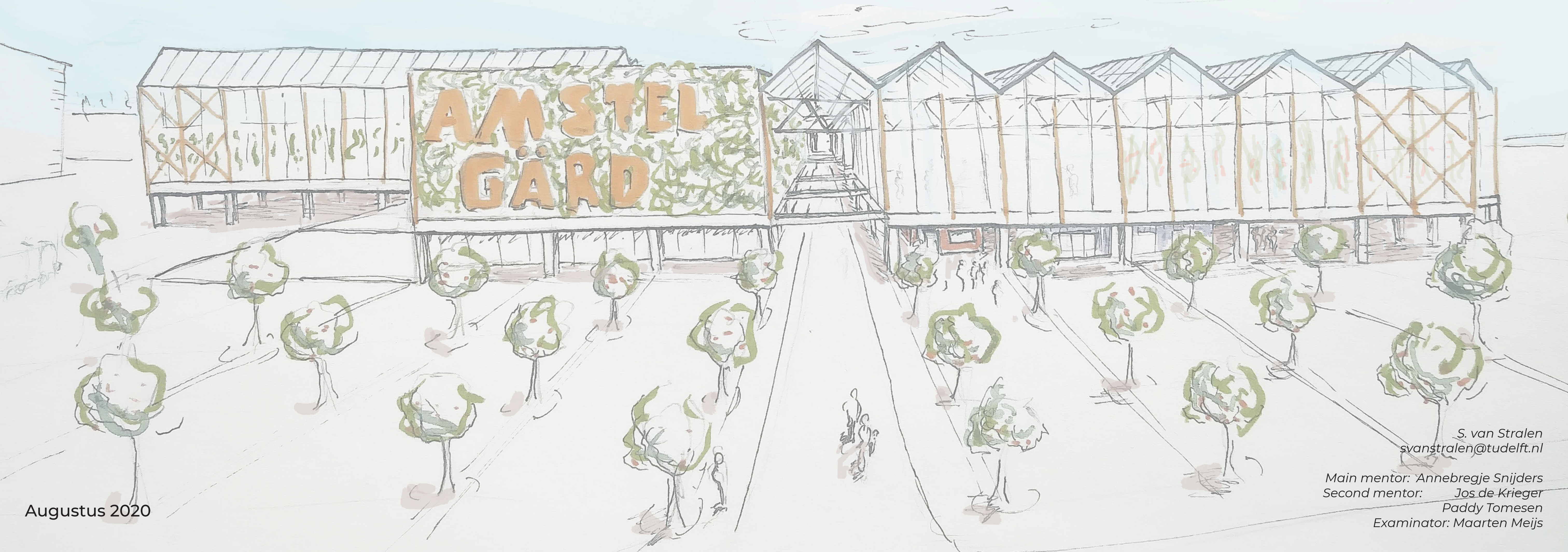


AMSTELGÄRD

Food System Amstel III

P5 presentation Stan van Stralen



S. van Stralen
svanstralen@tudelft.nl

Main mentor: Annebregje Snijders
Second mentor: Jos de Krieger
Paddy Tomesen
Examinator: Maarten Meijs

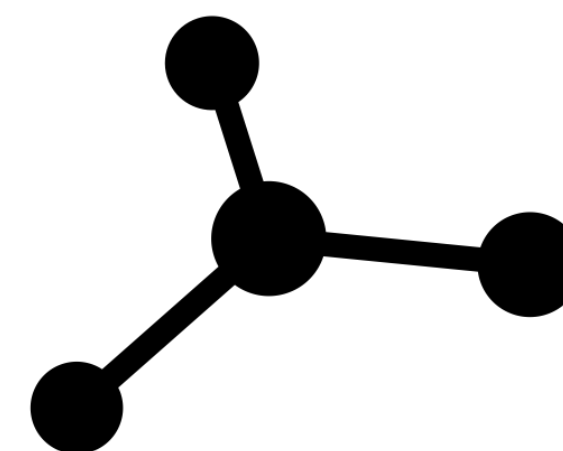
Augustus 2020



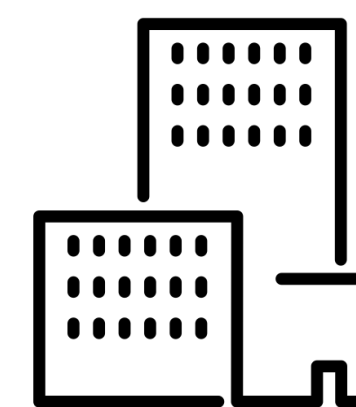
research



strategy /
masterplan

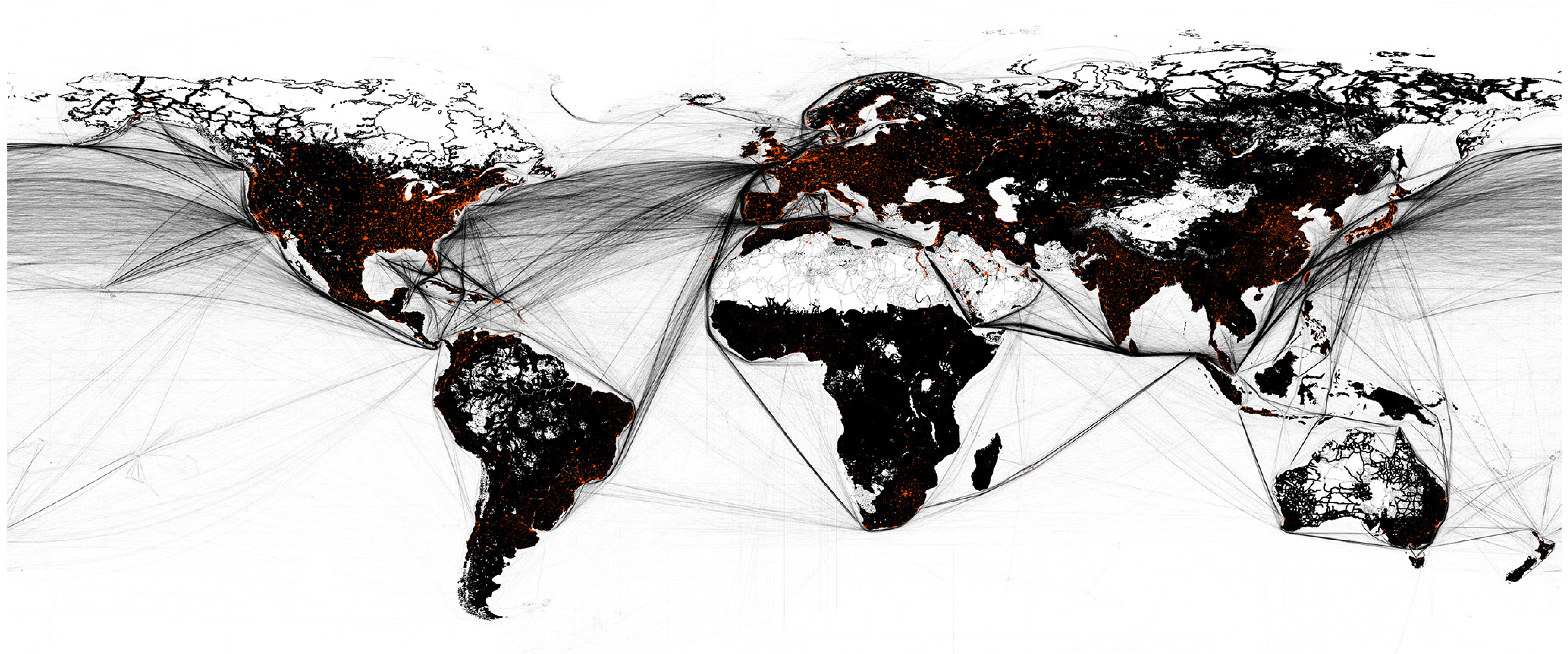


project program



design

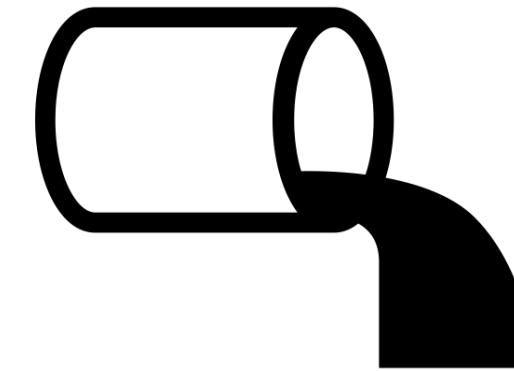
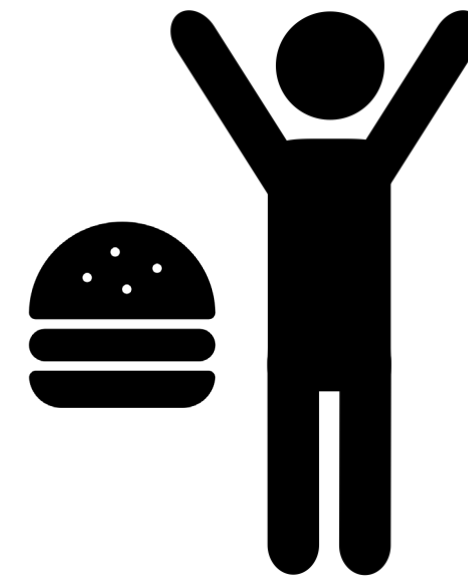
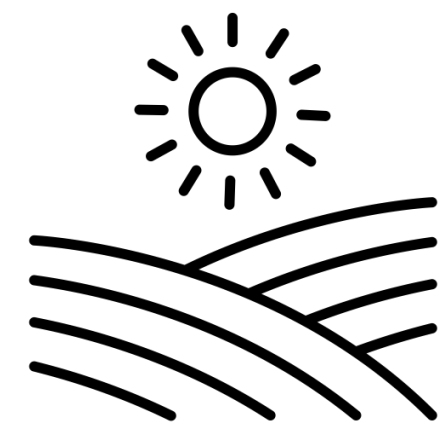
global food system



Nitrogen (N)
Natural gas + air

Phosphorus (P)
Salt mine extraction

Potassium (K)
Salt mine extraction



Depletion of mineralized fertilizer

The world's insatiable hunger for phosphorus

By Laurence Knight and Tim Bowler
BBC News

8 November 2013



Is it the biggest looming crisis that you have never heard of?

Since 1945, the world's population has tripled to seven billion, and feeding that population has relied increasingly on artificial fertilisers.

Phosphates, among the most important fertilisers, come from an ore that is in limited supply. It is mined, processed and spread on to our fields, whence it is ultimately washed away into the

Pollution

Boerderij

Home

Achtergrond 19 okt 2019 67 reacties

‘Niet minder vee, maar minder krachtvoer en kunstmest’

Niet de aantallen dieren maar de hoeveelheden kunstmest en – vooral – geïmporteerd voer moeten drastisch naar beneden om het stikstofprobleem en meer dan dat op te lossen. Dat vindt Jan Willem Erisman.

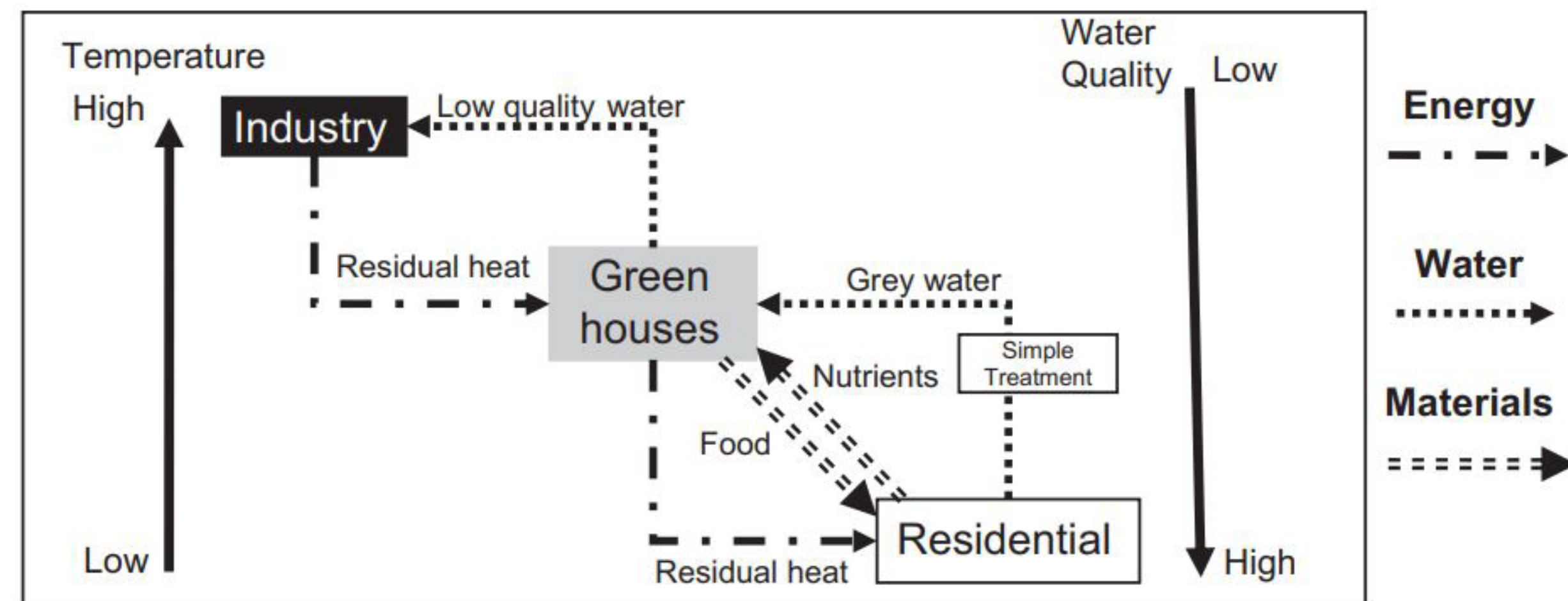
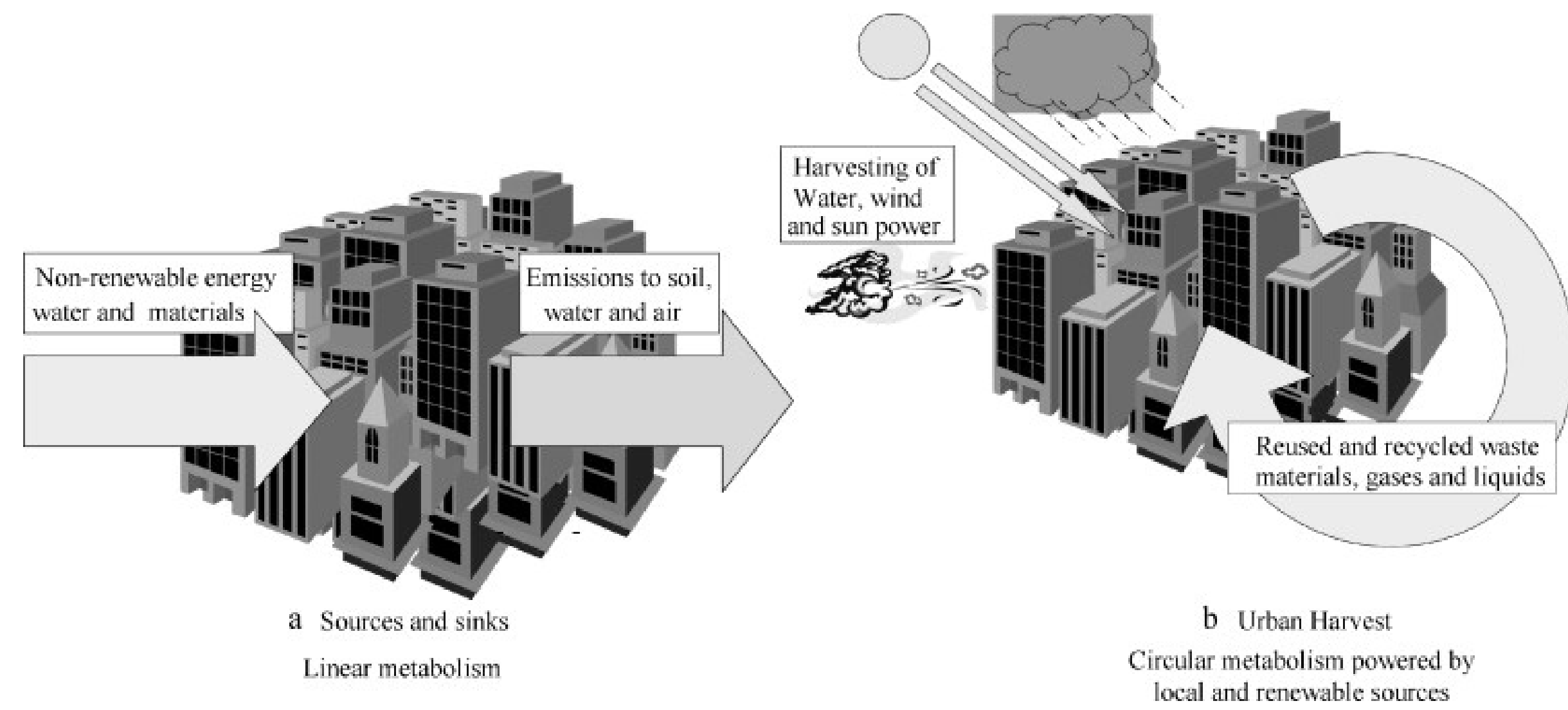
Een van de bekendste stikstofdeskundigen van Nederland is Jan Willem Erisman. Als stikstofprofessor aan de VU Amsterdam kon hij jaren lang betrekkelijk in de luwte werken. Maar net nu de leerstoel ‘Stikstofstudies’ aan de VU Amsterdam is geëindigd, stort het hele land zich op ‘zijn’ onderwerp. 3.000 trekkers op bezoek bij het RIVM. Zelden is een wetenschappelijk instituut zo belaagd. Boeren twijfelen zwaar aan de betrouwbaarheid van kennis over stikstof. Dat wantrouwen klinkt ook door in de politiek. Erisman is mede daarom een veel geraadpleegde deskundige. Hij probeert de valkuilen van het sterk gepolariseerde debat steeds te vermijden. Dat begint al meteen bij de vraag of het inderdaad nodig is de veestapel fors in te krimpen?



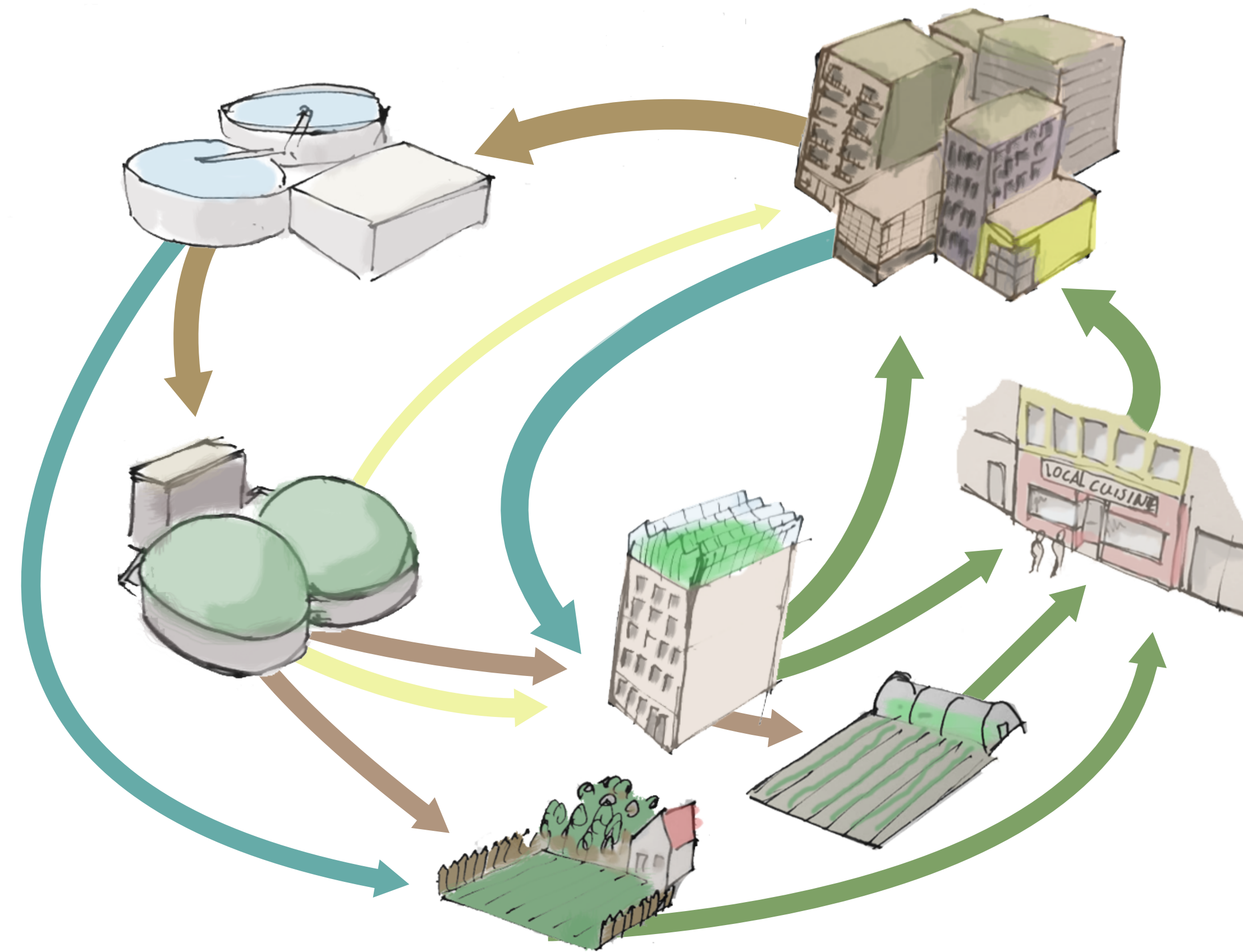
Jan Willem Erisman (58) is directeur van het Louis Bolk Instituut in Bunnik. Hij was tot 1 oktober ook bijzonder hoogleraar stikstofstudies aan de VU Amsterdam. Erisman is een veelgevraagd deskundige op het gebied van stikstof.

Stikstofbronnen

Erisman: “Mijn interesse begint niet bij de omvang van de veestapel maar bij de vraag: wat



Claudia M. Agudelo-Vera (2012), Harvesting urban resources towards more resilient cities



The objective is to define a role for urban farming within the urban social context which positively impacts the metabolism of a city, a strategy in which circular urban farming functions as a catalyst for better social cohesion, such as social projects, small business developments.

An aerial photograph of a city street scene. A wide, multi-lane road runs diagonally from the bottom left towards the top right. On the left side of the road, there are several large, modern buildings with glass facades, some with green roofs. There are also parking lots and smaller commercial buildings. On the right side, there are more modern office buildings, some with red brick facades, and a large industrial or warehouse building with a grey roof. In the background, there are more city buildings and a railway line with tracks. The overall scene is a dense urban environment.

Casus Amstel III

Amsterdam Zuid-Oost



2020

720 000 m² office

50 000 workspaces



94 000 users

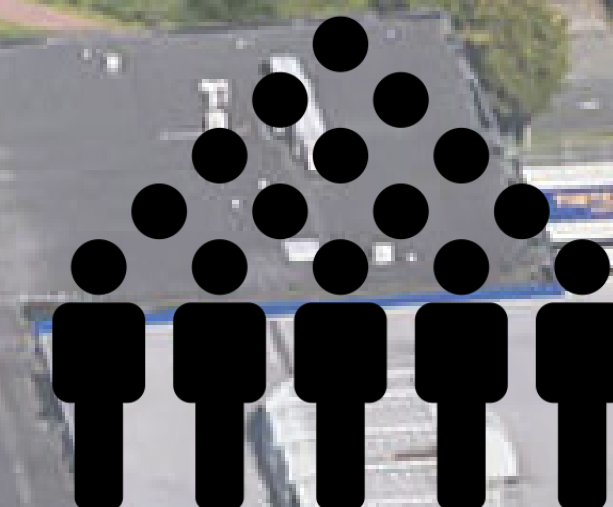


2040

720 000 m² office

50 000 workspaces

15 000 households



125 000 users

An aerial photograph of a modern urban development. The scene is dominated by a mix of architectural styles, including several tall, rectangular skyscrapers with glass facades and more traditional, multi-story brick buildings. A prominent feature is a large, green, curved structure on the left side, which appears to be a park or a large-scale landscaping element. A river or canal flows through the lower left portion of the image. The overall impression is one of a planned, integrated urban environment with a focus on green spaces and modern infrastructure.

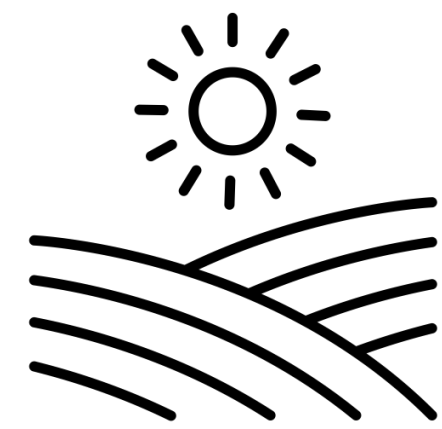
How can the metabolism of Amstel III 2040 be improved with the implementation of urban farming methods?

Nitrogen (N)
478 T

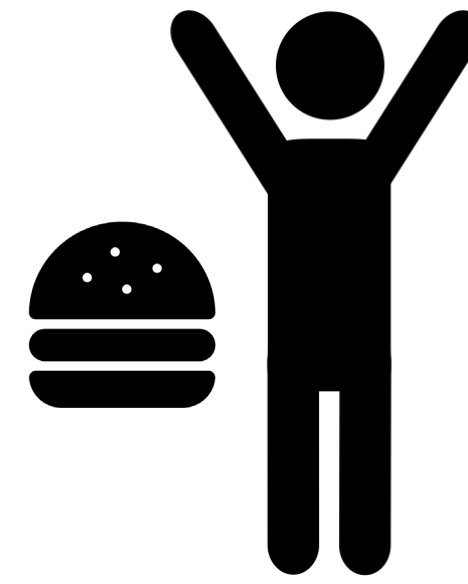
Phosphorus (P)
173 T

Potassium (K)
566 T

2900 ha



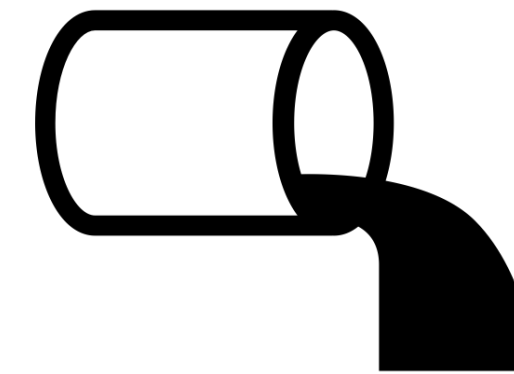
13000
Tonnes



125 000 users

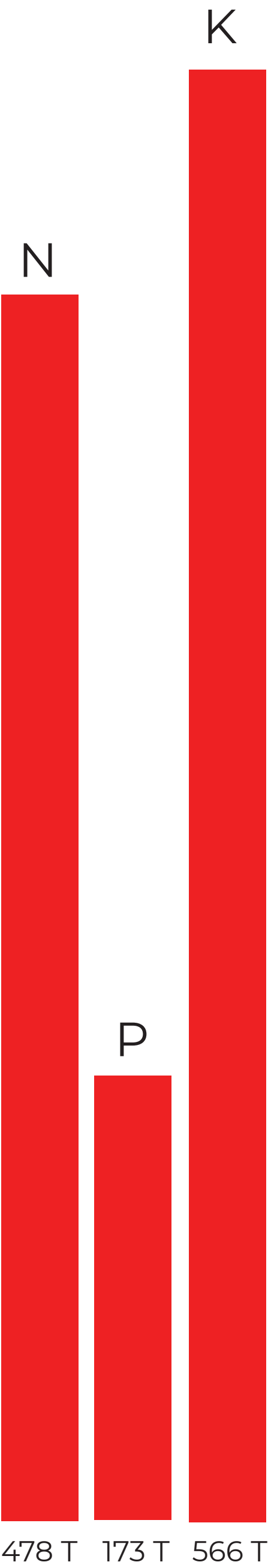
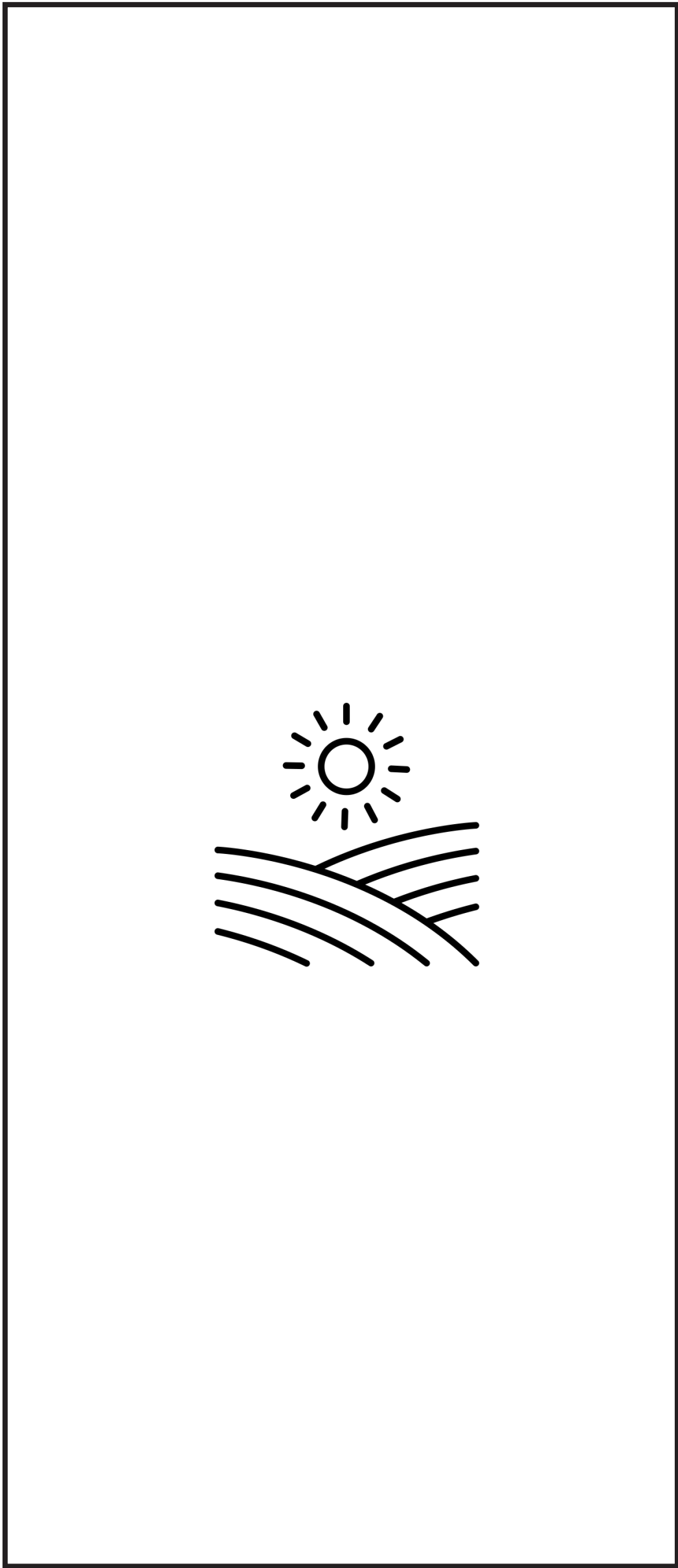


