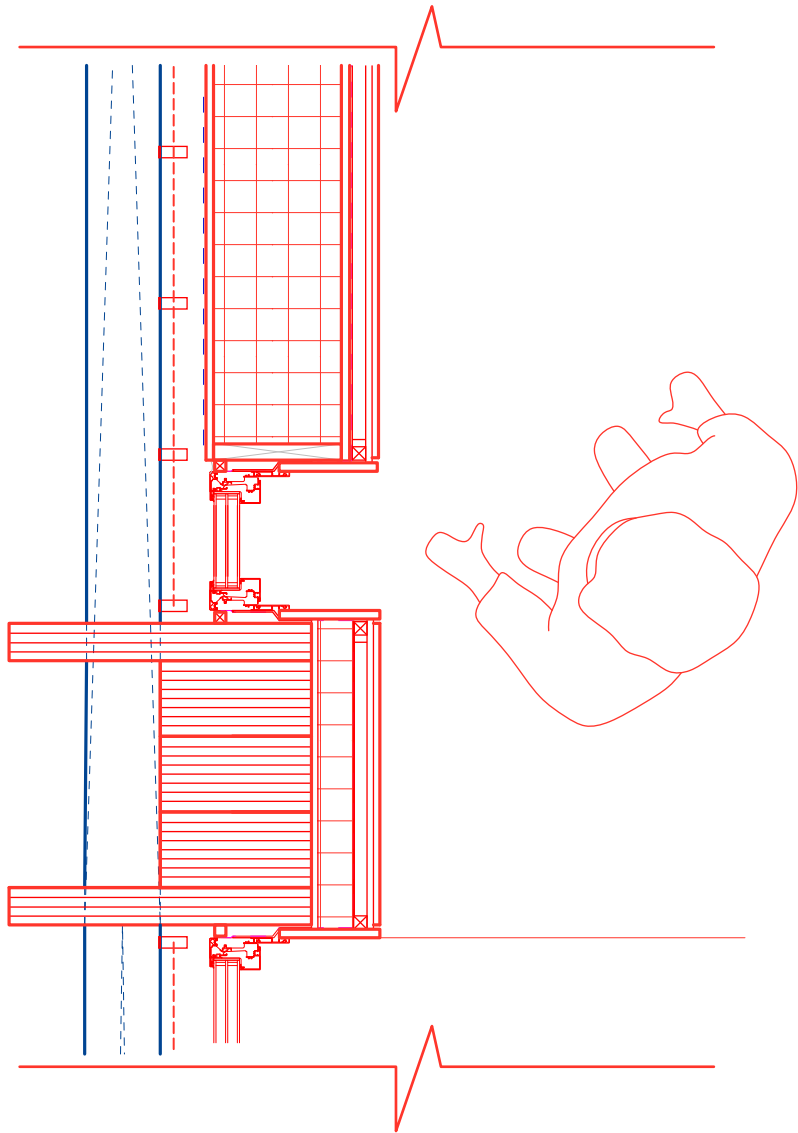
Typical Bay



1:200

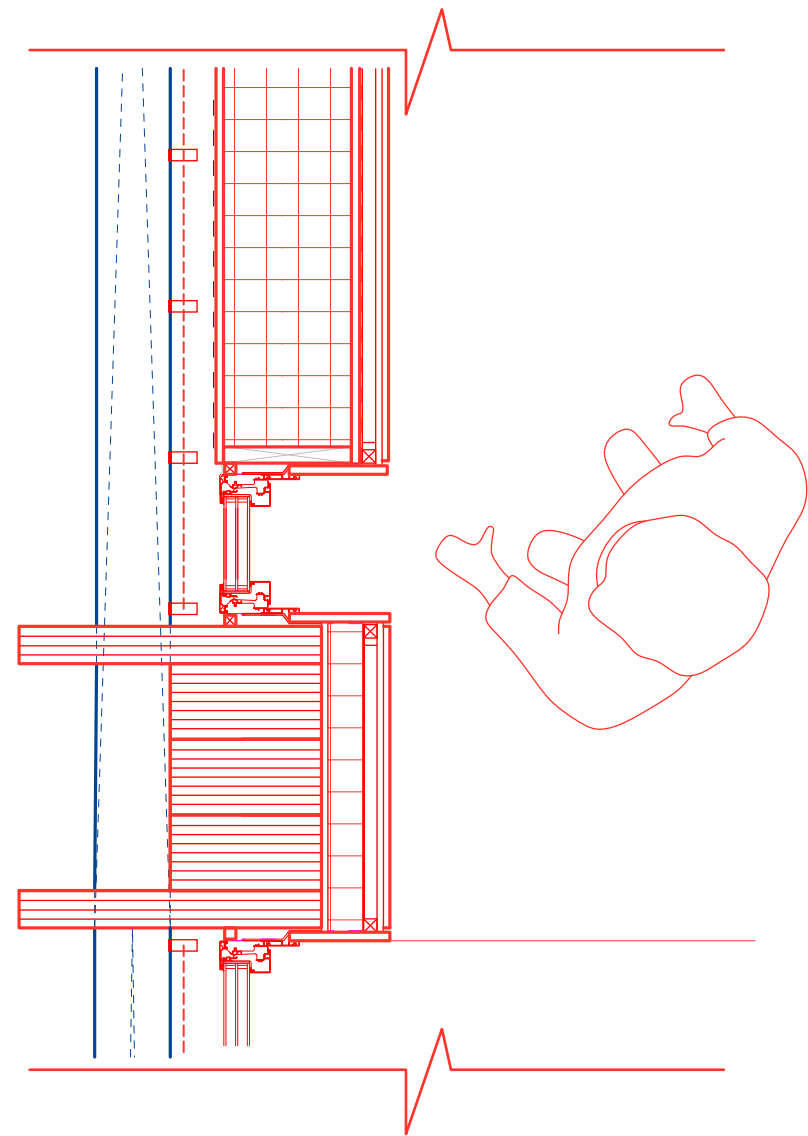
Diagram of water flow of gutter
Micro Scale

Visible - Sustainable - Kit of parts - Factory line- Promise

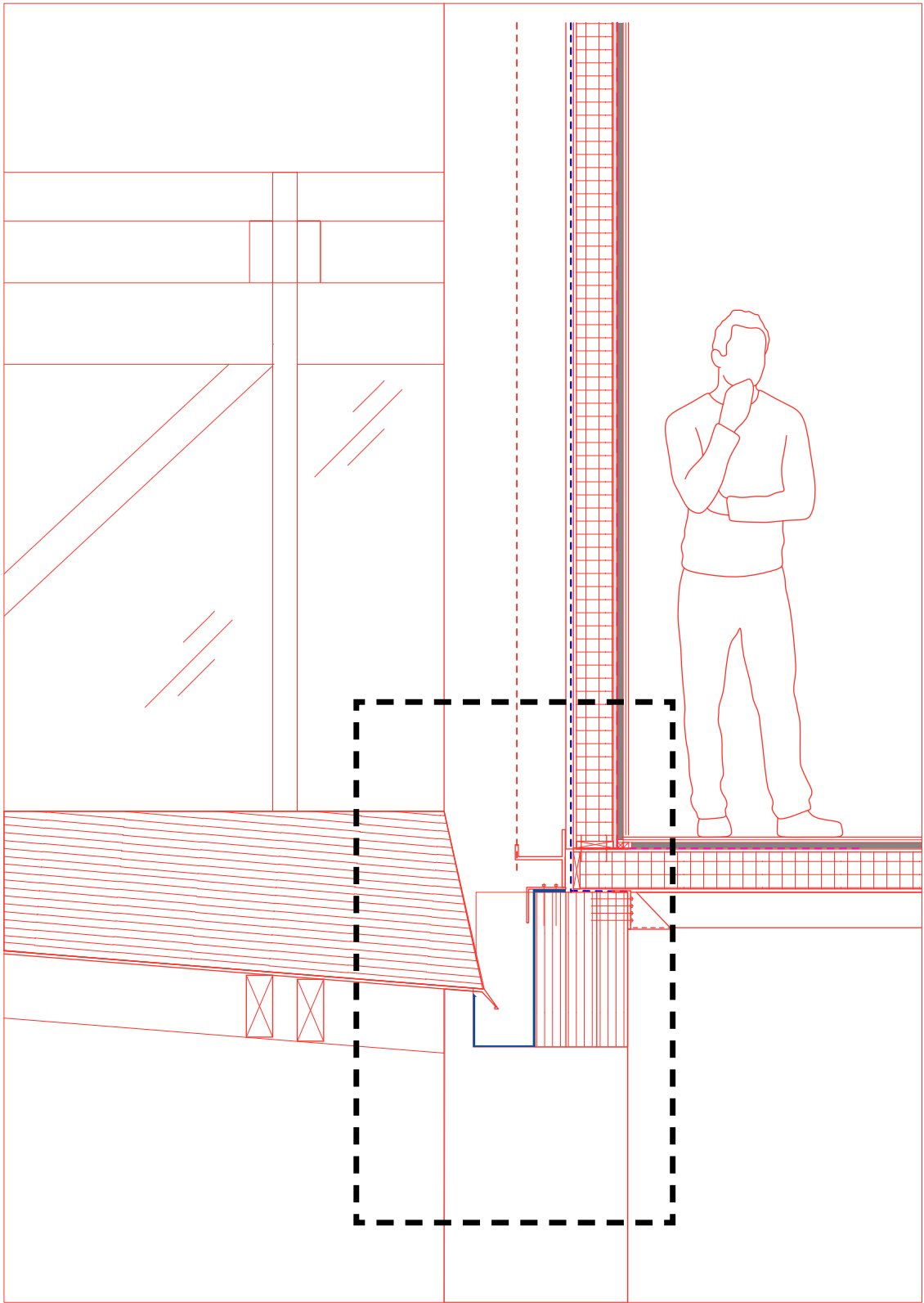


1:10 1st Floor Detail Plan
Column, Gutter and wall build up

Visible - Sustainable - Kit of parts - Factory line- Promise



1:10
Section of Roof meeting Gutter



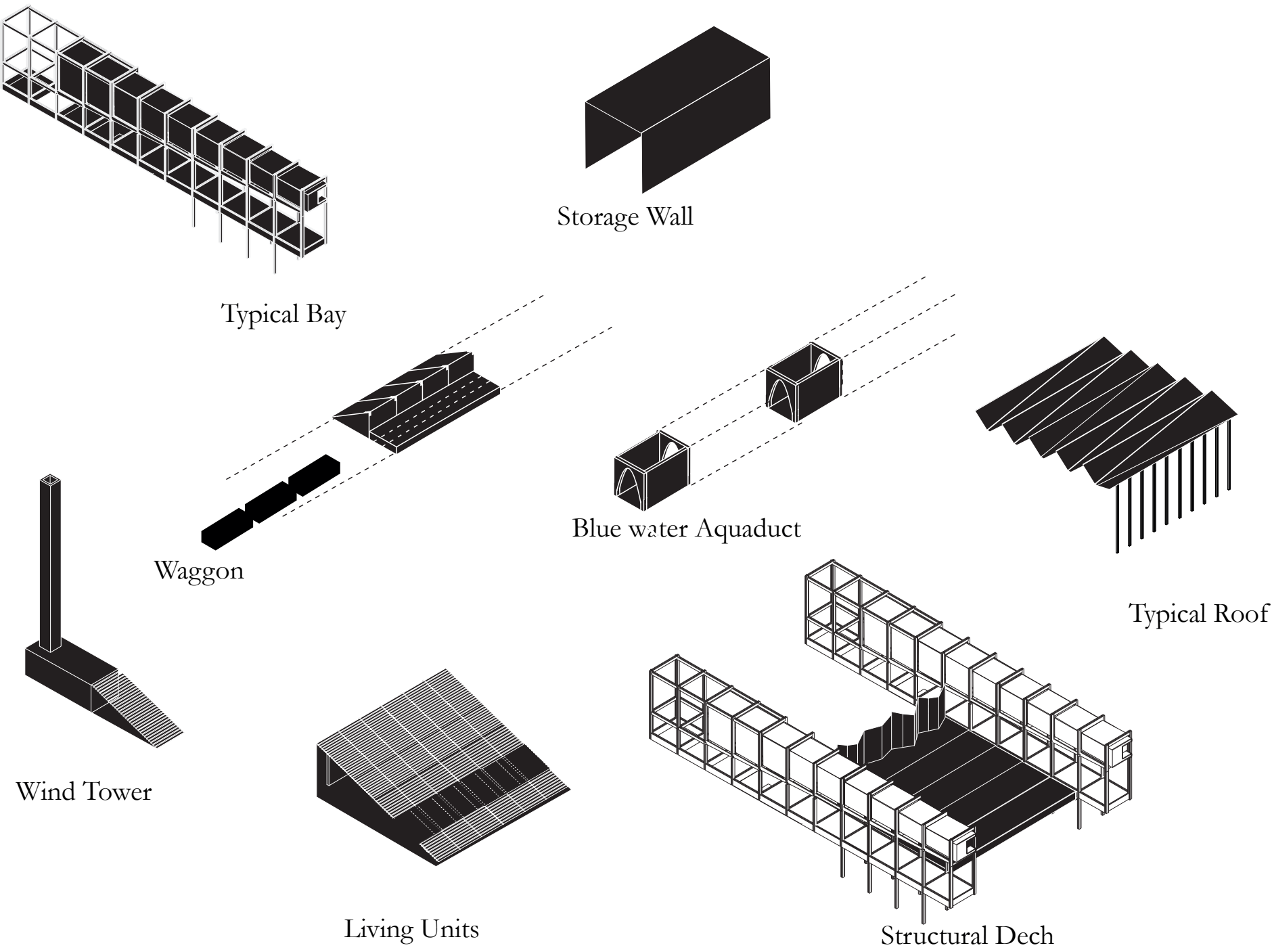
1:10
Section of Roof meeting Gutter

Visible - Sustainable - **Kit of parts** - Factory line- Promise

The city is designed as

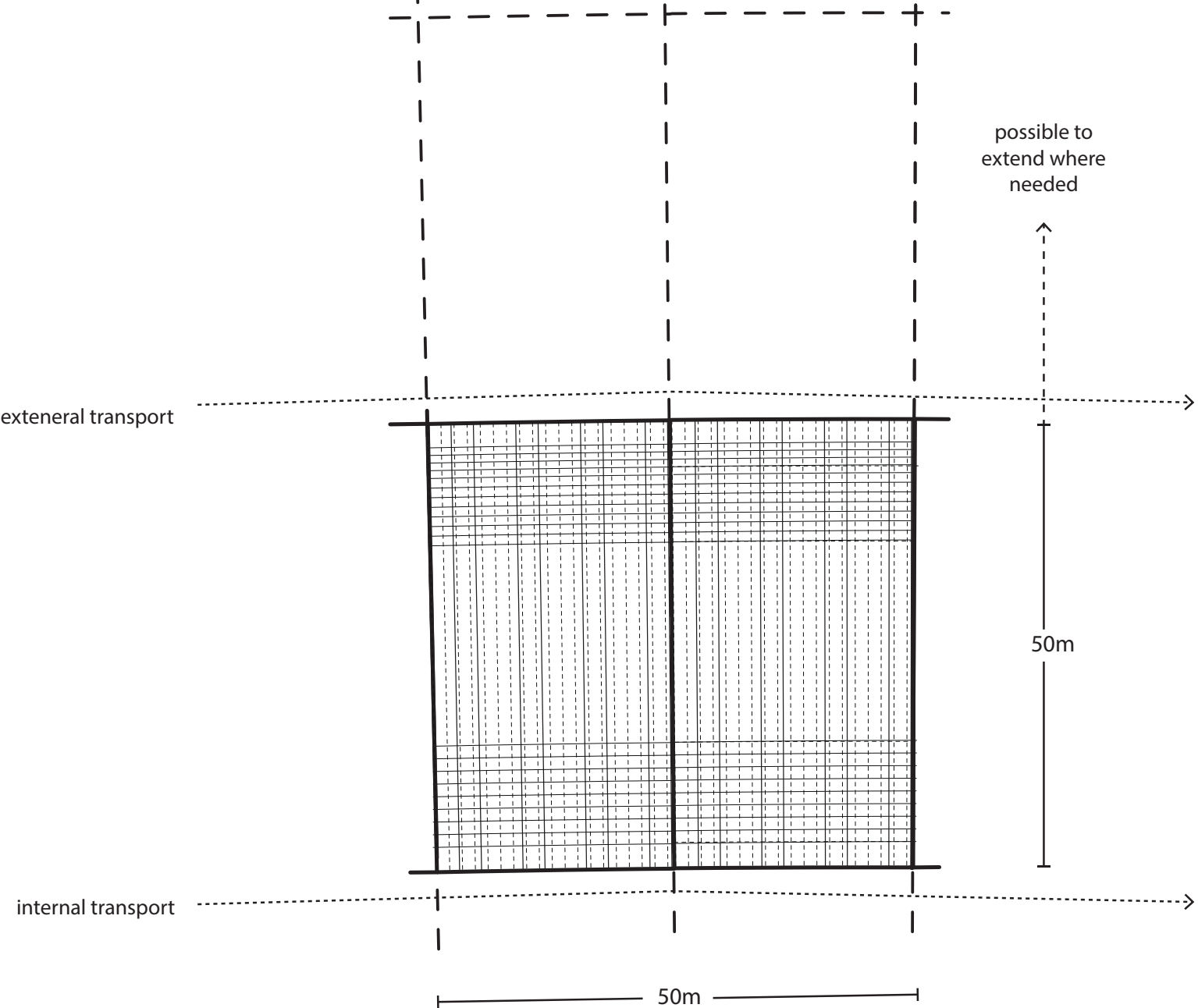
A KIT OF PARTS

Visible - Sustainable - **Kit of parts** - Factory line- Promise

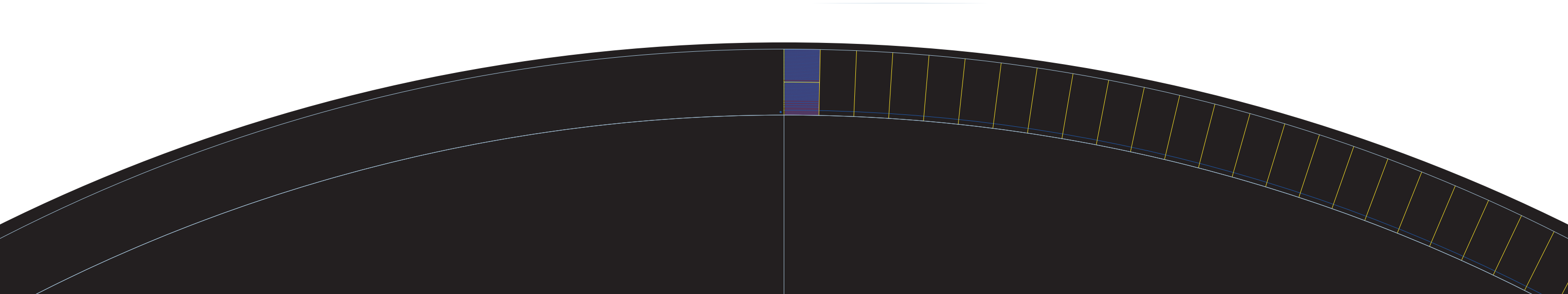


The city is... A kit of parts

Visible - Sustainable - Kit of parts - Factory line- Promise



typical cotton factory

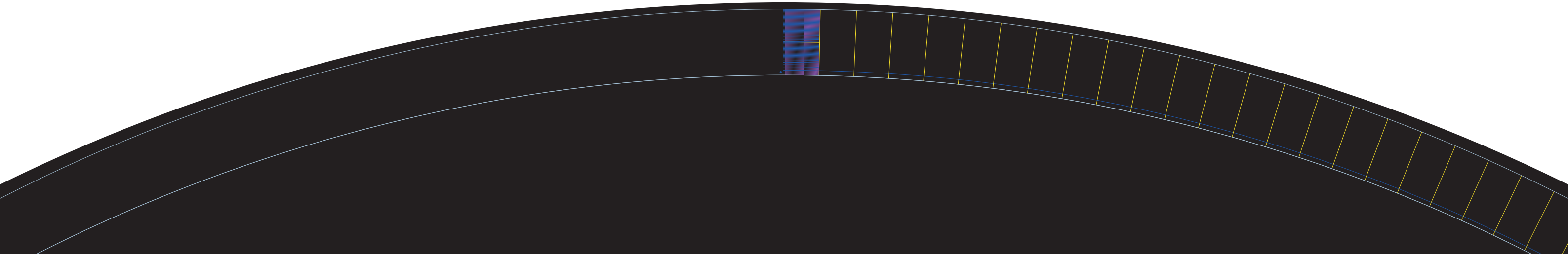
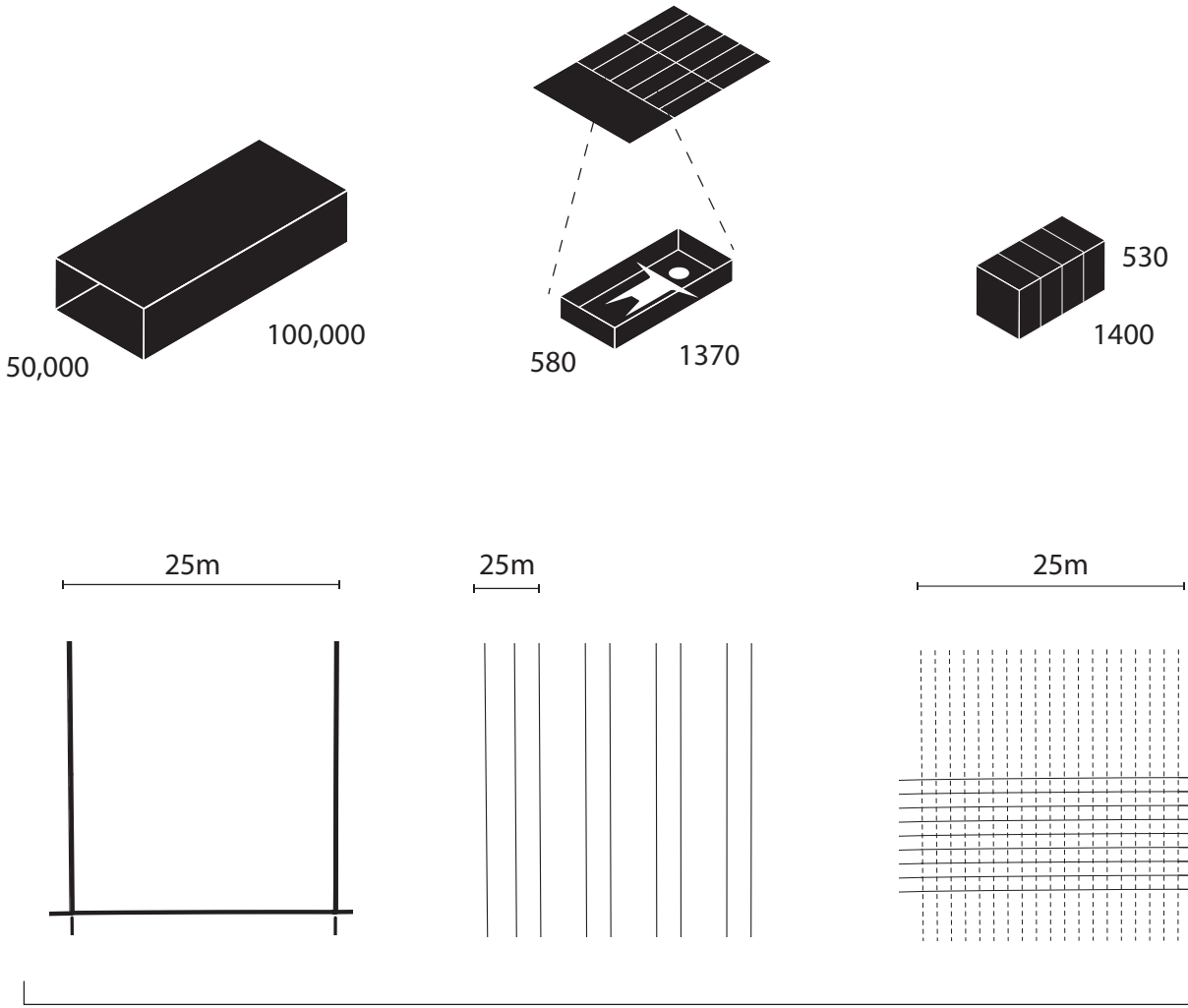