<16% Phosphorus
recovery

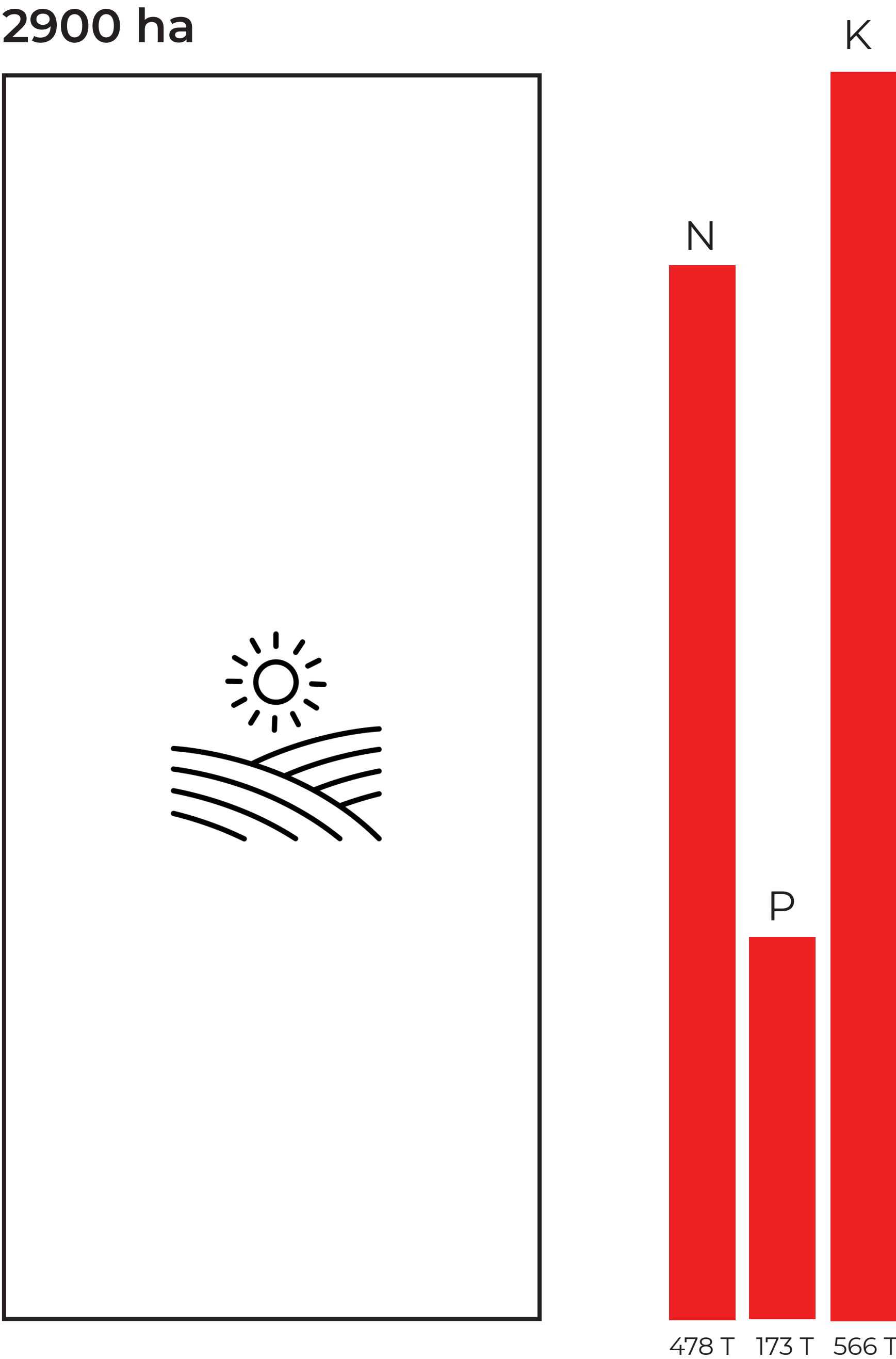


Demand of 125000 users

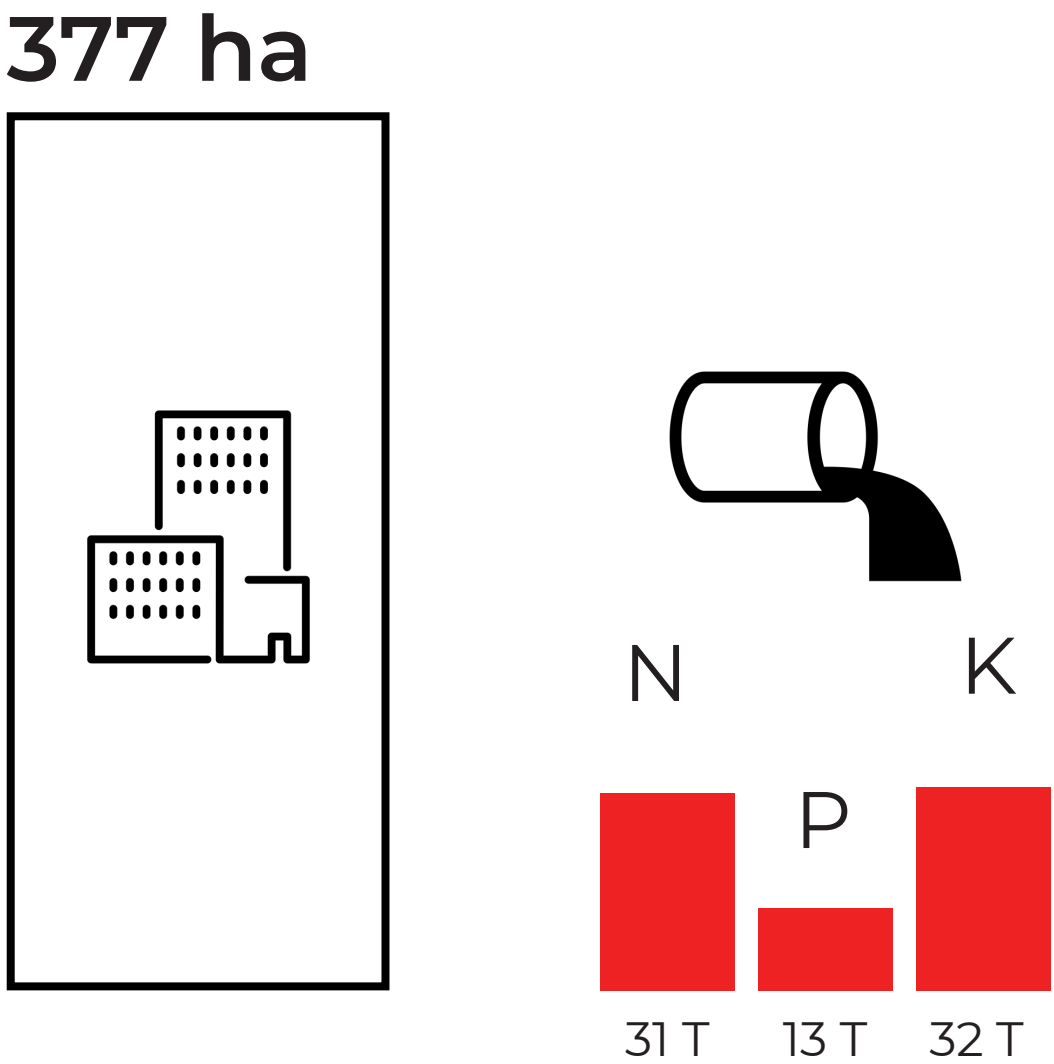
2900 ha



Demand of 125000 users



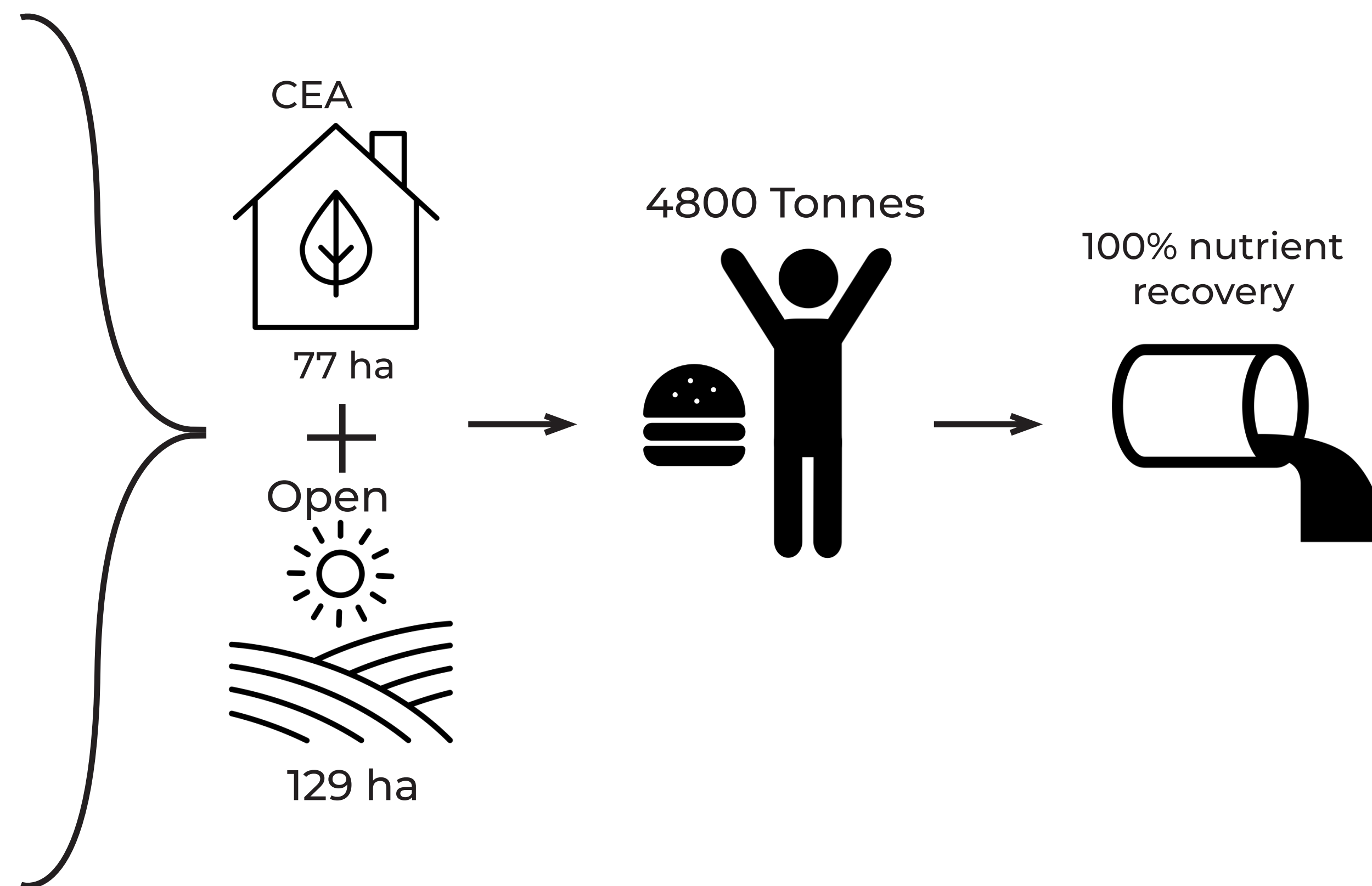
Available in Amstel III



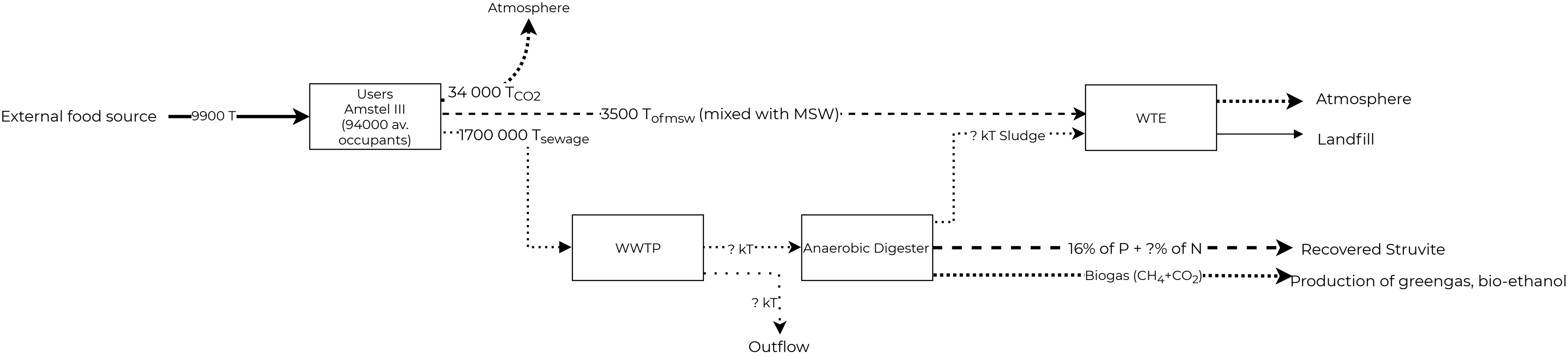
Nitrogen (N)
31 T

Phosphorus (P)
13 T

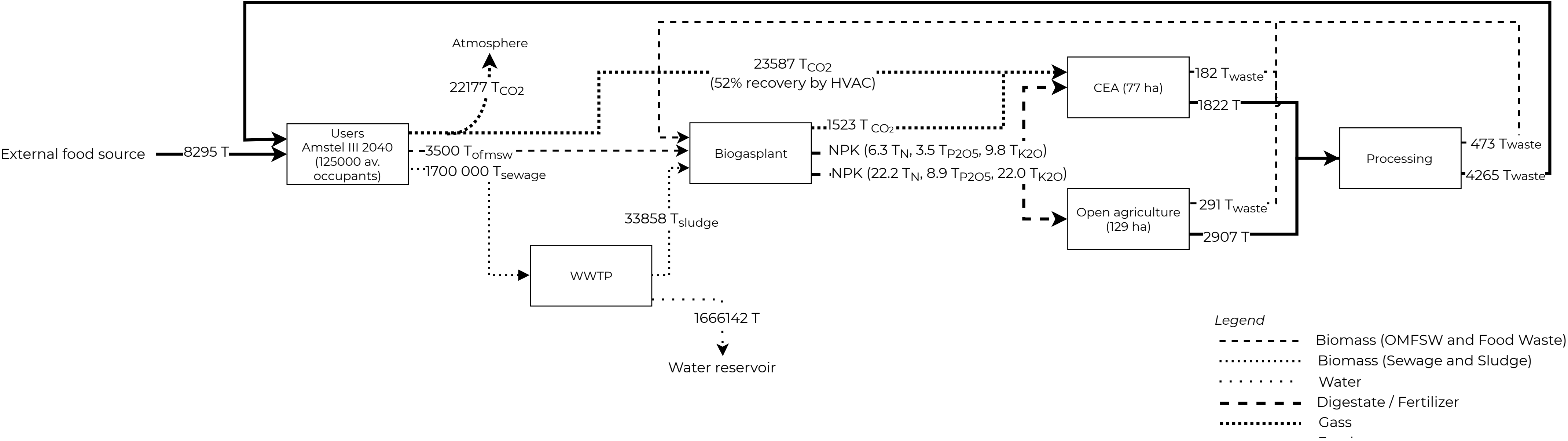
Potassium (K)
32 T



Organic Material Flow
current situation



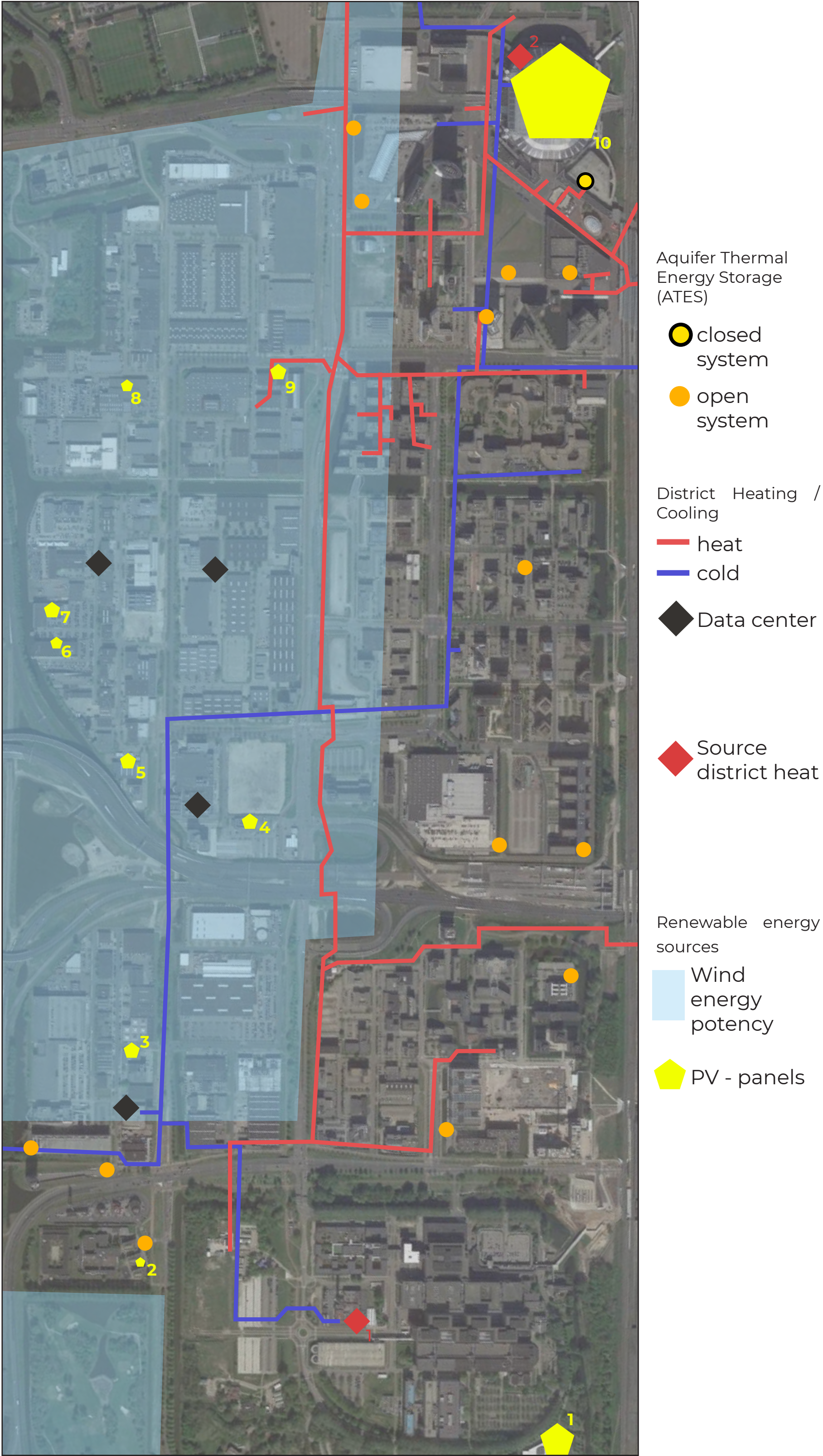
Organic Material Flow 2040
proposed model



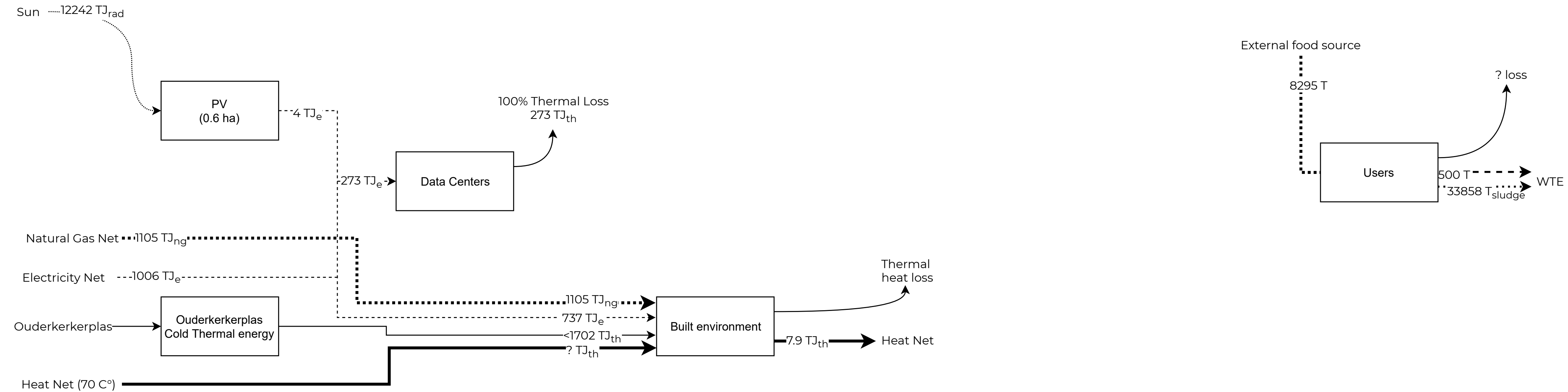
Energy

1006TJ natural gas
(or 35000 x around the earth by car)
4% of total natural gas use
Amsterdam.

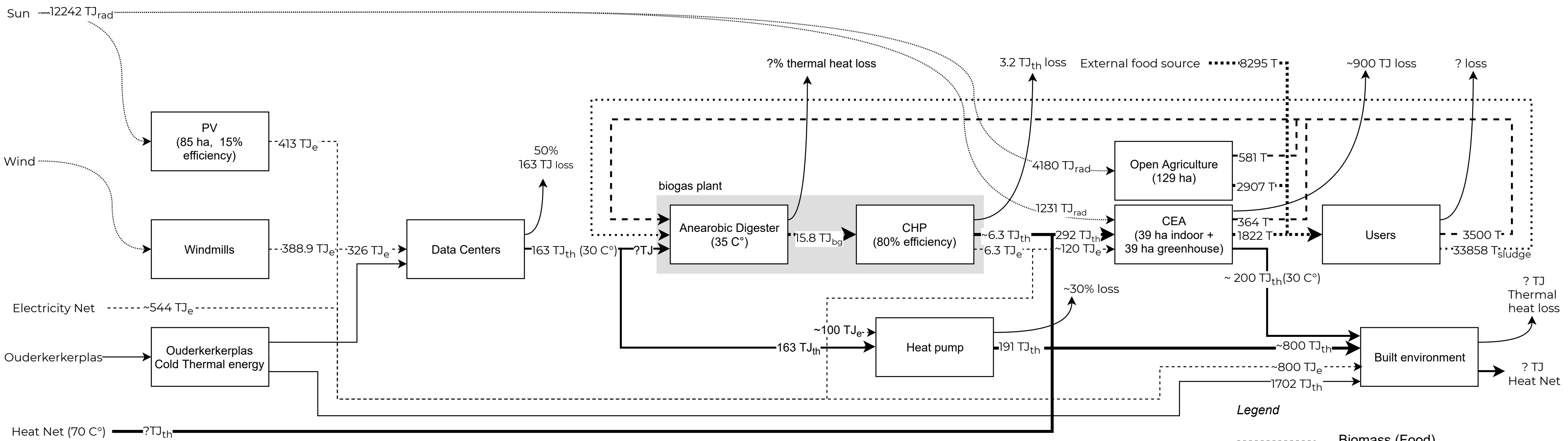
1105TJ electricity
(or 38000 x around the earth by car)
6% of total electricity use
Amsterdam.



Energy Material Flow
current situation



Energy Material Flow 2040
proposed model

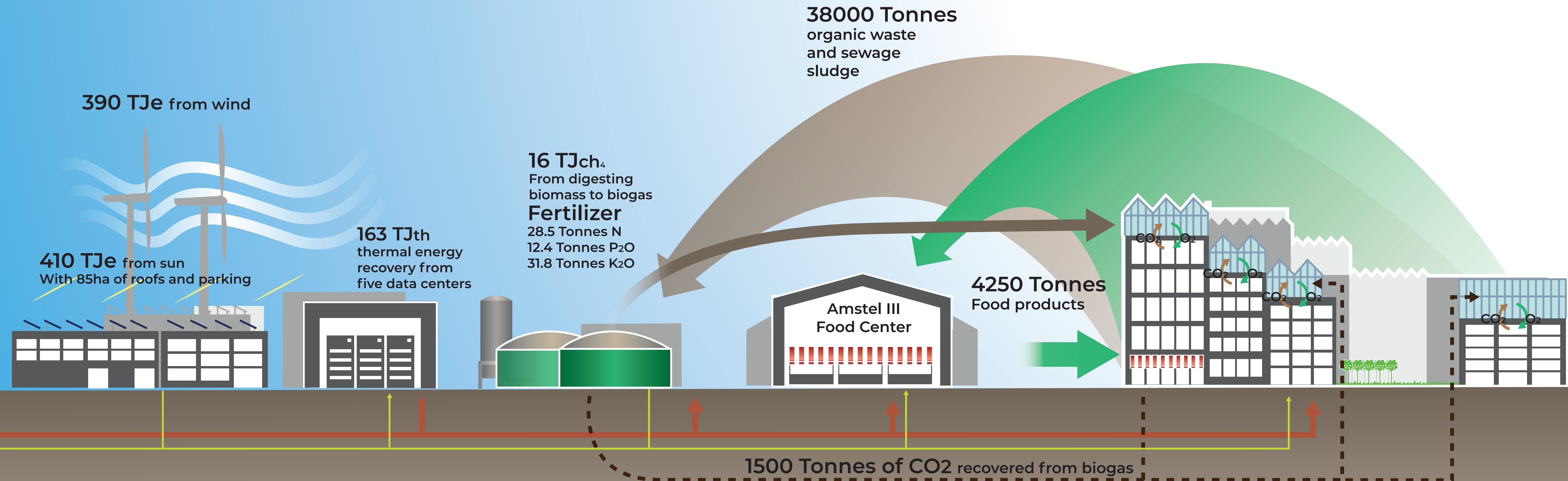


Legend

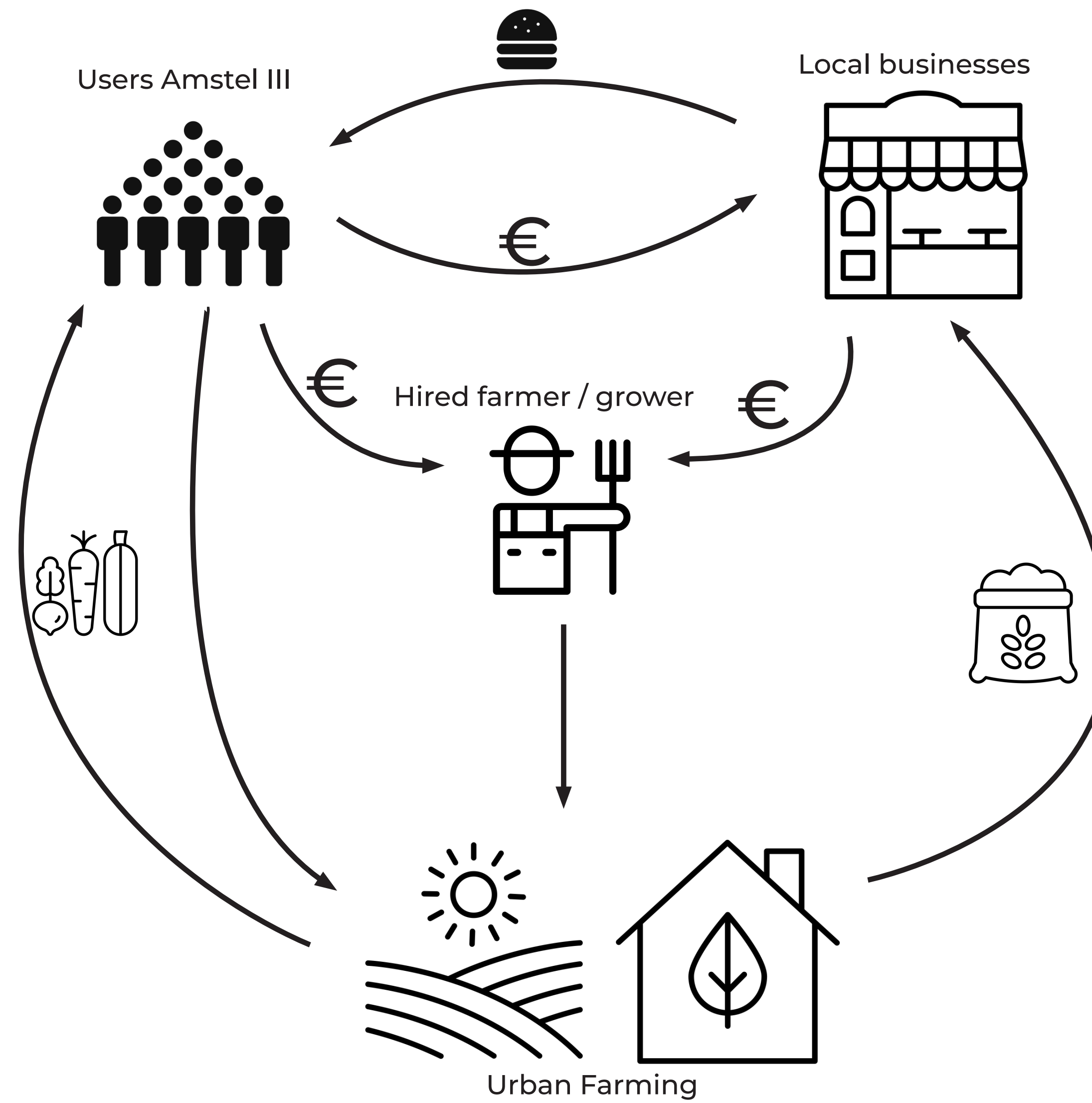
- Biomass (Food)
- Biomass (OMFSW and Food Waste)
- Biomass (Sewage and Sludge)
- Gas
- Electricity
- Cold Thermal Energy Flow
- Low Temperature Thermal Energy Flow
- High Temperature Thermal Energy Flow

Will provide for...

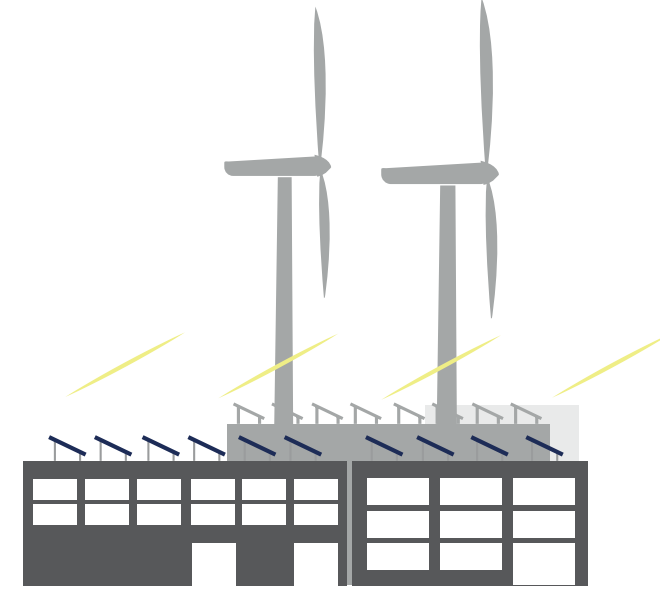
125000 average occupants
77 ha controlled environment agriculture
128 ha agriculture
4250T of locally produced food
1/2 of the electrical energy produced locally



Socioeconomic Model



1. Utilize all existing roofs for PV and utilize wind potential with windmills



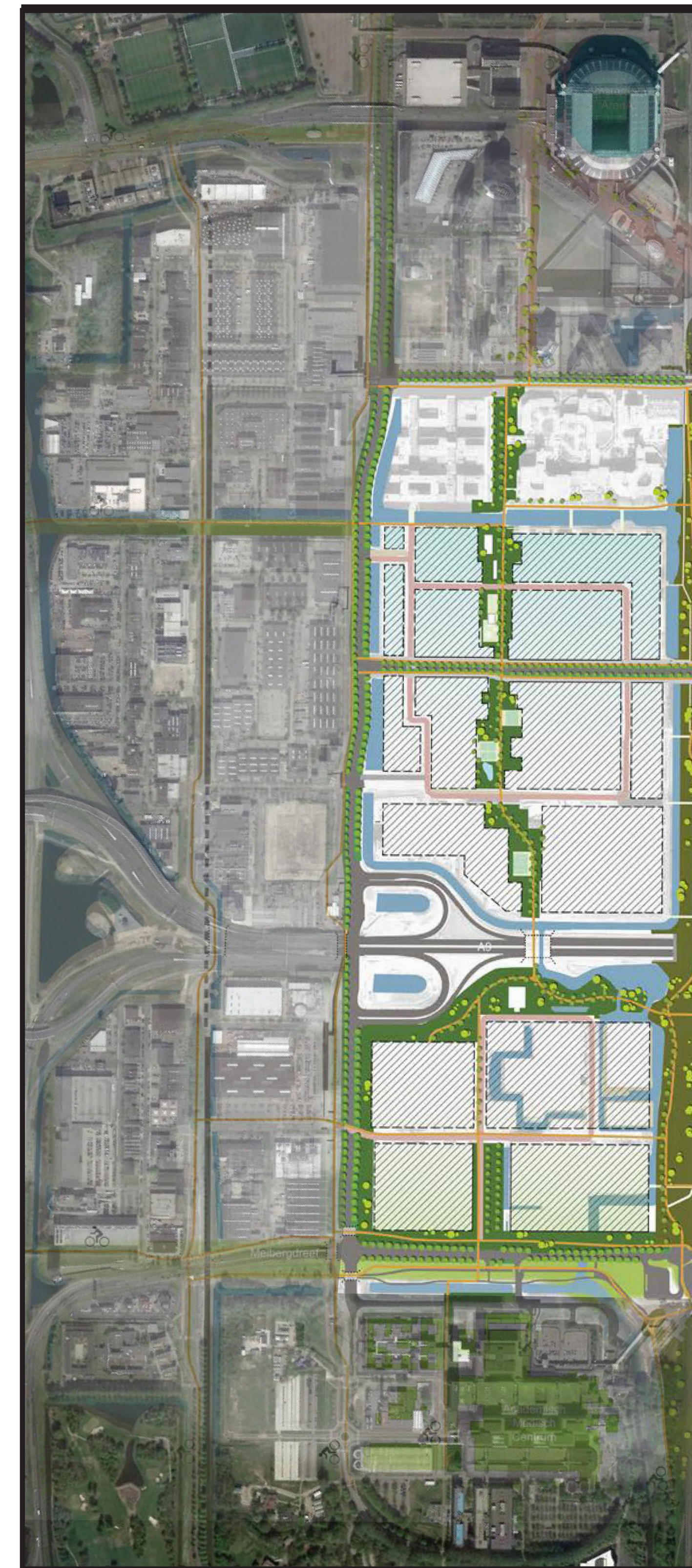
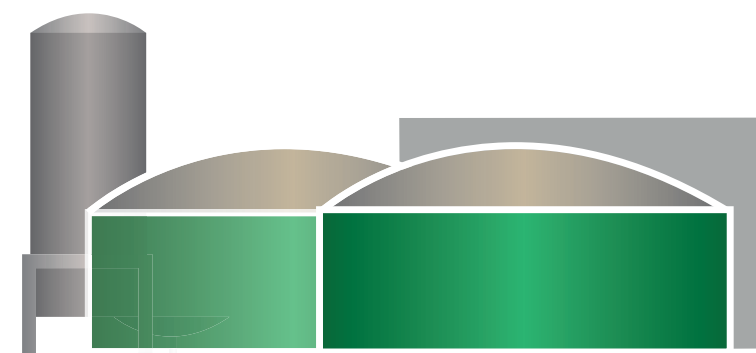
2. Implement roof greenhouses on new buildings, parking and private open space will be used for open agriculture.



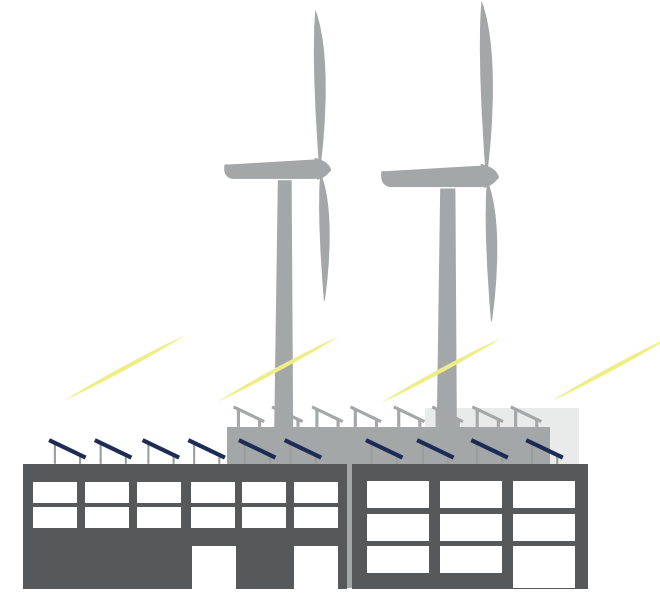
3. Central hub for food processing, distribution, selling, knowledge and engagement.



4. Waste water treatment plant and biogas plant.



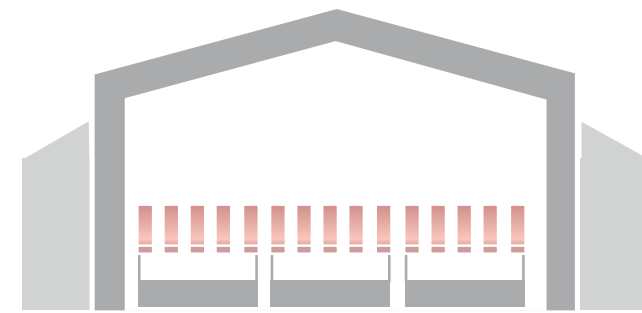
1. Utilize all existing roofs for PV and utilize wind potential with windmills



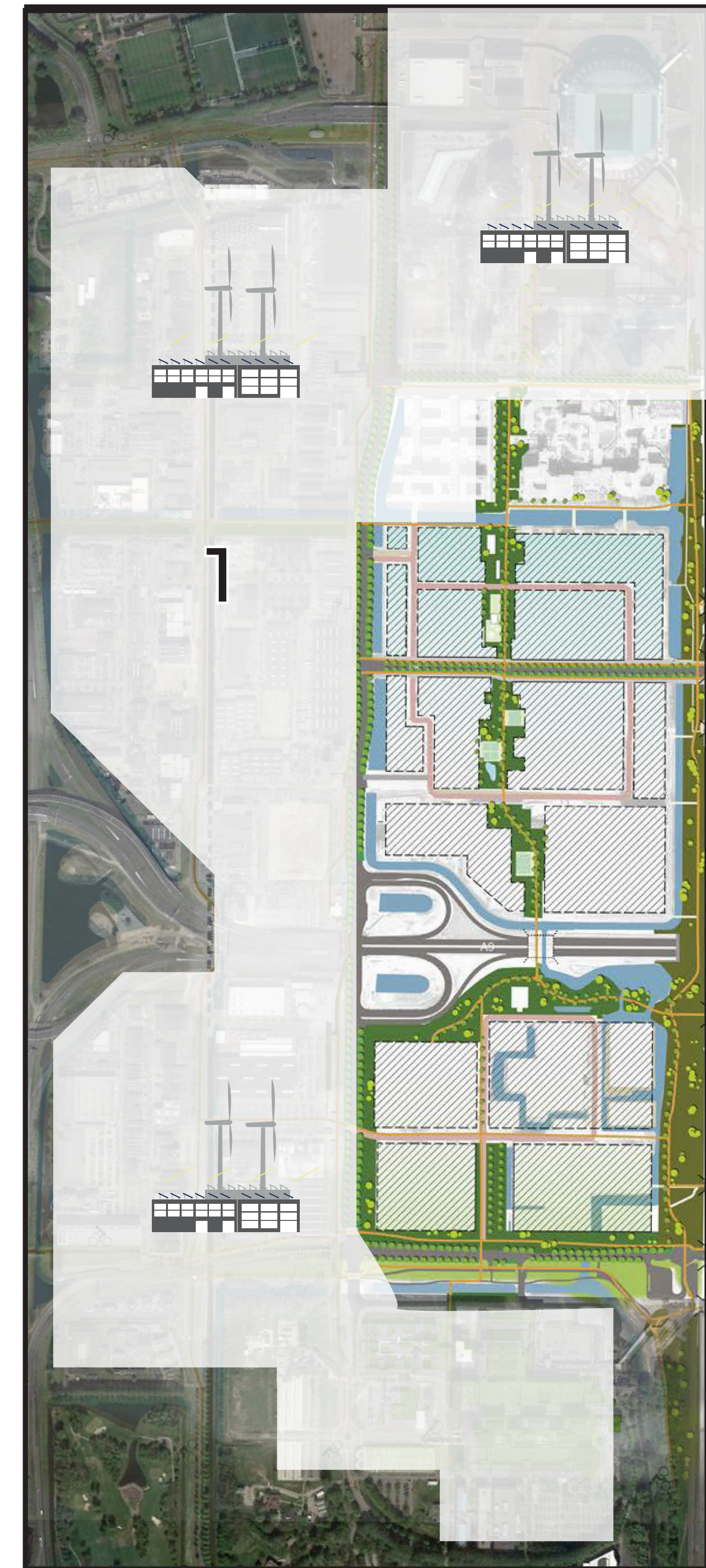
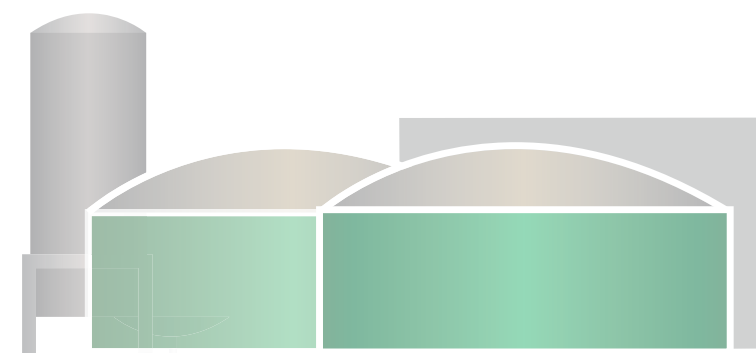
2. Implement roof greenhouses on new buildings, parking and private open space will be used for open agriculture.



3. Central hub for food processing, distribution, selling, knowledge and engagement.

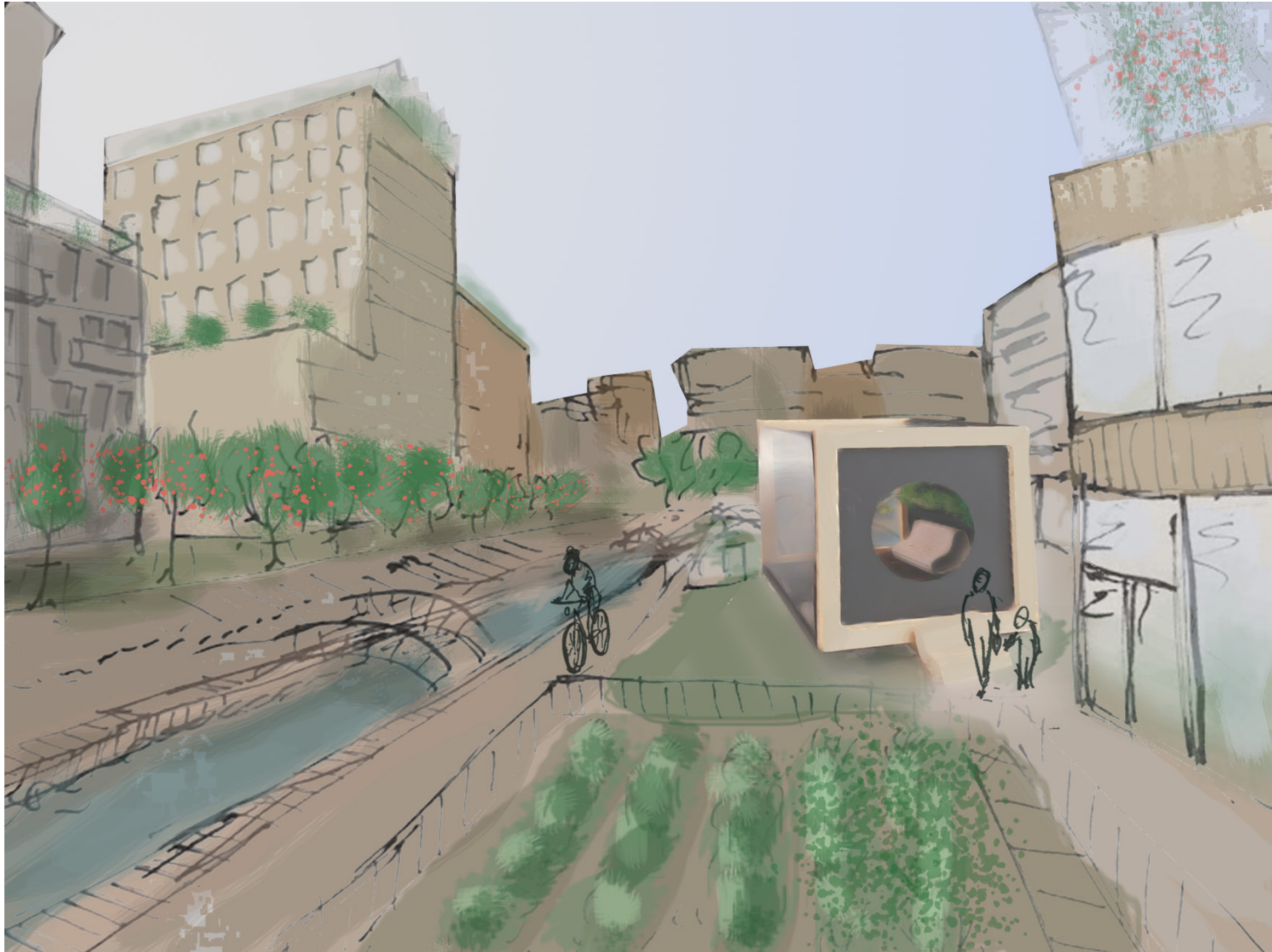


4. Waste water treatment plant and biogas plant.



2

Urban Food System Amstel III



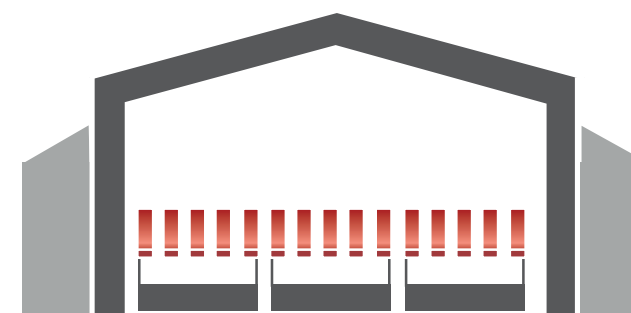
1. Utilize all existing roofs for PV and utilize wind potential with windmills



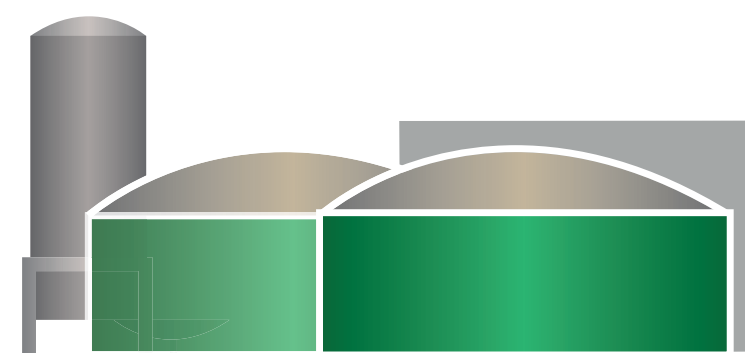
2. Implement roof greenhouses on new buildings, parking and private open space will be used for open agriculture.



3. Central hub for food processing, distribution, selling, knowledge and engagement.

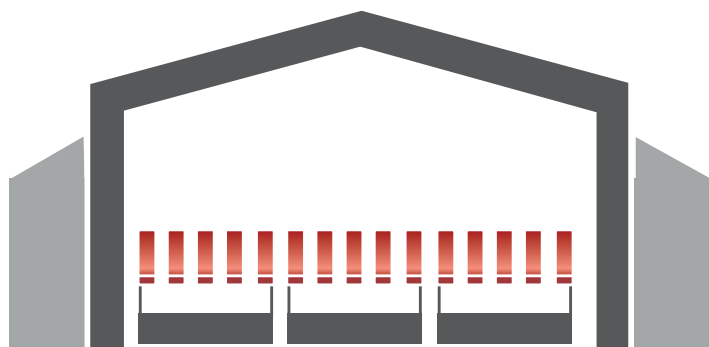


4. Waste water treatment plant and biogas plant.

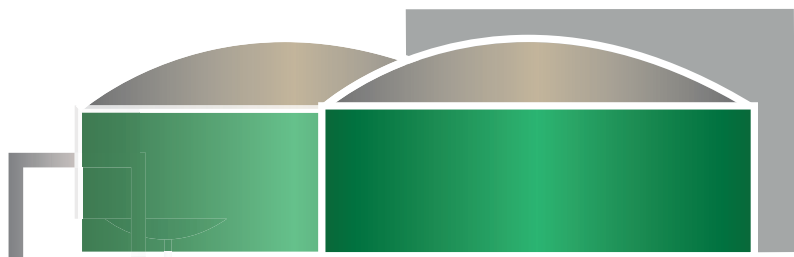


Design Program

3. Central hub for food processing, distribution, selling, knowledge and engagement.



4. Waste water treatment plant and biogas plant.



Functions

Market and engagement space for users Amstel III and visitors

Food and fertilizer distribution and processing for Amstel III

Knowledge and educational center

Engagement with food production

Waste water treatment plant (WTPP)

Biogas plant for processing organic waste

Combined Heat Powerplant (CHP)

Specifications

- Marketspace / public winter garden
- Interactive food space
- Space for local SMEs

- Distributing and storage of 4250 tonnes of locally produced food and 2000 tonnes imported food
- Shared kitchenspace

- Educational hub for 100 students
- Research center with indoor farming and greenhouse

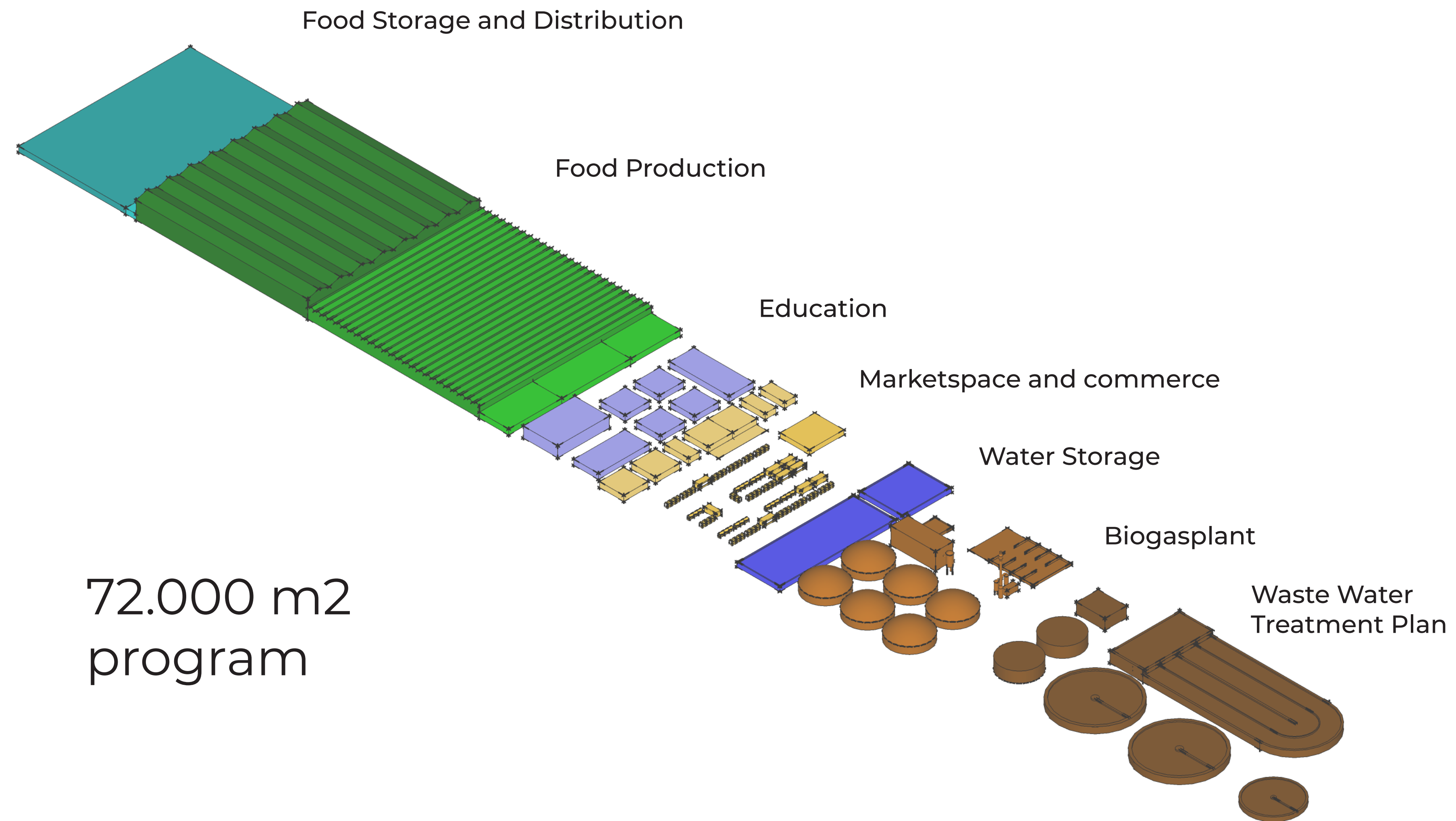
- Exemplary greenhouse space
- Water storage of 5000 m³

- Capacity of 1700*10³ m³ waste water annually

- Capacity of 38*10³ tonnes organic waste
- CO₂ storage and distribution

- Capacity of 7*10⁵ m³ biogas to 16 TJ energy

Design Program



IKEA



- Positioned central of Amstel III
- Large volume
- Existing distribution utilities



IKEA 2040

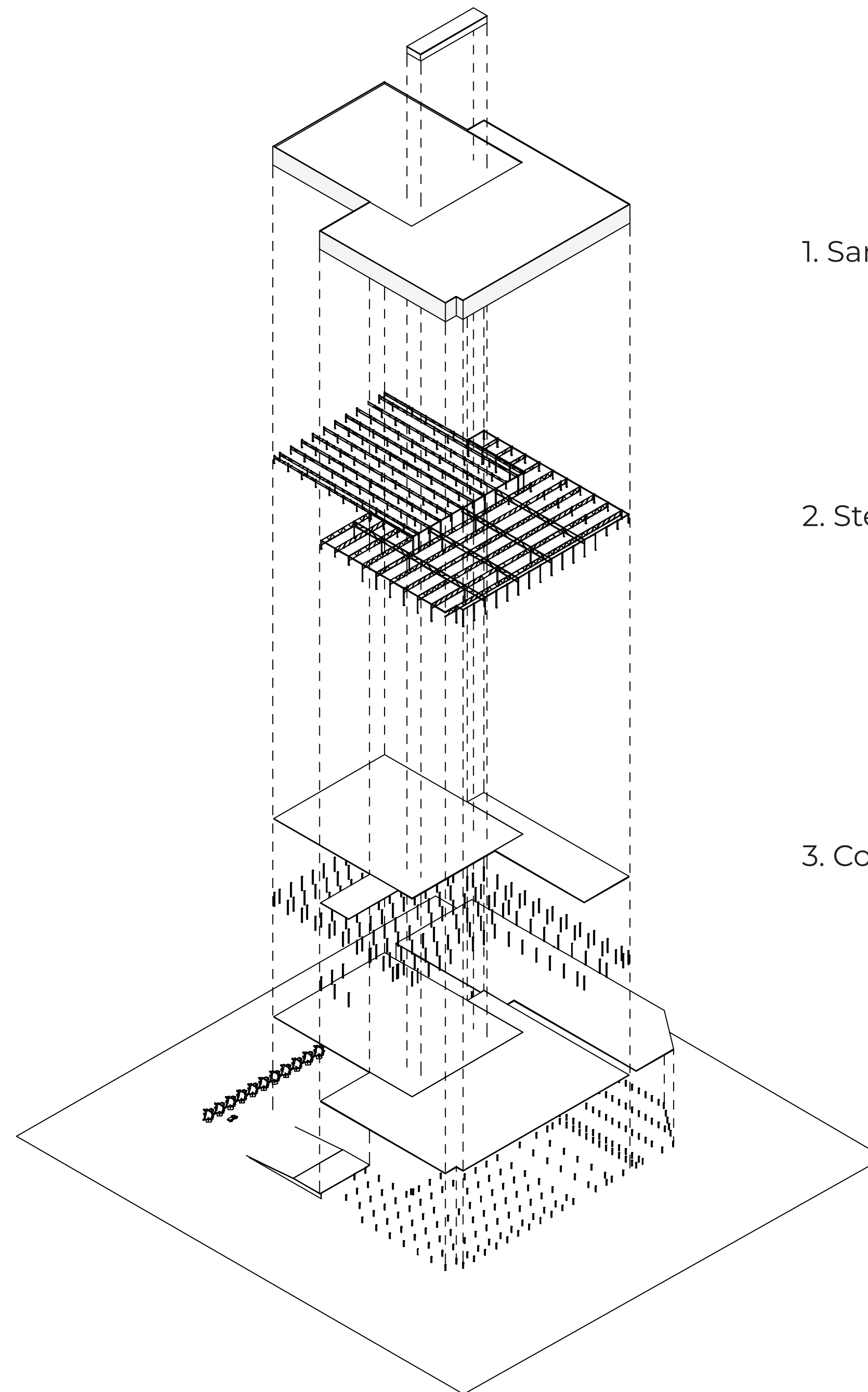






'87

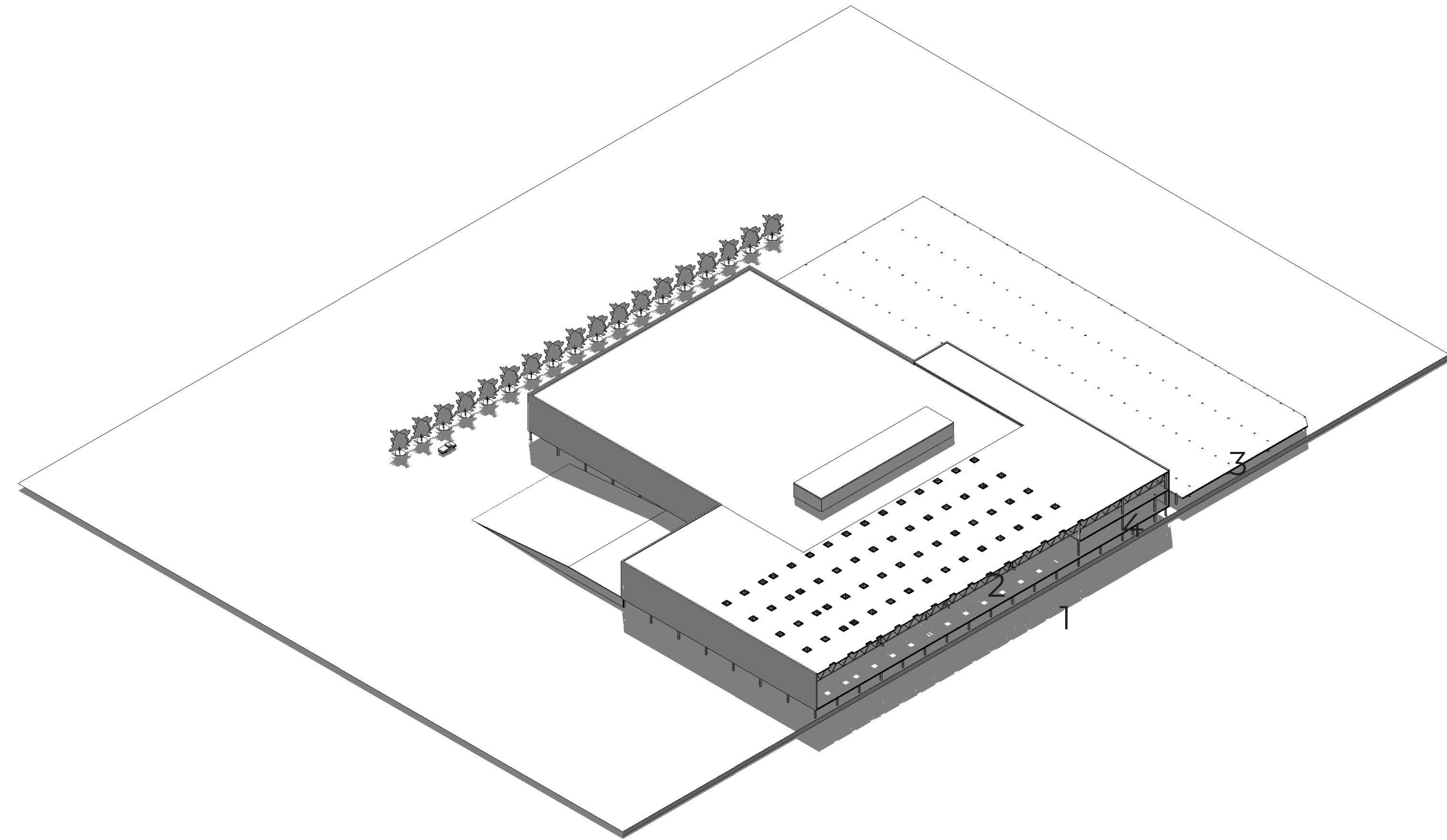
'98



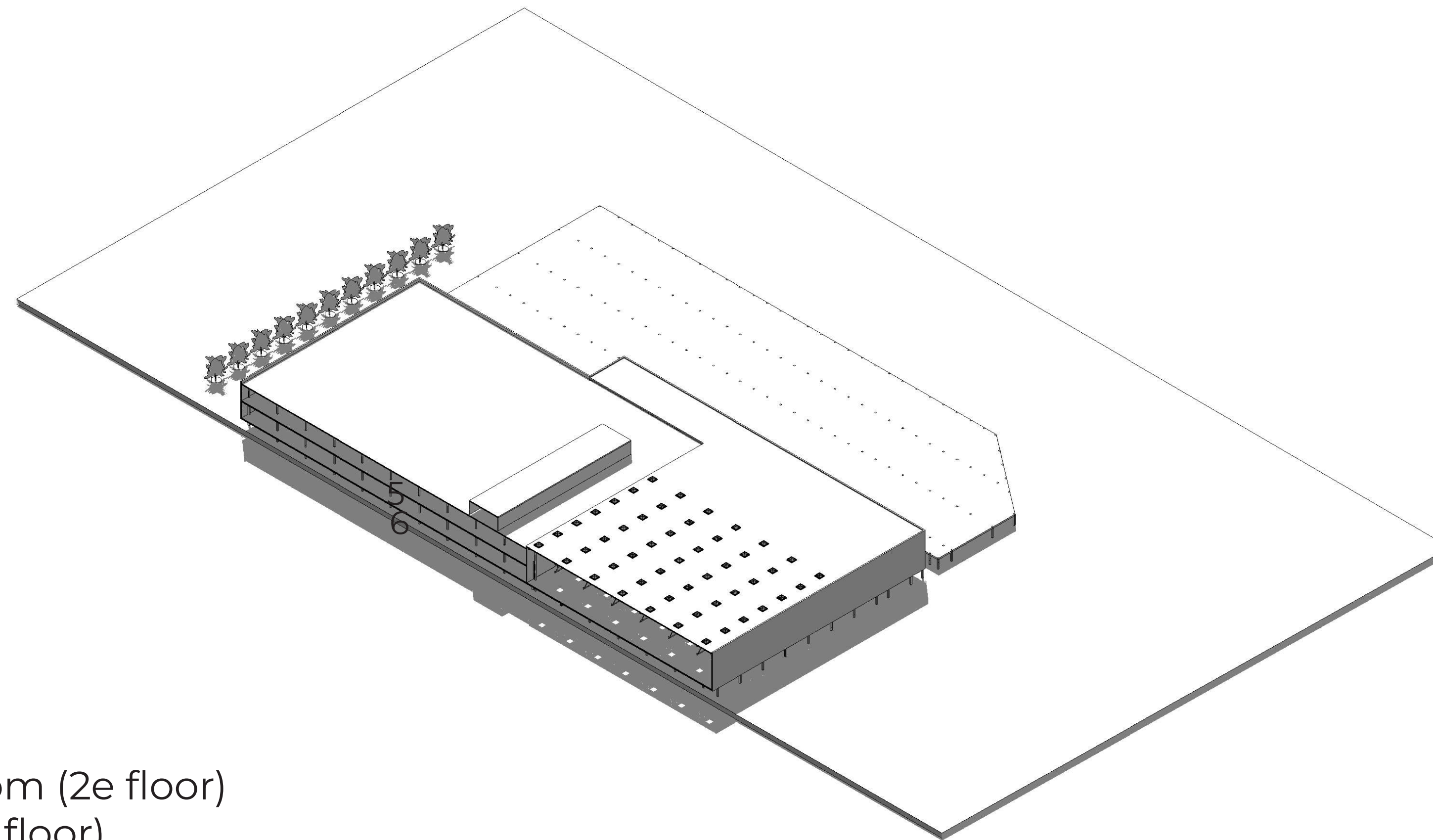
1. Sandwich panels skin

2. Steel structure

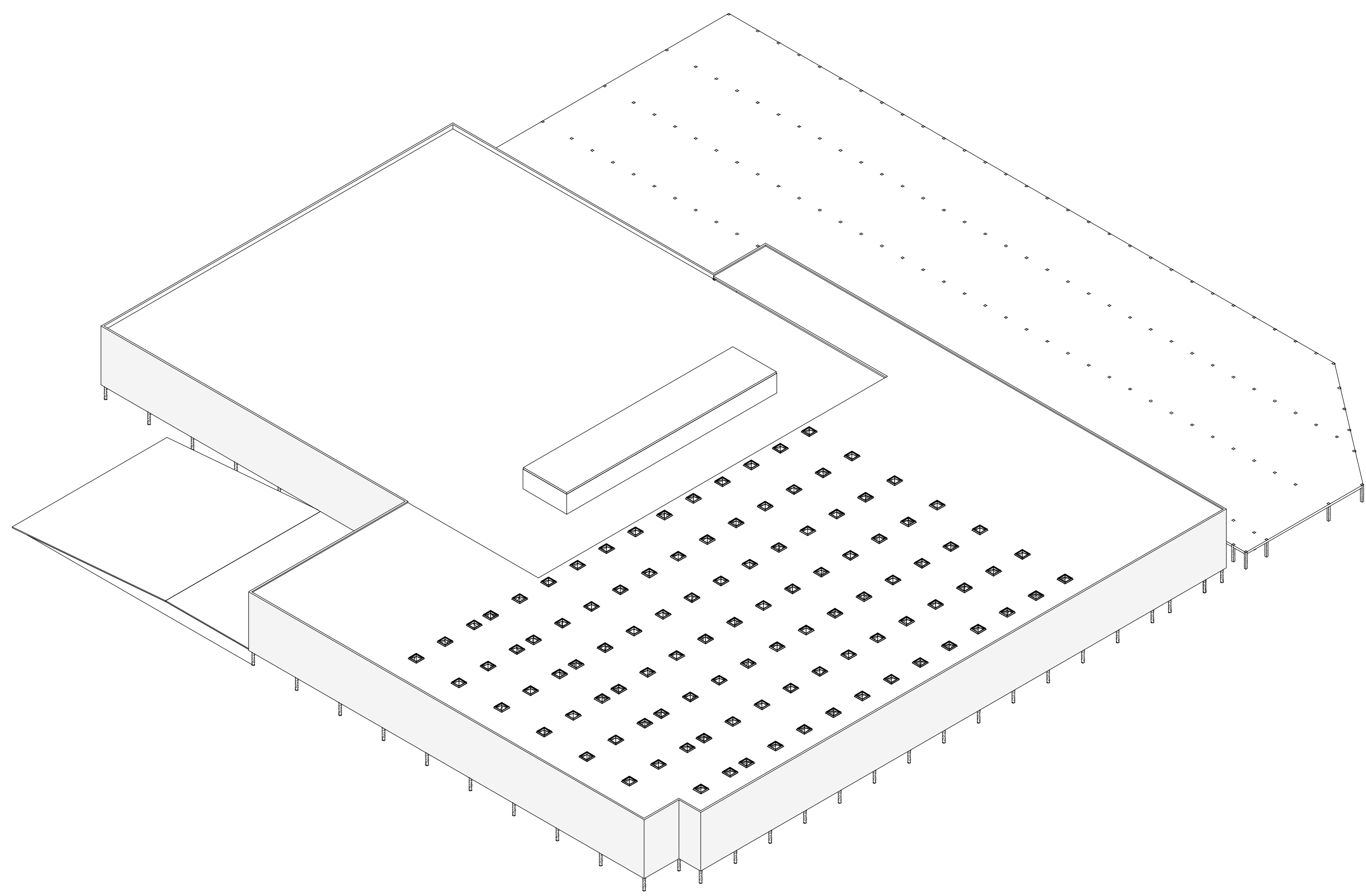
3. Concrete structure

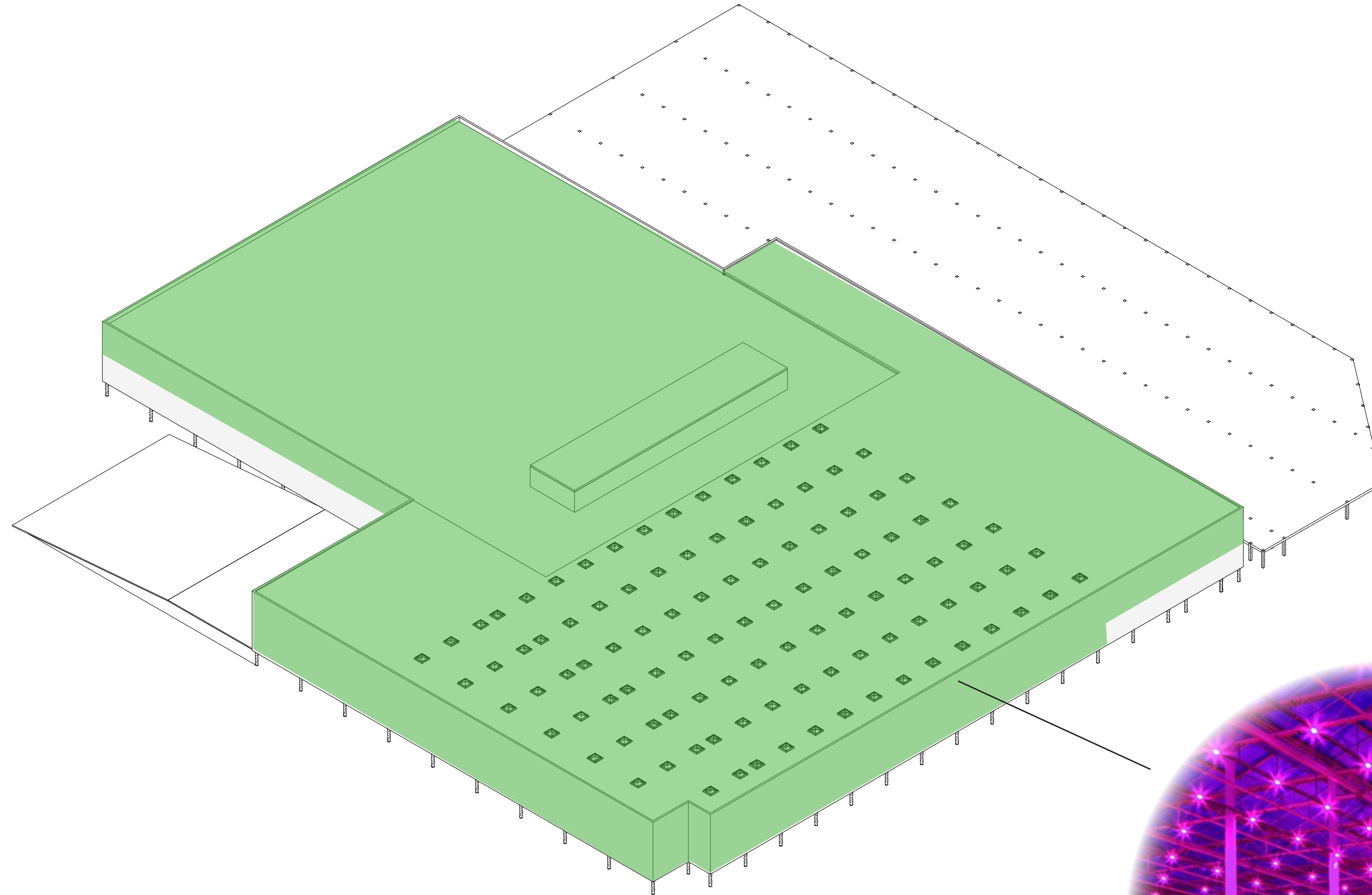


- 1 Parking (Groundlevel)
- 2 Warehouse (1e floor)
- 3 Parking deck (1e floor)
- 4 Office and restaurant (2e floor)