Visible - Sustainable - **Kit of parts** - Factory line- Promise

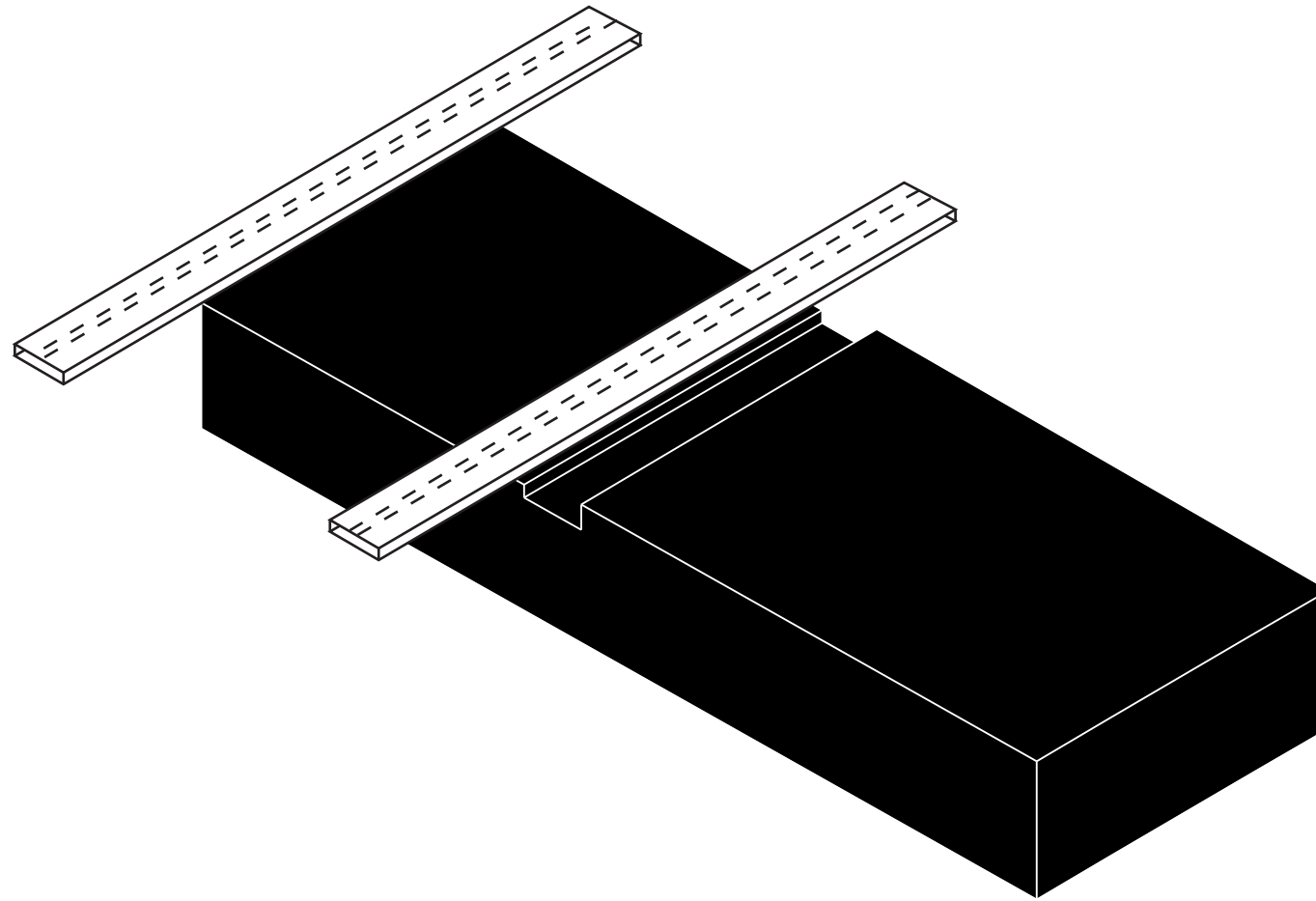
Factory

Human

Cotton

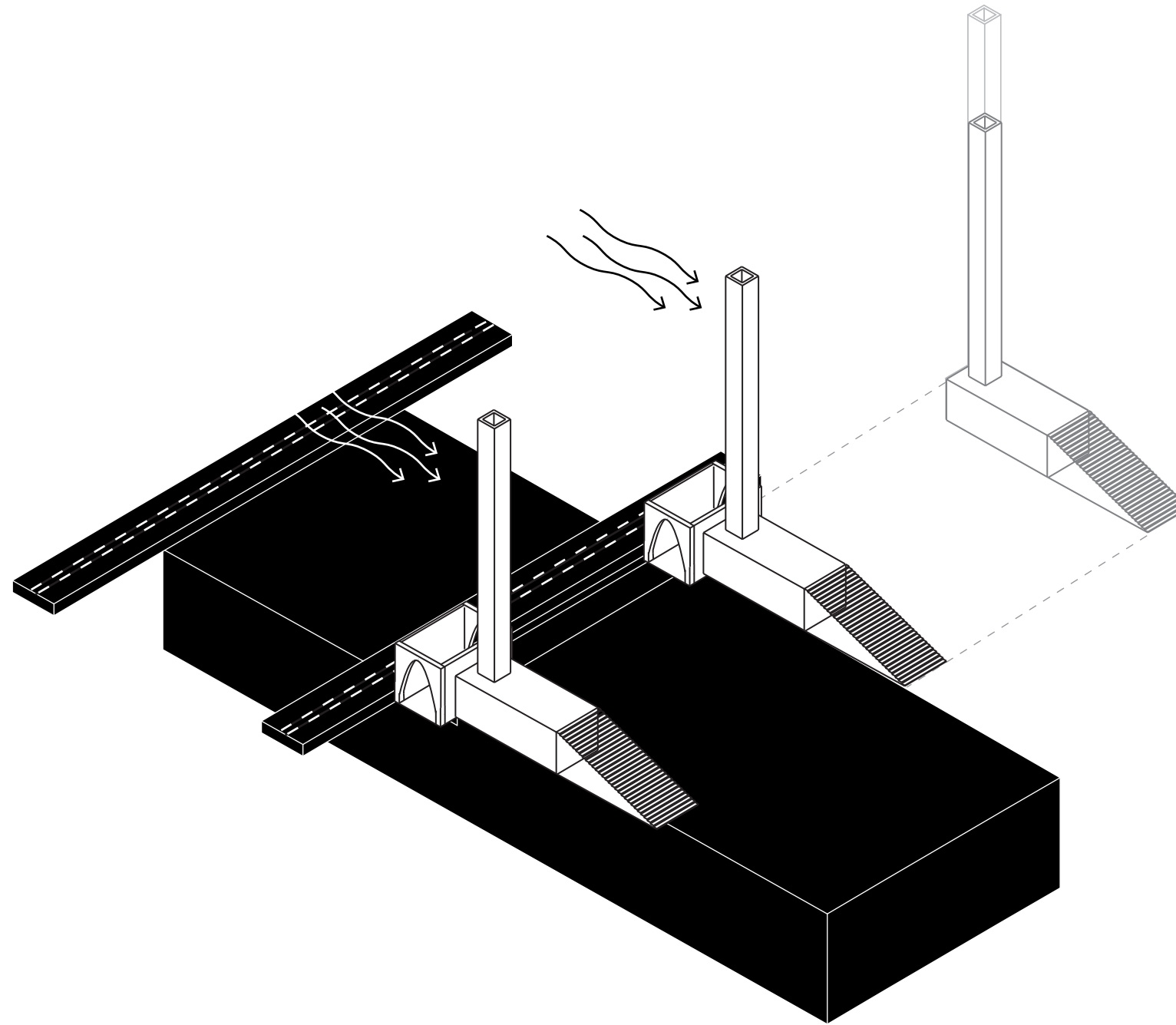


Visible - Sustainable - **Kit of parts** - Factory line- Promise



Stage 1 - Stage 2 - Stage 3
Building foundations and aqueduct excavated for blue and grey
water, tracks laid to bring in building material

Visible - Sustainable - **Kit of parts** - **Factory line-** Promise



Stage 1 - Stage 2 - Stage 3
Concrete prefabricated Wind Tower and
Aqueduct units placed on site

Visible - Sustainable - Kit of parts - Factory line- Promise

-  1. Rain water collects and used for toilets before joining grey water aqueduct
-  3. Water flowing in qanat. air cooled by convection and evaporation
-  4. passive ventilation through roof and by manual opening of window
Cross ventilation achieved by opening windows across the factory
-  5. Solar shading in summer from louvered facade

-  longest day is June 21, with 15 hours, 9 minutes of daylight.
-  10 cm of rain
-  8.5 kilometers per hour

SUMMER DAY



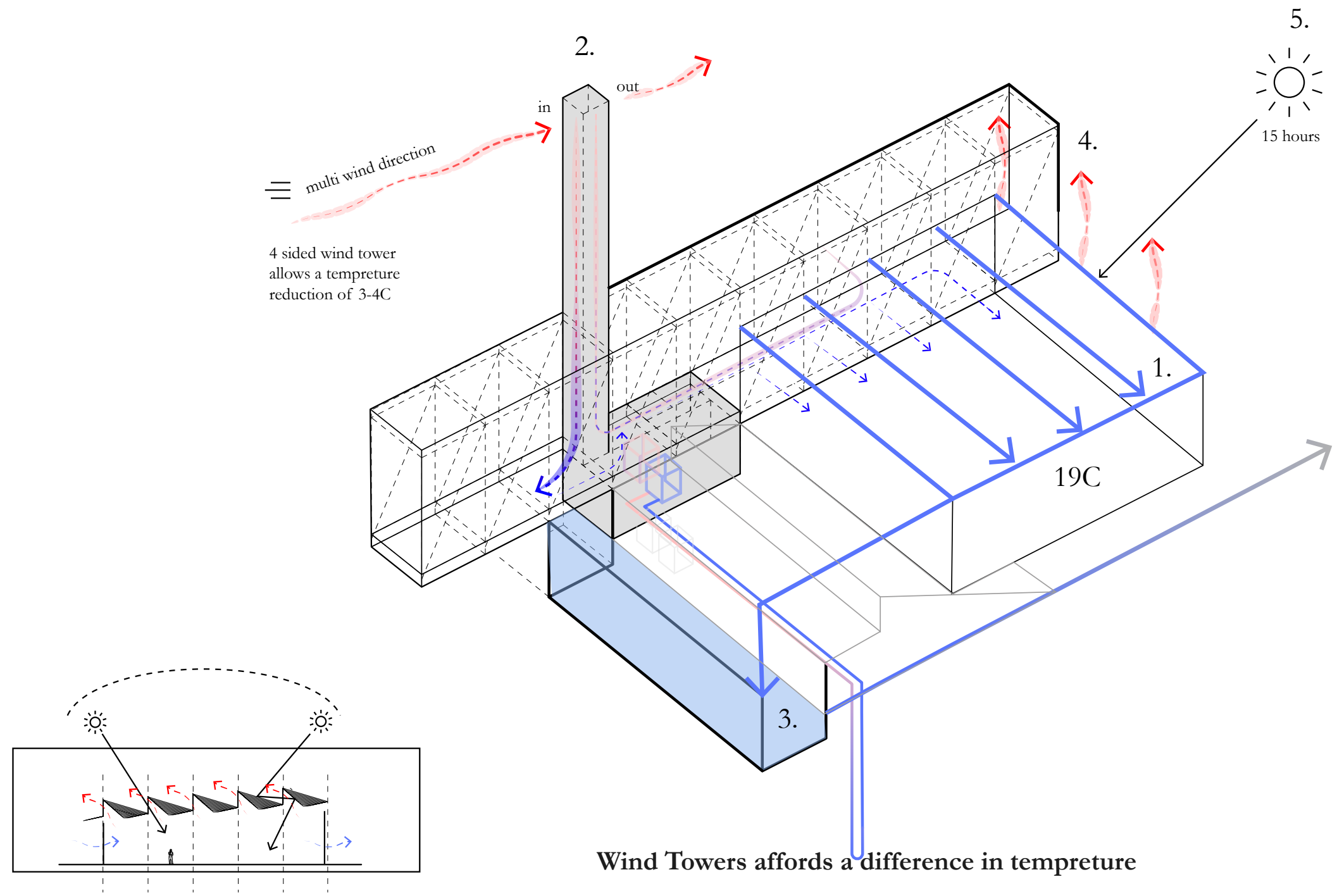
28C

Day

SUMMER TEMPERATURE

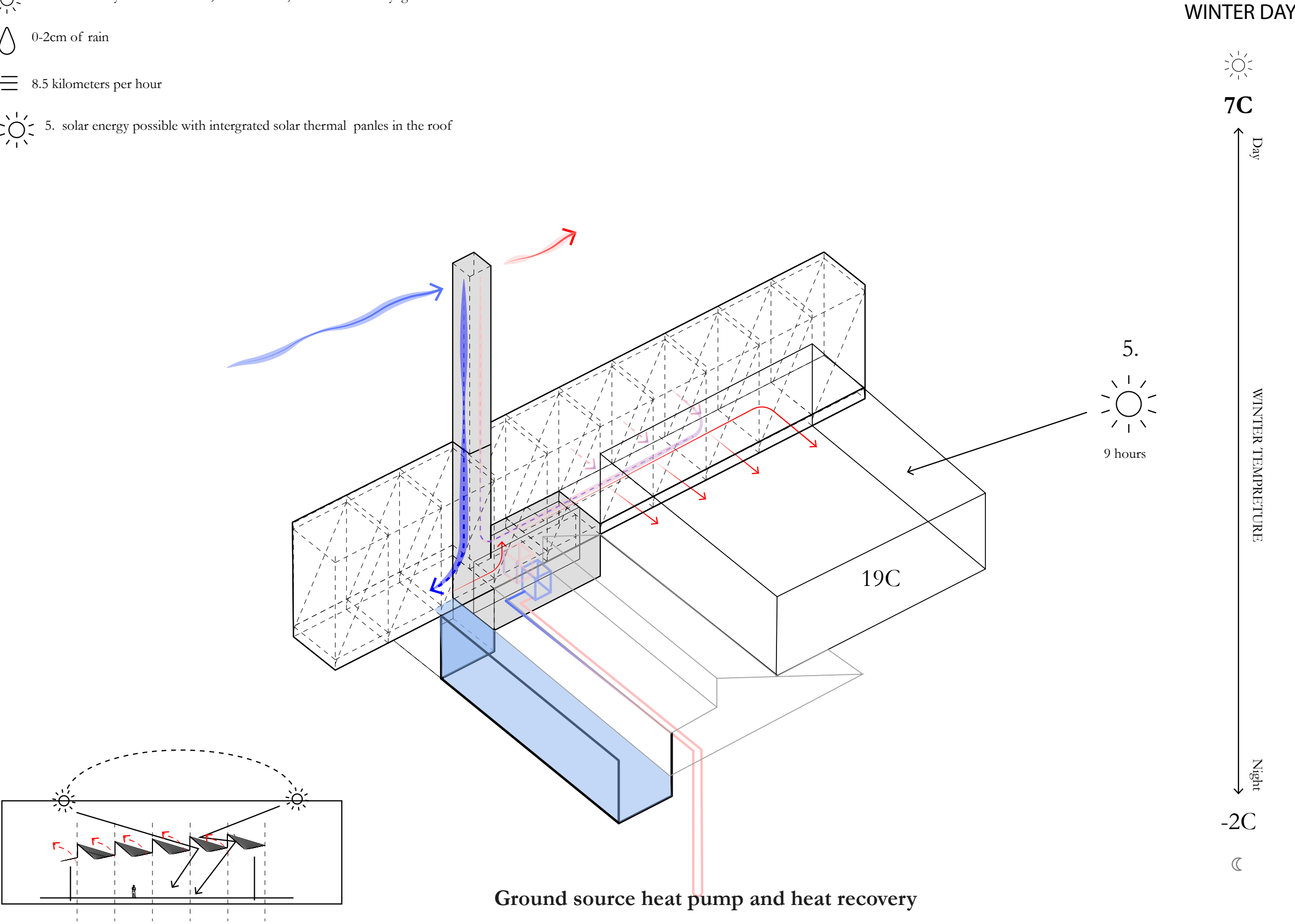
Night

15C

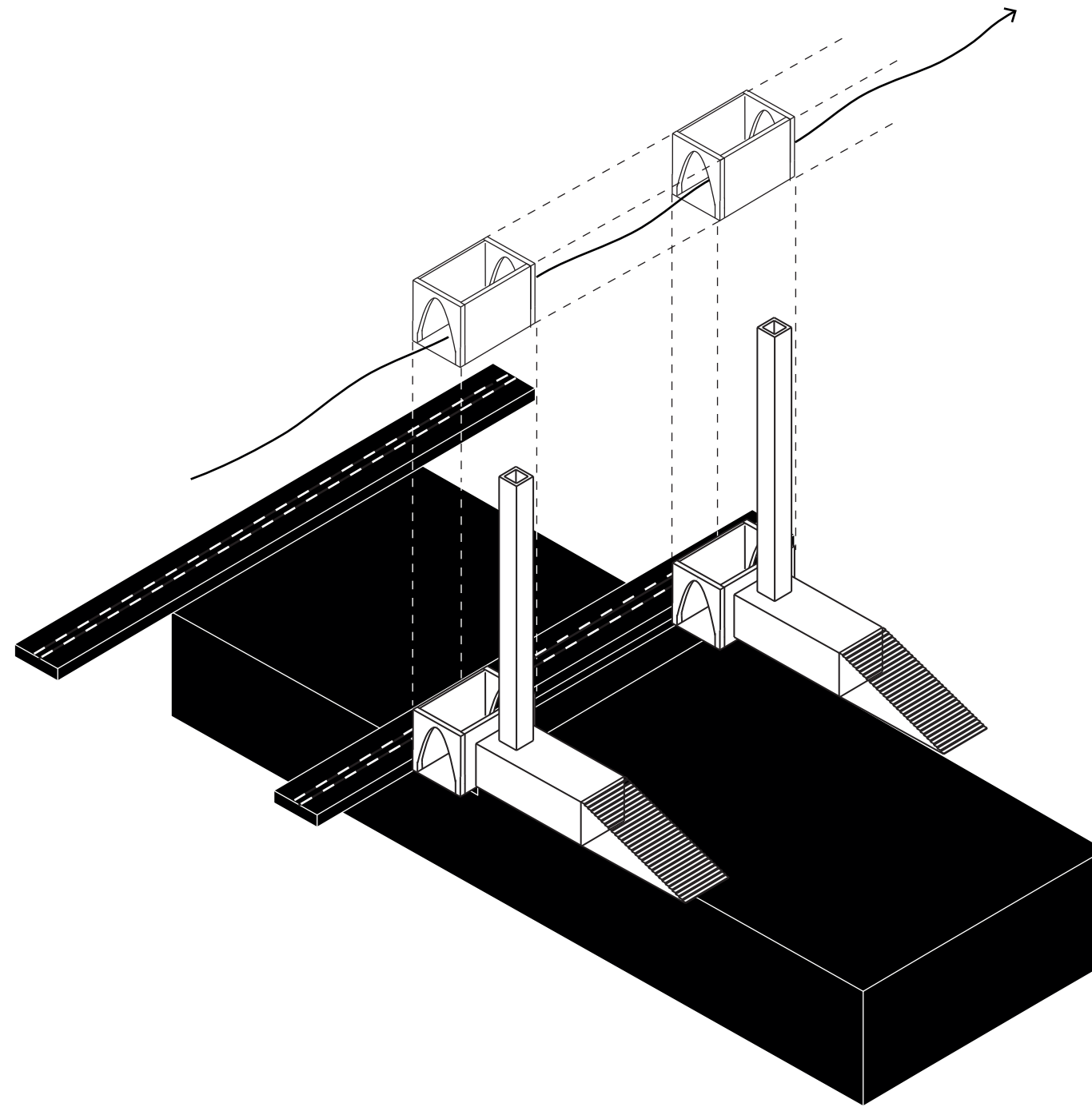


Visible - Sustainable - Kit of parts - Factory line- Promise

-  the shortest day is December 21, with 9 hours, 12 minutes of daylight
-  0-2cm of rain
-  8.5 kilometers per hour
-  5. solar energy possible with intergrated solar thermal panles in the roof