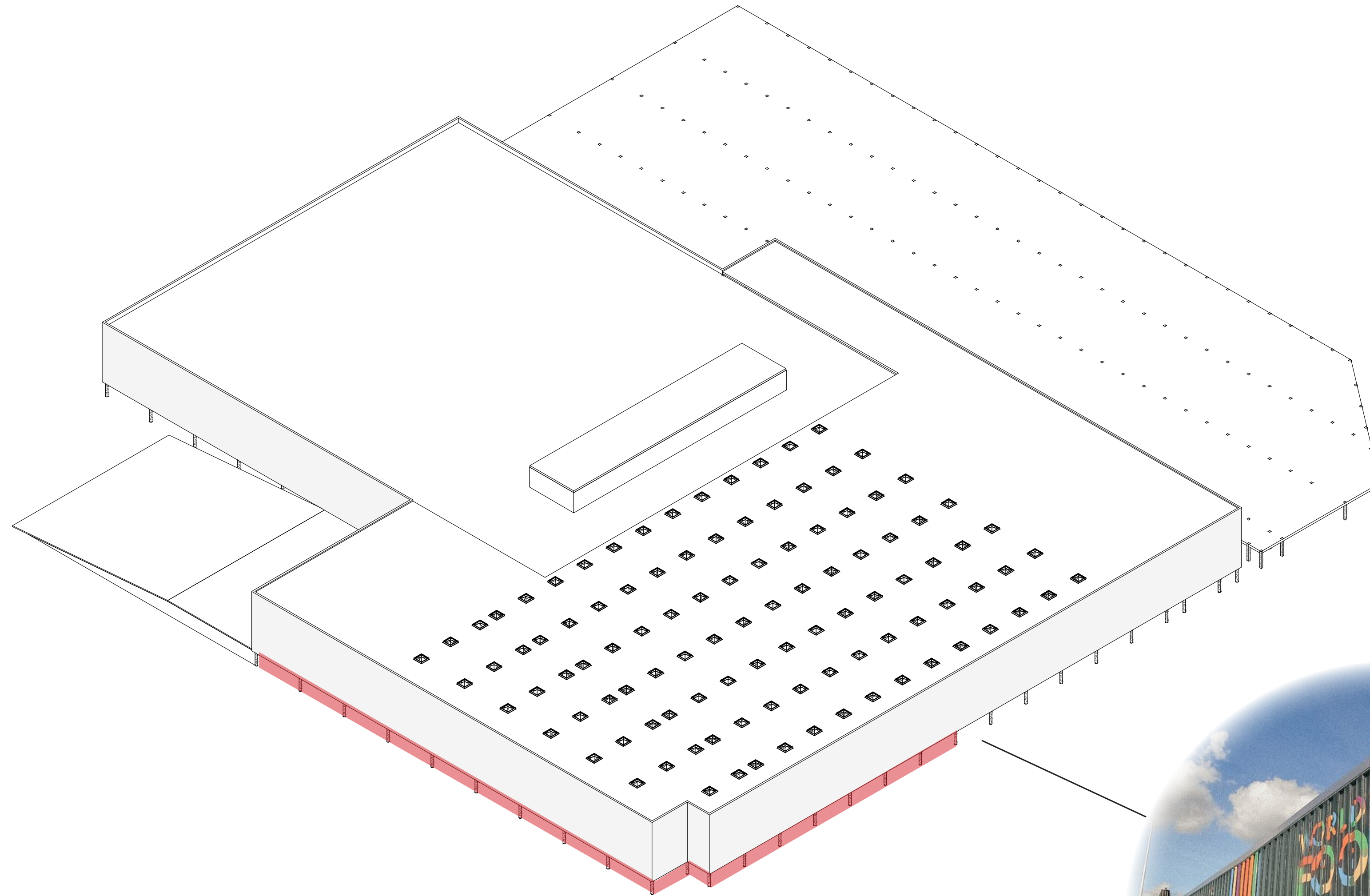
5 Showroom (2e floor)
6 Shop (1e floor)





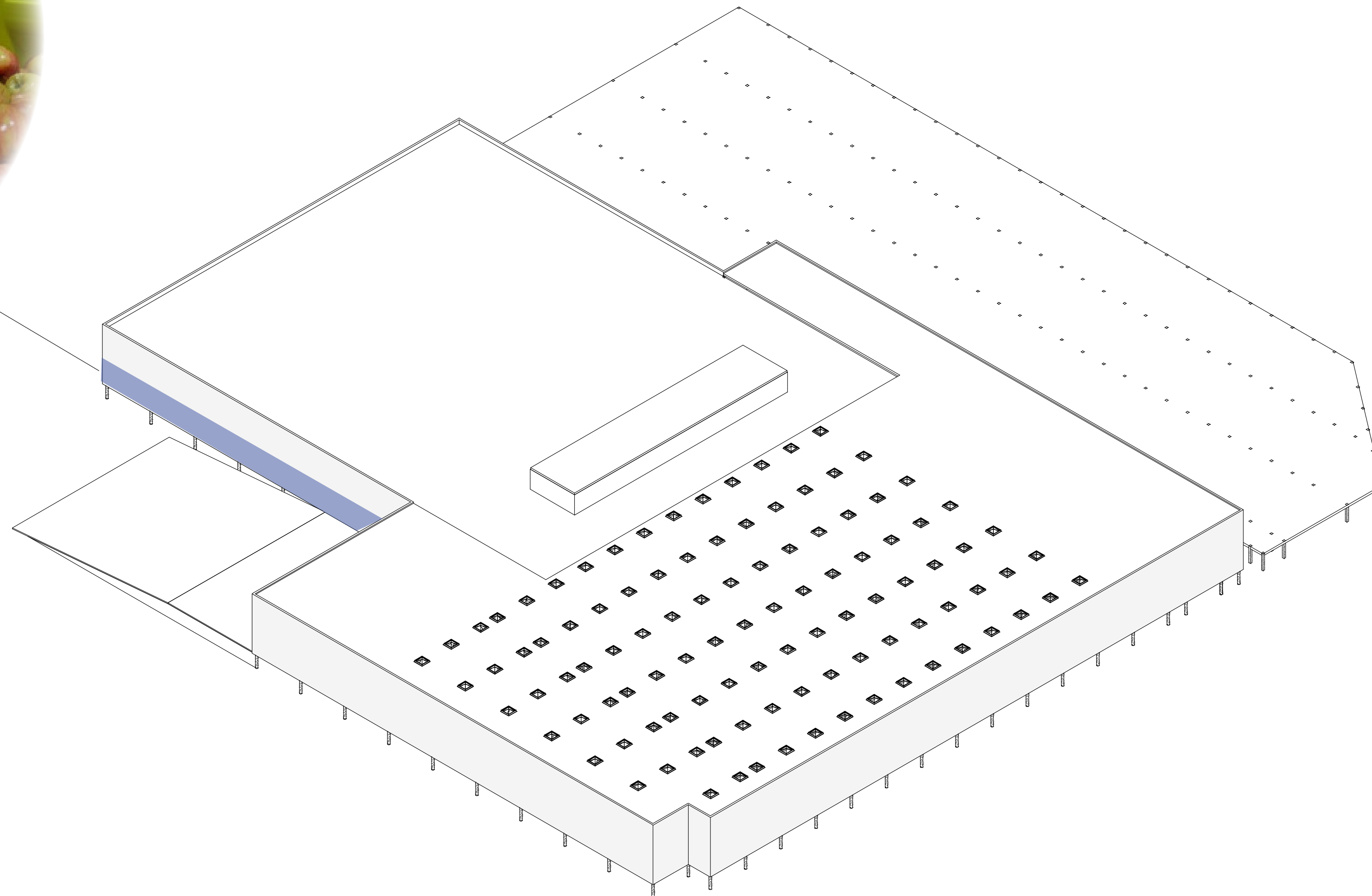
utilize large surface area upper levels for food production through greenhouses



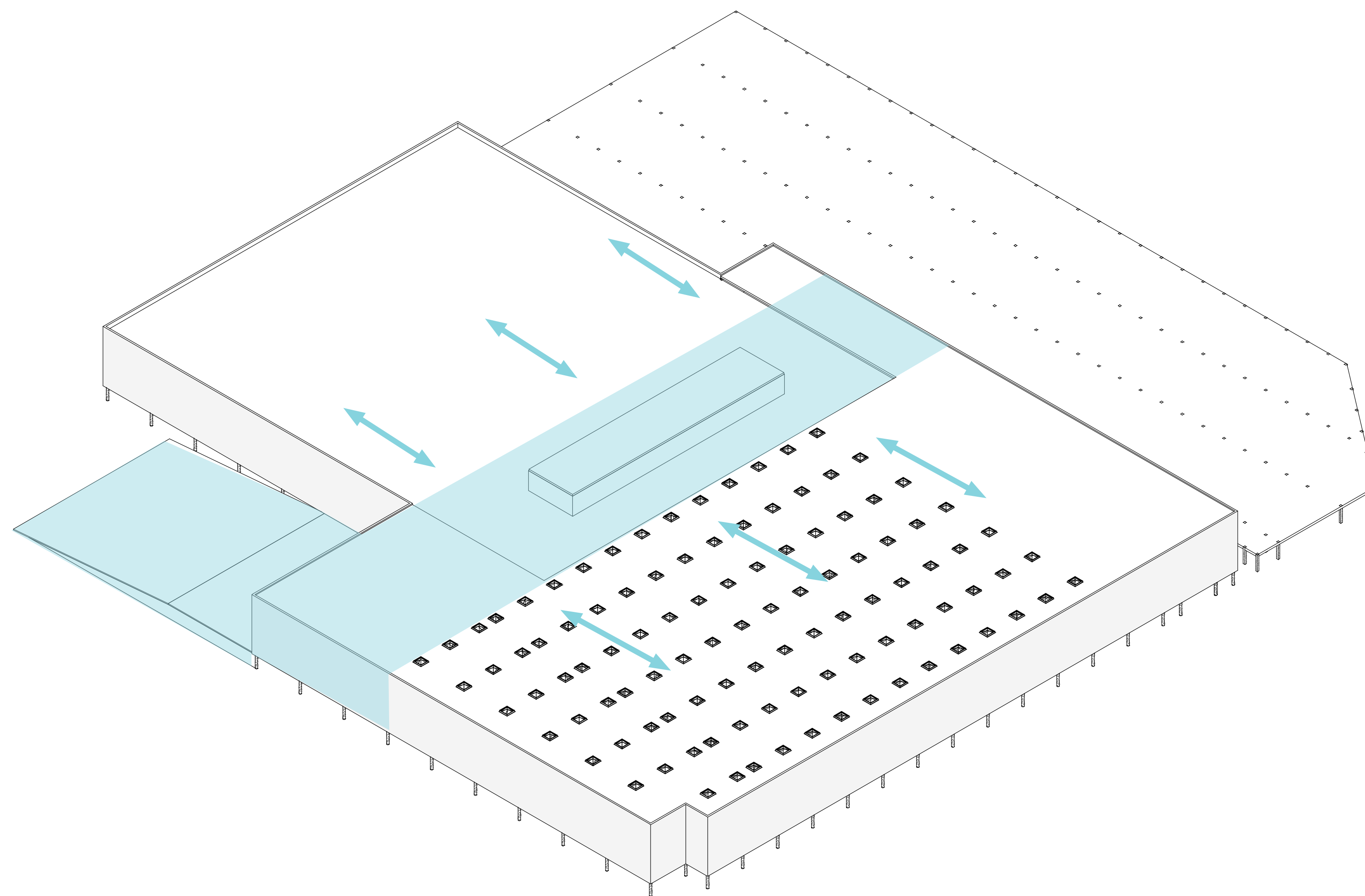


Front facade on ground floor as a public space supporting small businesses and a market place for local produce

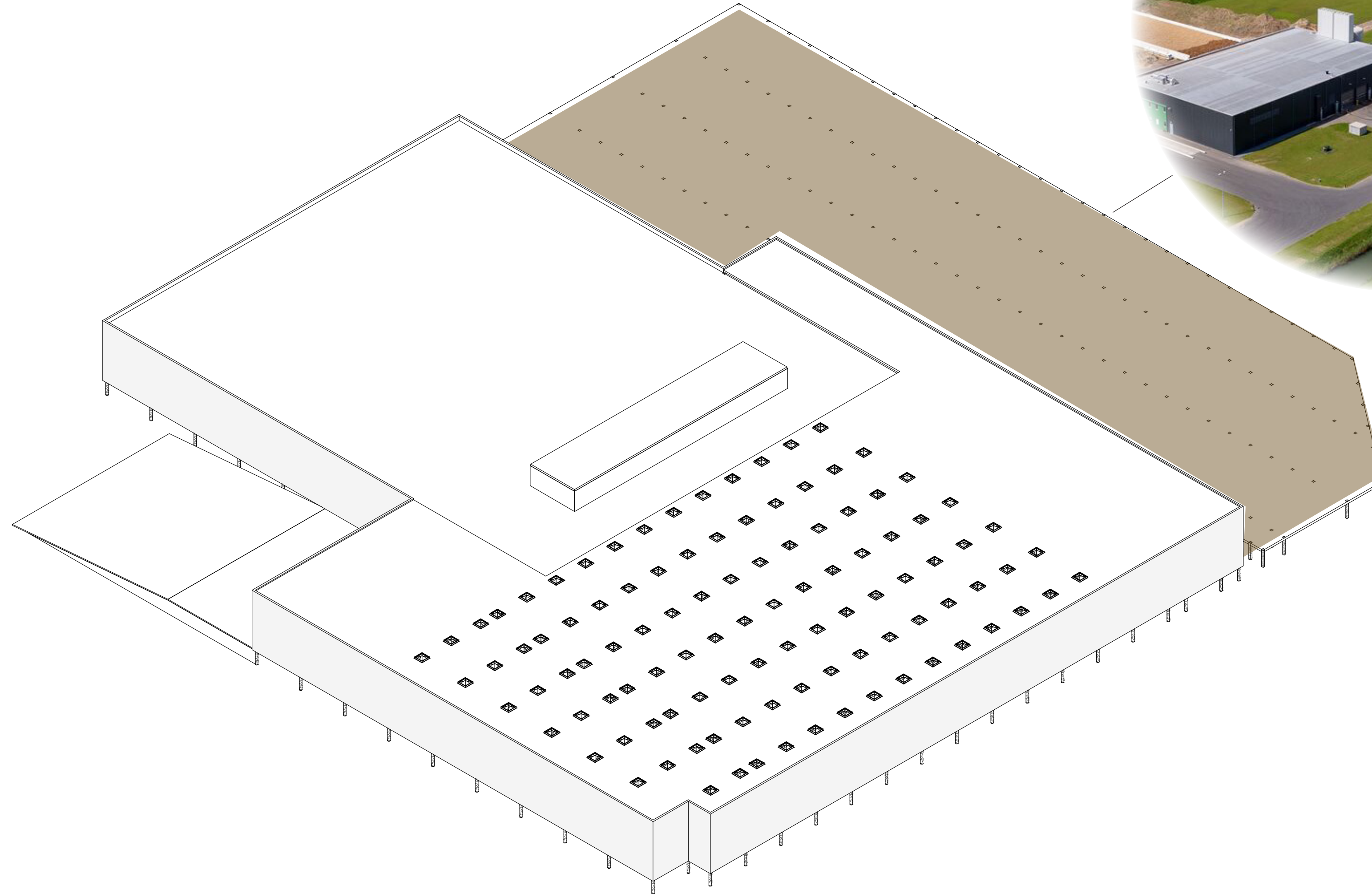




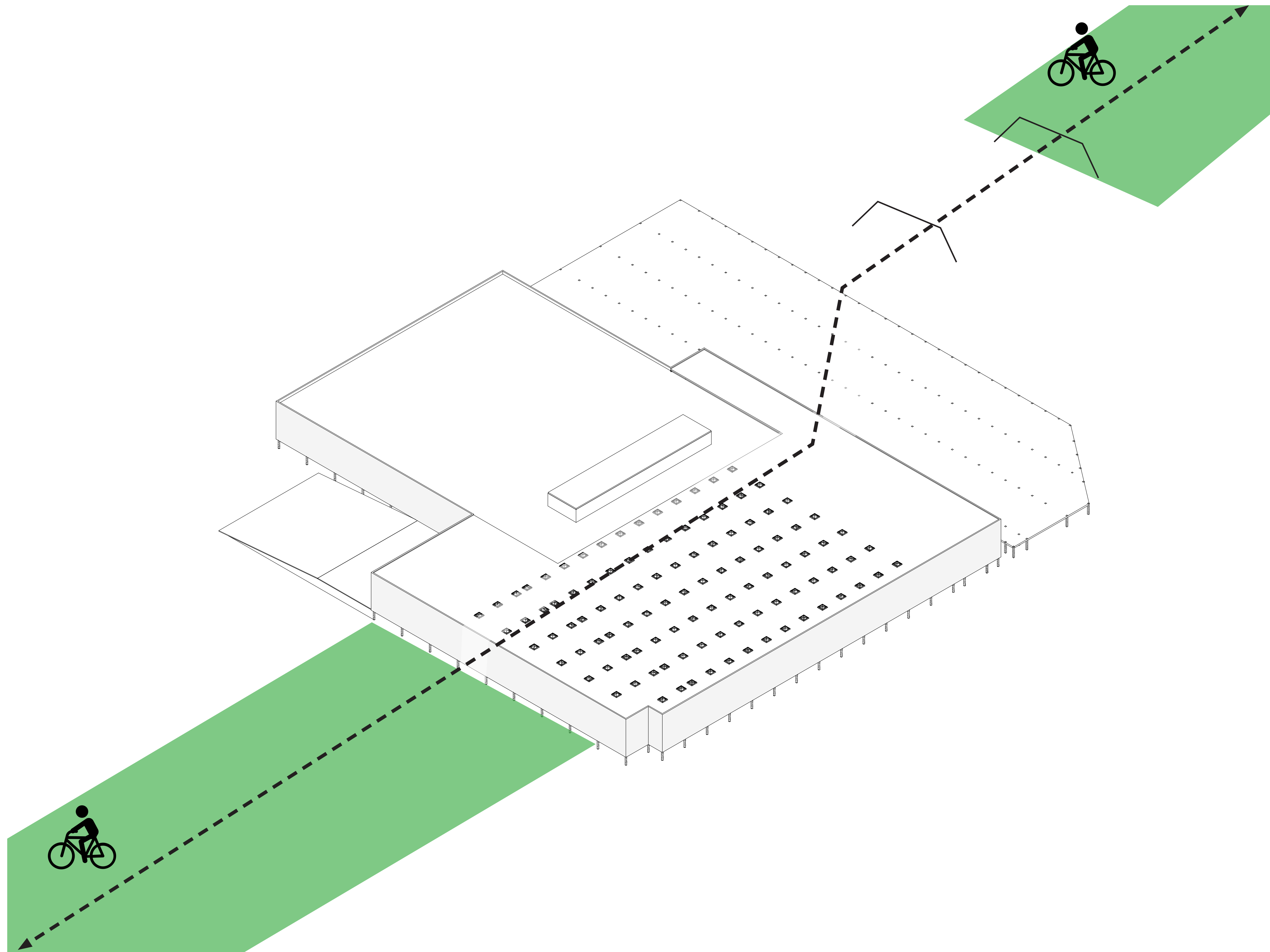
the easy accessible and day light poor second floor can be used for food storage



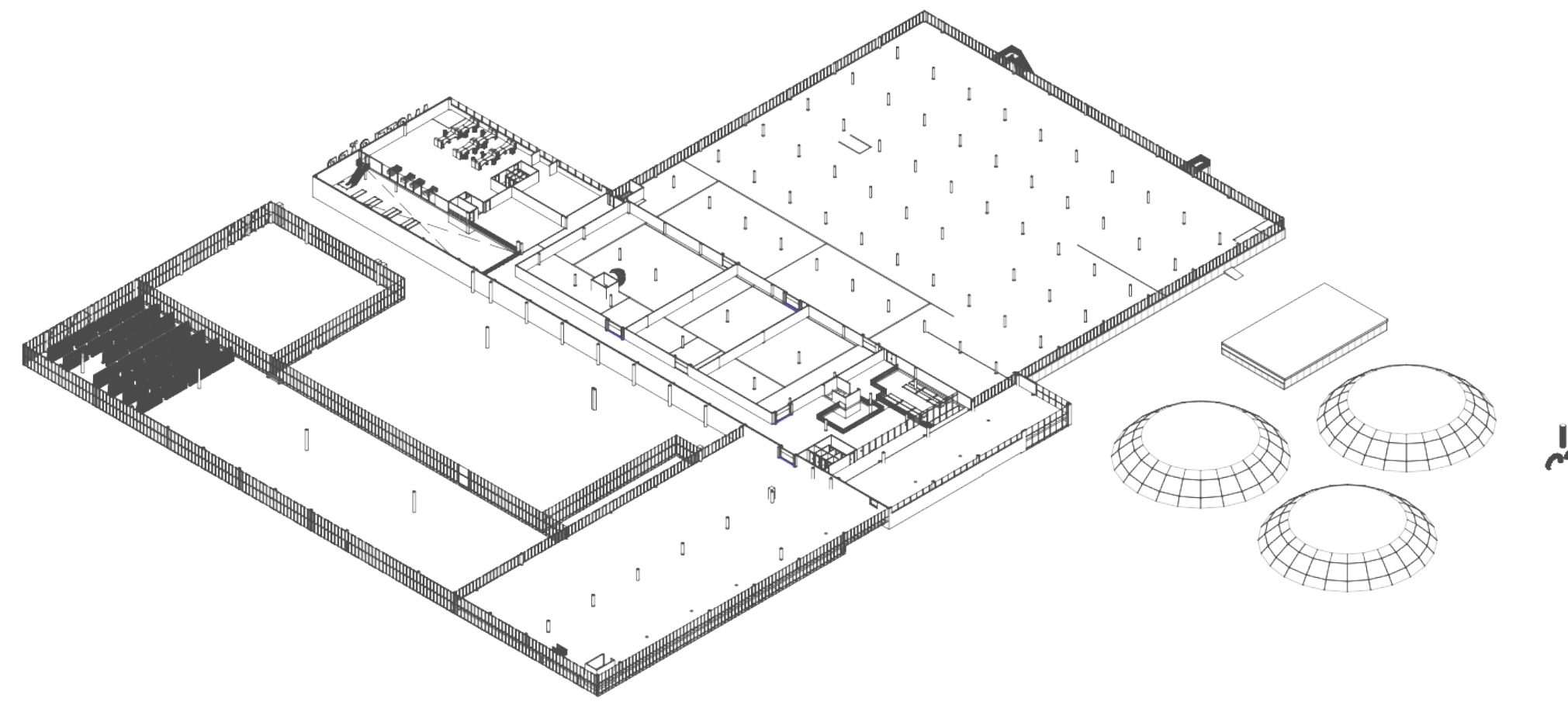
use existing infrastructure for the distribution within the building
and with Amstel III



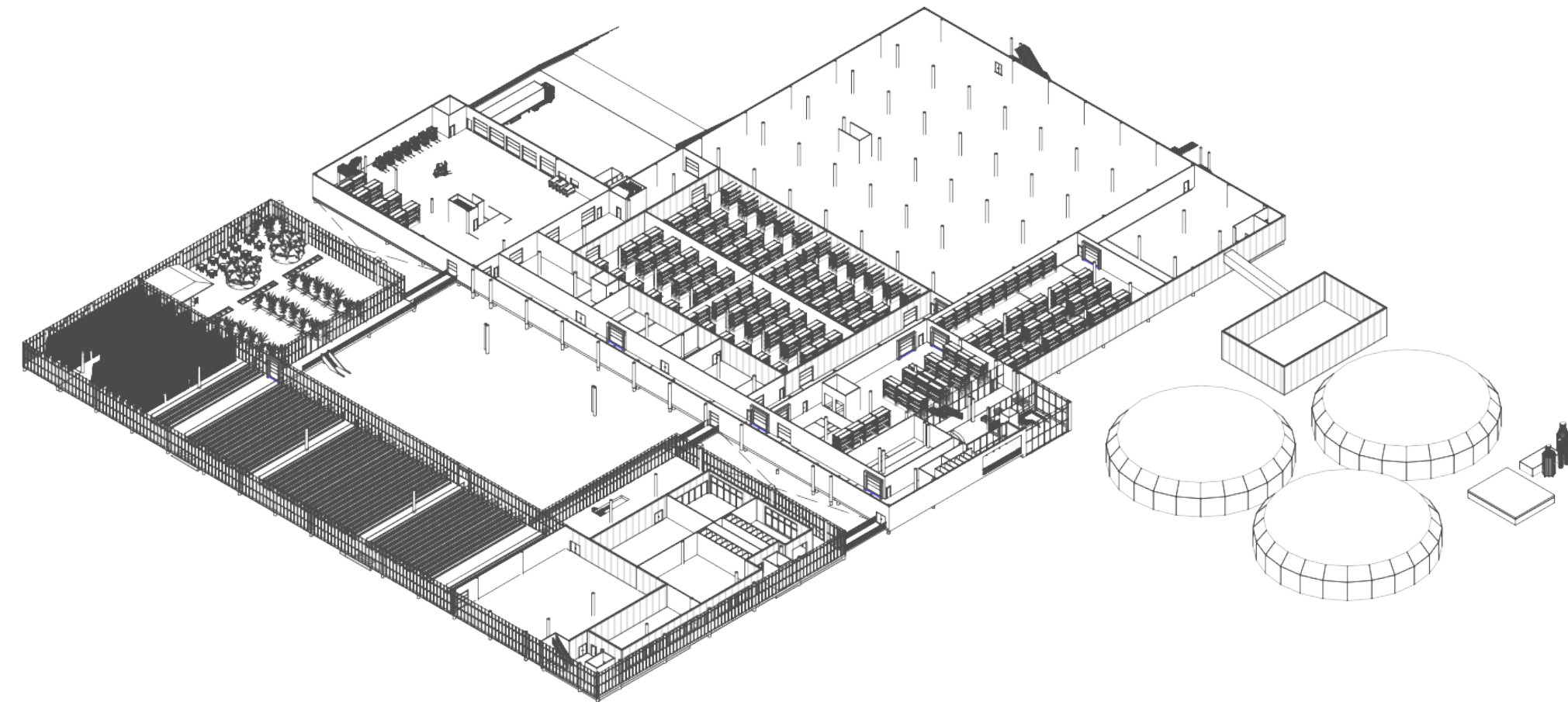
south-side to be transformed in to biogasplant and waterreservoir