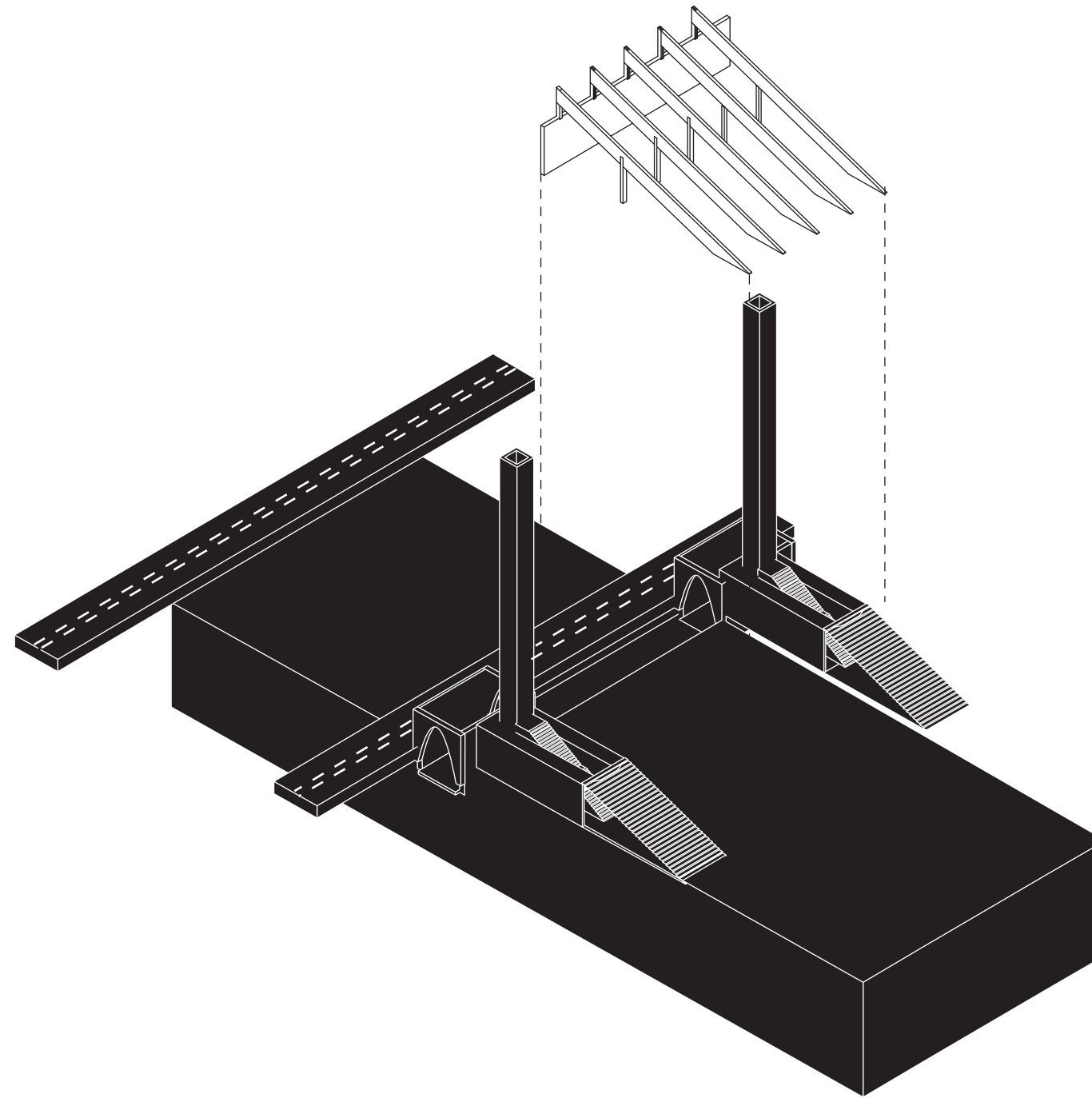


Visible - Sustainable - **Kit of parts** - Factory line- Promise



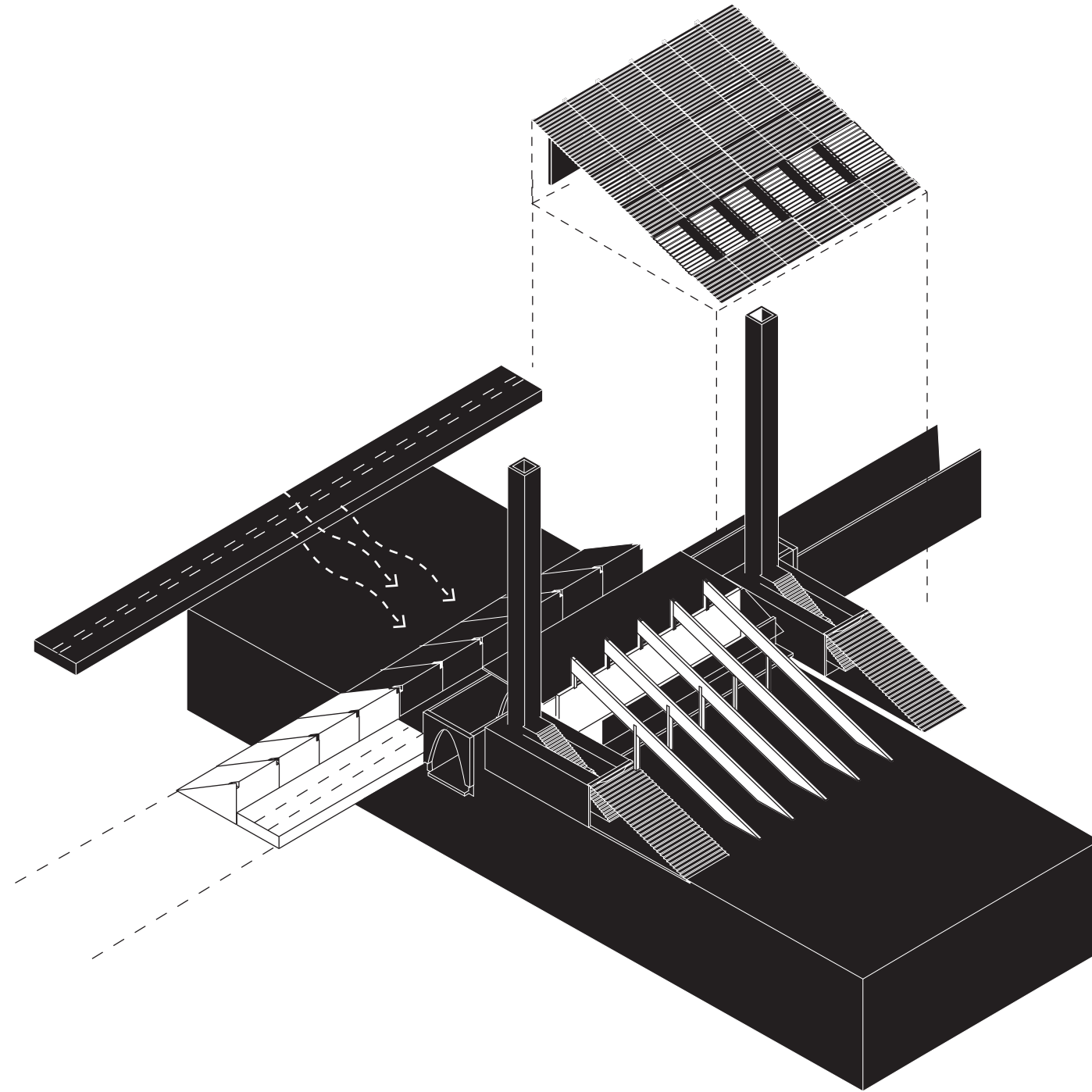
Stage 1 - Stage 2 - Stage 3
Aqueduct walls cast in place connecting
the units

Visible - Sustainable - **Kit of parts** - Factory line- Promise



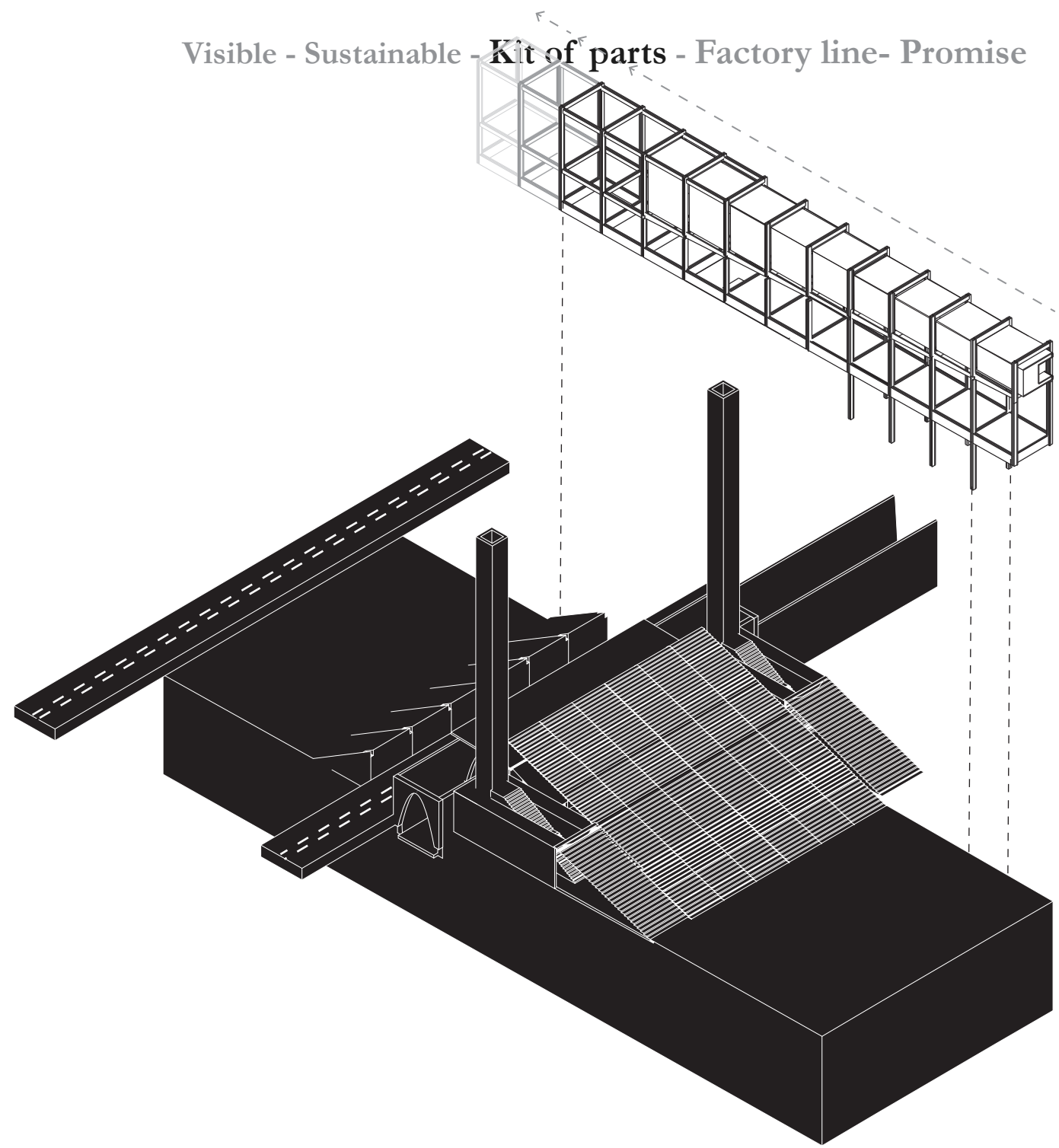
Stage 1 - Stage 2 - Stage 3
Precast triangular beams placed for the
living bay

Visible - Sustainable - **Kit of parts** - Factory line- Promise



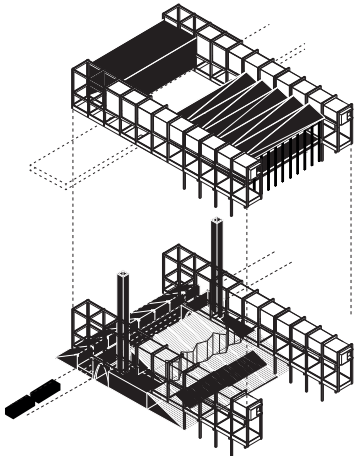
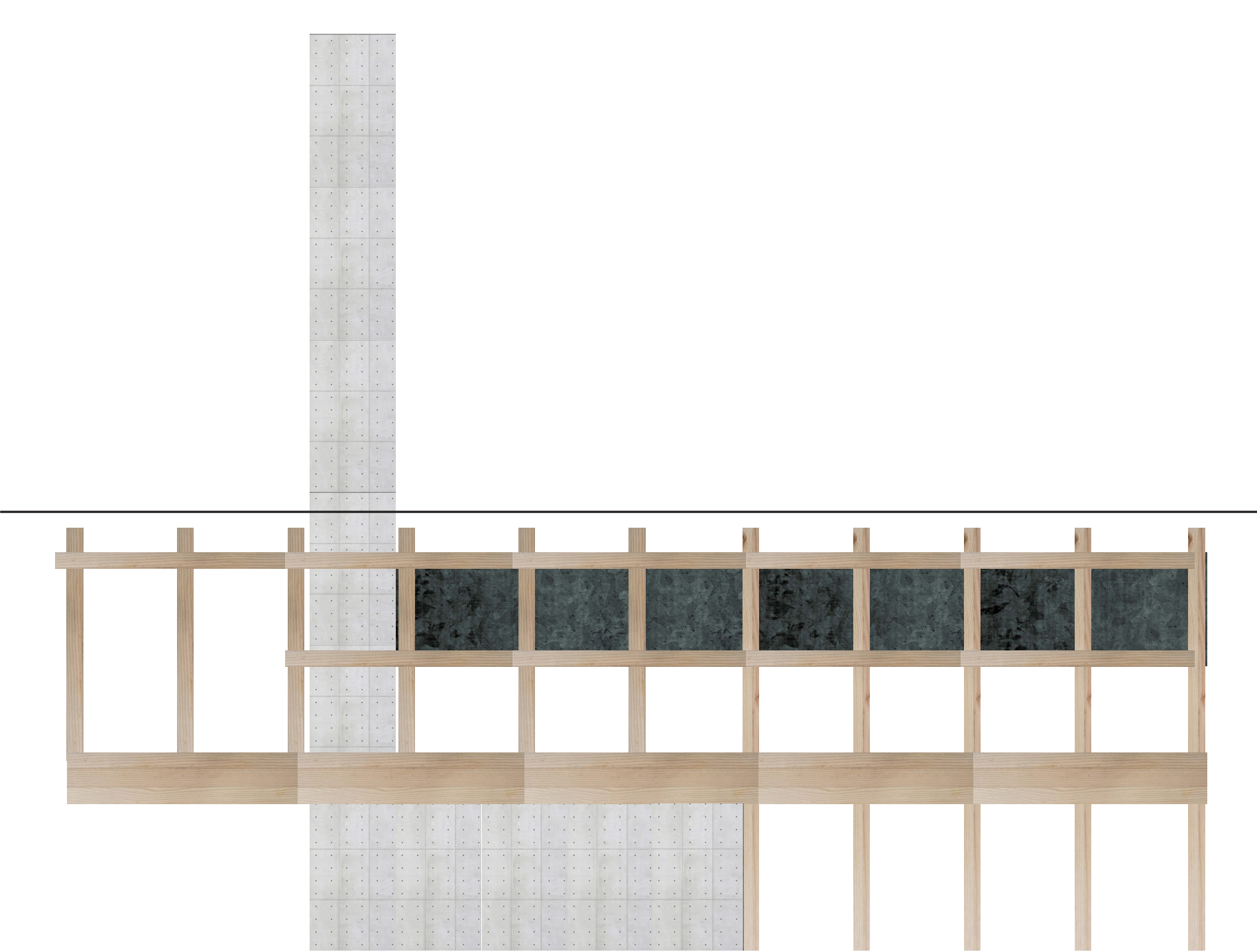
Stage 1 - Stage 2 - Stage 3
 Exterior Barrier protects exterior road from sand erosion and
 stepped facade added onto the living bay.

Visible - Sustainable - Kit of parts - Factory line- Promise



Stage 1 - Stage 2 - Stage 3
Bay Element added onto Wind Tower units

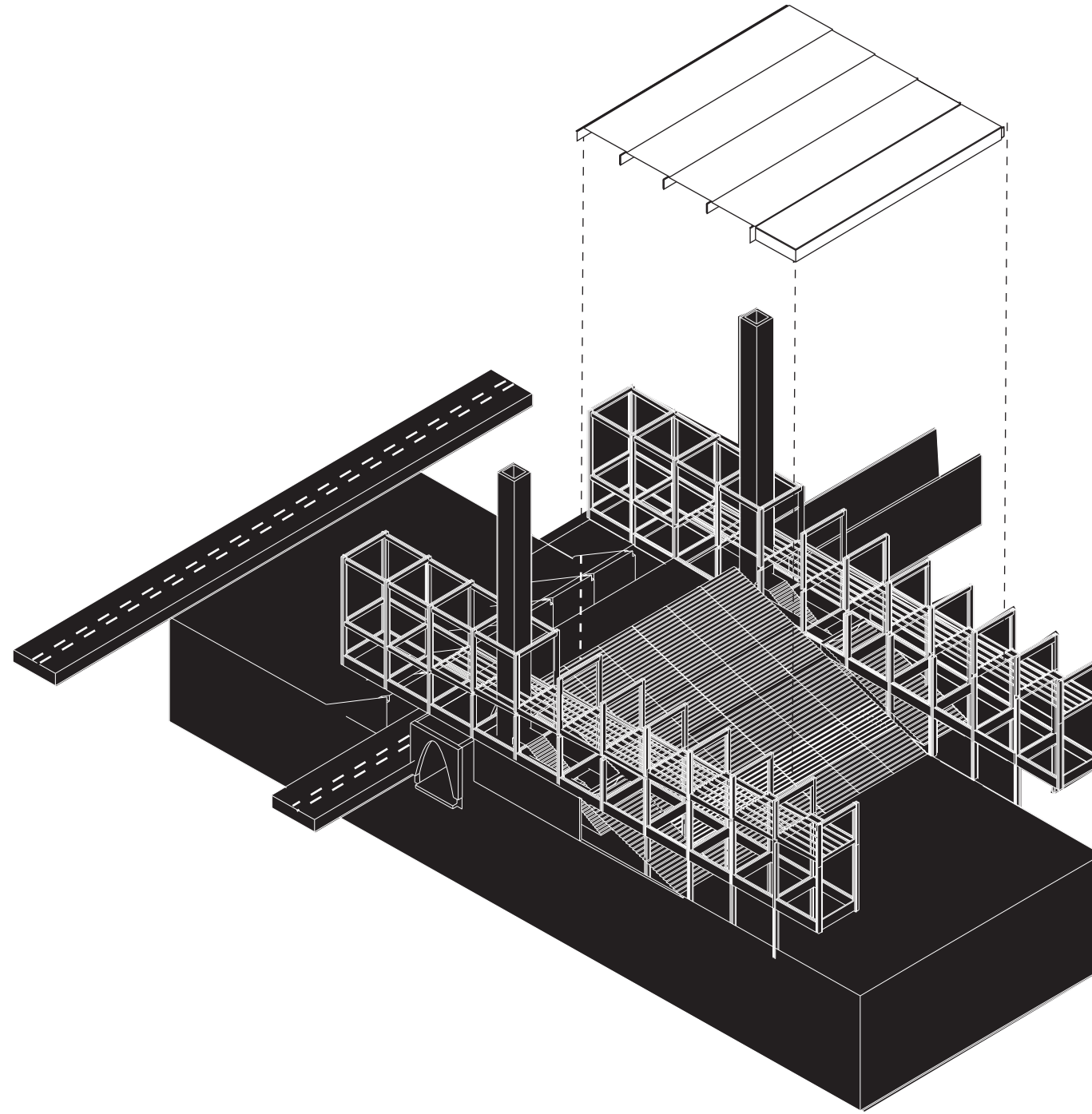
Visible - Sustainable - **Kit of parts** - Factory line- Promise