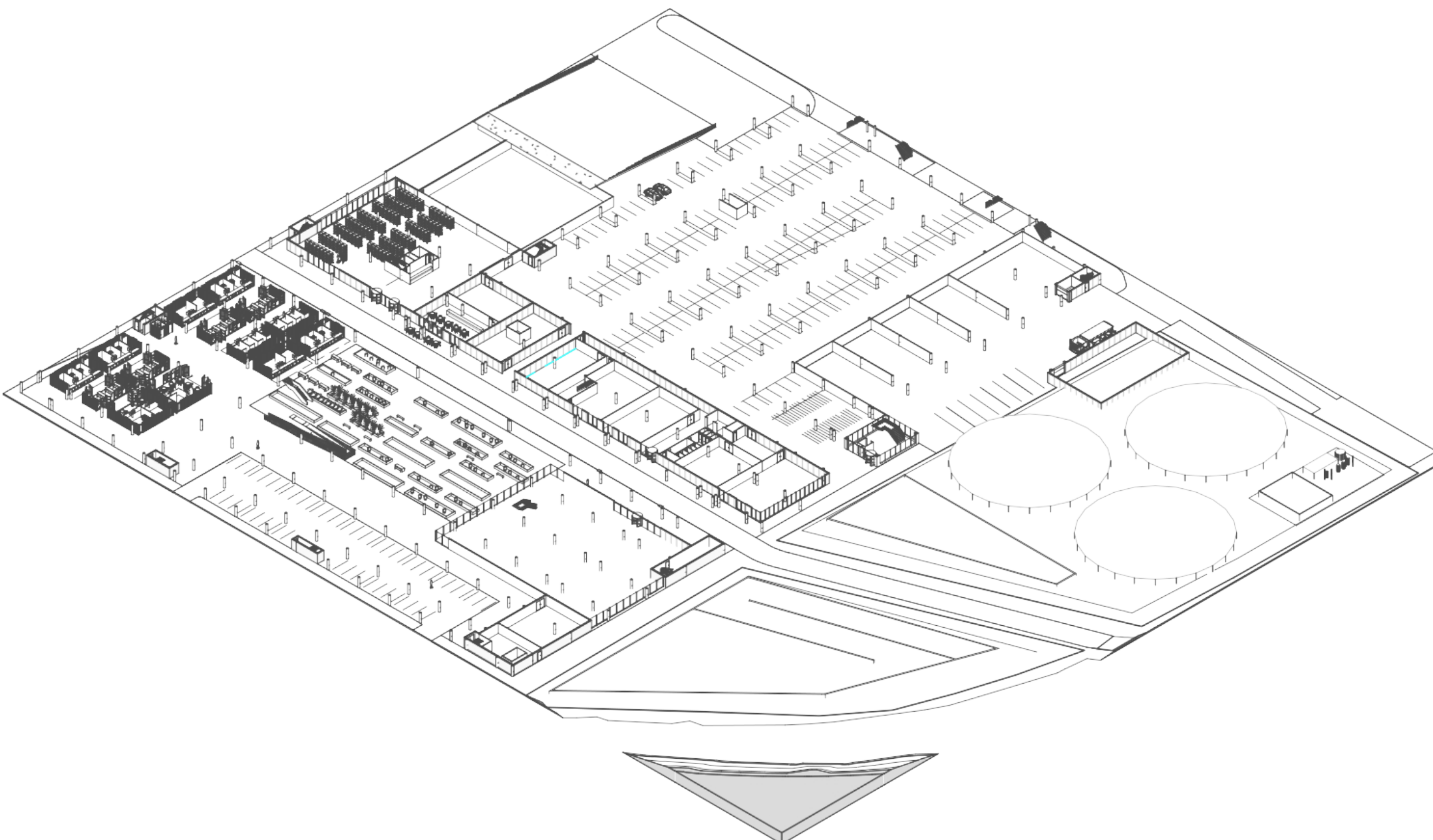
02



01

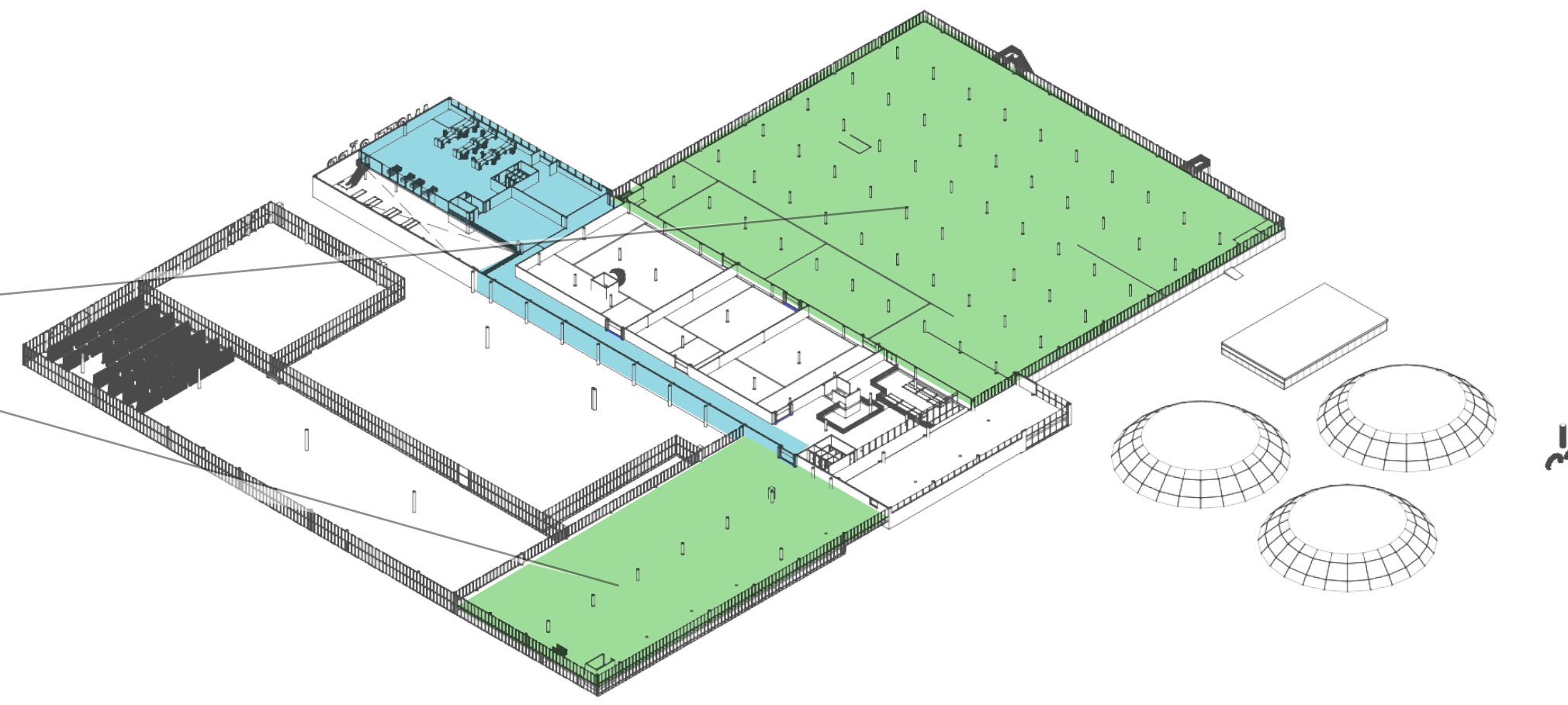


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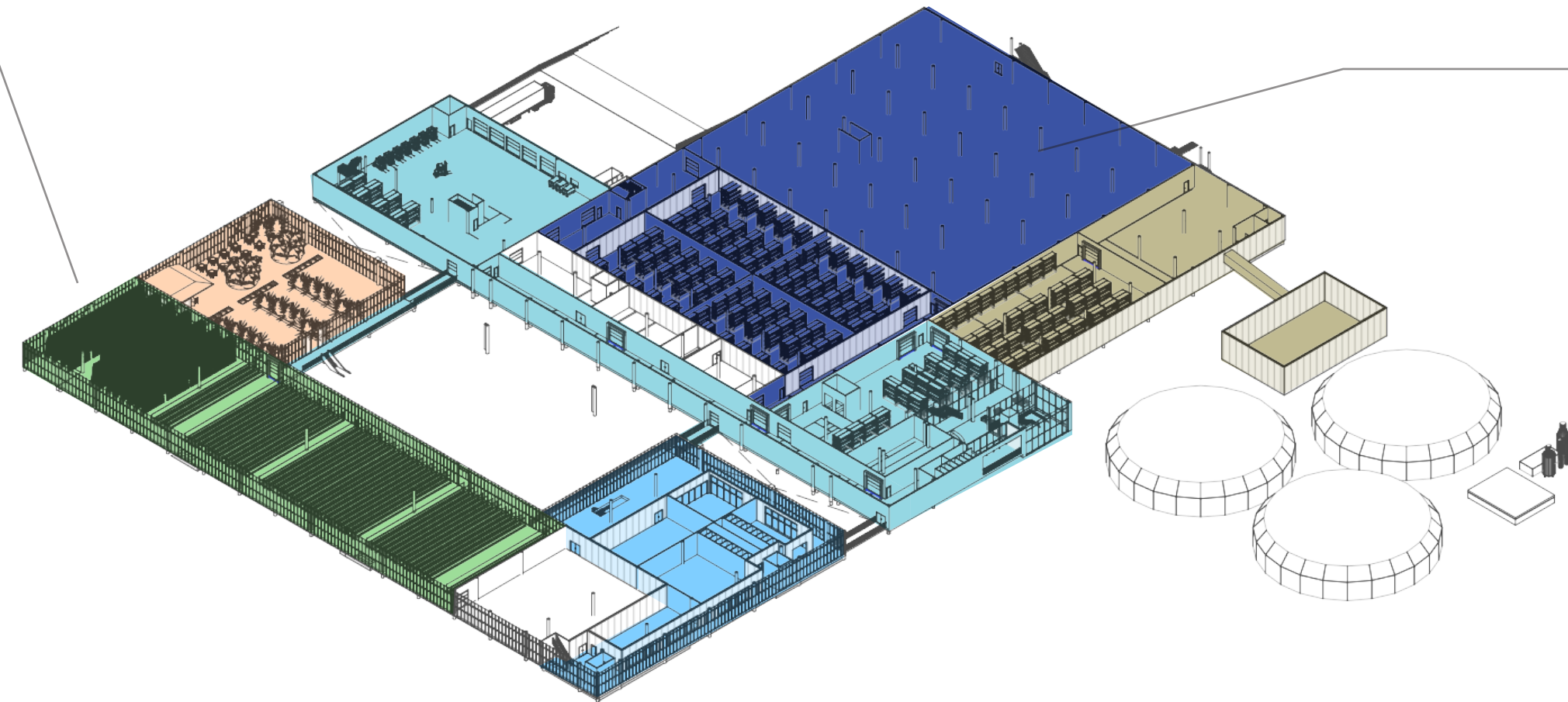




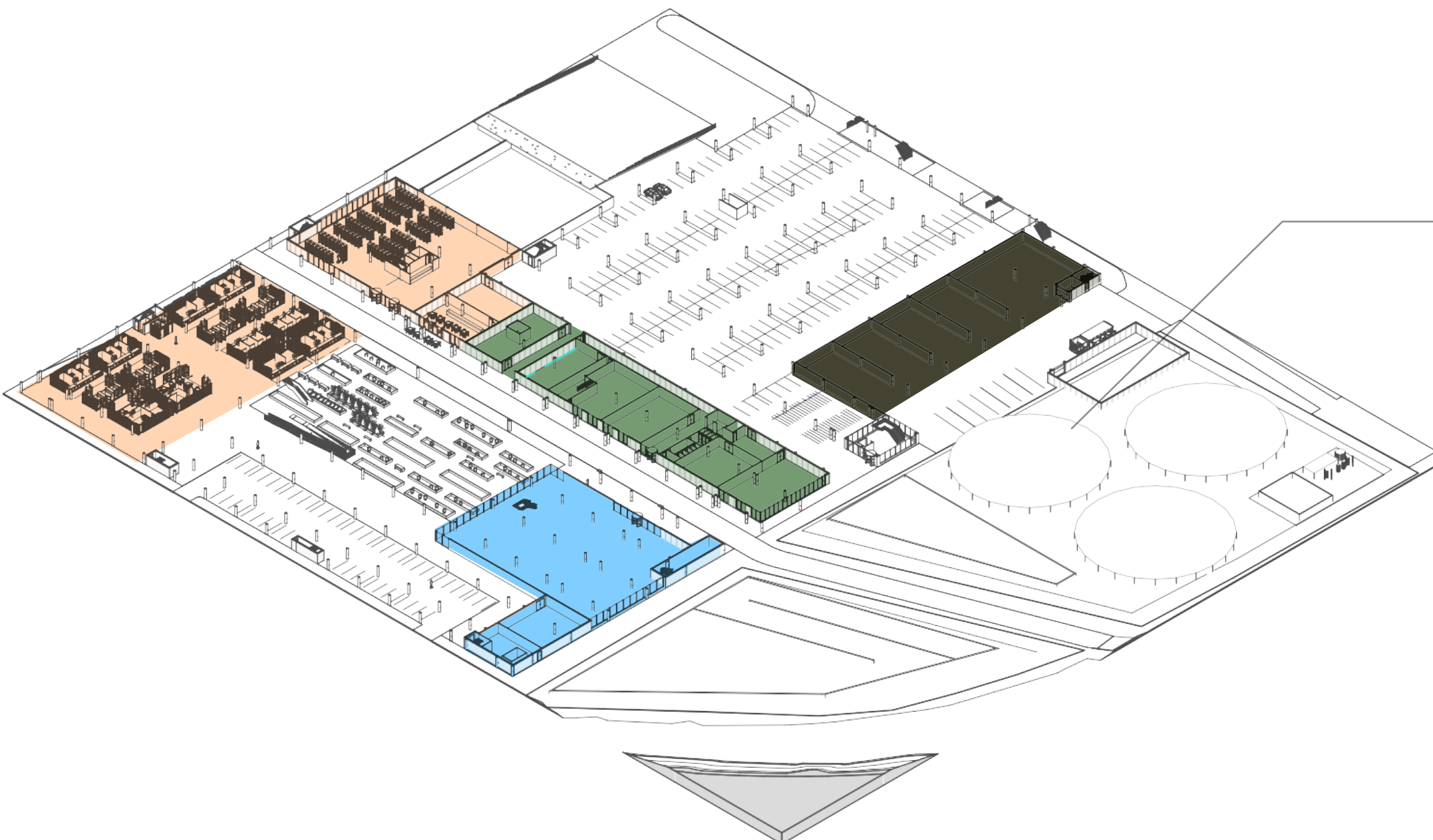
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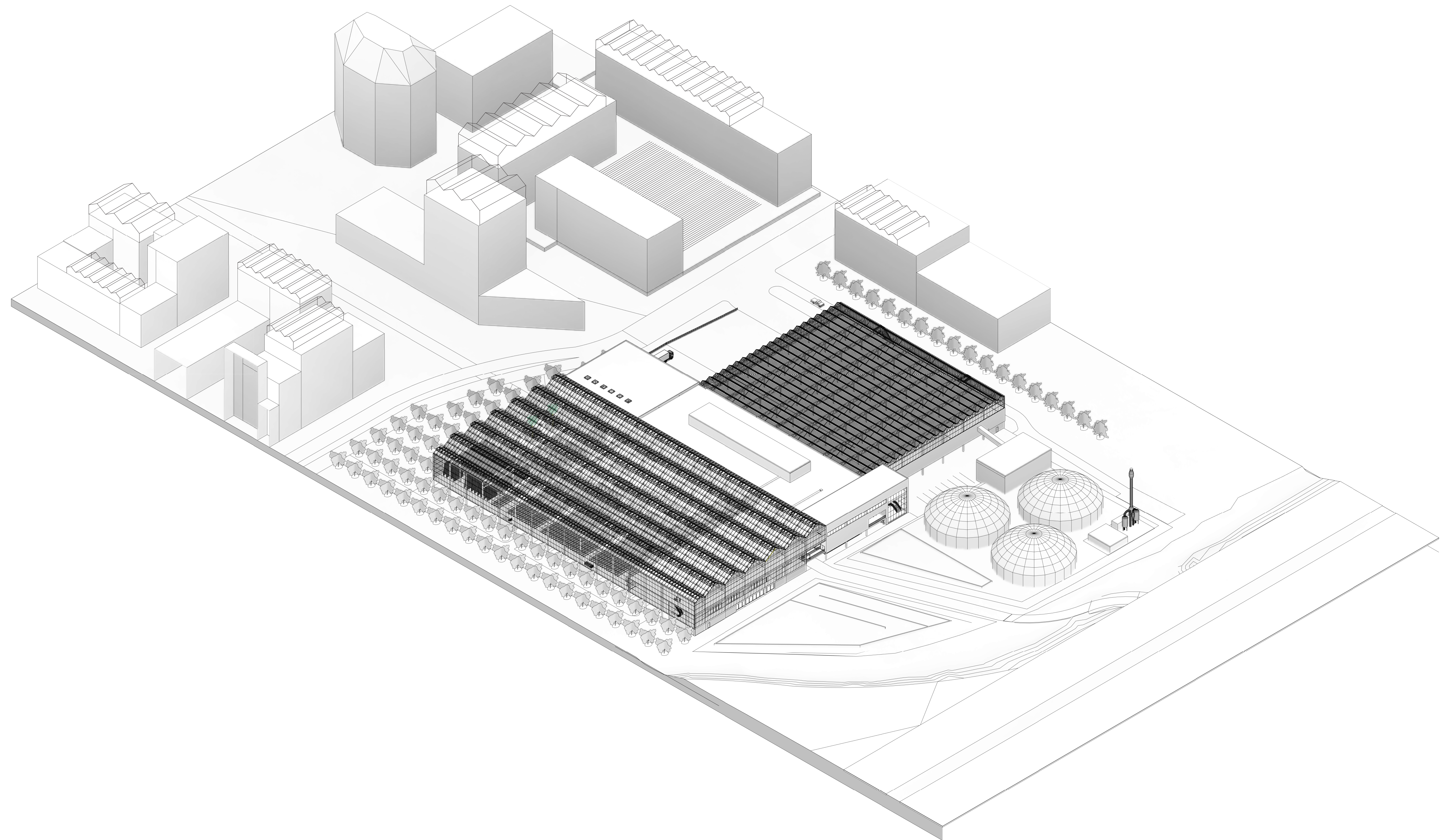
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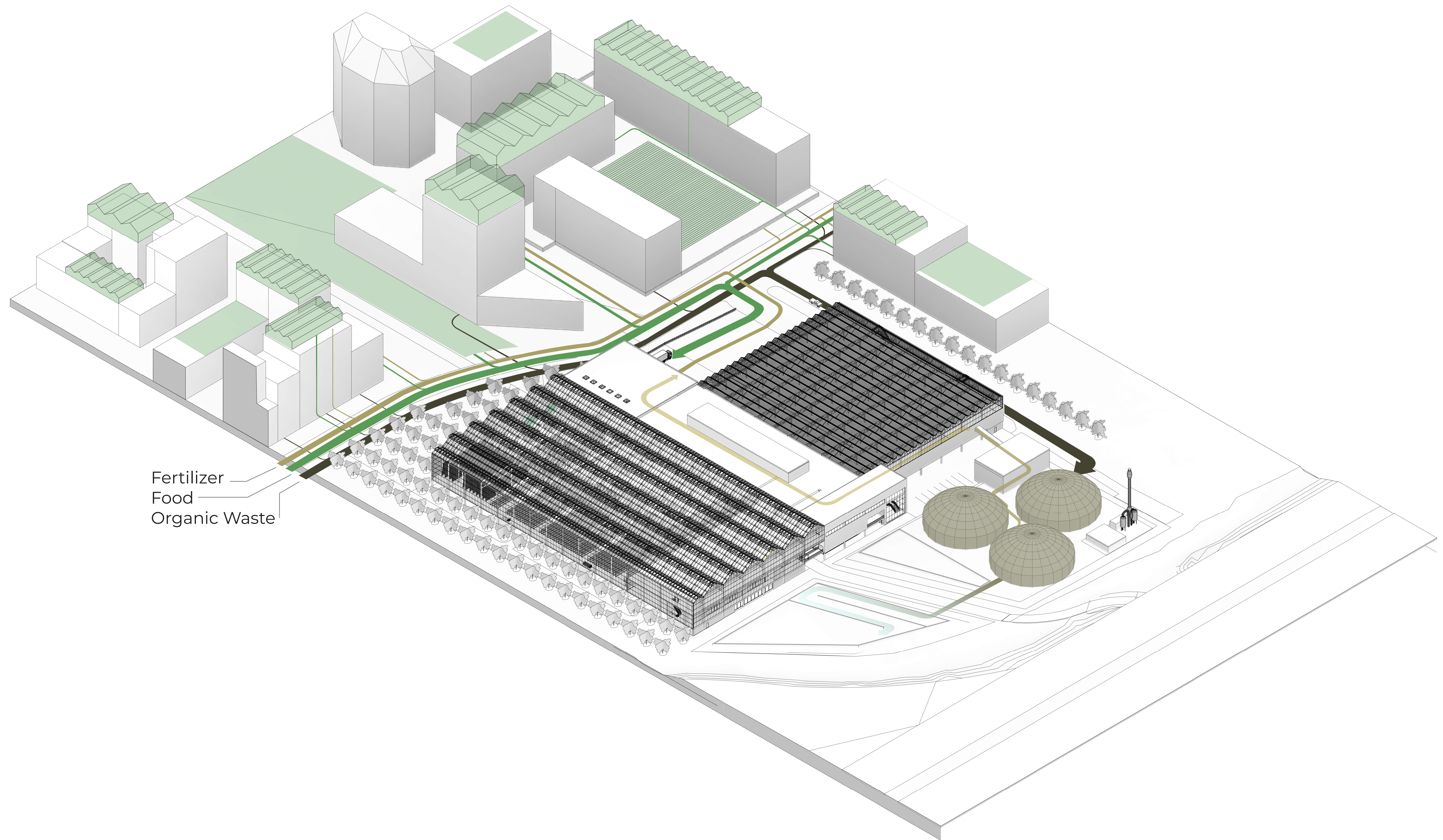


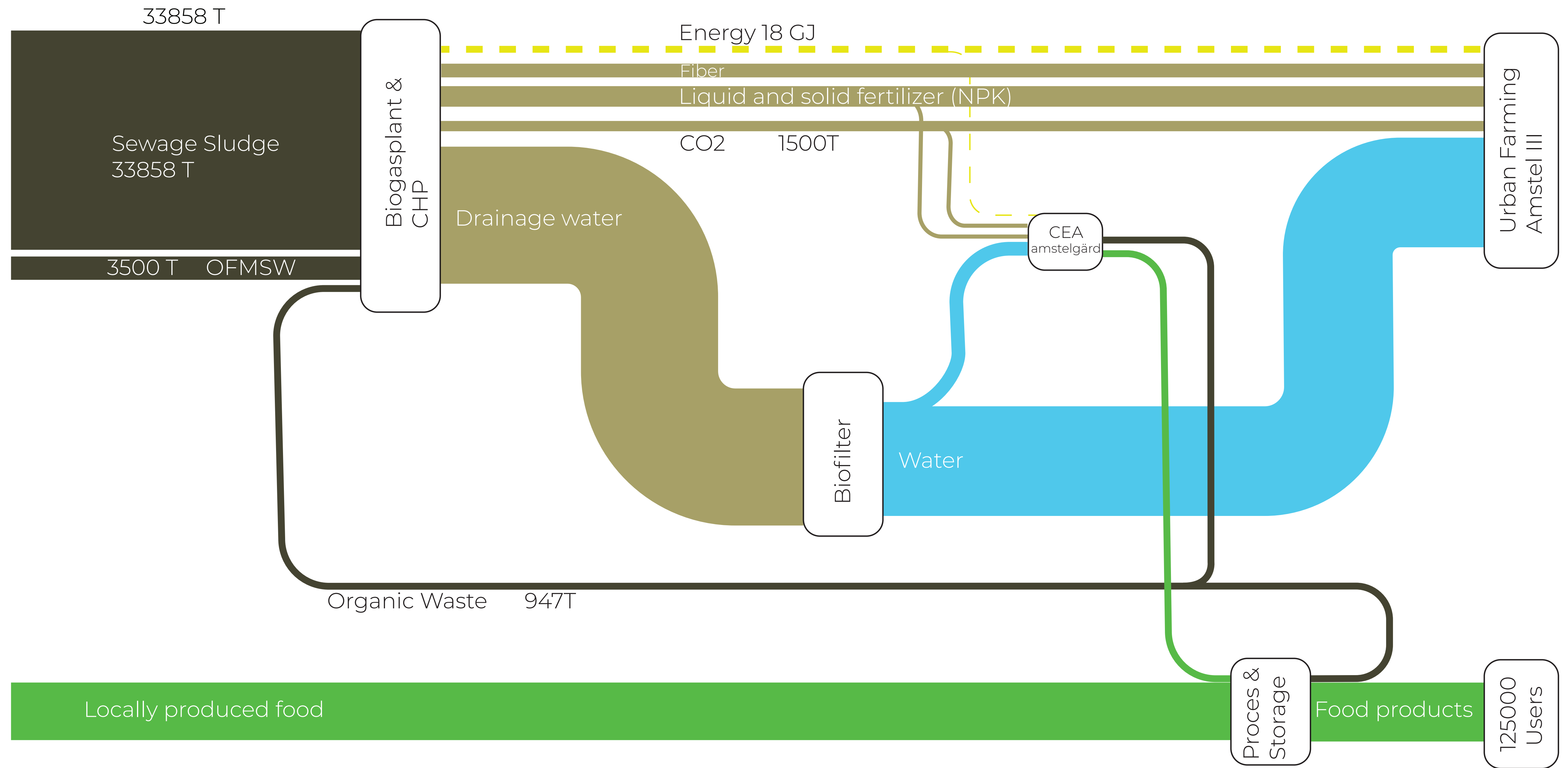
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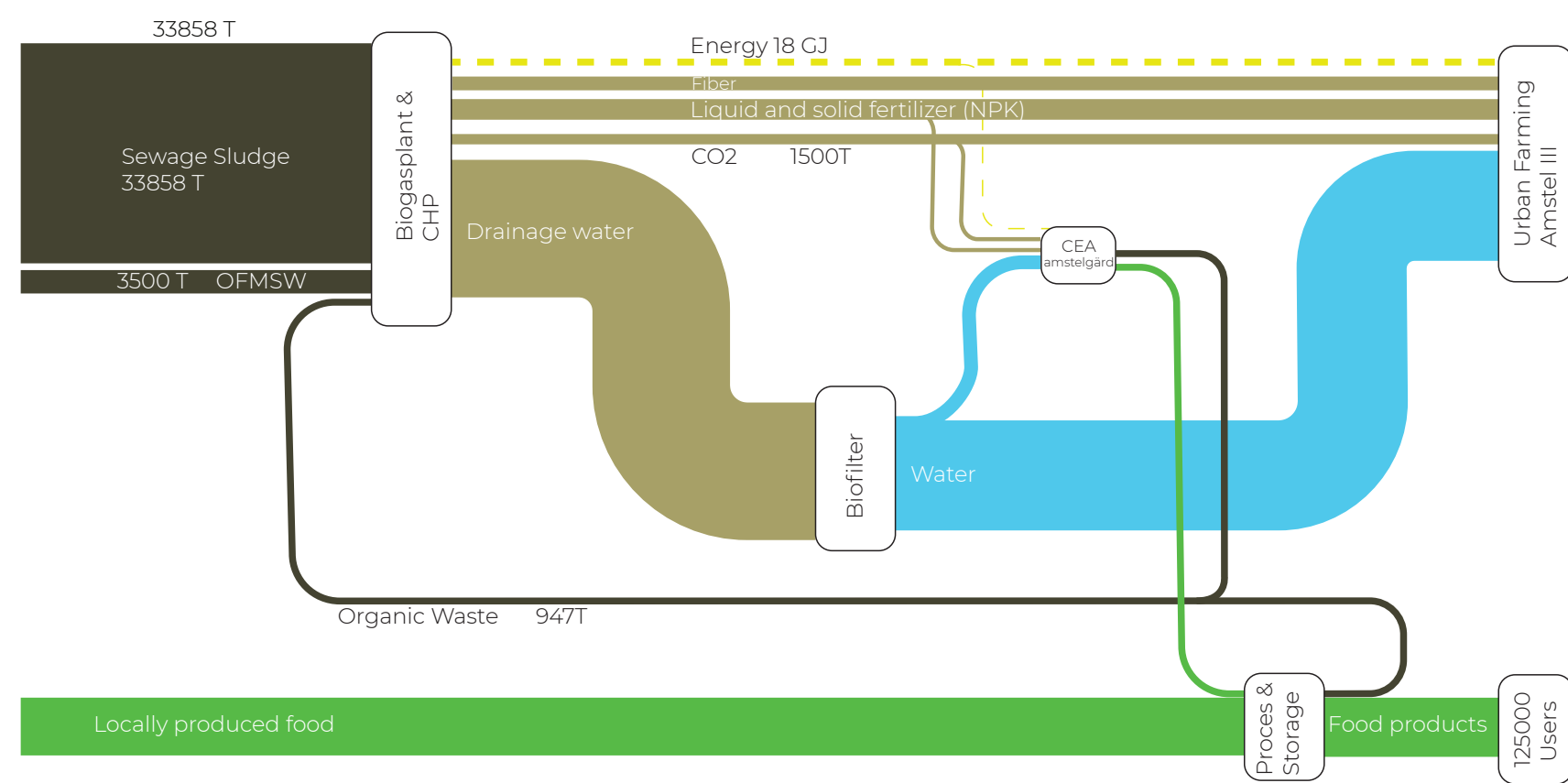




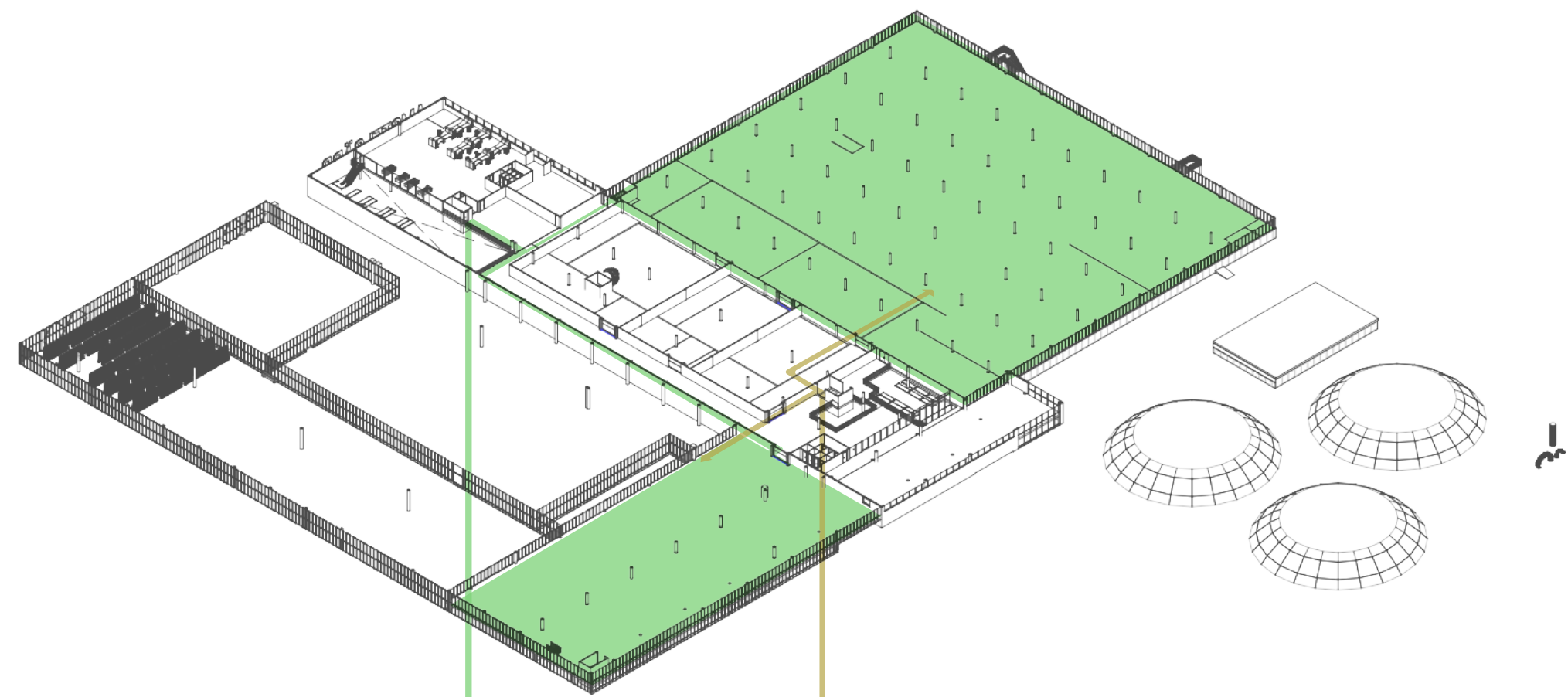




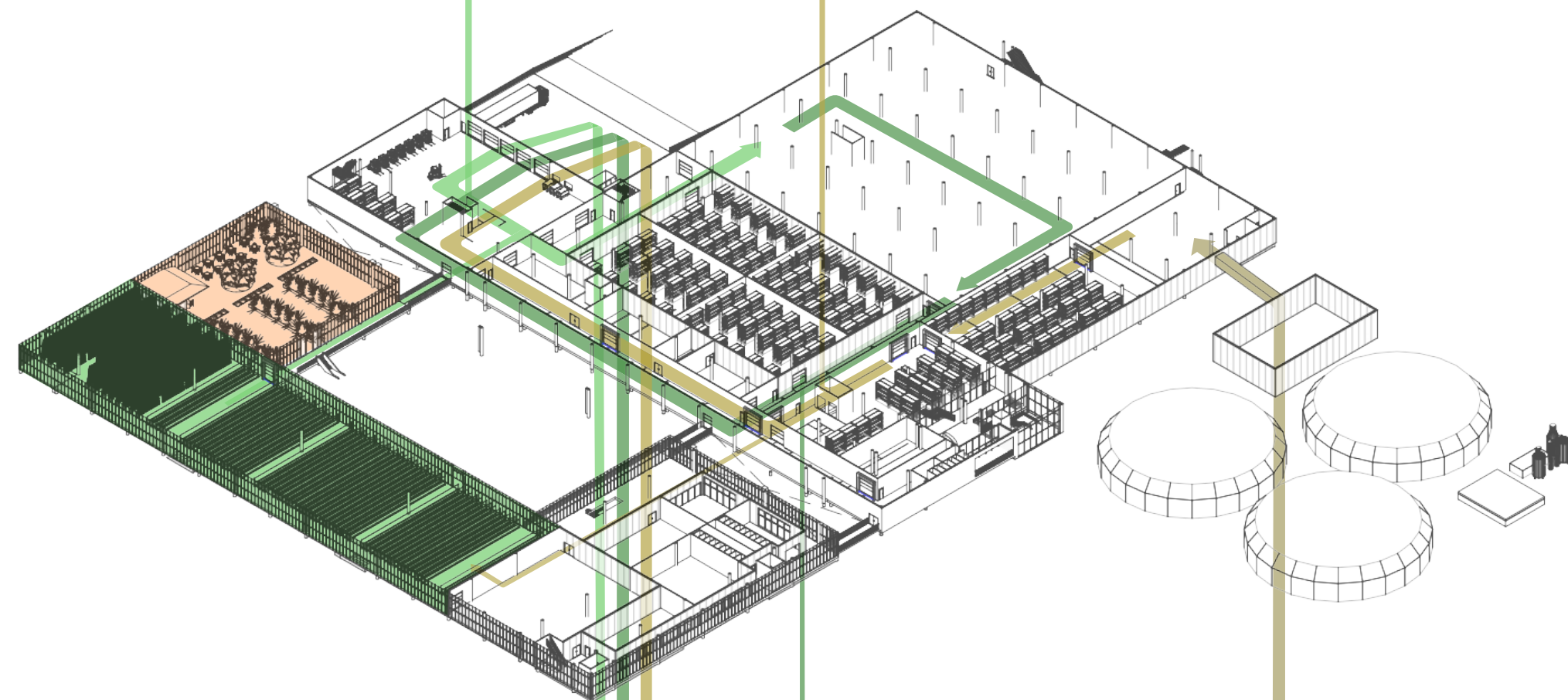




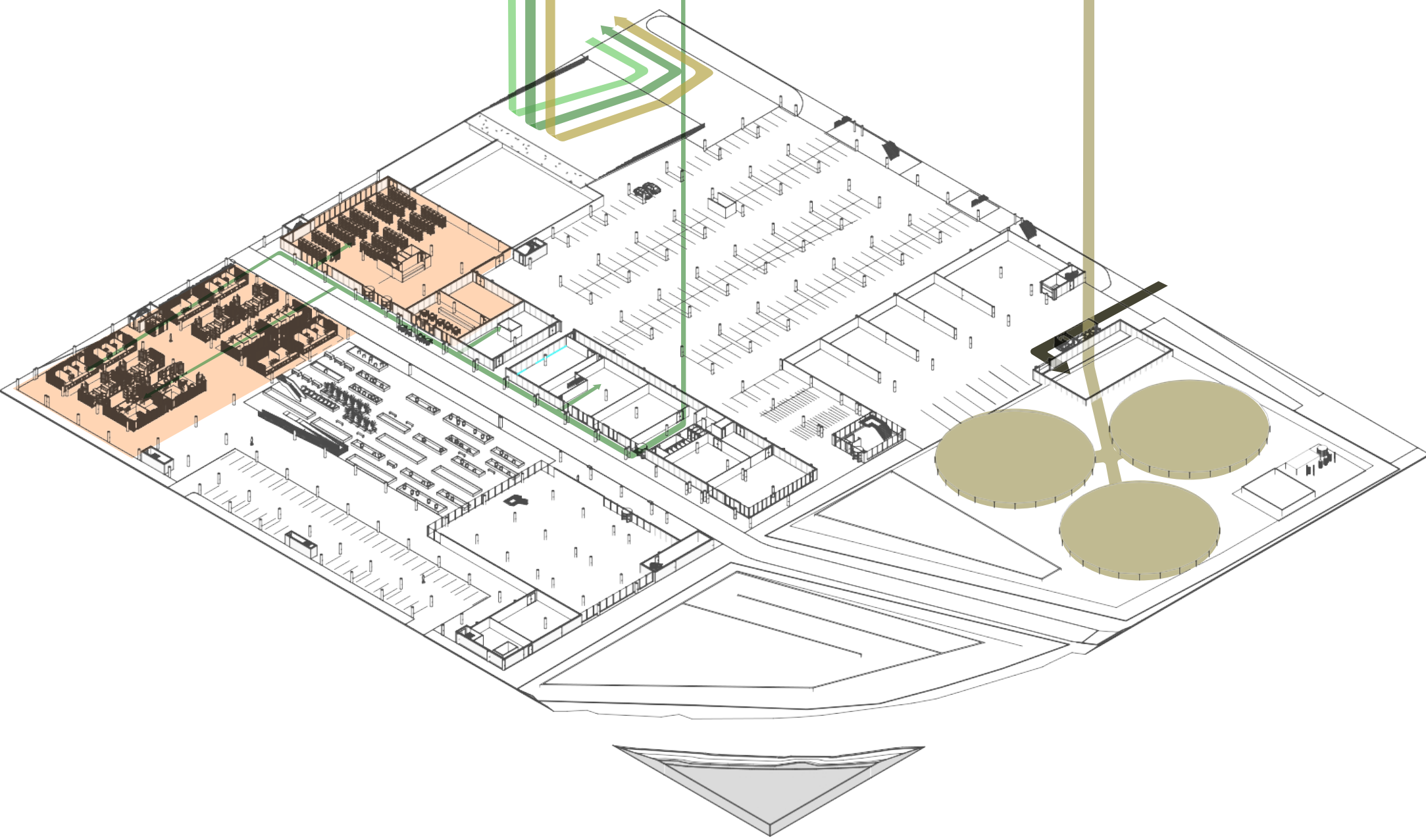
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01