Visible - Sustainable - **Kit of parts** - Factory line- Promise

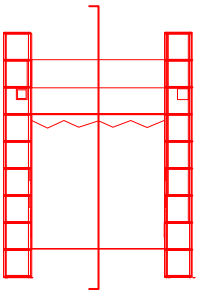
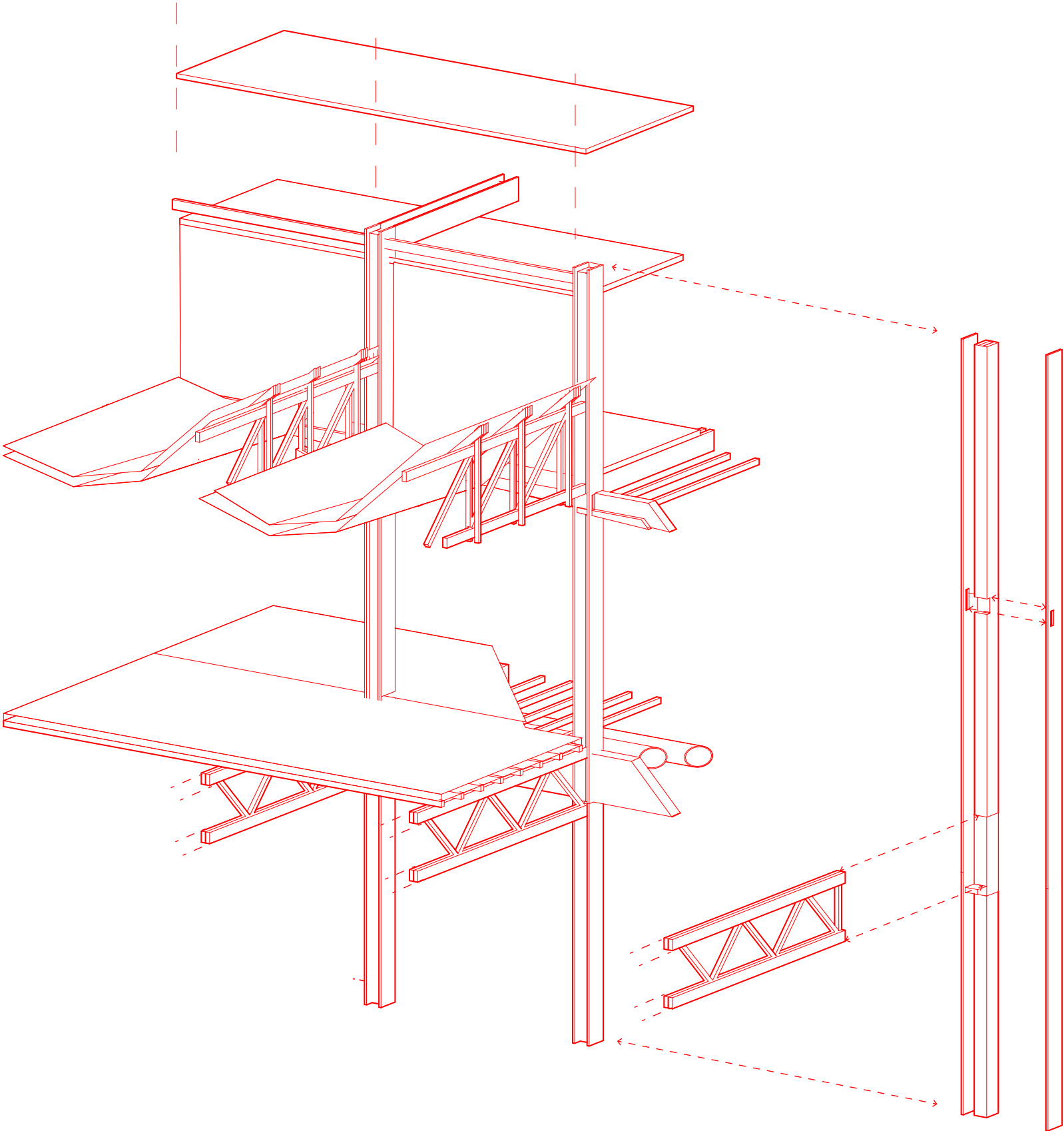


Visible - Sustainable - **Kit of parts** - **Factory line**- **Promise**



Prefabricated wooden vierendeel Bays
are loaded onto prefab Wind Tower units

Visible - Sustainable - **Kit of parts** - Factory line- Promise



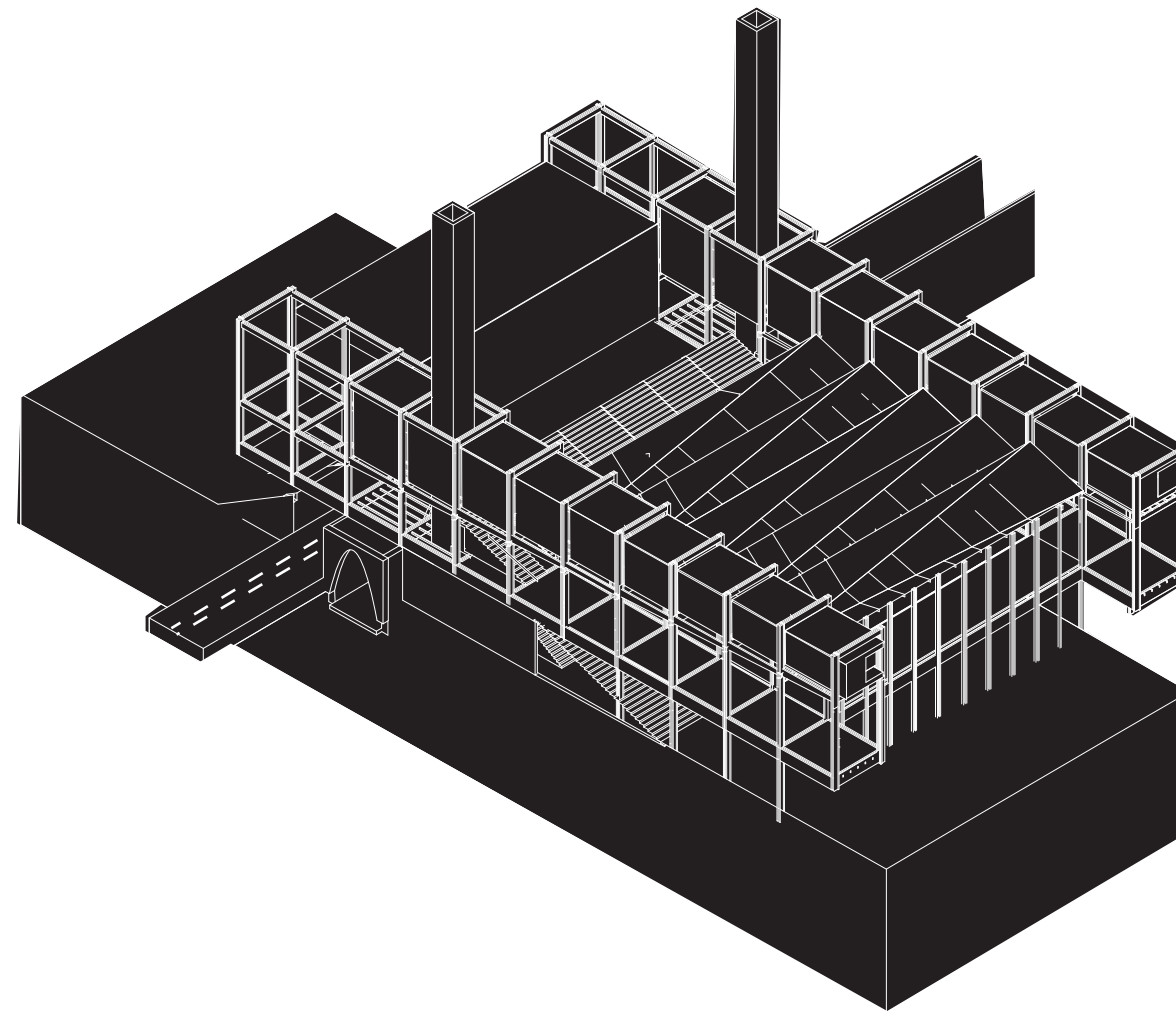
SIP Panel
Bamboo and Cotton fiber

window
Timber roof

window

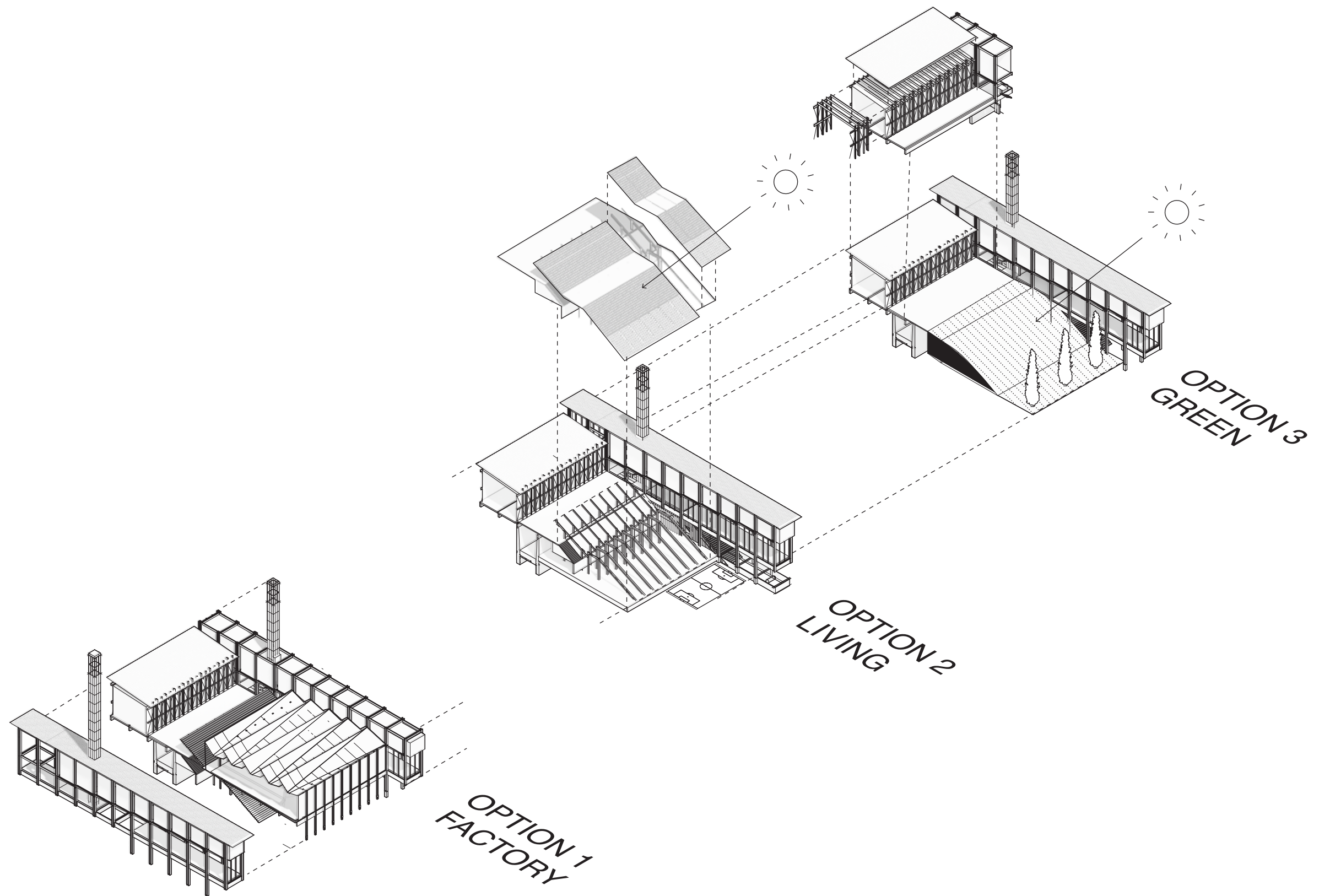
Wood Truss

Visible - Sustainable - **Kit of parts** - Factory line- Promise



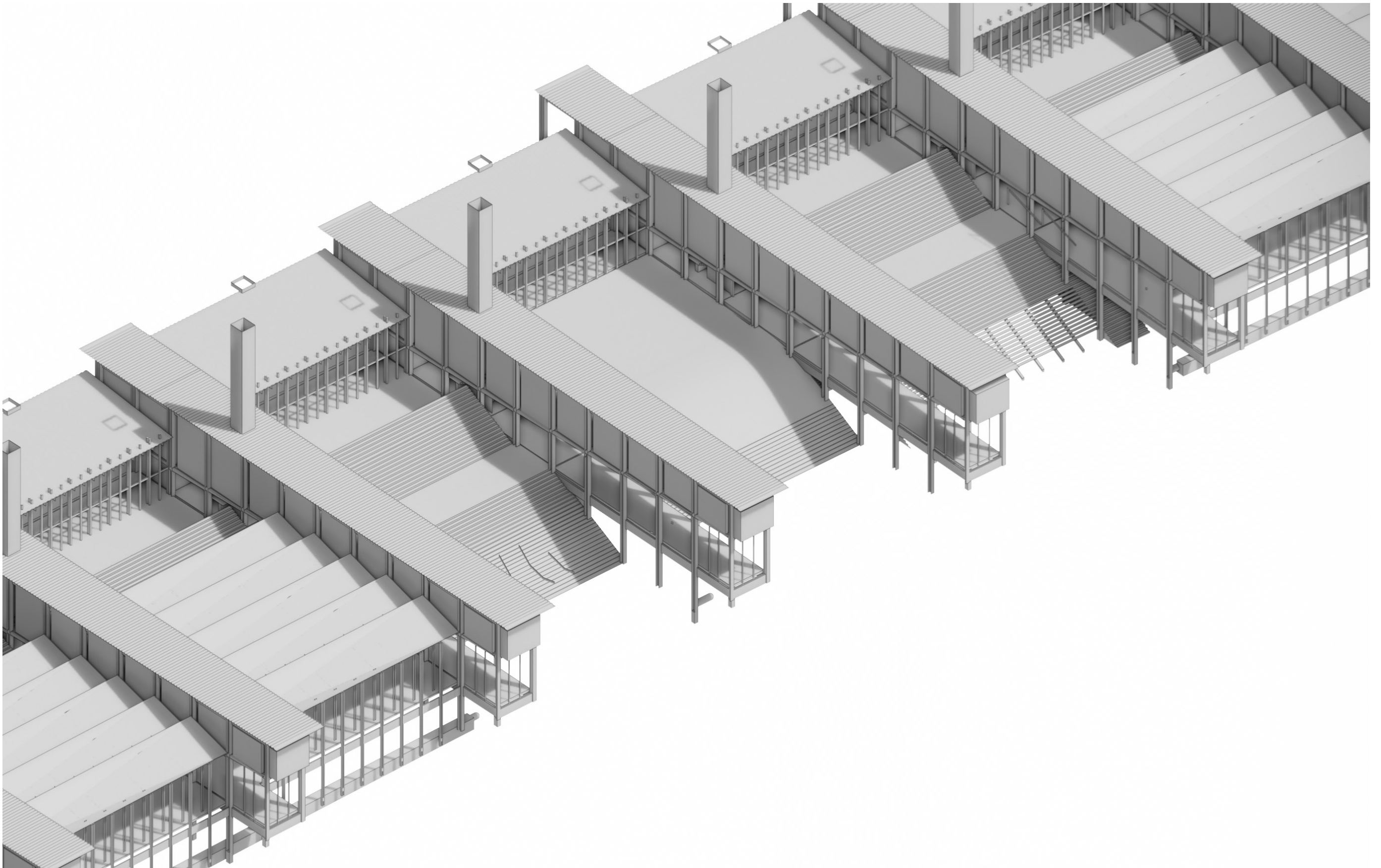
Roof and External Facade

Visible - Sustainable - **Kit of parts** - Factory line- Promise



Varitations

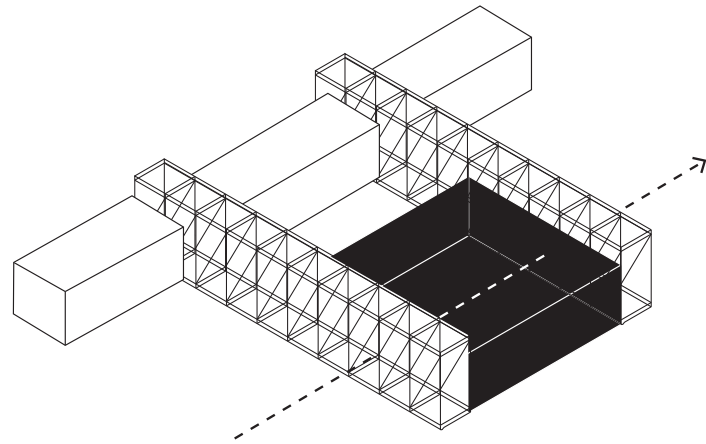
Visible - Sustainable - **Kit of parts** - Factory line- Promise



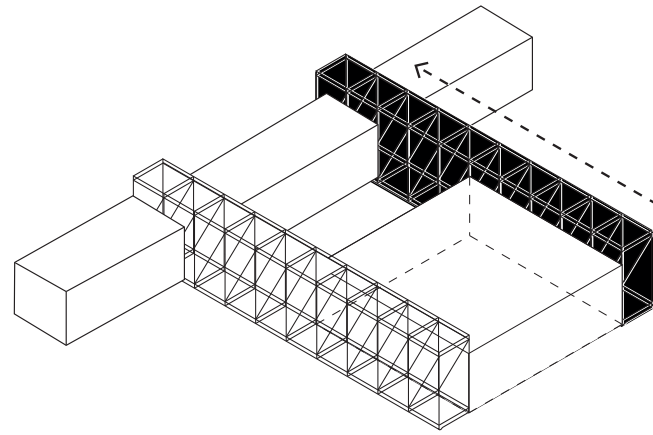
Visible - Sustainable - Kit of parts - Factory line- Promise

The city is designed as a
A FACTORY

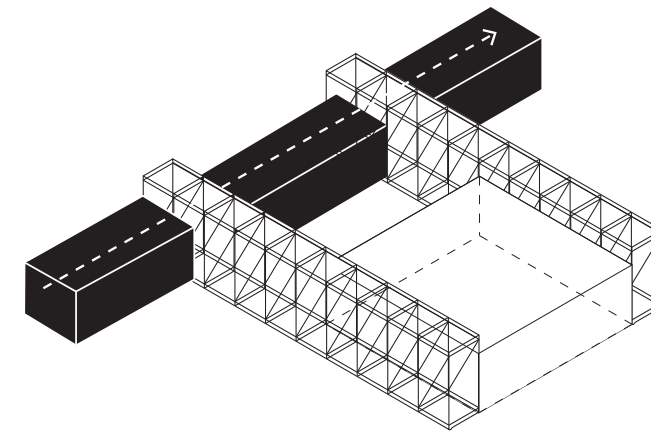
Visible - Sustainable - Kit of parts - Factory line- Promise



Factory

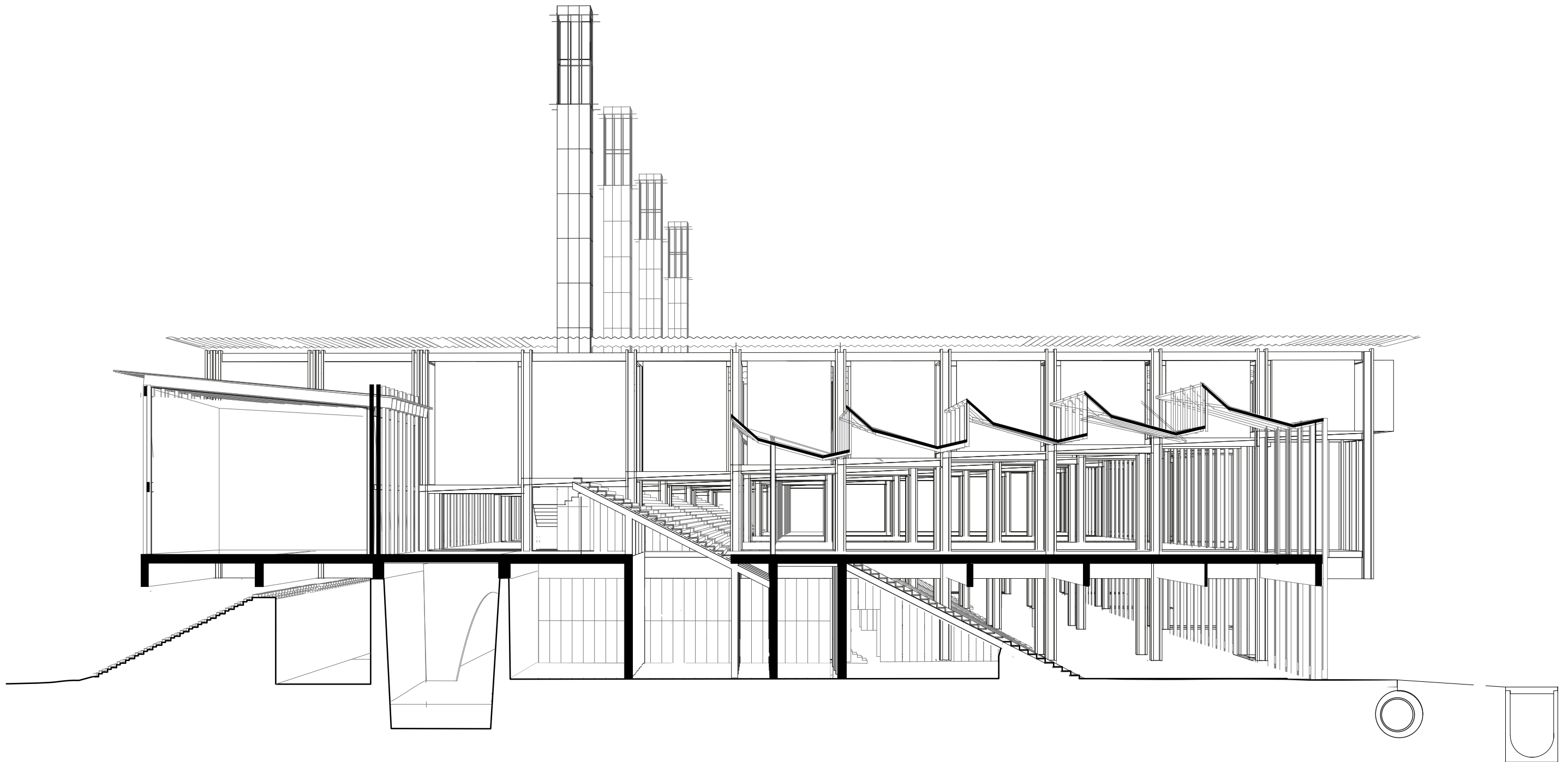


Automated Bays

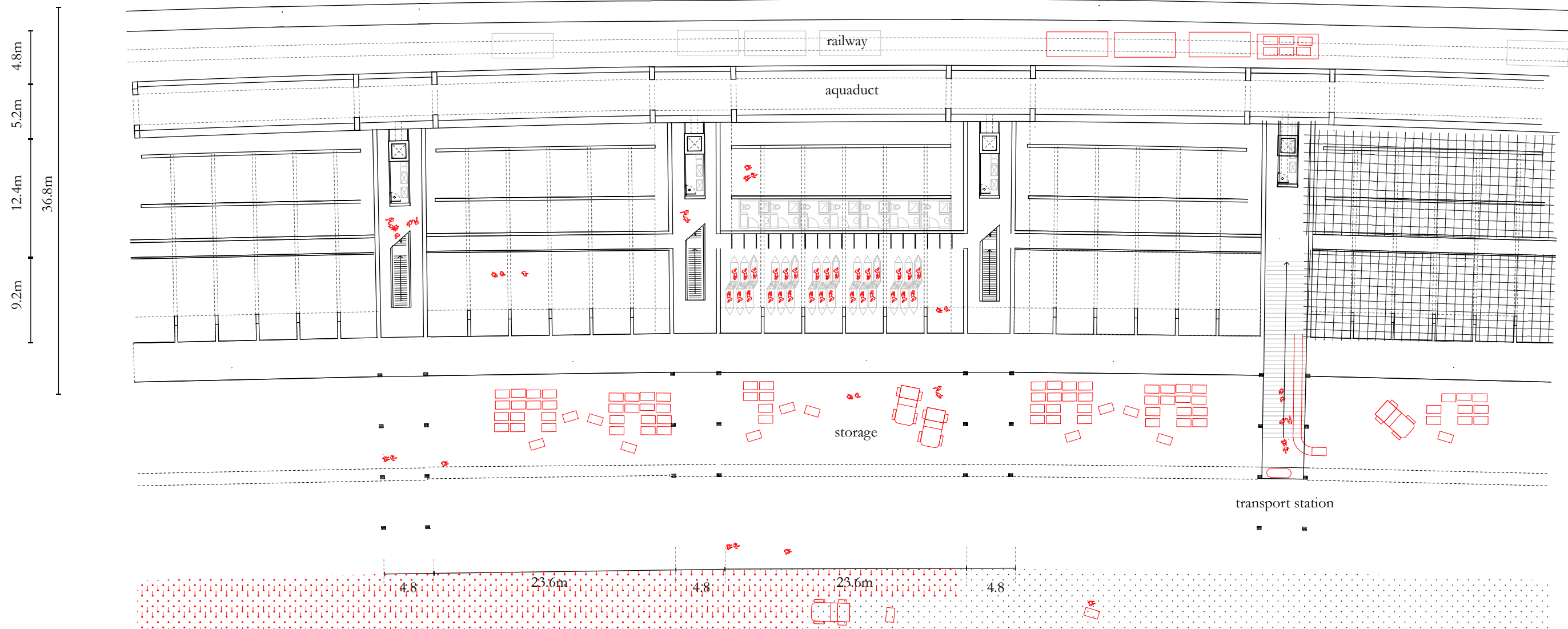
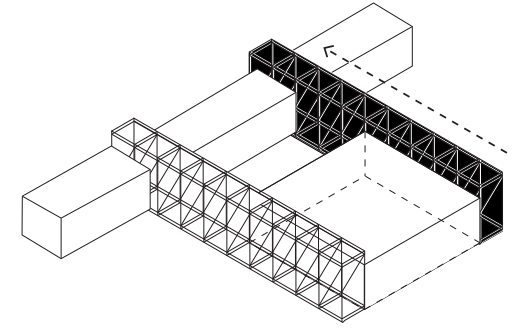
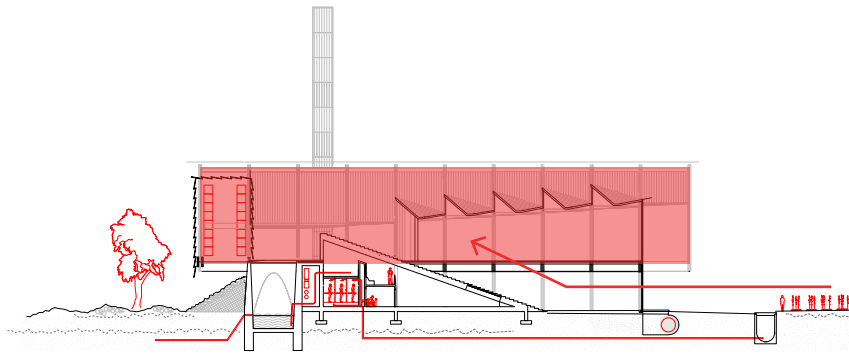


**Automated Storage
Wall**

Visible - Sustainable - Kit of parts - Factory line- Promise

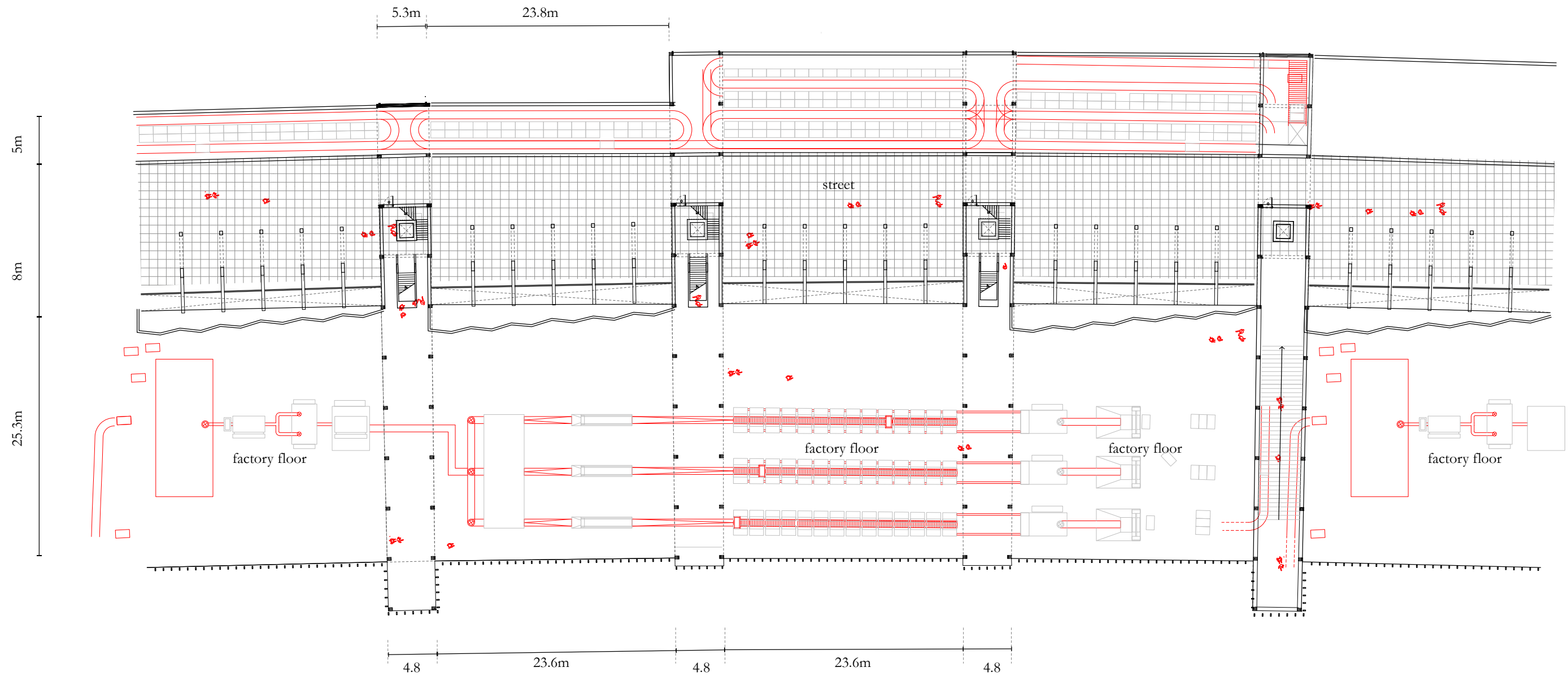
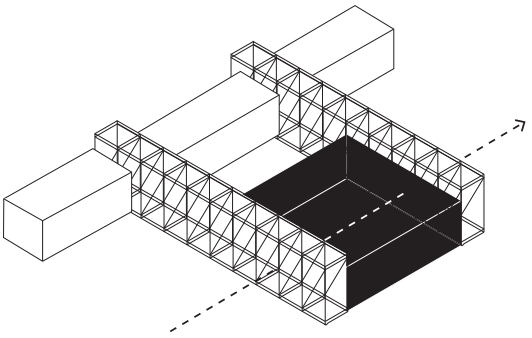
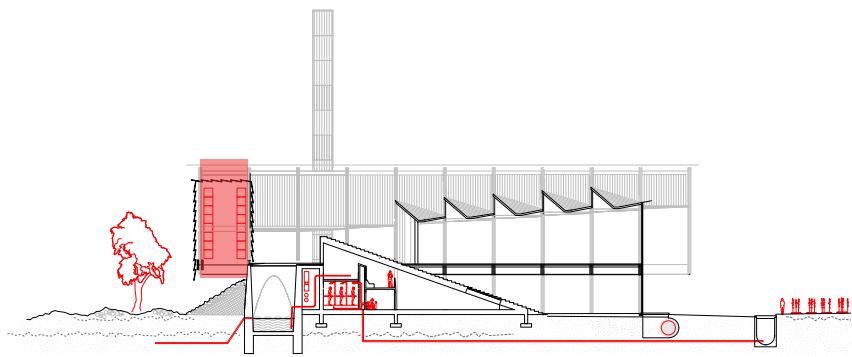


Visible - Sustainable - Kit of parts - Factory line- Promise



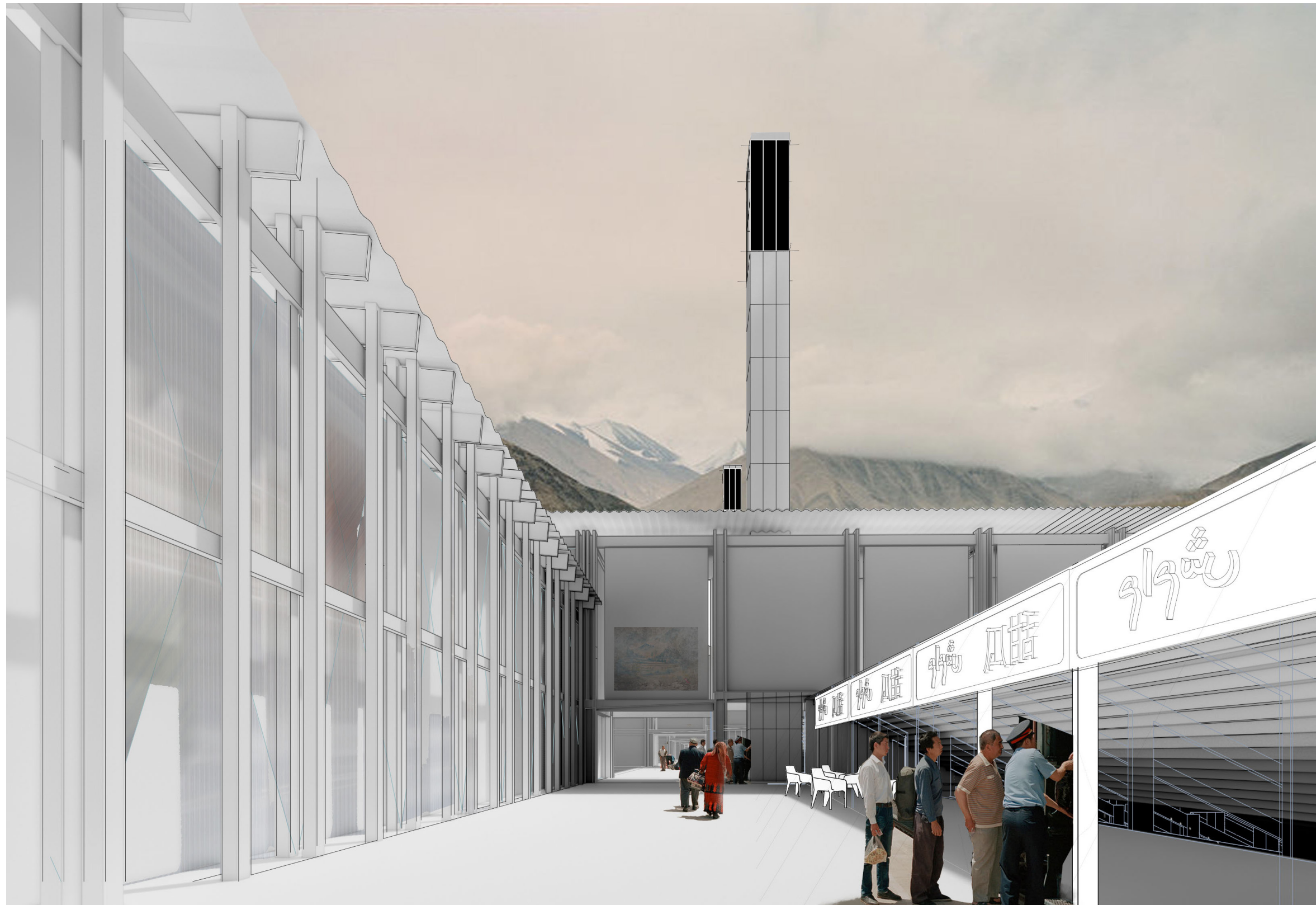
1:200 Ground Floor Plan
Cotton from the fields is brought up into the factory

Visible - Sustainable - Kit of parts - Factory line- Promise

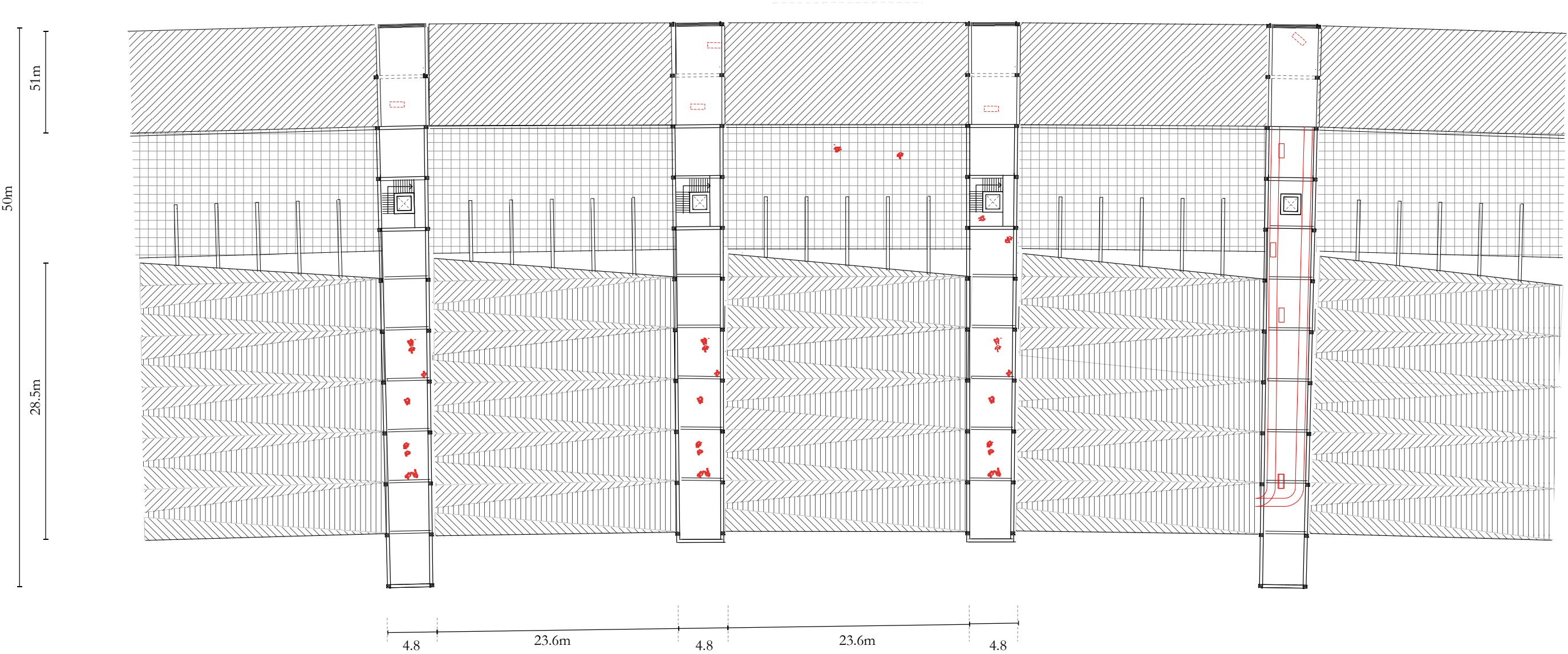
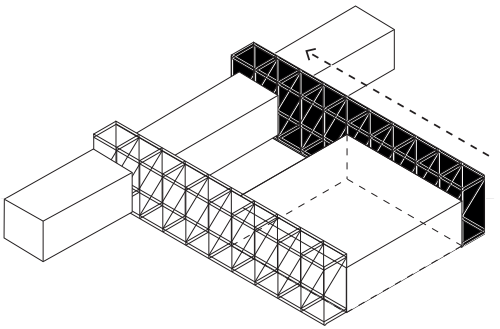
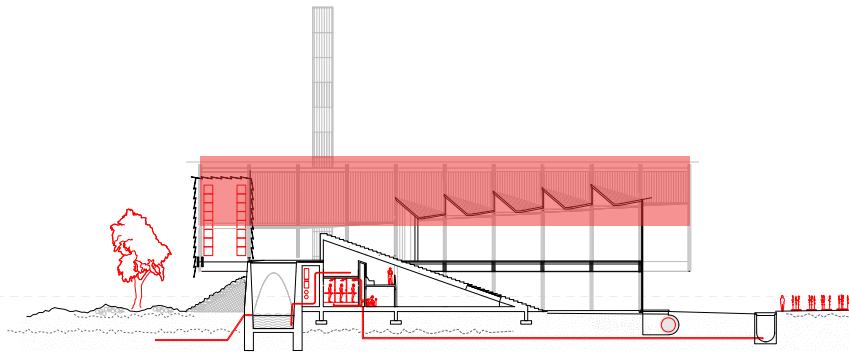


1:200 Ground Floor Plan
Cotton from the fields is brought up into the factory

Visible - Sustainable - Kit of parts - Factory line- Promise



Visible - Sustainable - Kit of parts - Factory line- Promise

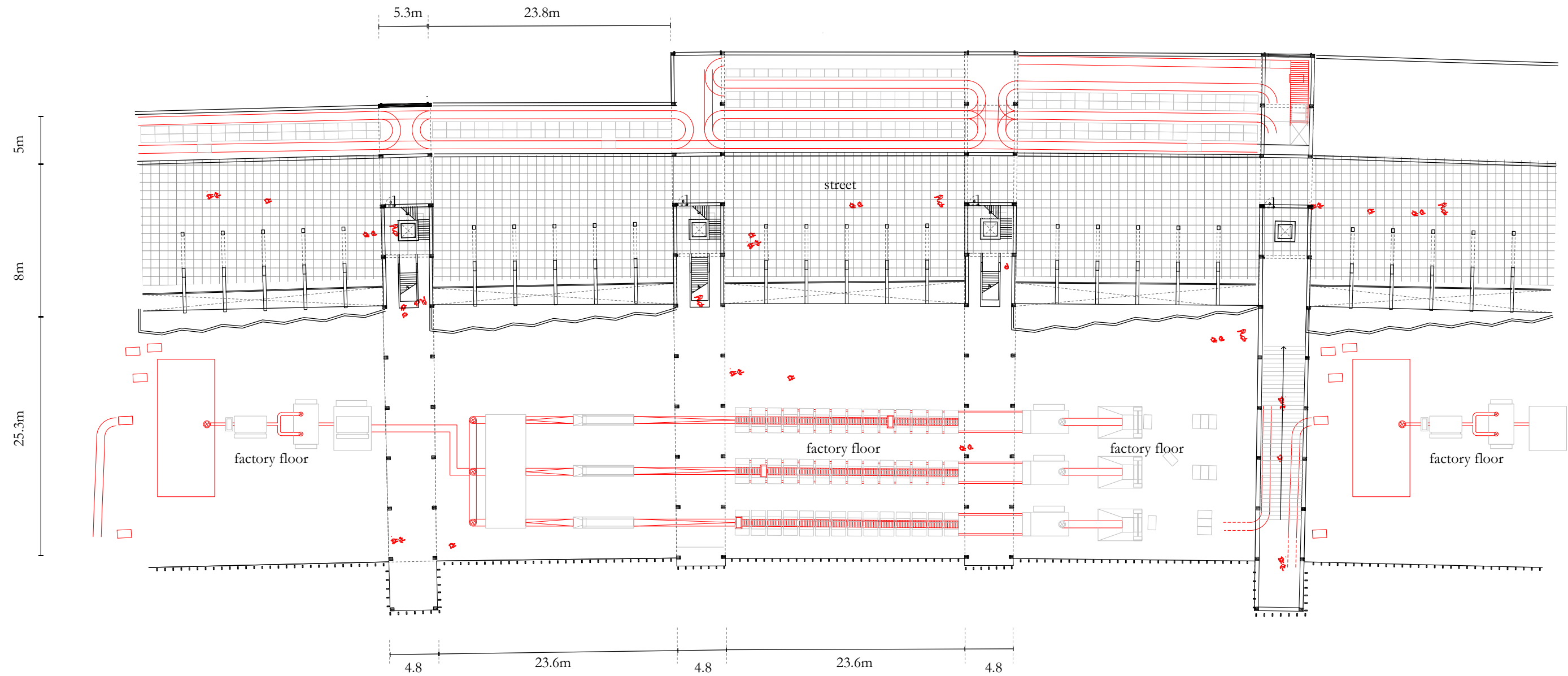
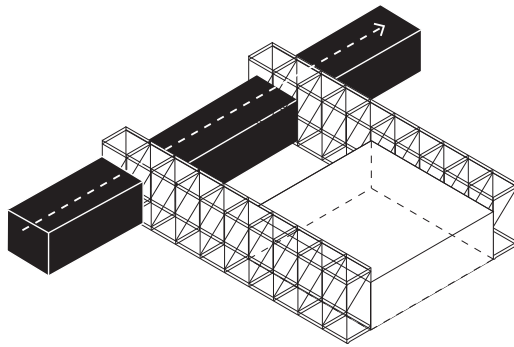
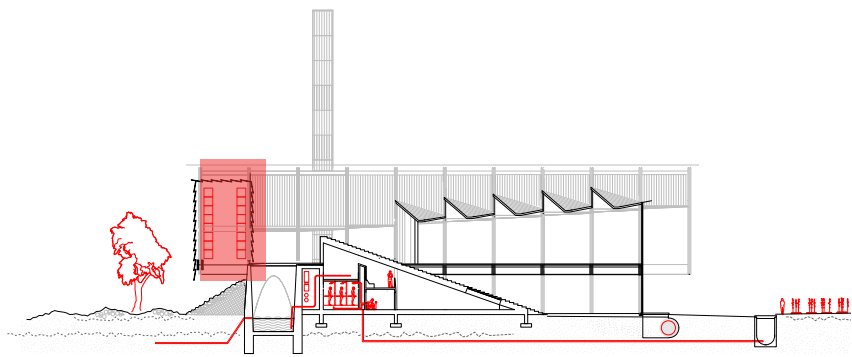