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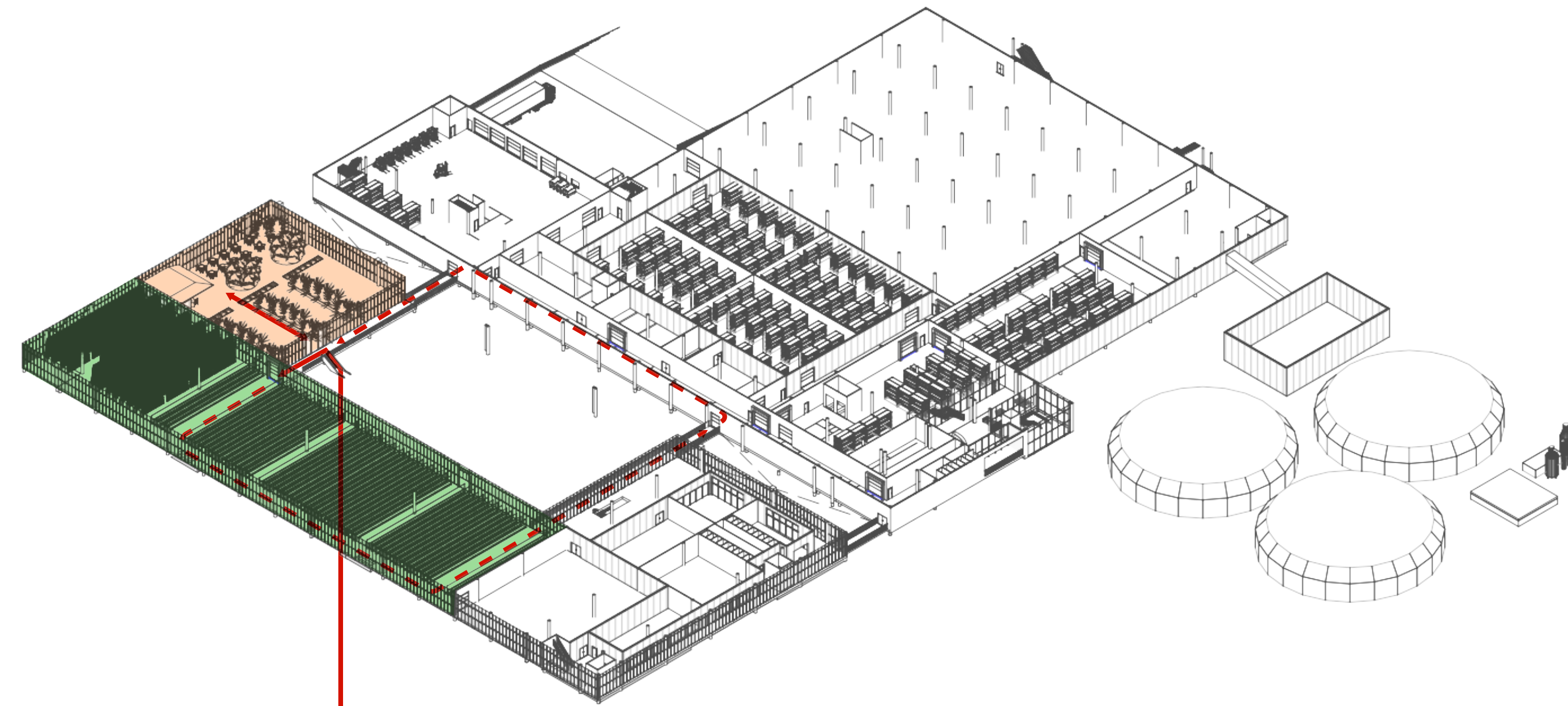


AMSTELGÄRD

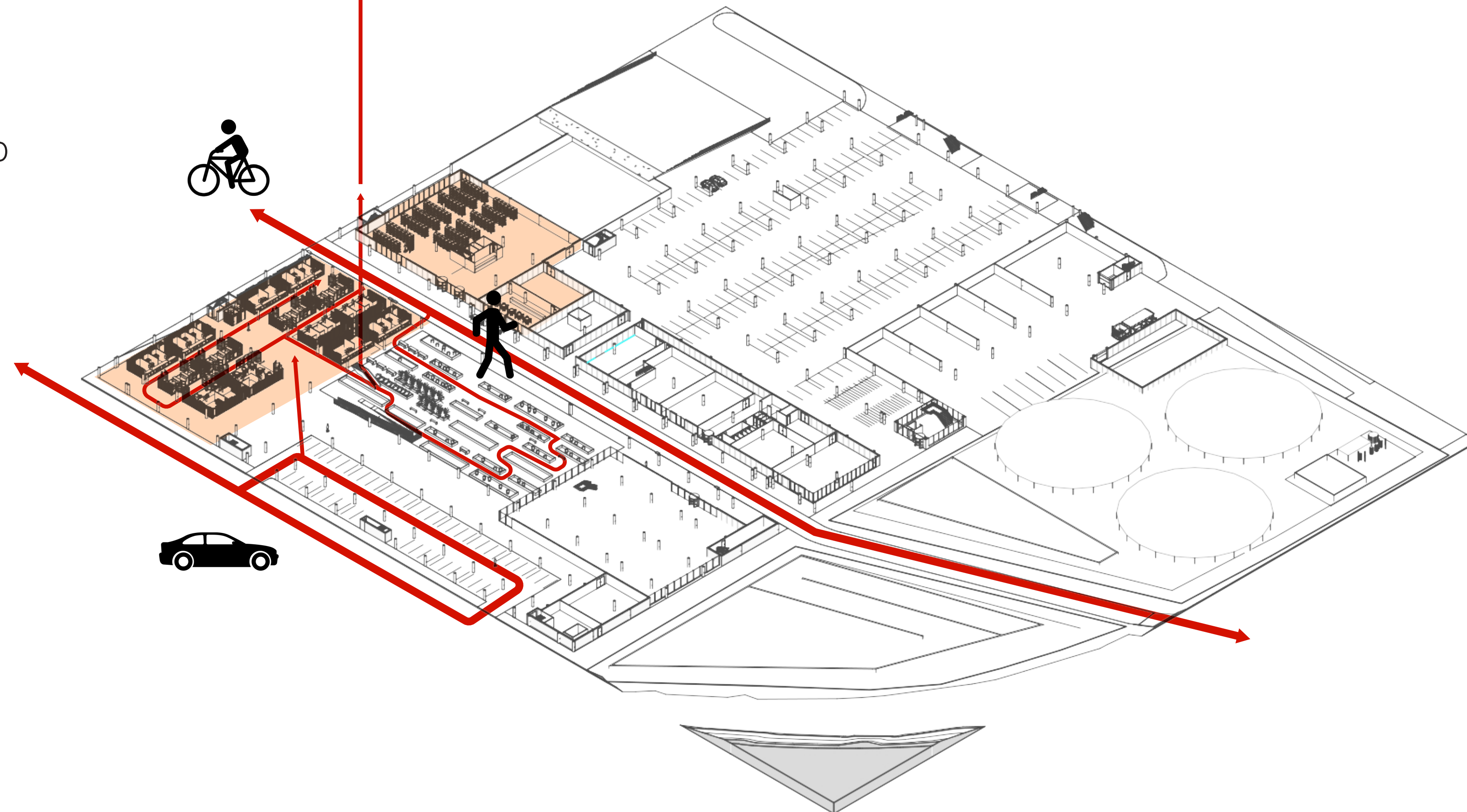


Routing

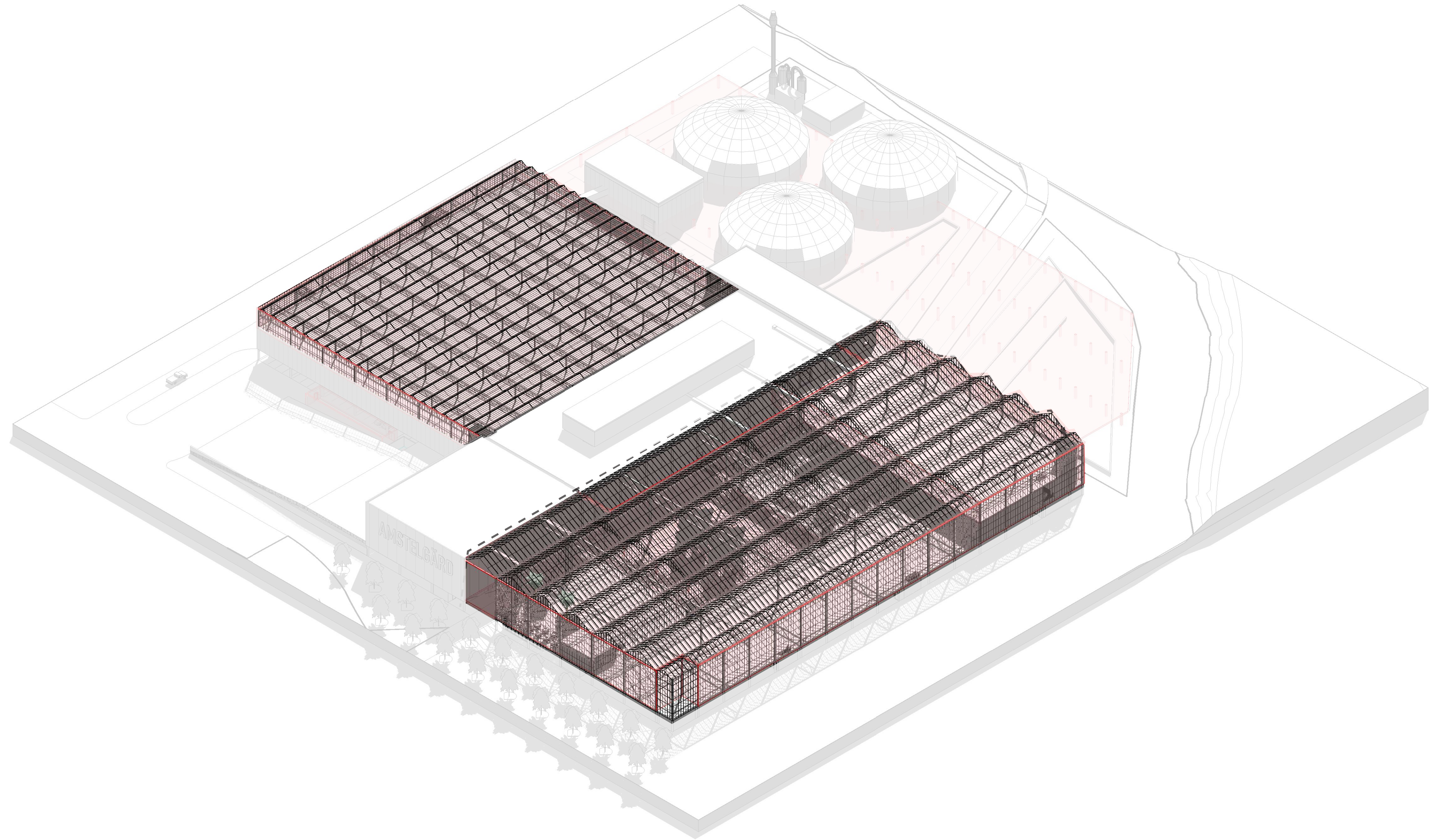
01



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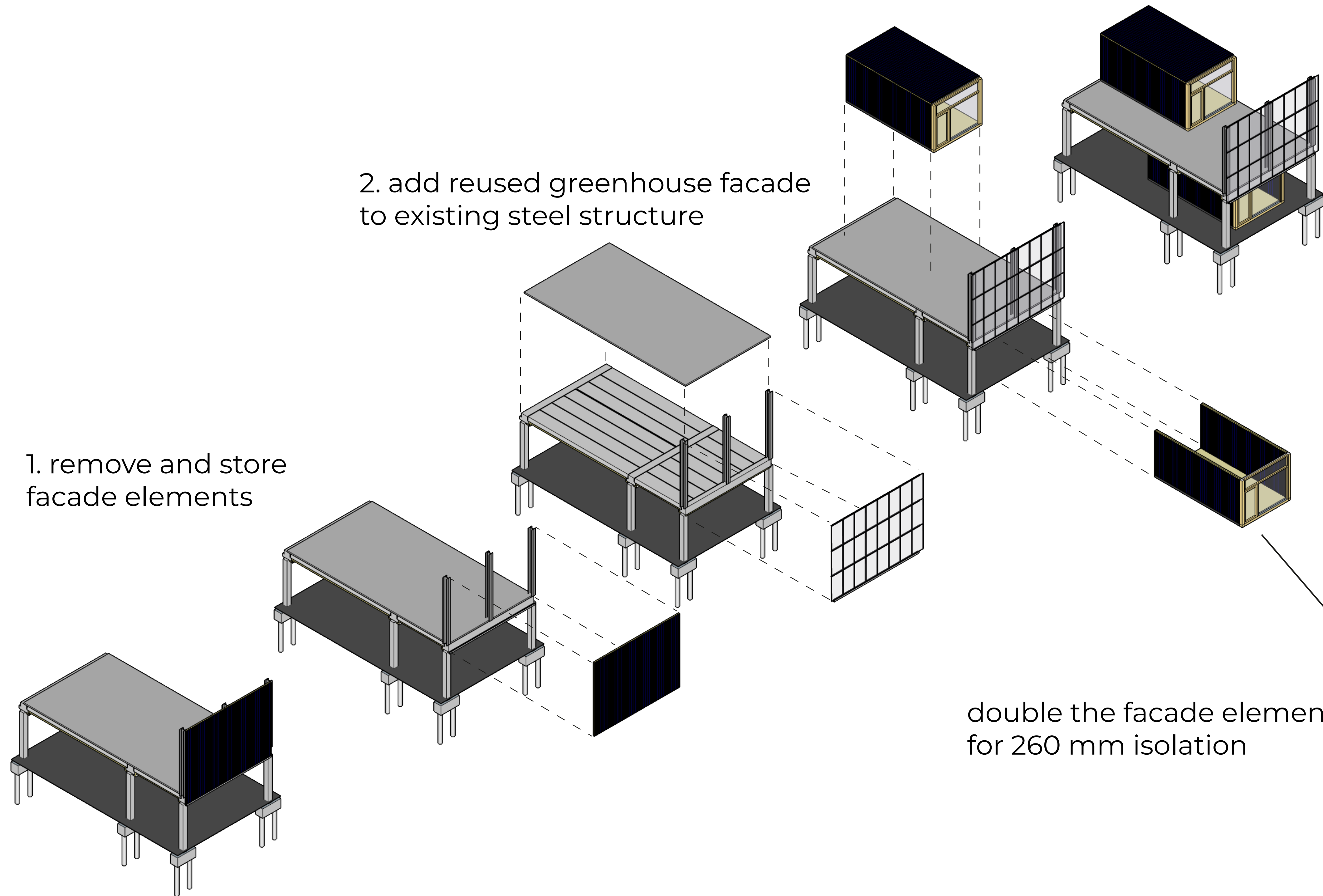




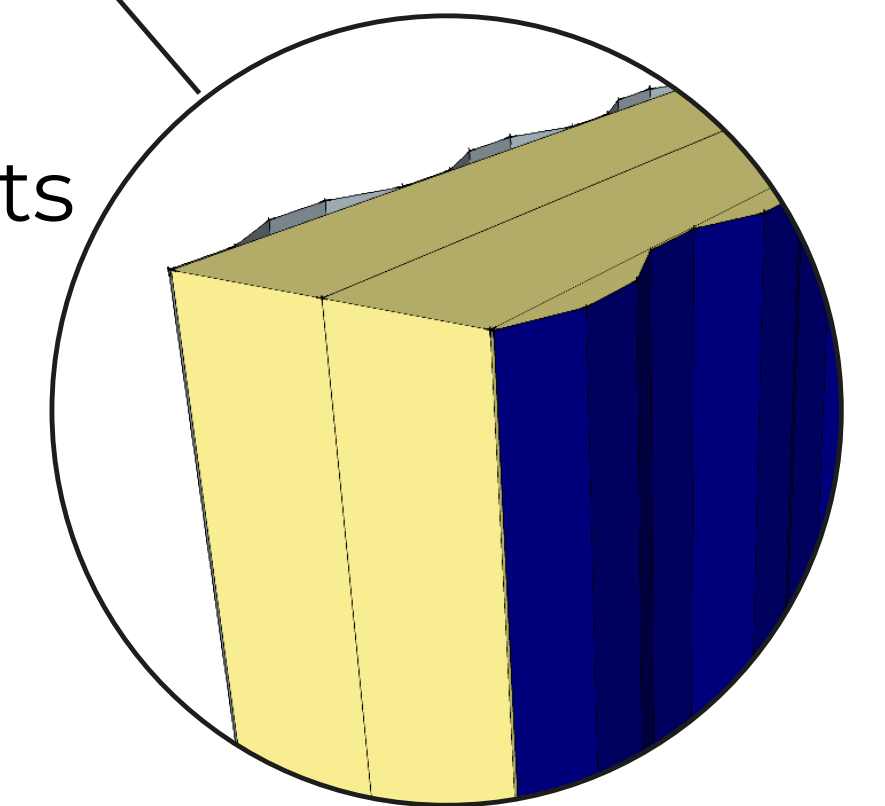
3. fabricate box-in-box units from facade elements

2. add reused greenhouse facade
to existing steel structure

1. remove and store
facade elements



double the facade elements
for 260 mm isolation



Second hand greenhouse



	Alle groepen...	Postcode	Alle afstanden...	Zoek
--	-----------------	----------	-------------------	------