1:200 Second Floor Plan
Finished goods are brought up the Bay and transported across
to the automated storage unit on the external face of the city

Visible - Sustainable - Kit of parts - **Factory line-** Promise

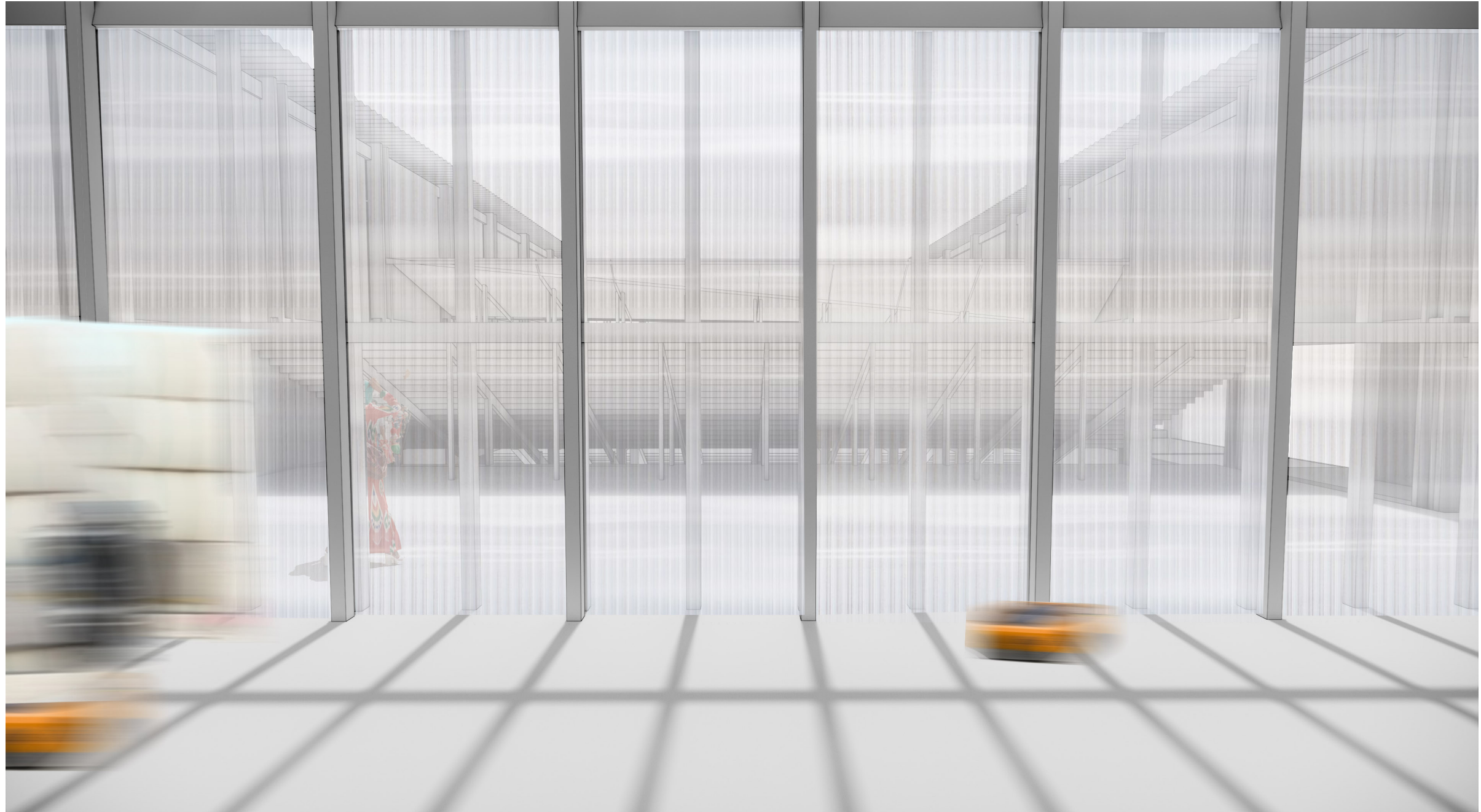


Visible - Sustainable - Kit of parts - Factory line- Promise

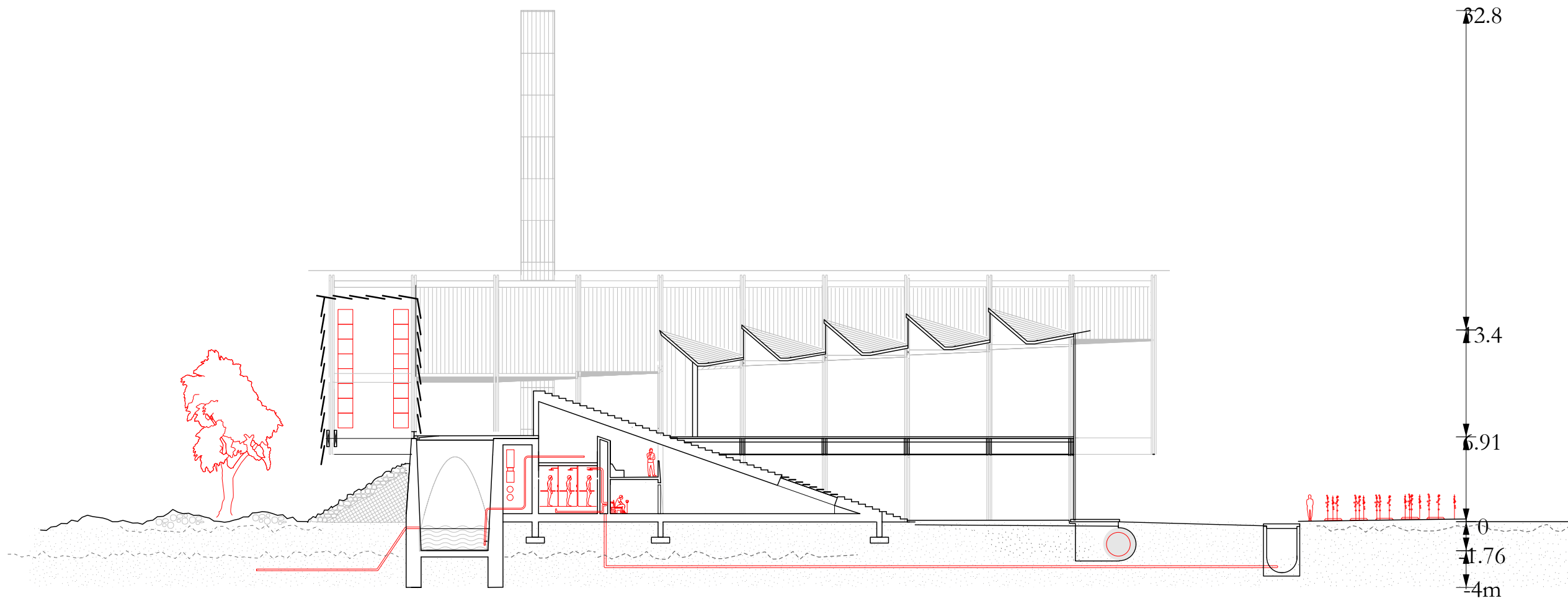


1:200 Ground Floor Plan
Cotton from the fields is brought up into the factory

Visible - Sustainable - Kit of parts - **Factory line-** Promise

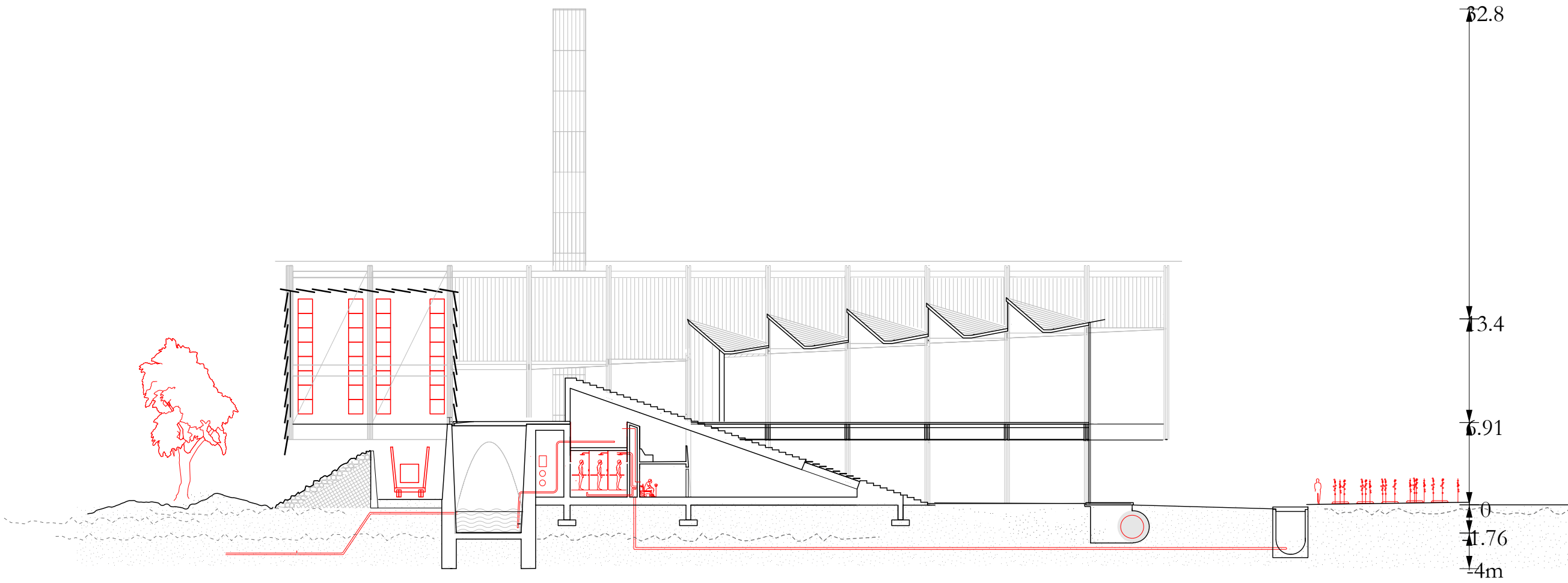


Visible - Sustainable - Kit of parts - Factory line- Promise



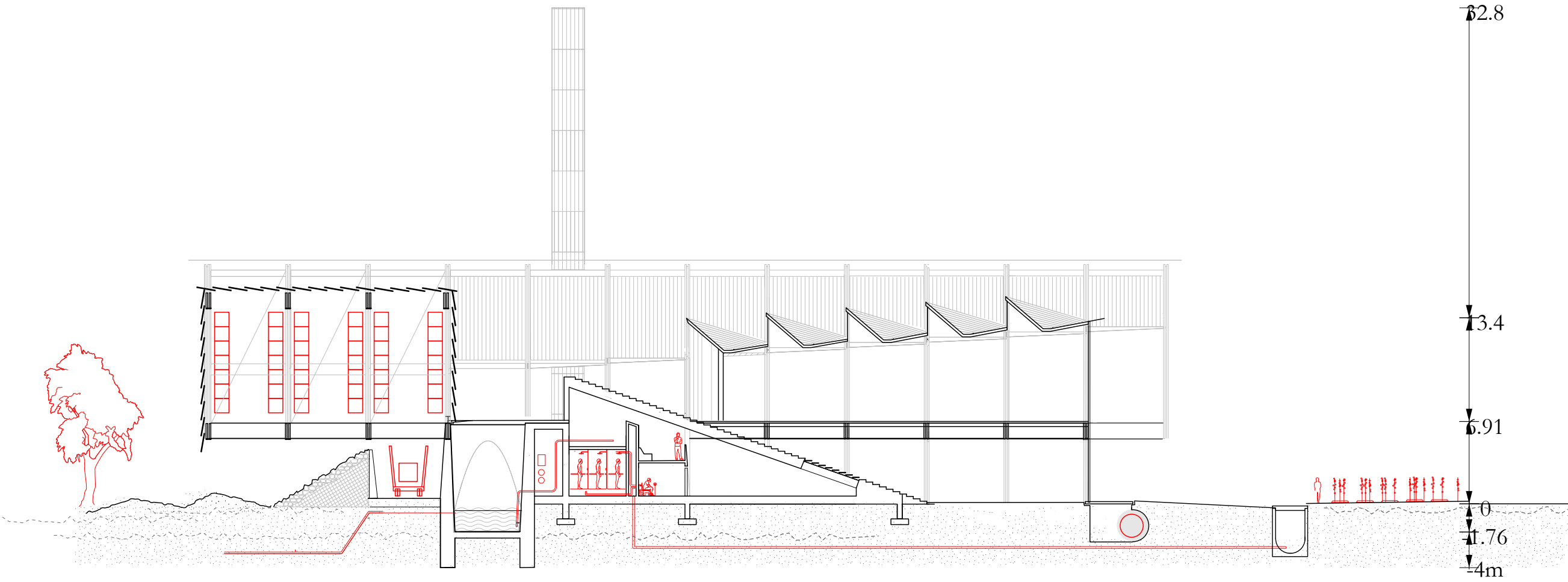
1:200
Section through factory

Visible - Sustainable - Kit of parts - Factory line- Promise



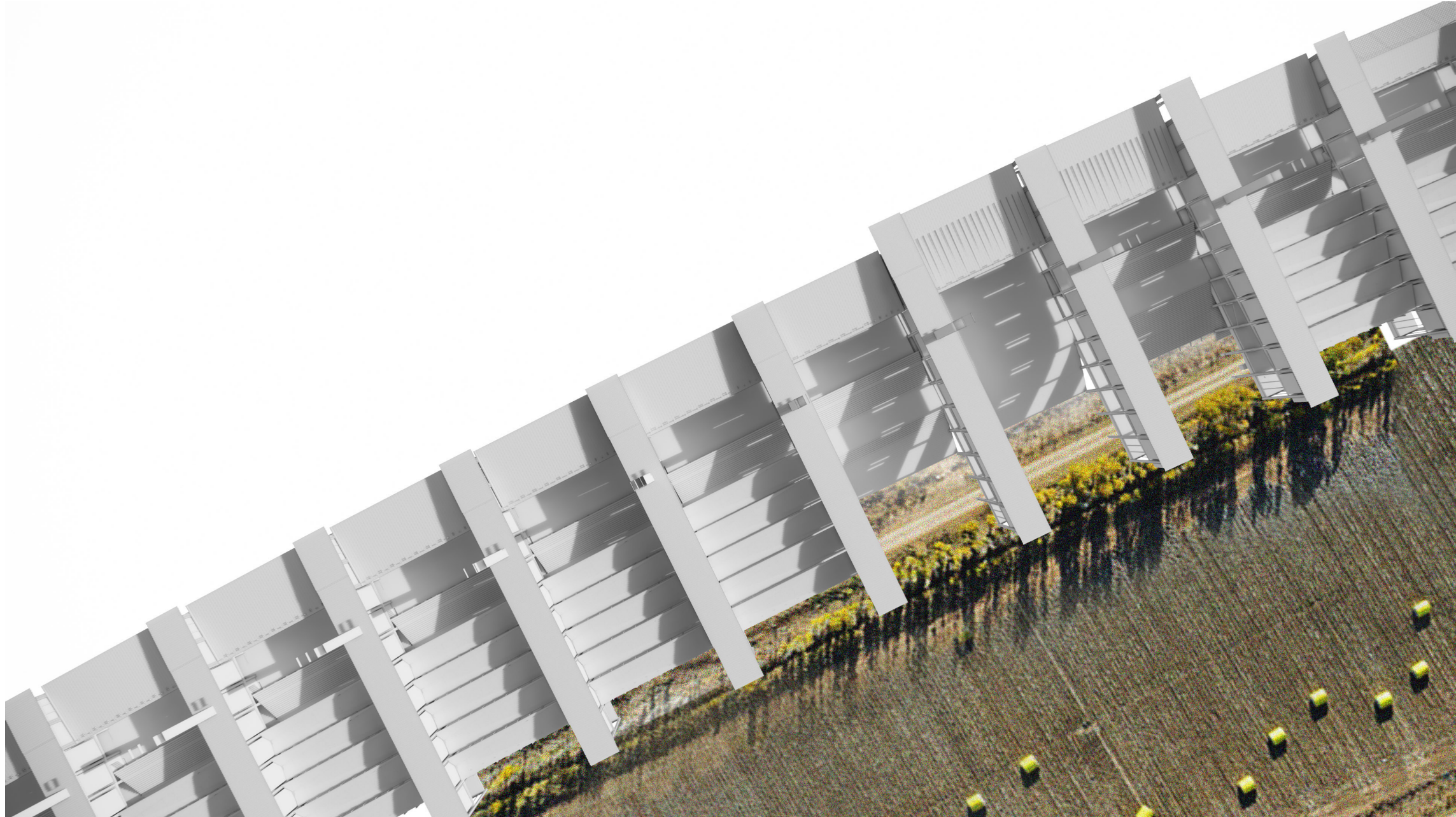
1:200
Section through a factory

Visible - Sustainable - Kit of parts - Factory line- Promise



1:200
Section through a factory

Visible - Sustainable - Kit of parts - **Factory line-** Promise



Variation of the border condition

Visible - Sustainable - Kit of parts - Factory line - **Promise**

The city's
PROMISE OF PRODUCTION

Visible - Sustainable - Kit of parts - Factory line - Promise



Reassembled as a single city: A a single narrative

Visible - Sustainable - Kit of parts - Factory line - Promise

Hi Kat,

Glad that you can use the information I gathered and sent.

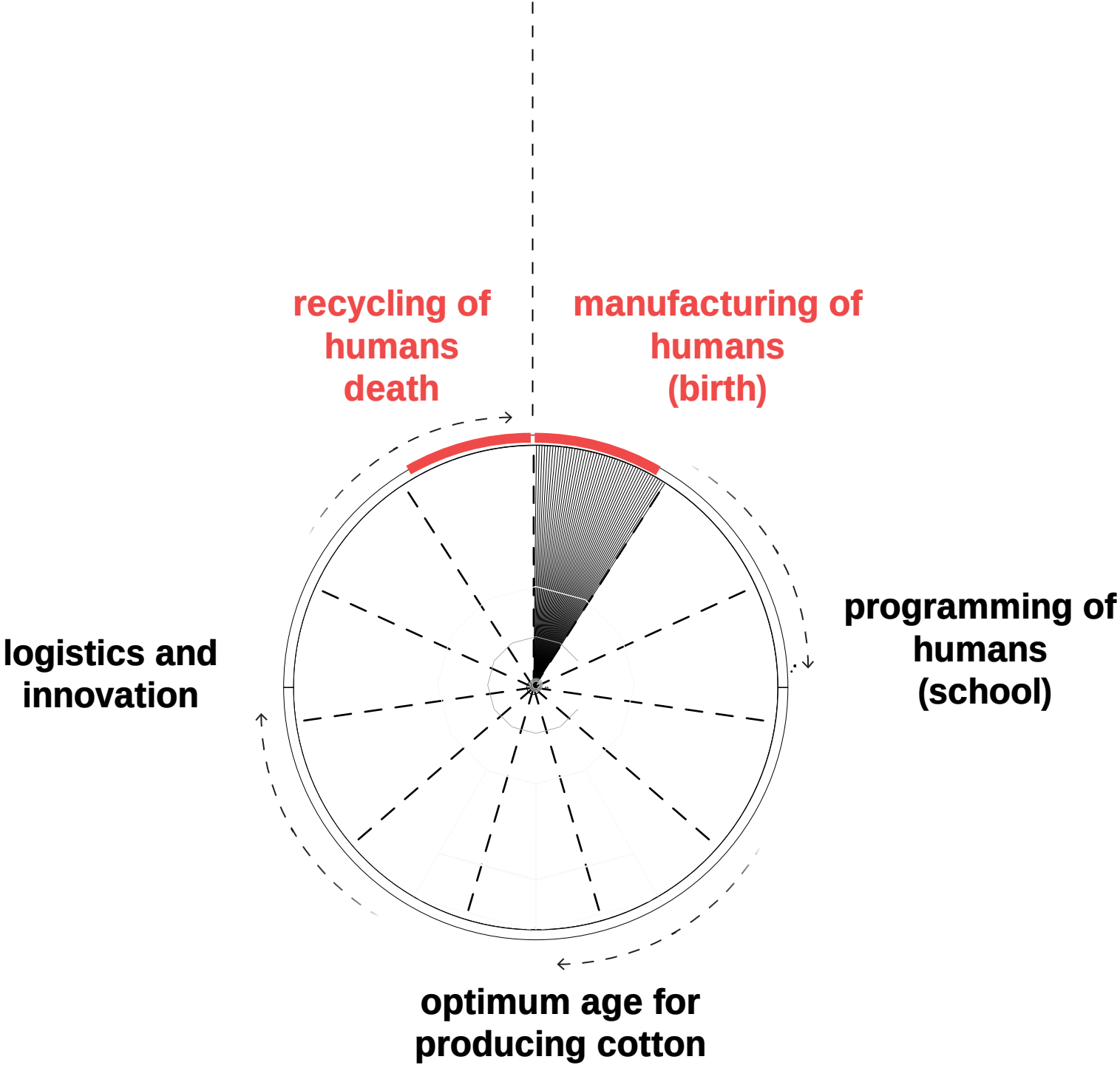
Regarding your final question, my personal view is that China probably has at least 10 to 20 years to go in maintaining or even dominating the textile industry. China has the history, the experience, the technology and the manpower to sustain a leadership position. The only area which may continue to post some pressure and a question mark is manpower. Like any other developed countries, people go for higher end jobs and grow tired of industrial work. China is no exception. The more developed coastal provinces in China have already experienced a shortage of industrial workers for some years. The majority of workers in our own factories are from inland provinces. Those who are well trained and have gained experiences want to be bosses themselves. They established their own cottage factories but are hard pressed in getting skilled and willing labour themselves as young people in inland provinces become better educated and abandon any desire to invest their future in factories.