Breed-kapper kas 11.500 m2

191 x gezien

0 x bewaard

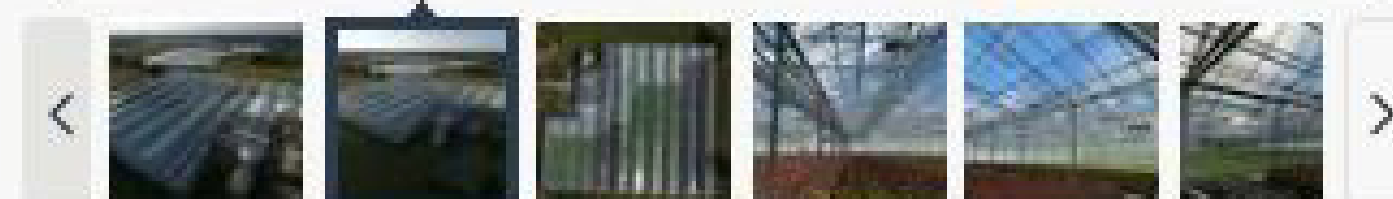
sinds 02 jun. '20, 08:04

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Website



Bericht



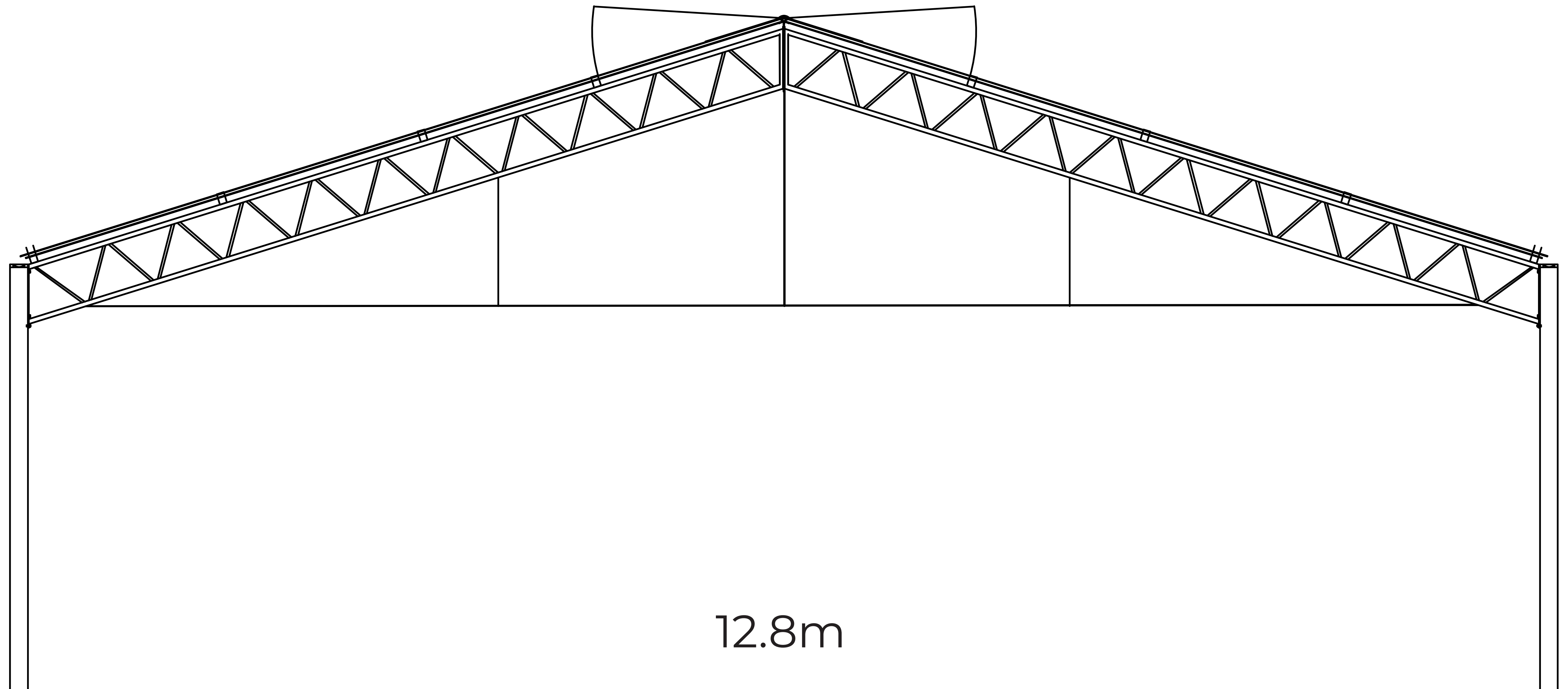
Toon
nummer

Anderen bekeken

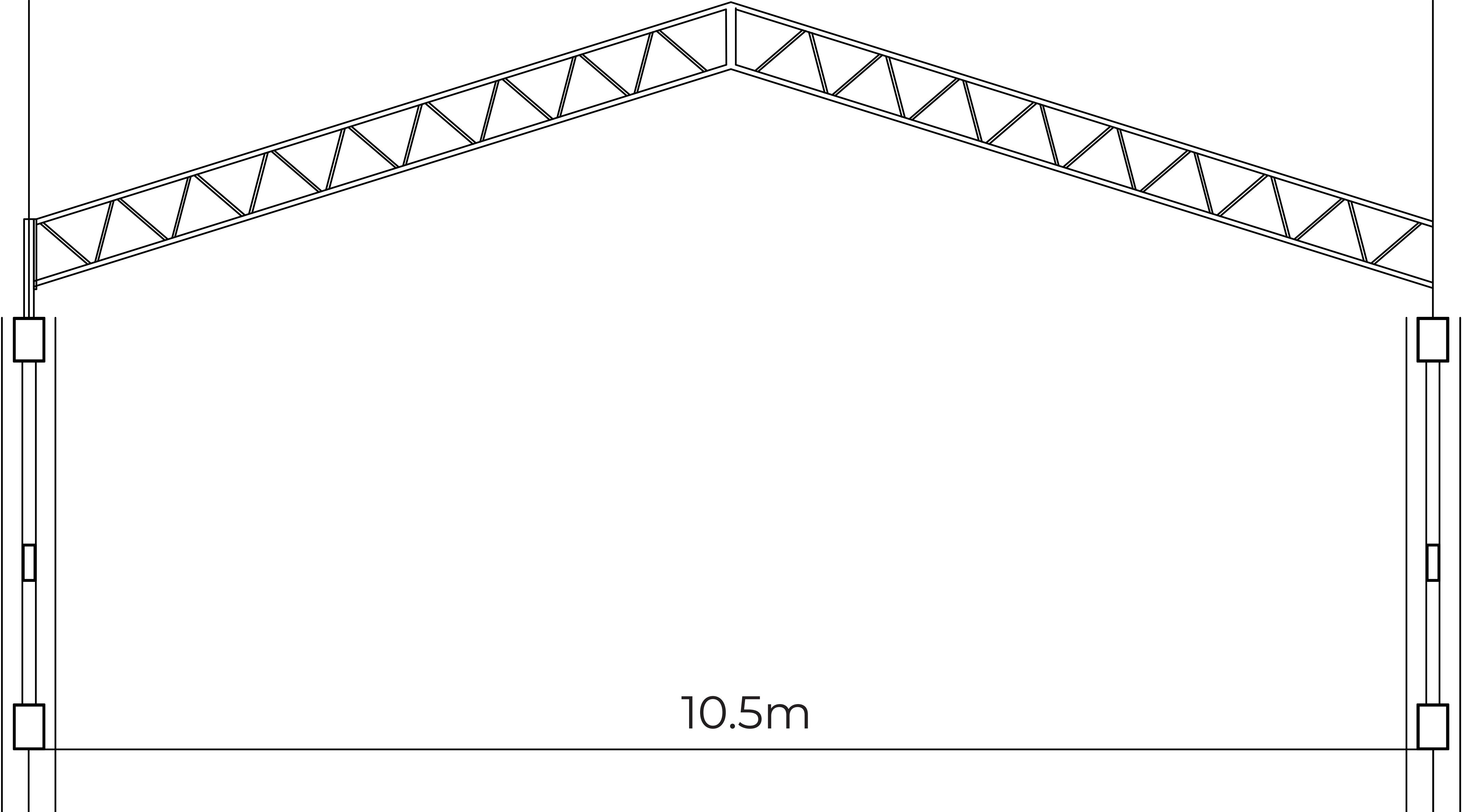


****GIGA** Kas serre
kweekkas hobbykas
3x3 meter *Extra
€ 995,00**

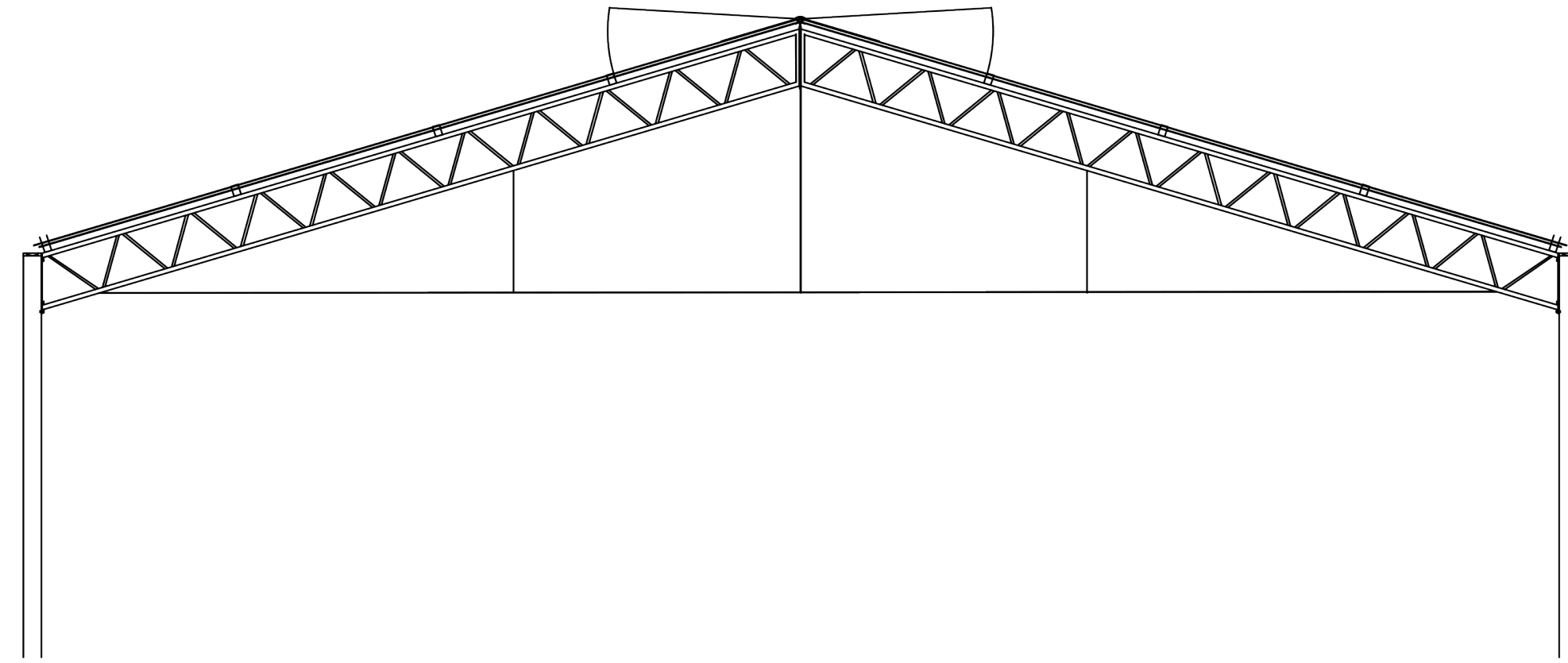
Breedkap greenhouse



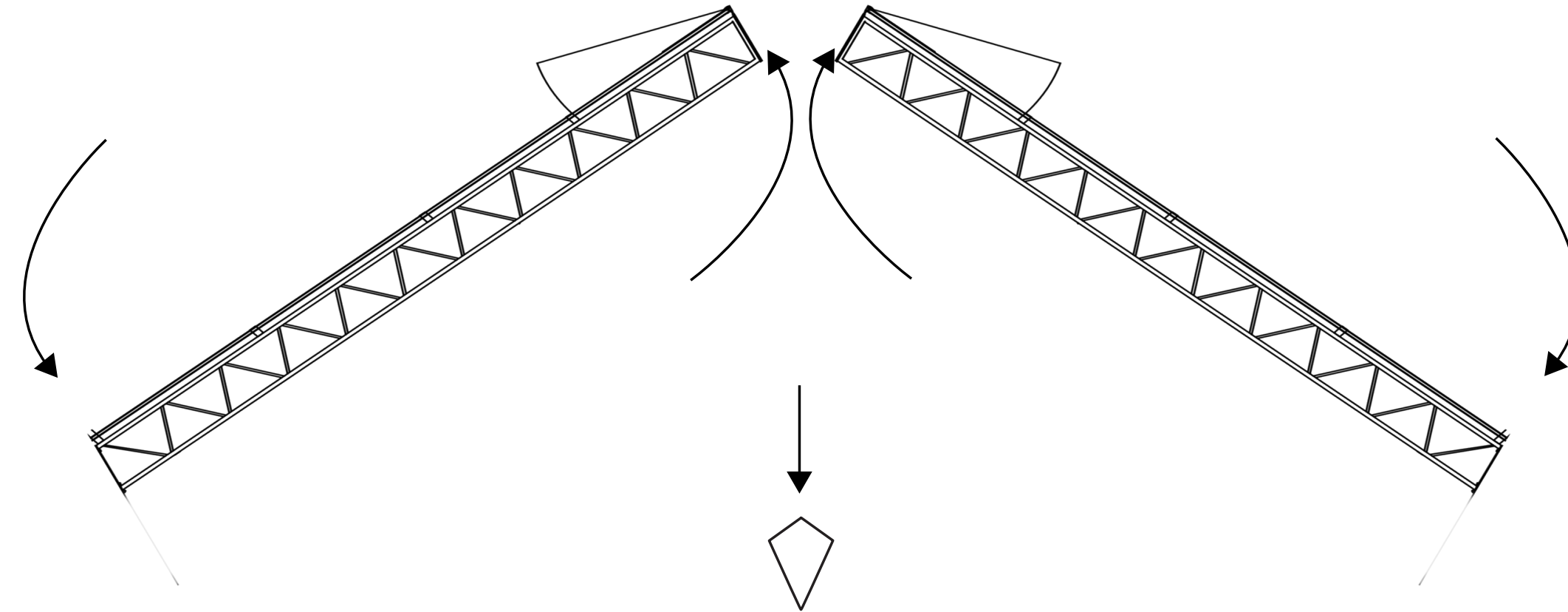
Desired situation



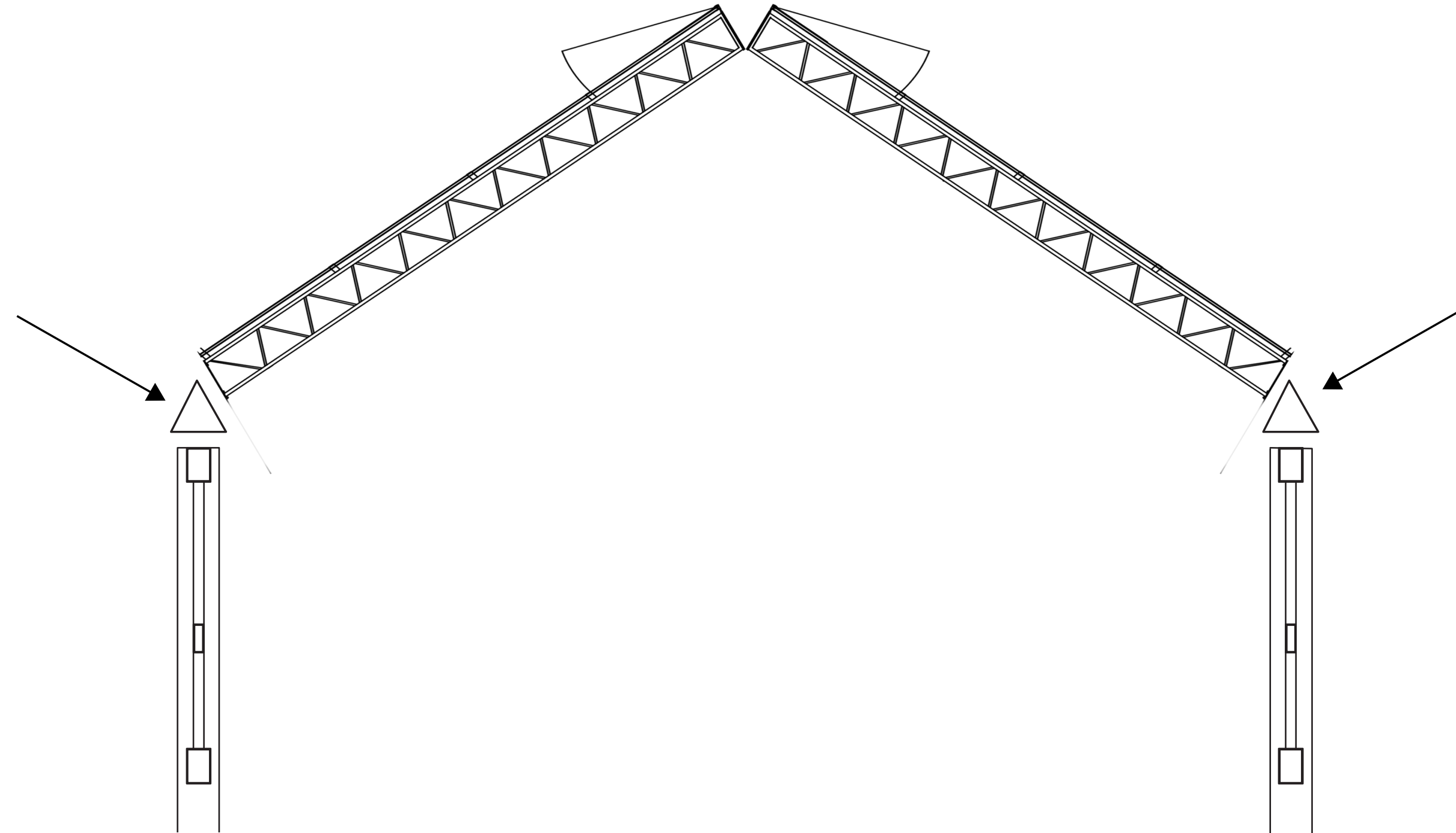
1.

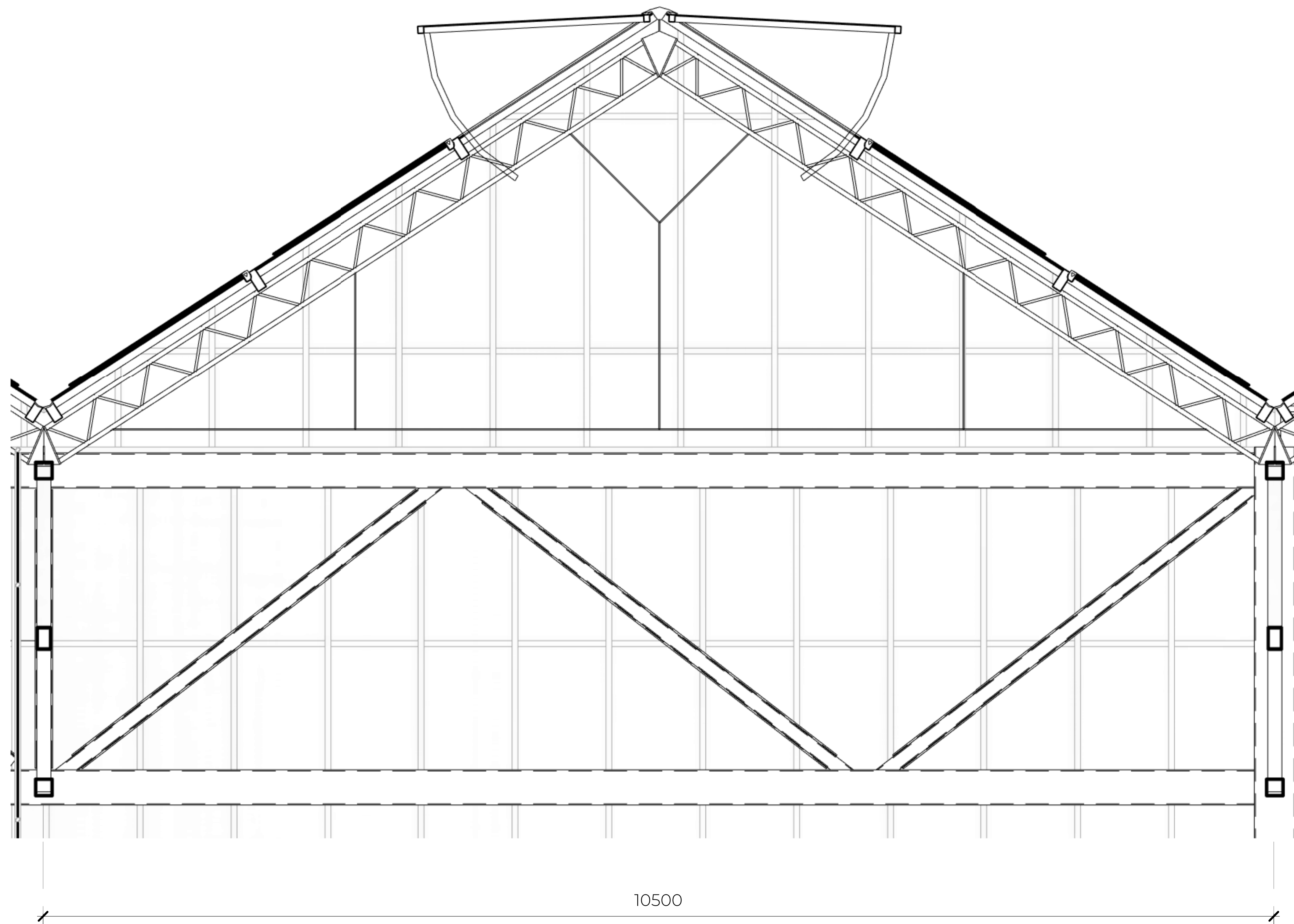


2.

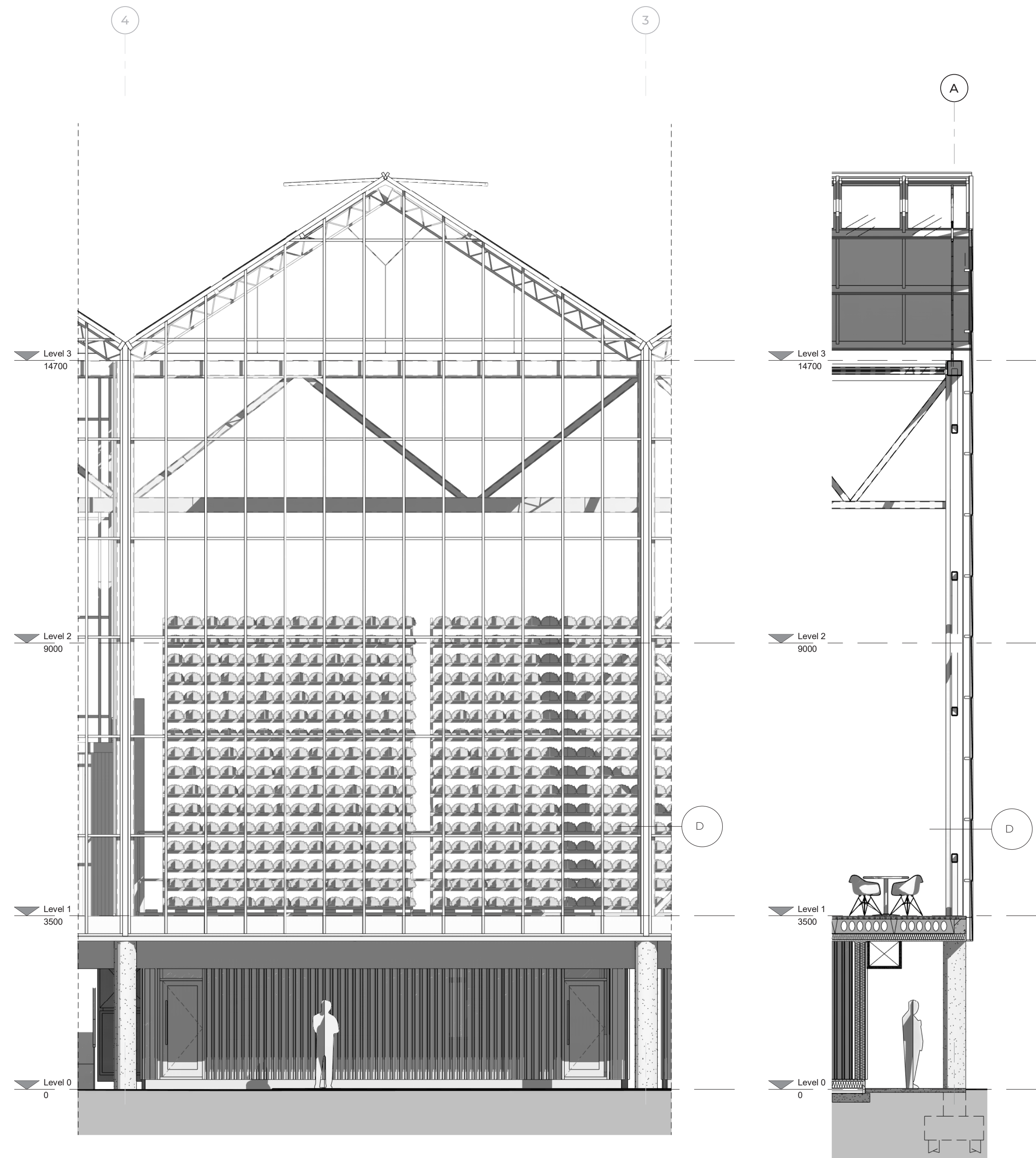


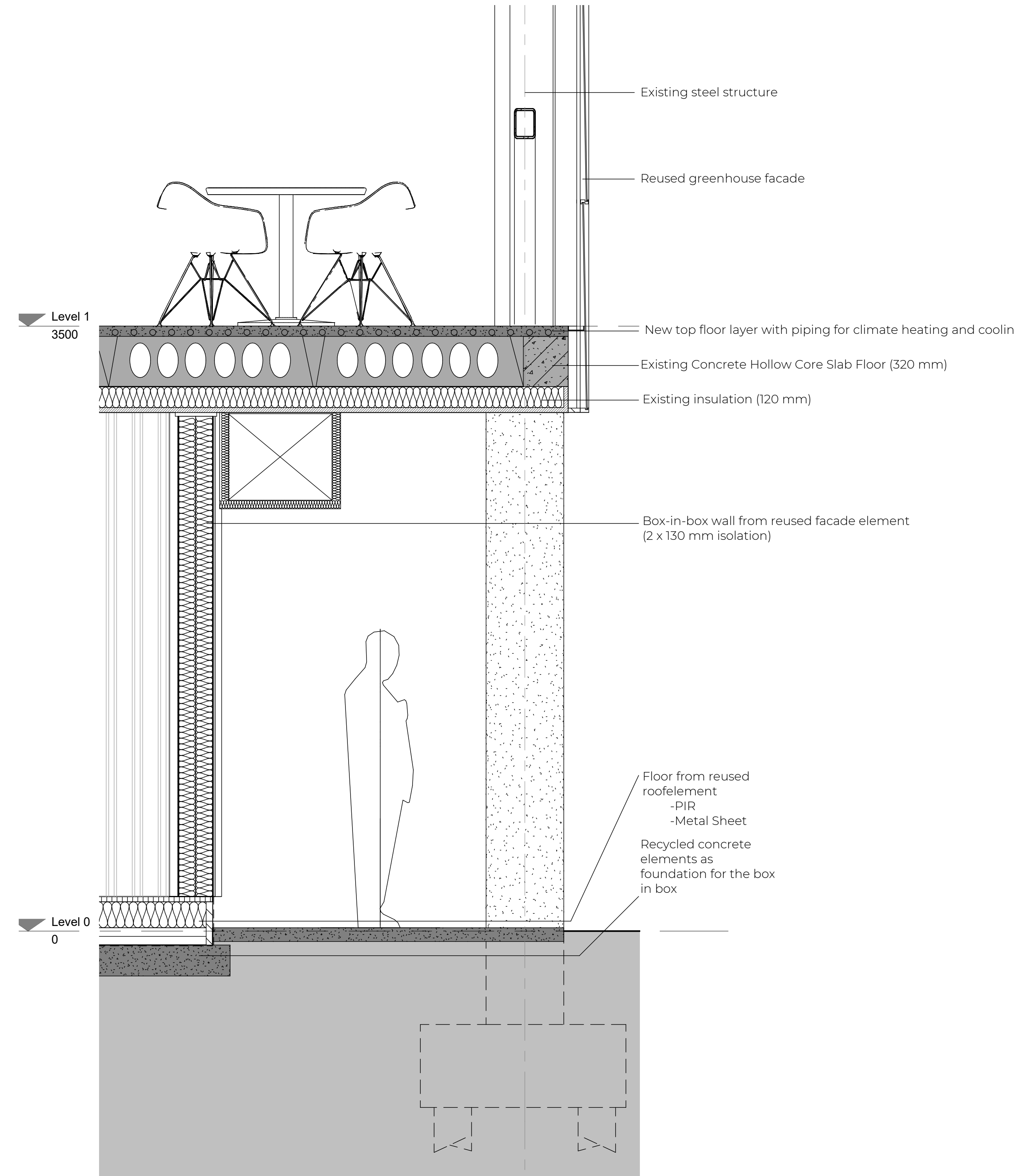
3.