However, other developing countries such as Bangladesh, Vietnam, Cambodia, India and African countries are political unstable and are far behind in catching up to the production efficiency of China. I personally cannot see any of them to be a threat to China's dominance in textile manufacturing, at least not in the near future of 10-20 years,

James

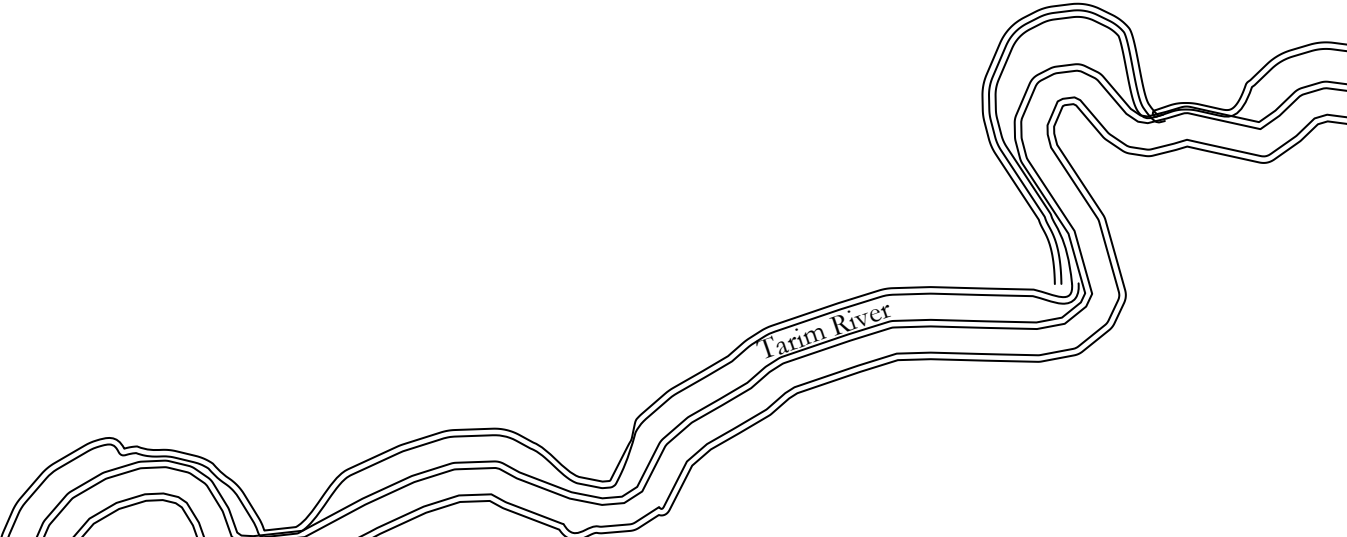
Interview with Chinese Textile Factory Owner

Visible - Sustainable - Kit of parts - Factory line - Promise

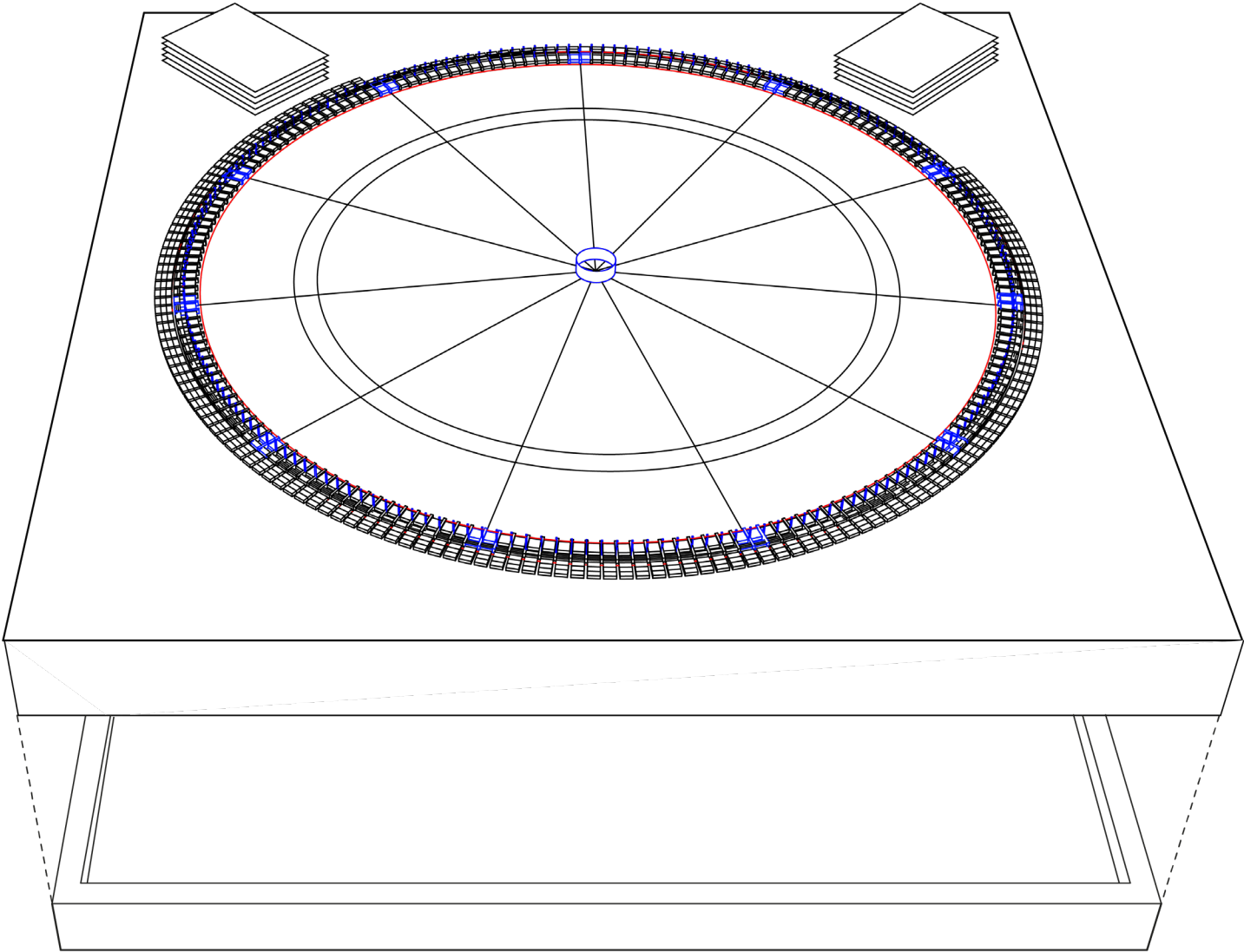


LIFE CYCLE

Zones

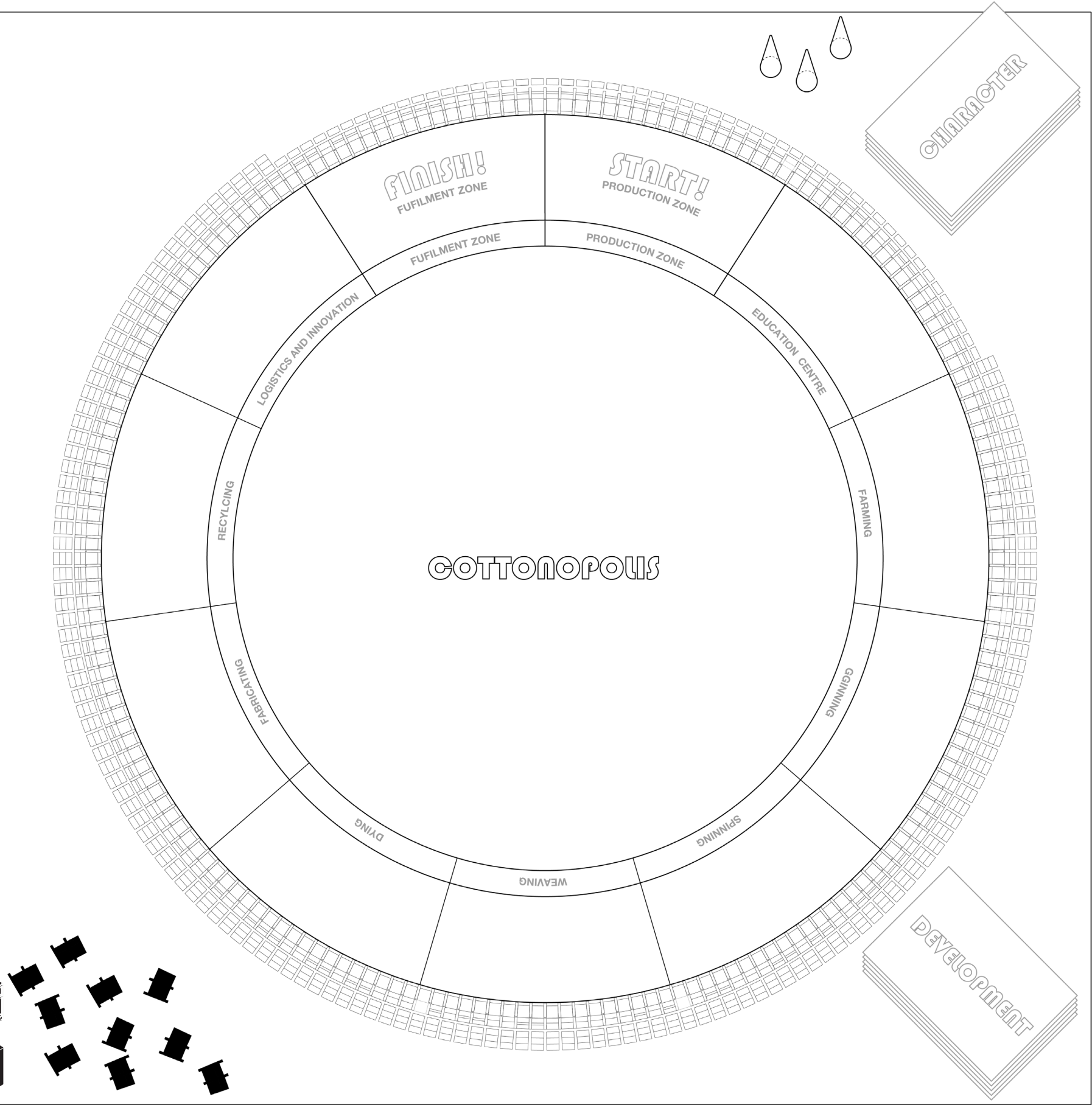


Visible - Sustainable - Kit of parts - Factory line - Promise

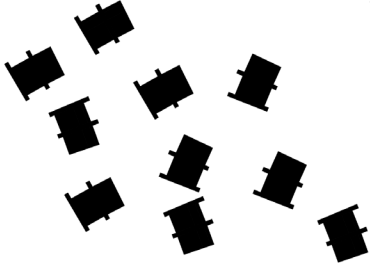
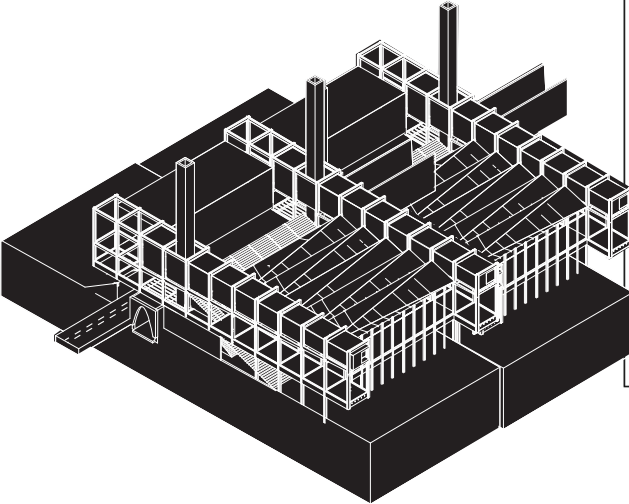


Visible - Sustainable - Kit of parts - Factory line - Promise

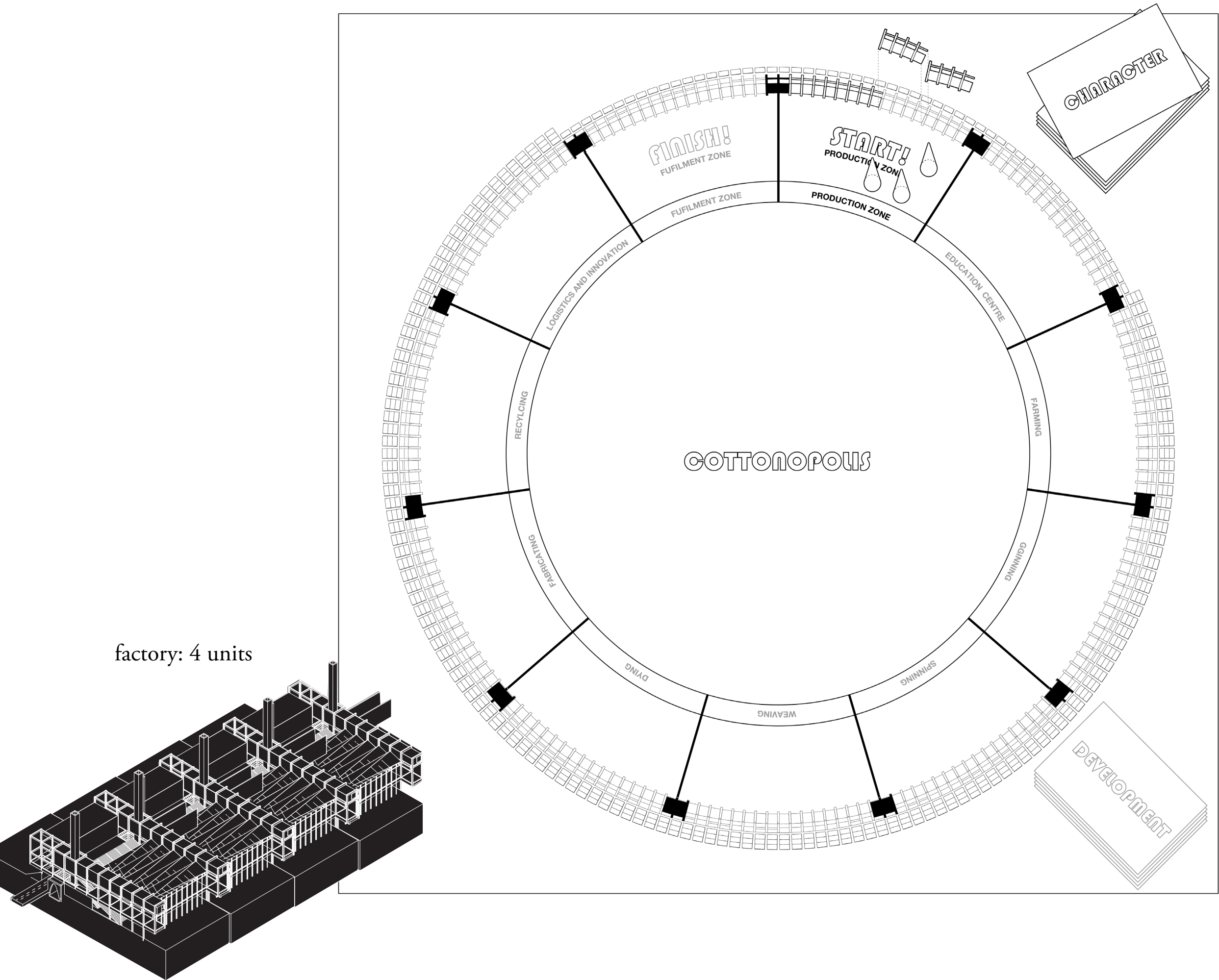
11 section



boarder: 2 units



Visible - Sustainable - Kit of parts - Factory line - Promise



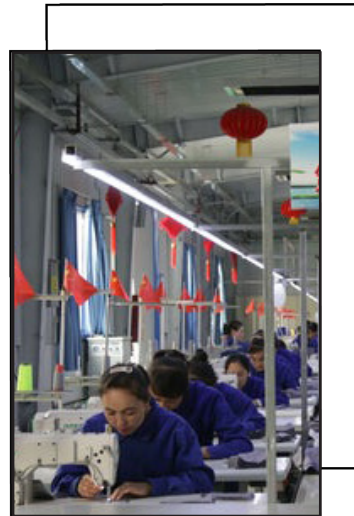
11 sections
50 bays
2 boarder bays

TOTAL: 12 factories

Visible - Sustainable - Kit of parts - Factory line - Promise



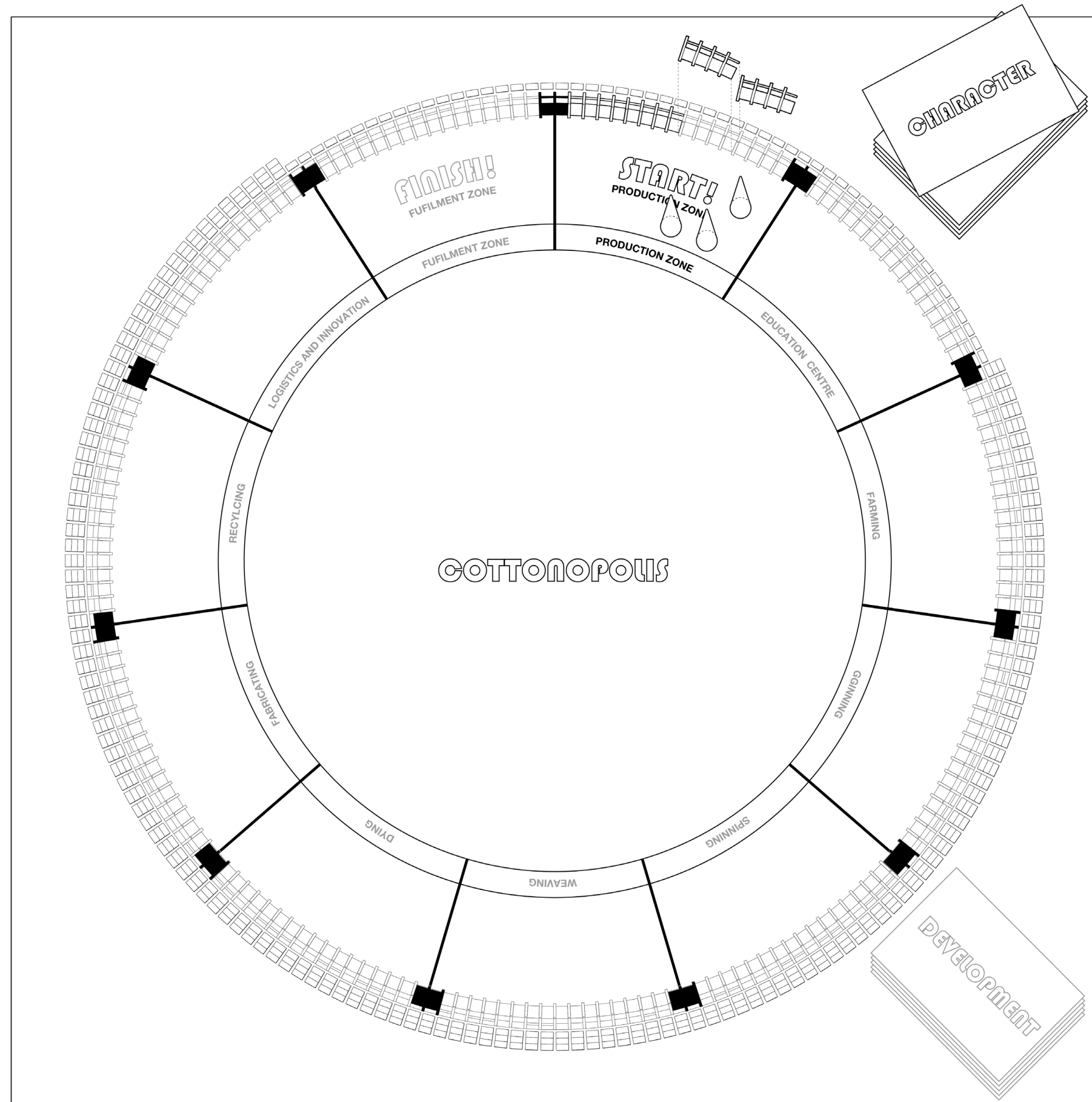
farmer



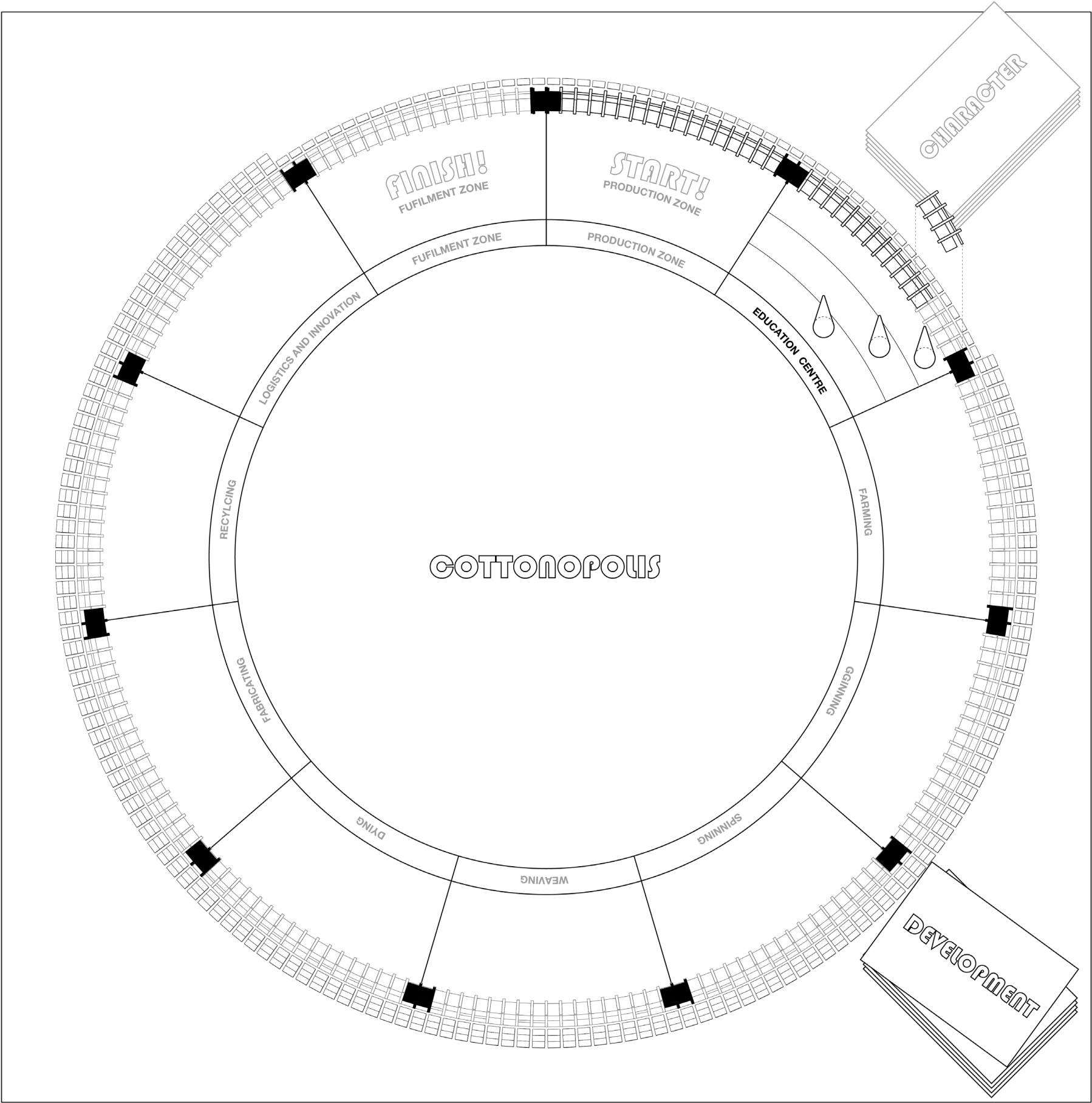
factory workers



engineer

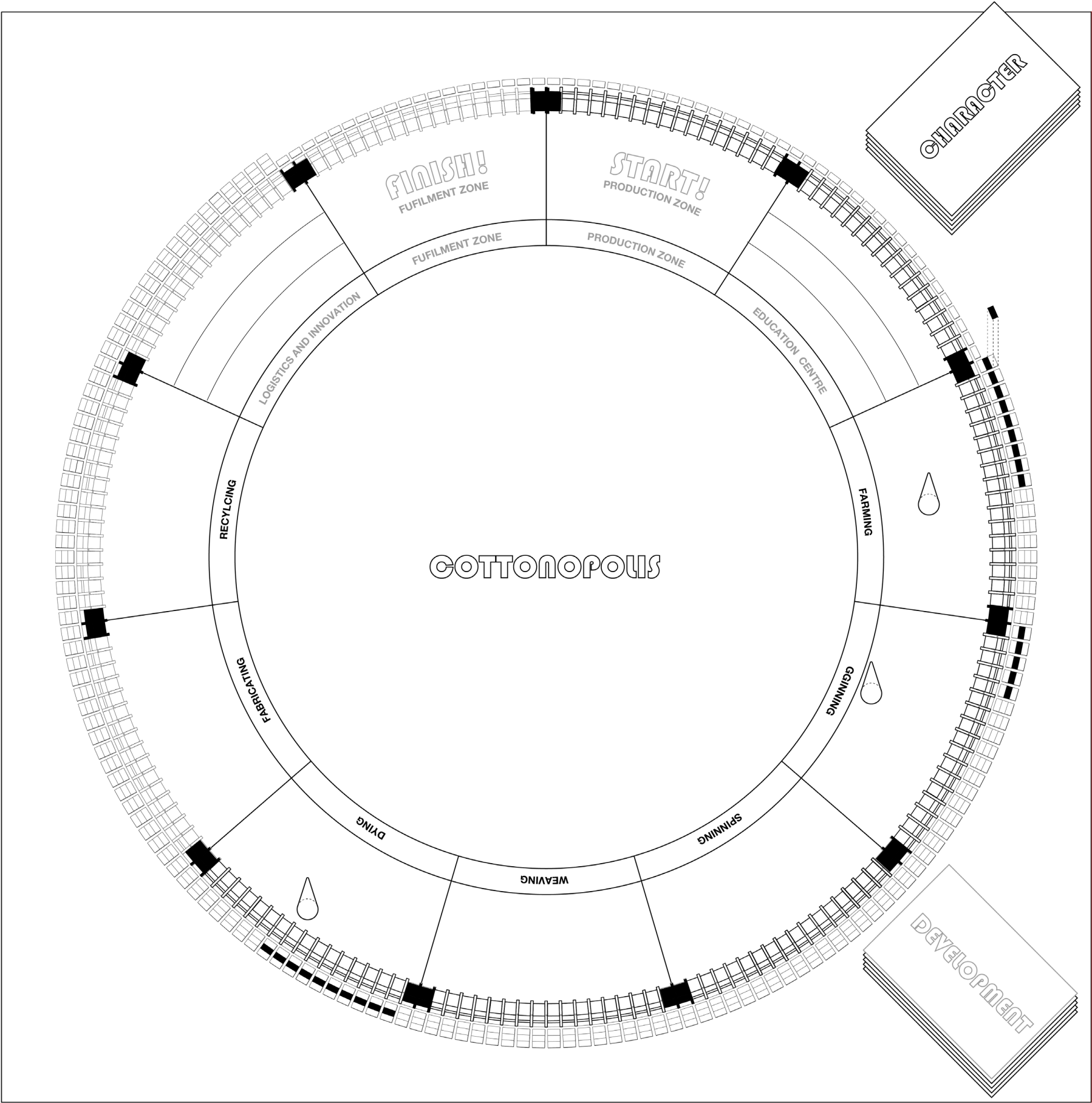


Visible - Sustainable - Kit of parts - Factory line - Promise



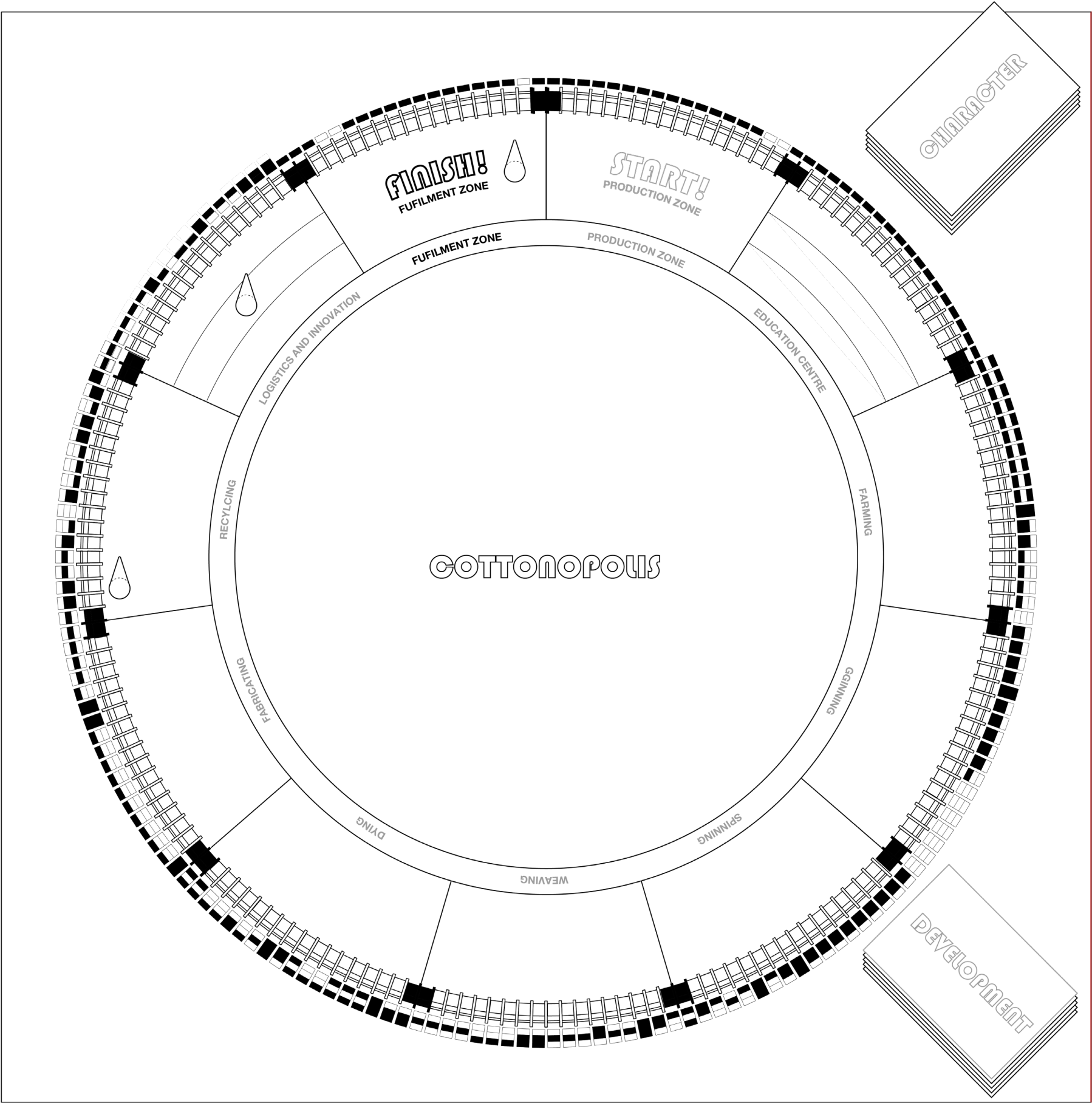
progress around the board.
points are recorded in

Visible - Sustainable - Kit of parts - Factory line - Promise

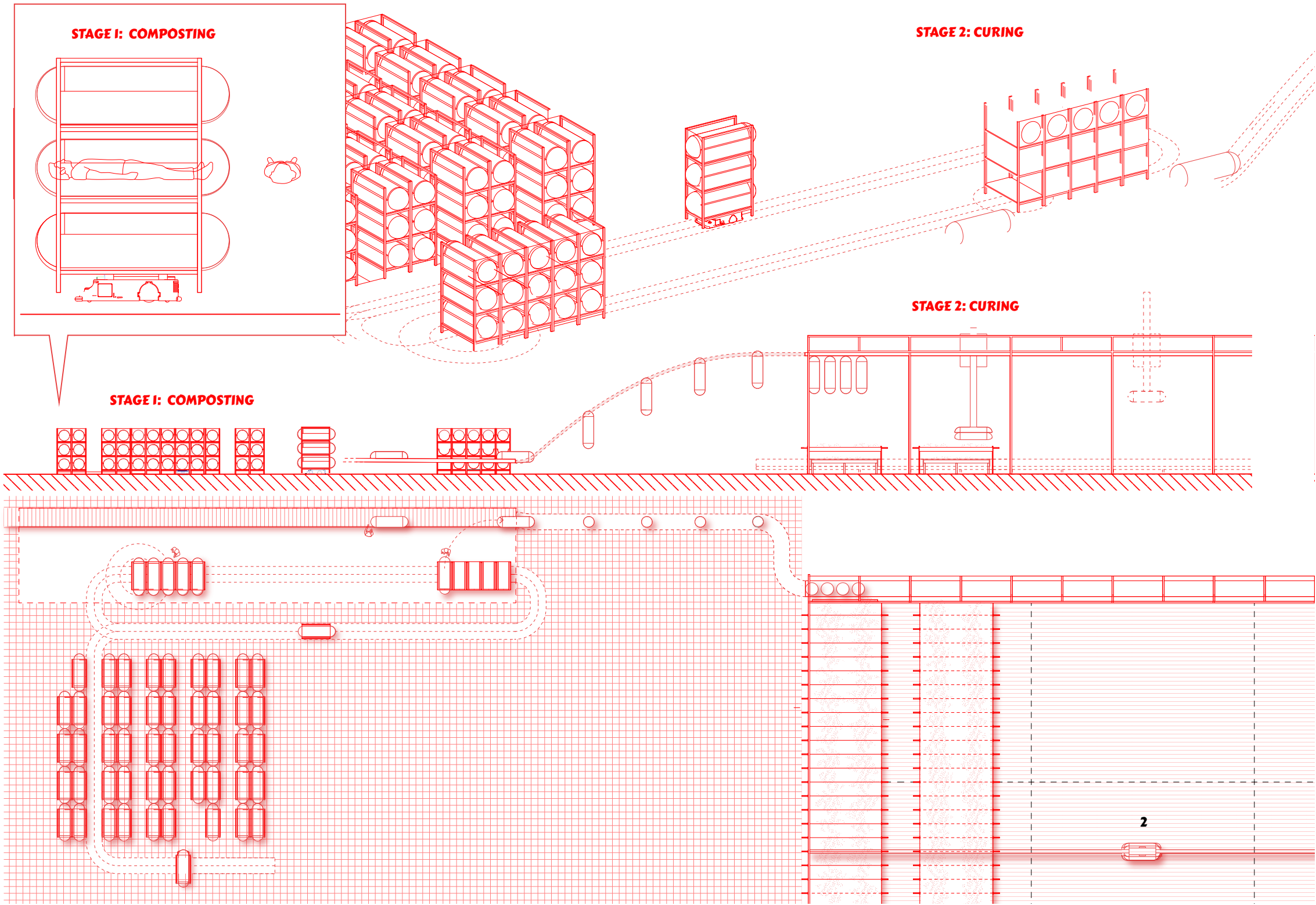


Producing over the game cycle

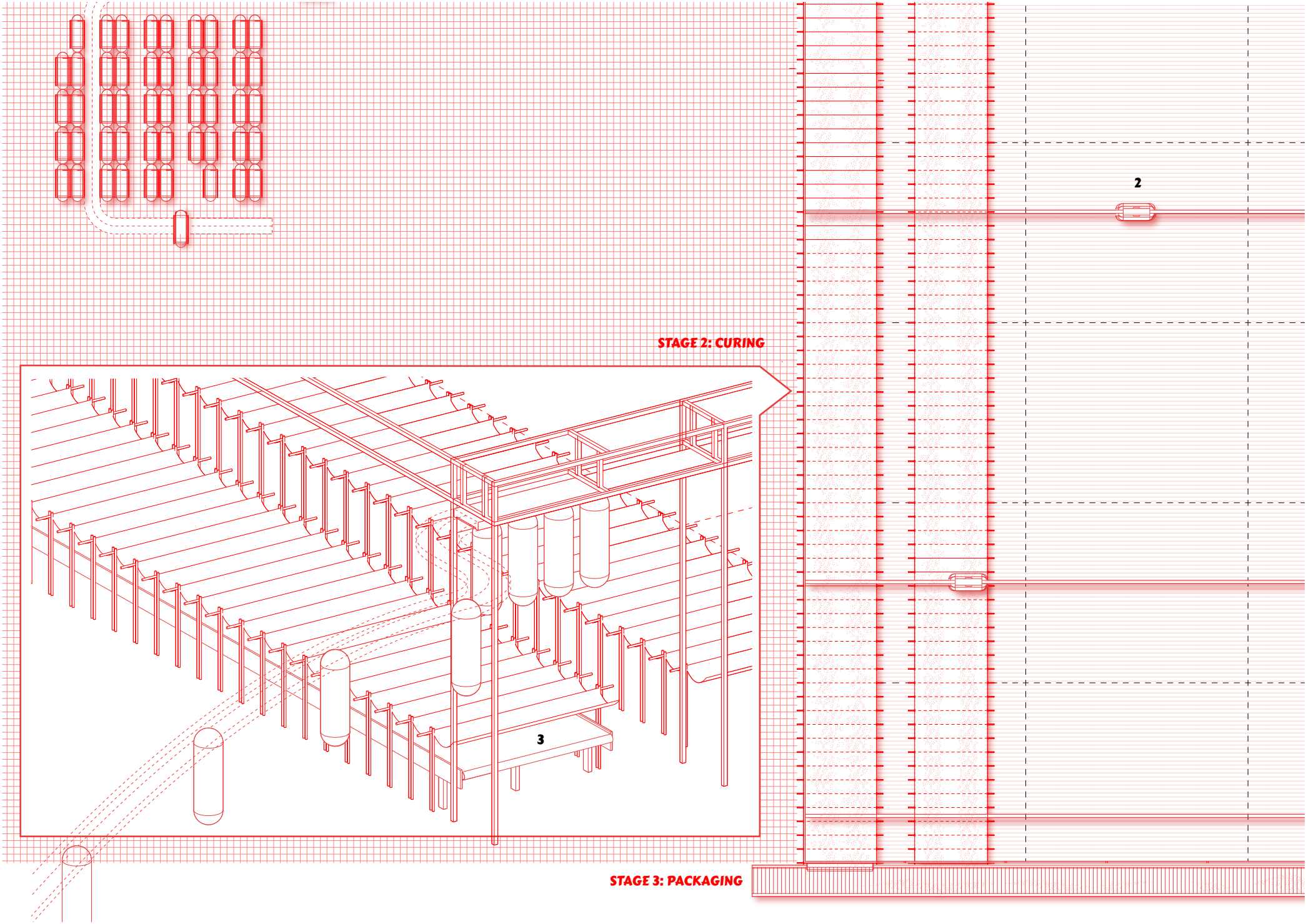
Visible - Sustainable - Kit of parts - Factory line - Promise



Visible - Sustainable - Kit of parts - Factory line - Promise



Visible - Sustainable - Kit of parts - Factory line - Promise

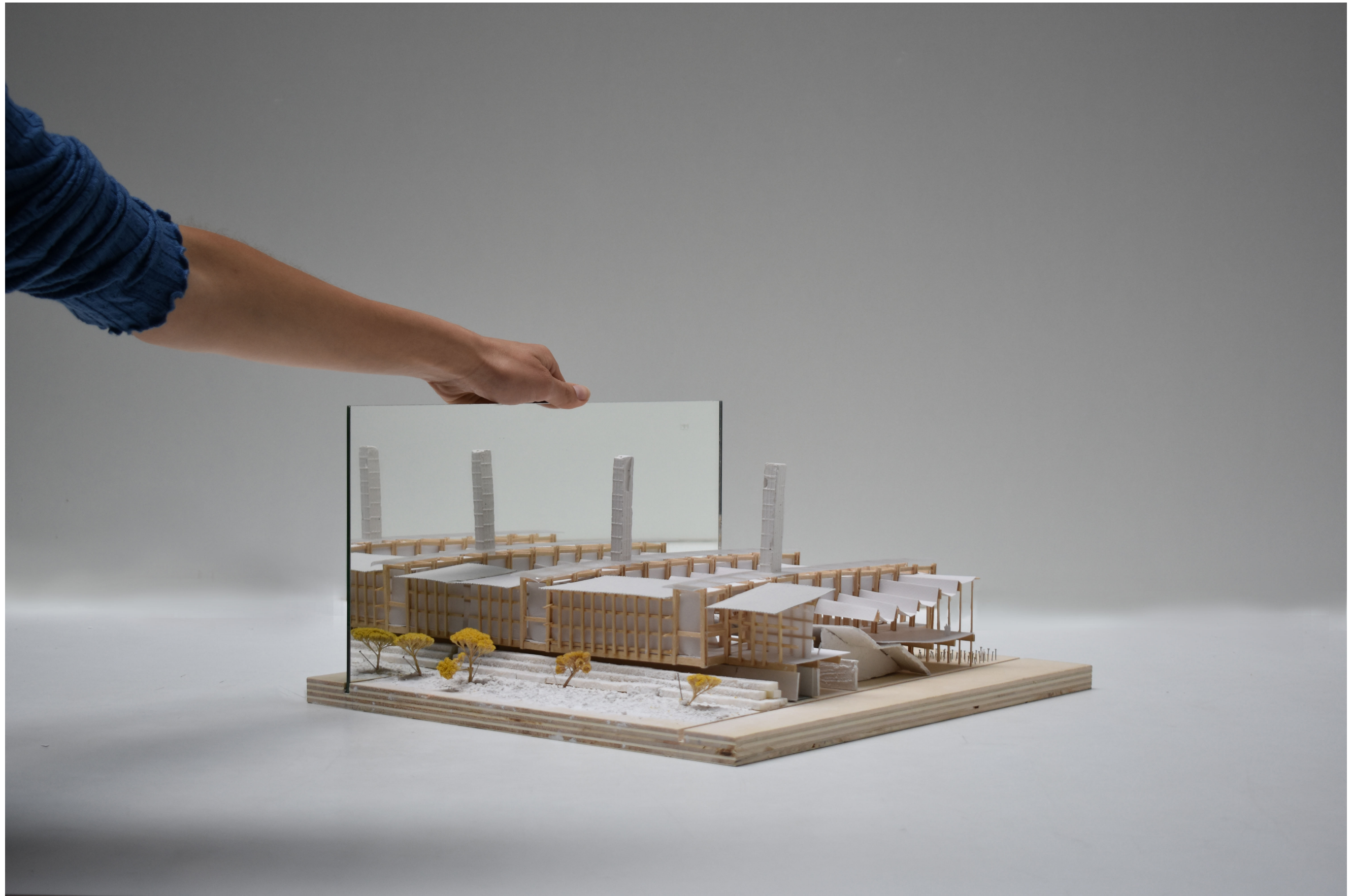




Visible - Sustainable - Kit of parts - Factory line - Promise



Visible - Sustainable - Kit of parts - Factory line - **Promise**



Visible - Sustainable - Kit of parts - Factory line - **Promise**