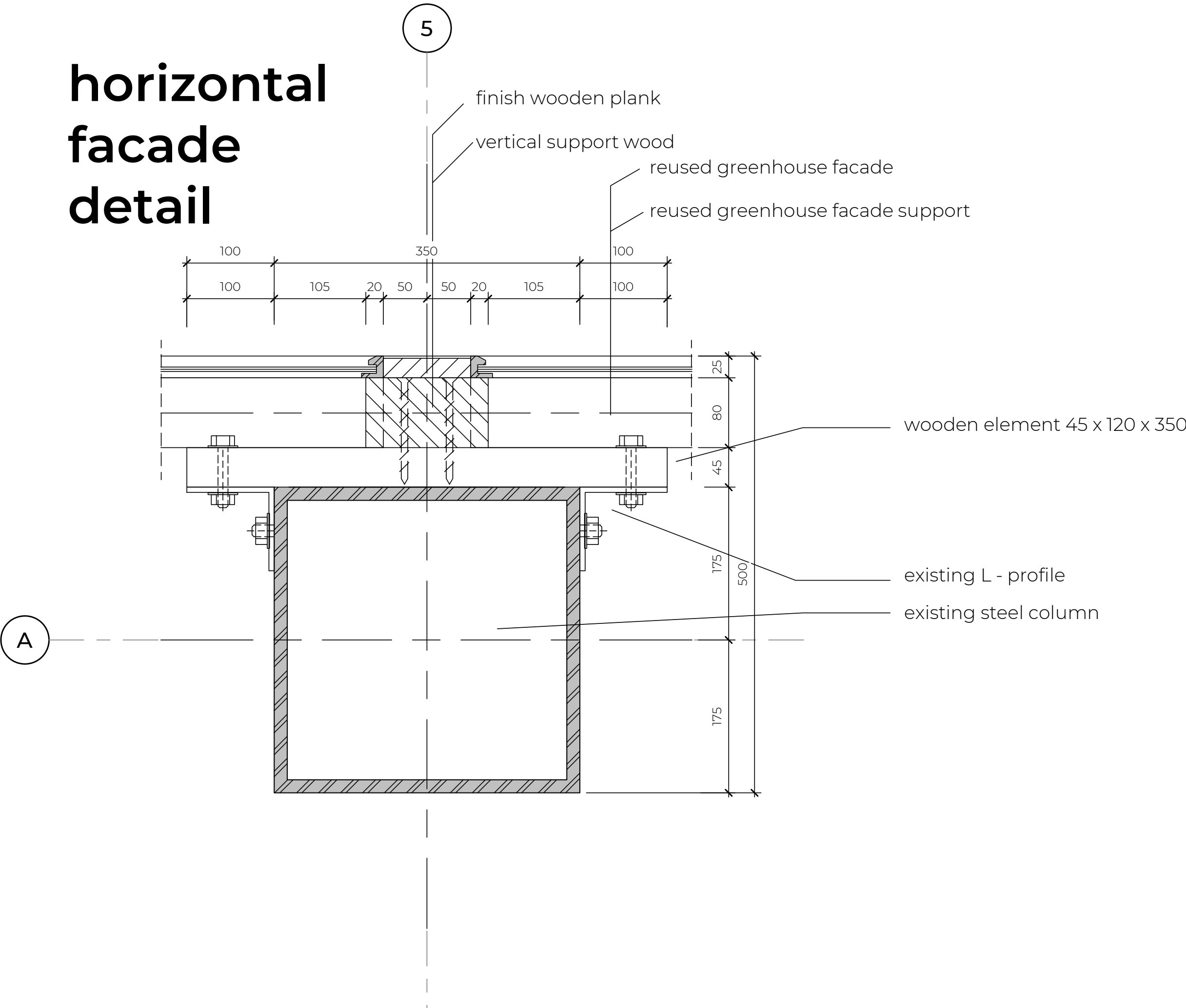




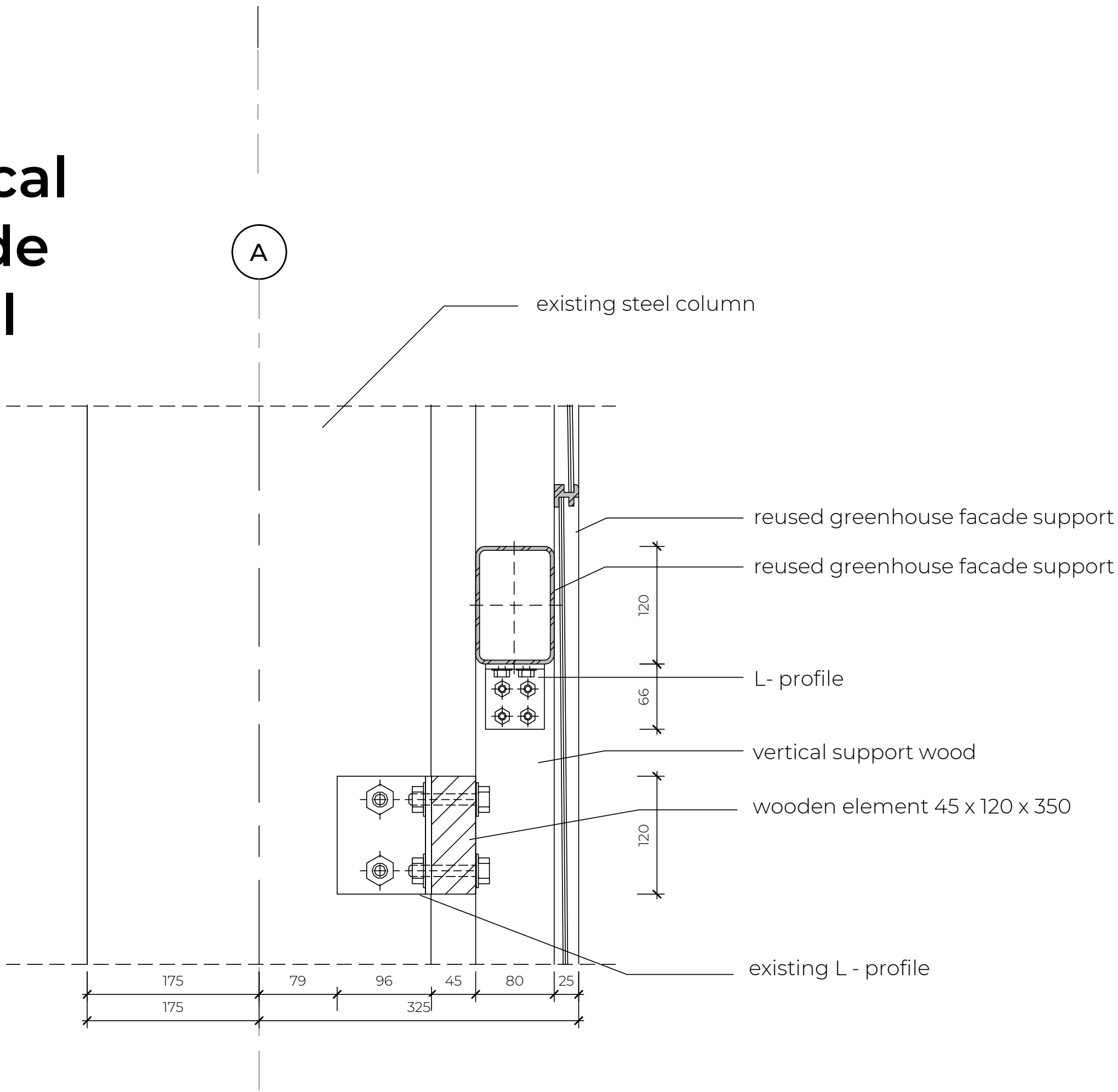


facade section 1:20

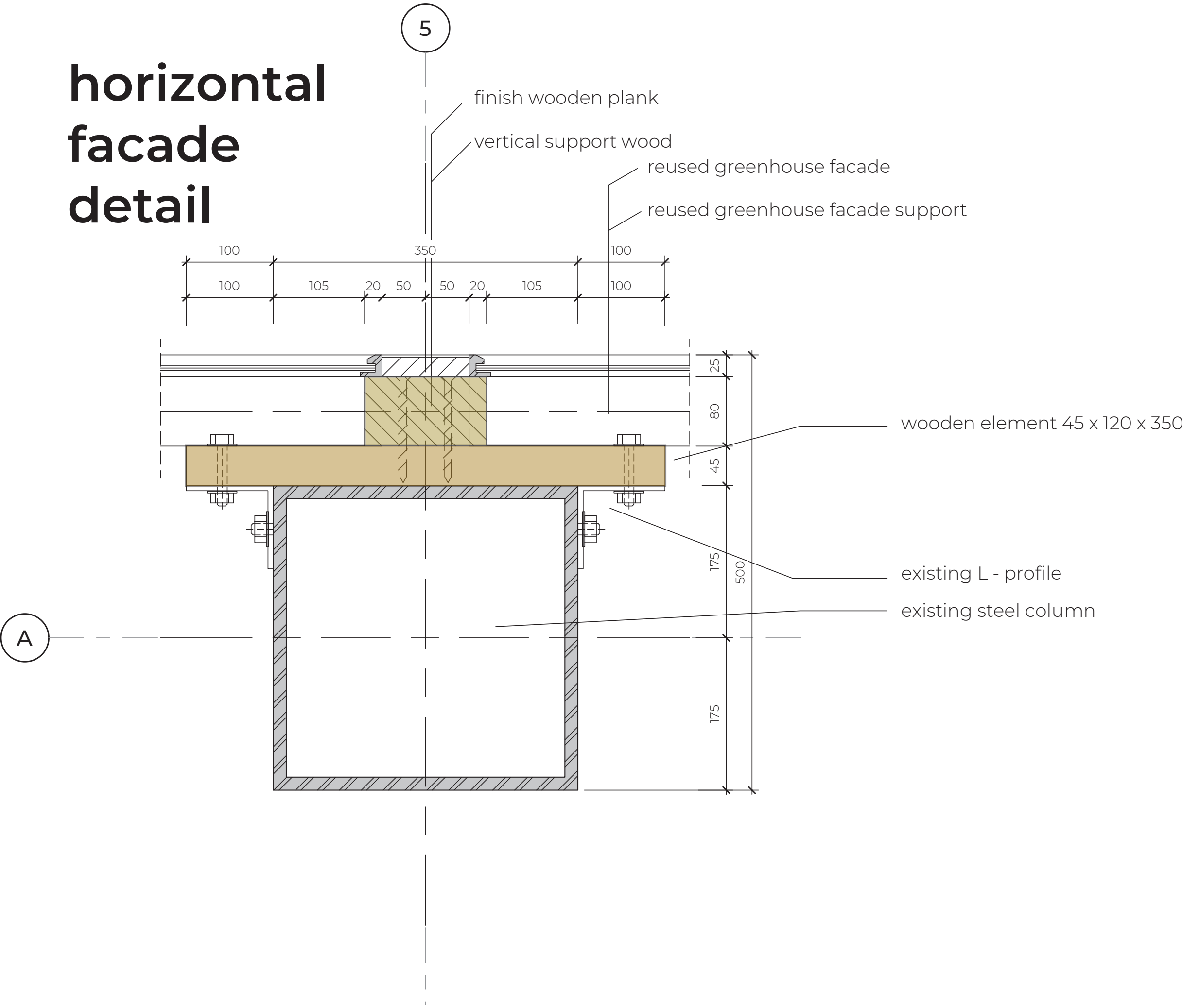
horizontal facade detail



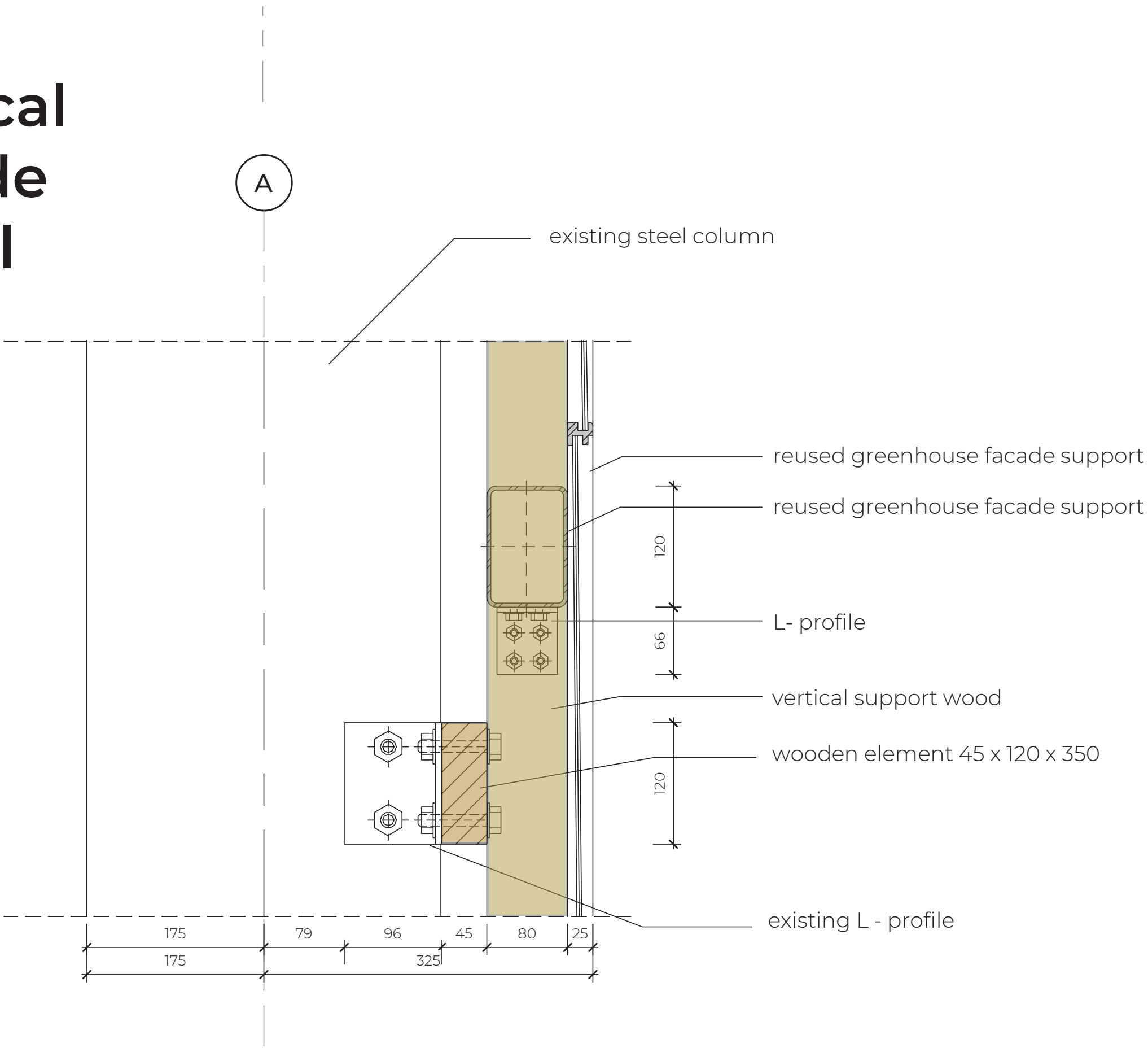
vertical facade detail



horizontal facade detail



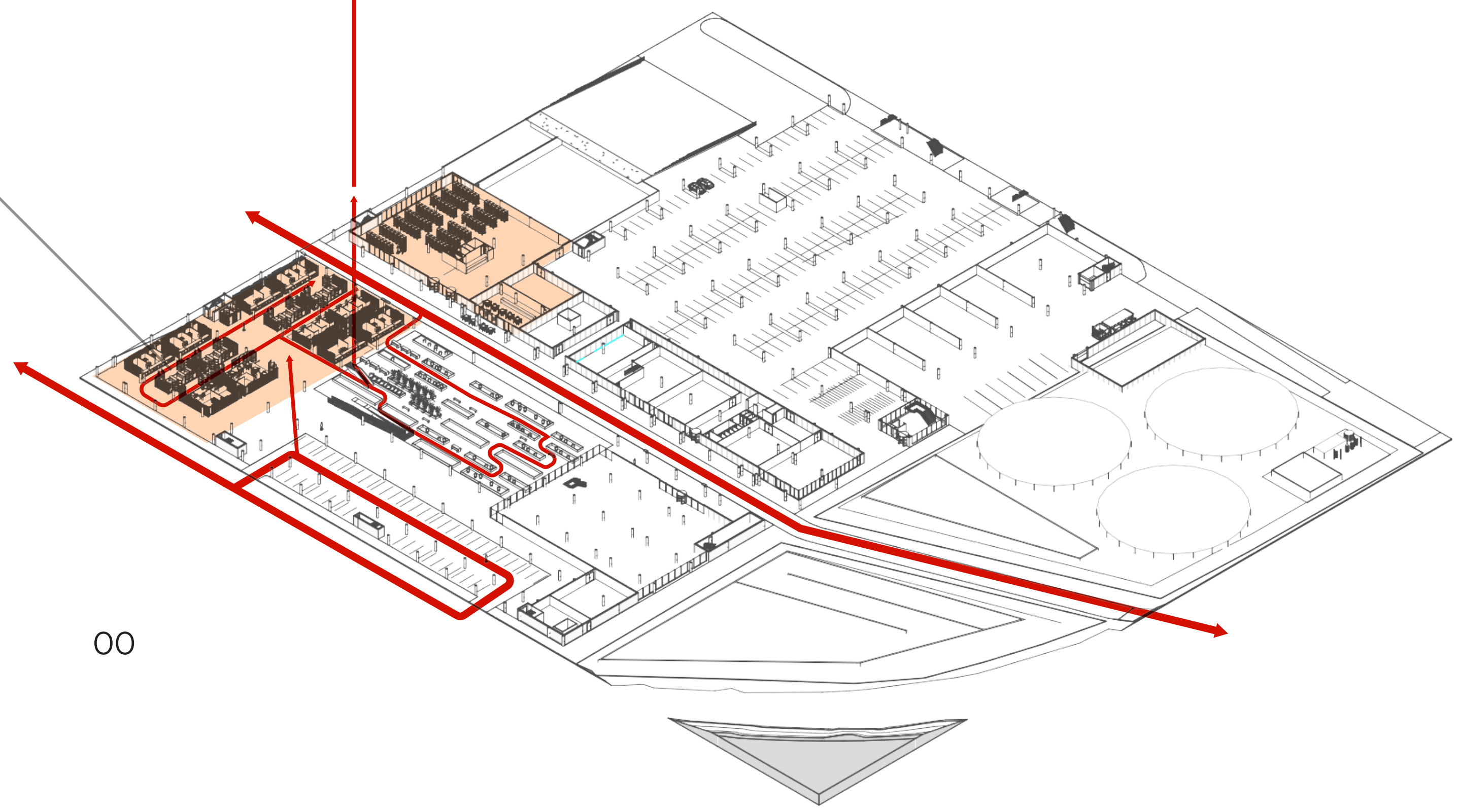
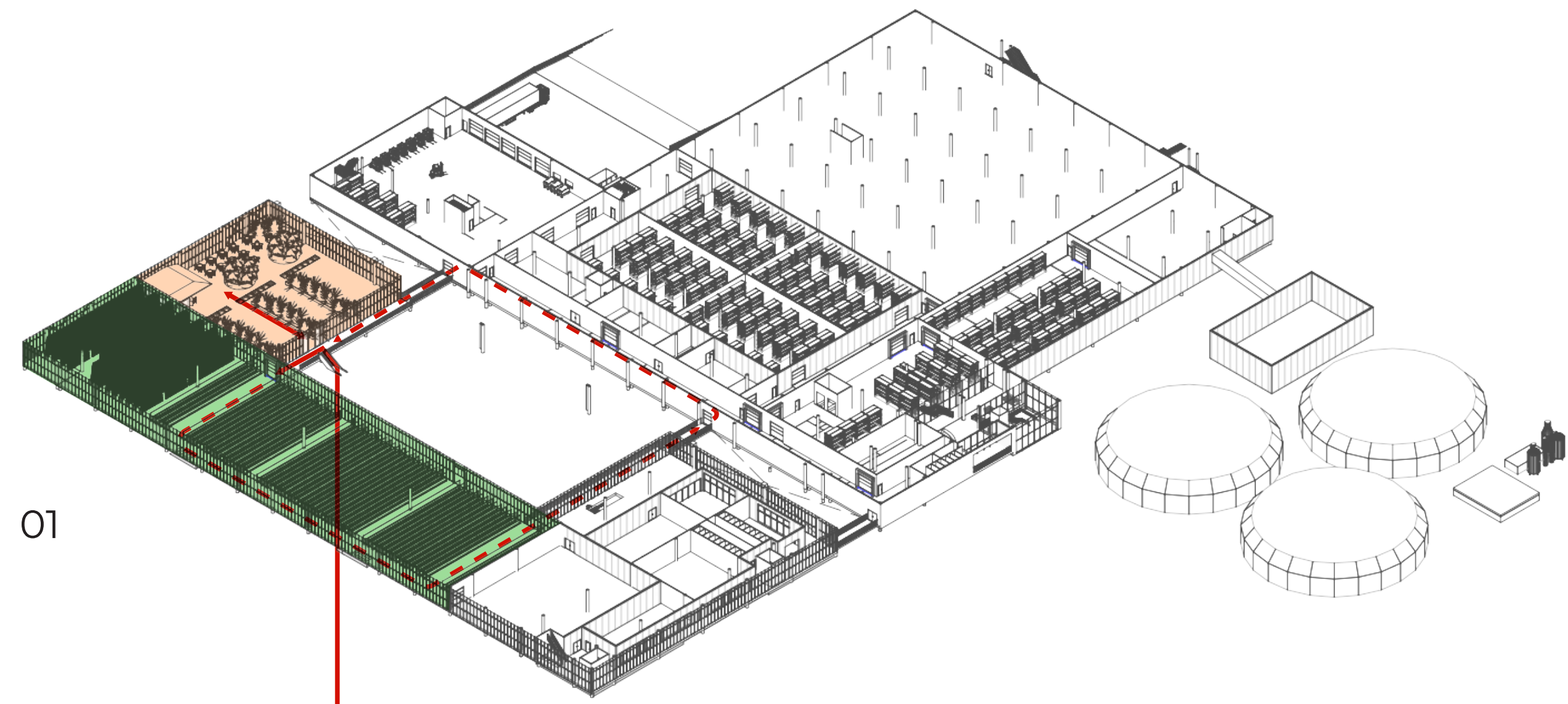
vertical facade detail



AMSTELGÄRD

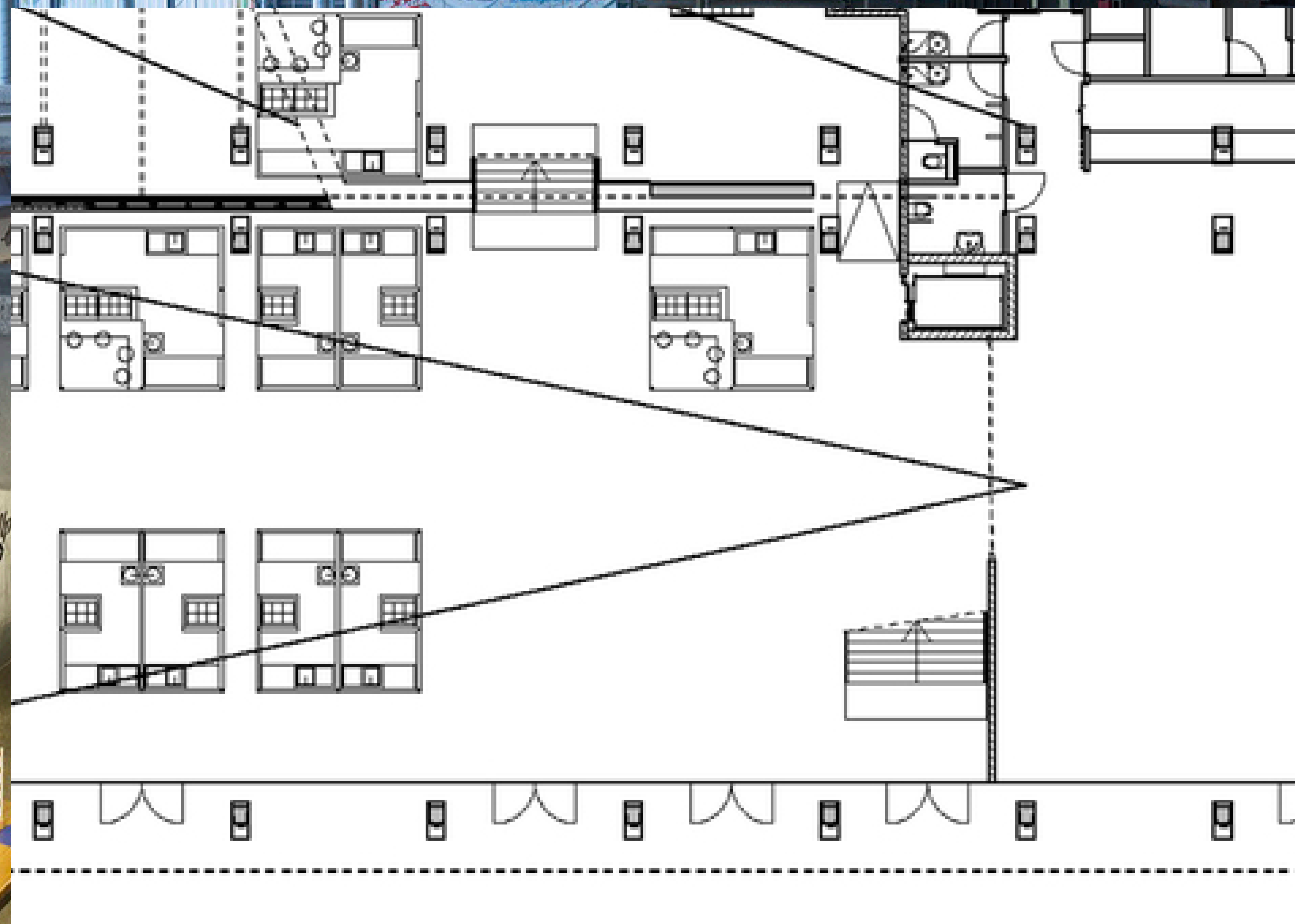












Plus Achtergrond

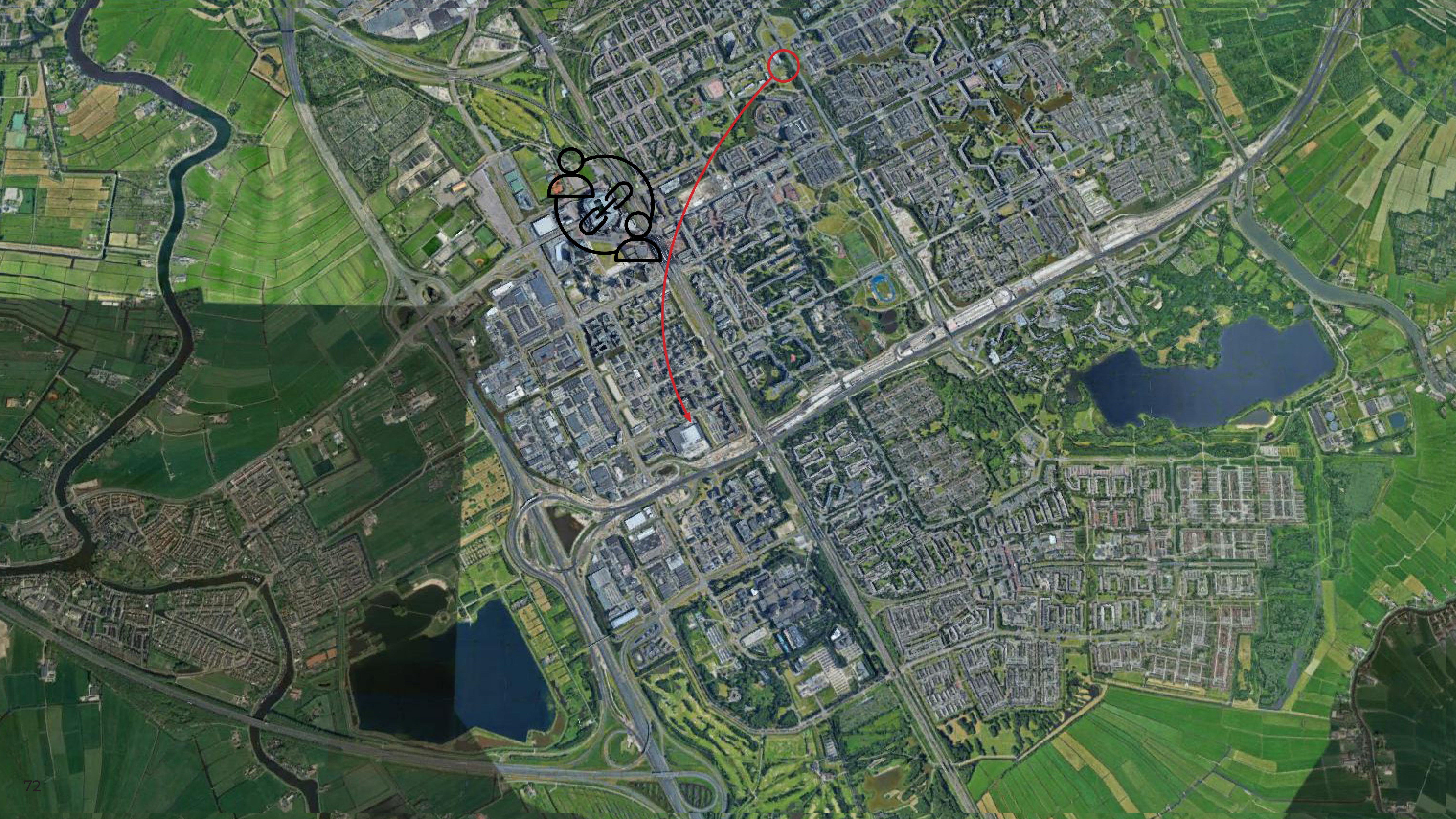
De World of Food in Zuidoost krijgt een nieuw onderkomen

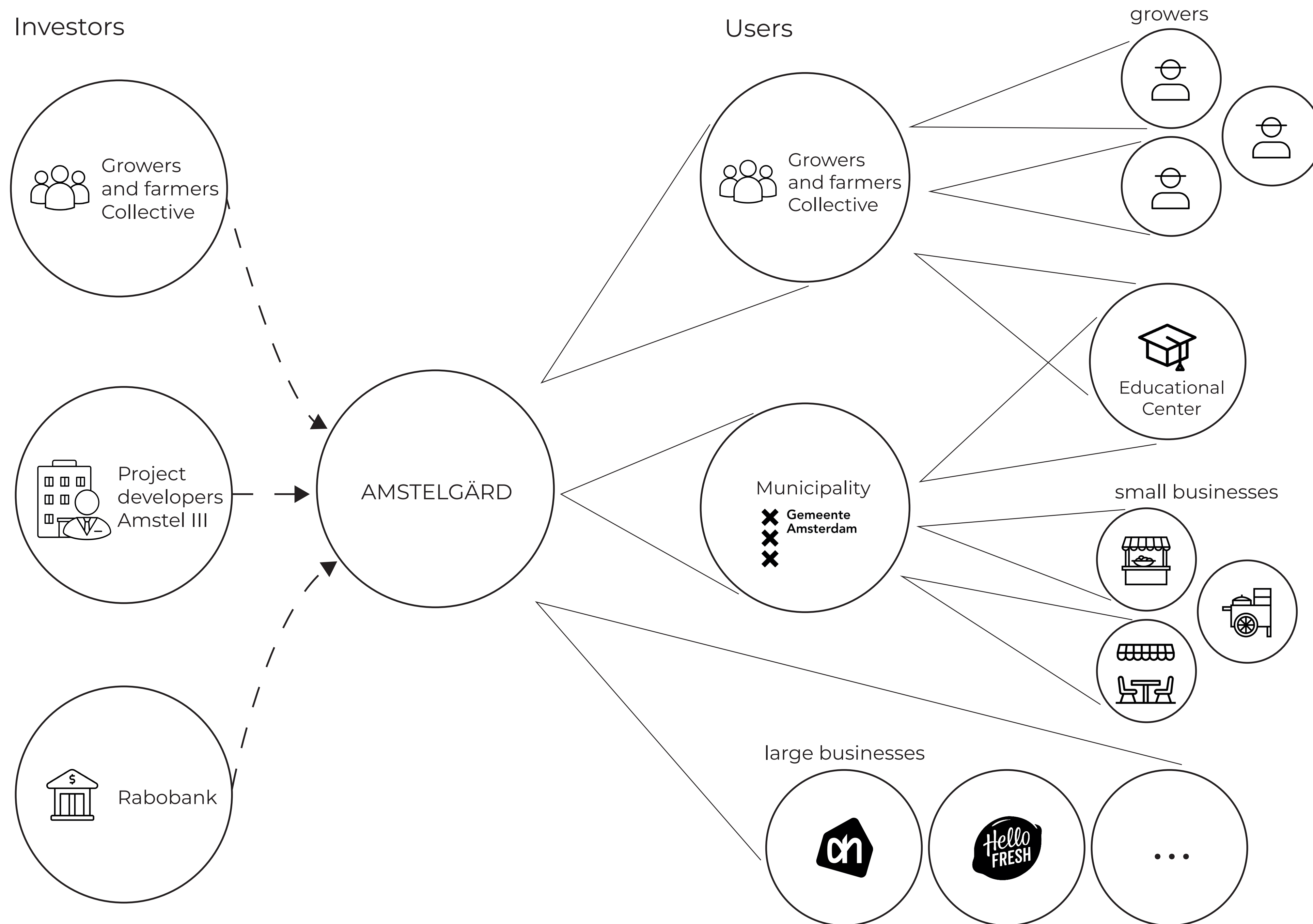
De World of Food in Zuidoost krijgt een nieuw onderkomen. De oude parkeergarage Develstein is een molensteen om de nek van eigenaar Lingotto en de ondernemers in het verzamelrestaurant.

Patrick Meershoek 17 maart 2020, 10:40

Improvements

- Bad indoor climate
- No climatized dining area
- High energy bill
- Building only used in afternoon and evening



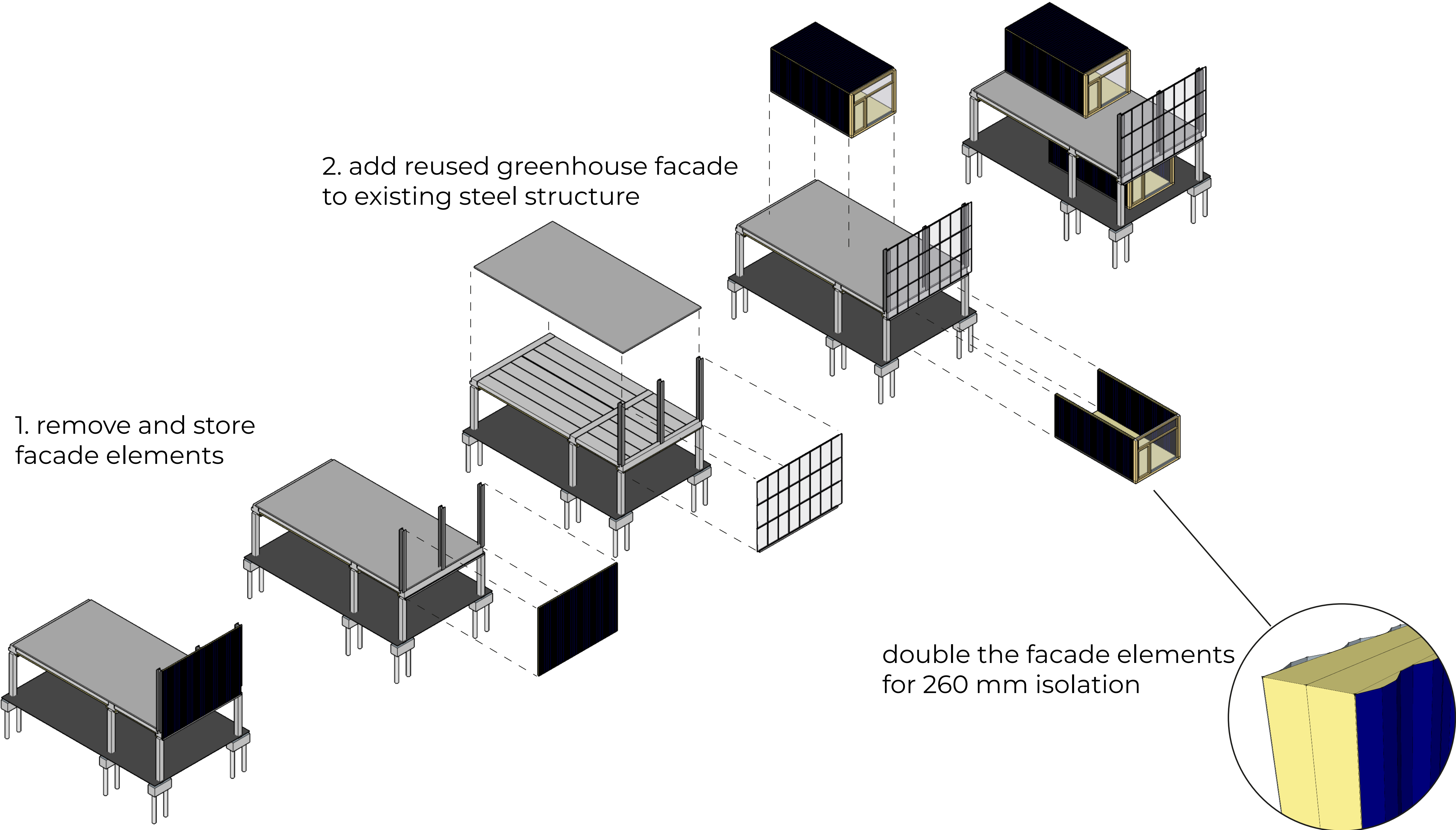




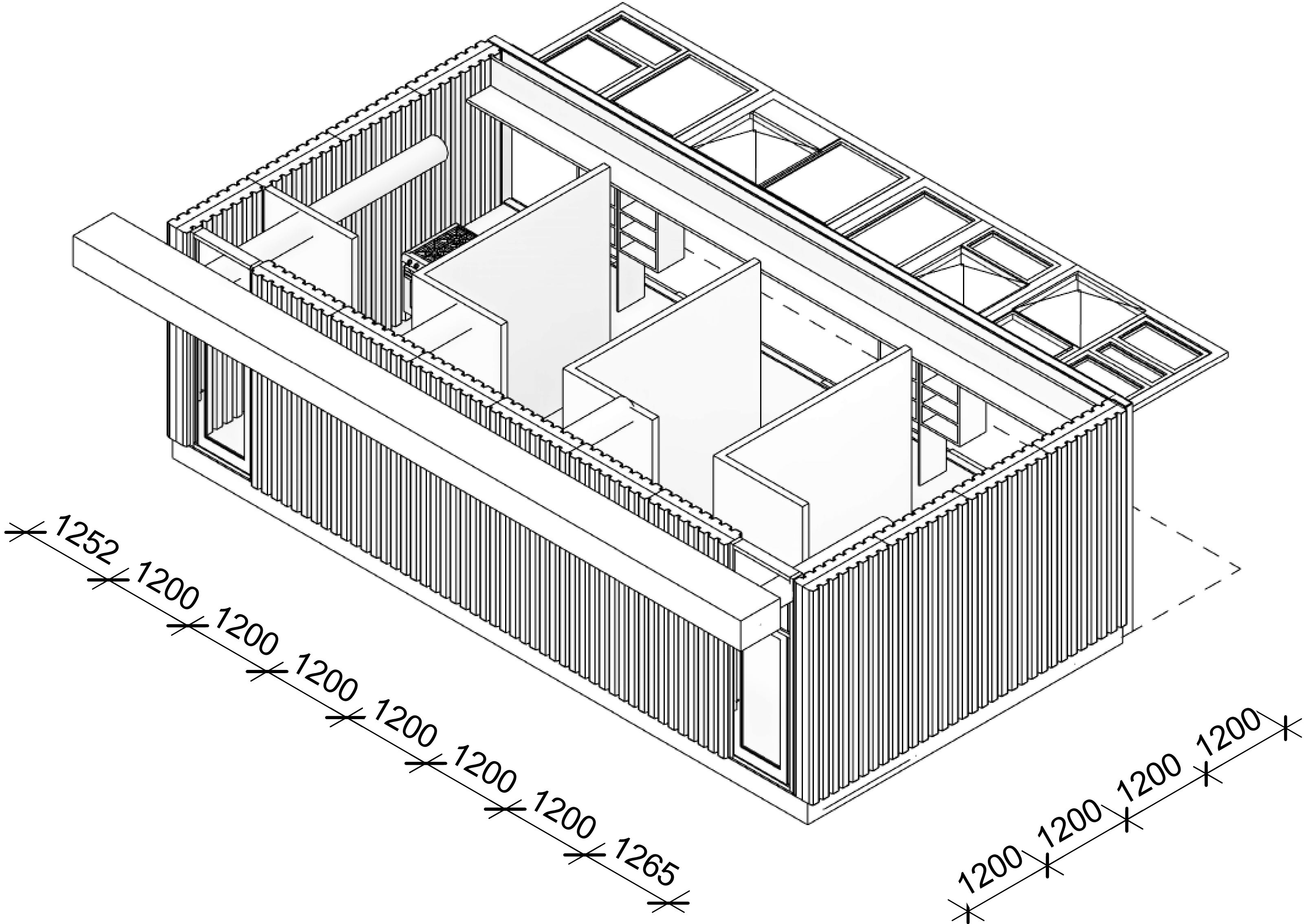
3. fabricate box-in-box units from facade elements

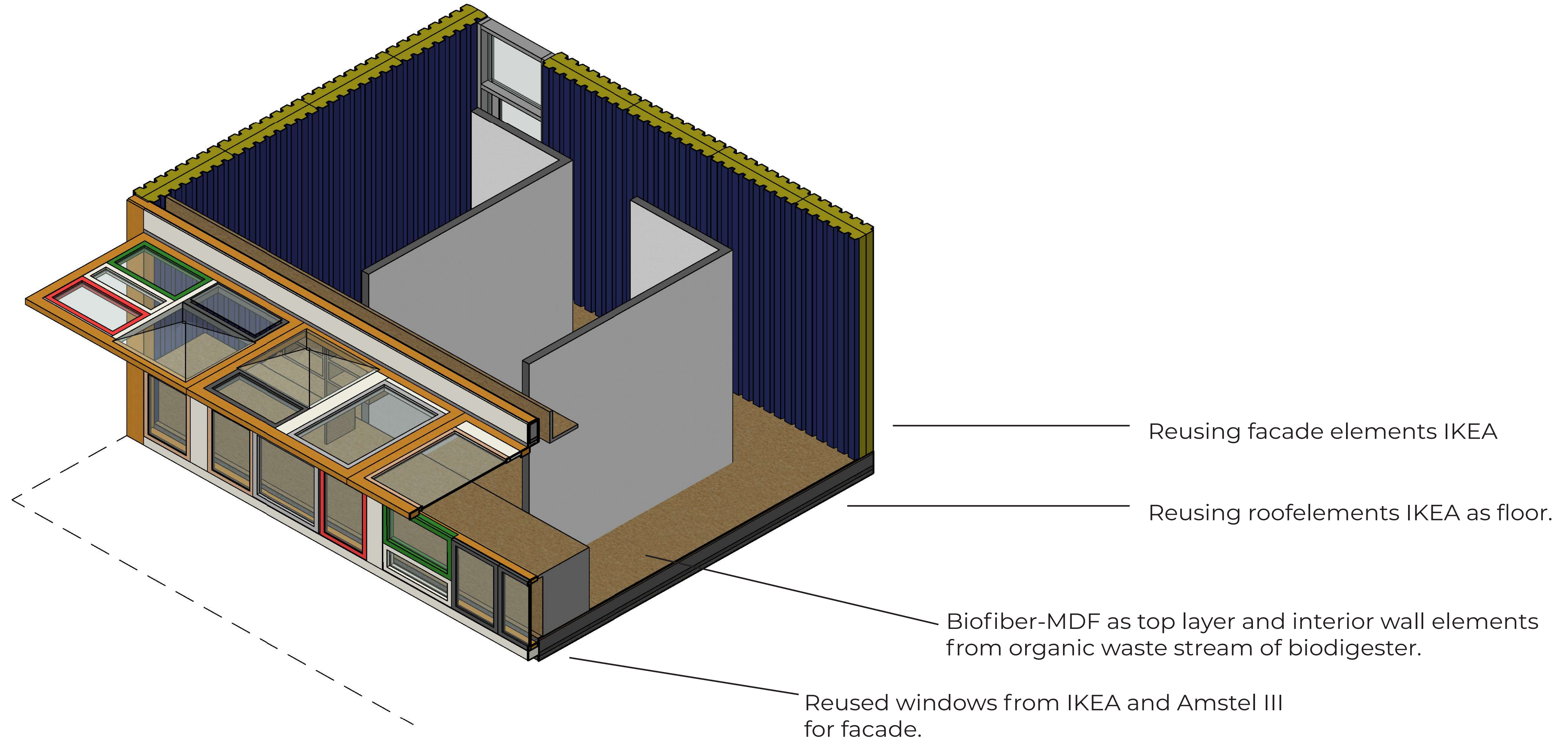
2. add reused greenhouse facade
to existing steel structure

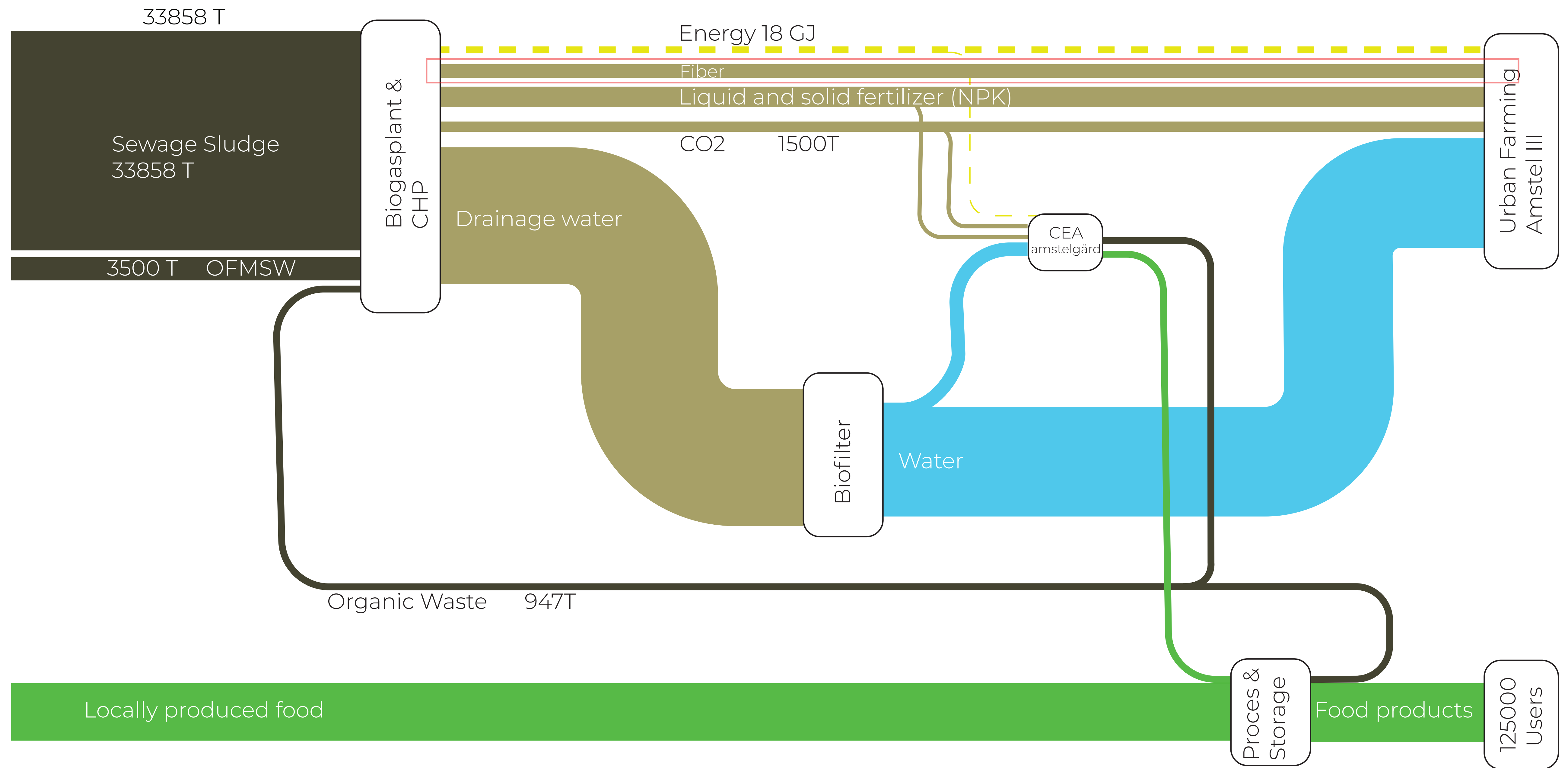
1. remove and store
facade elements

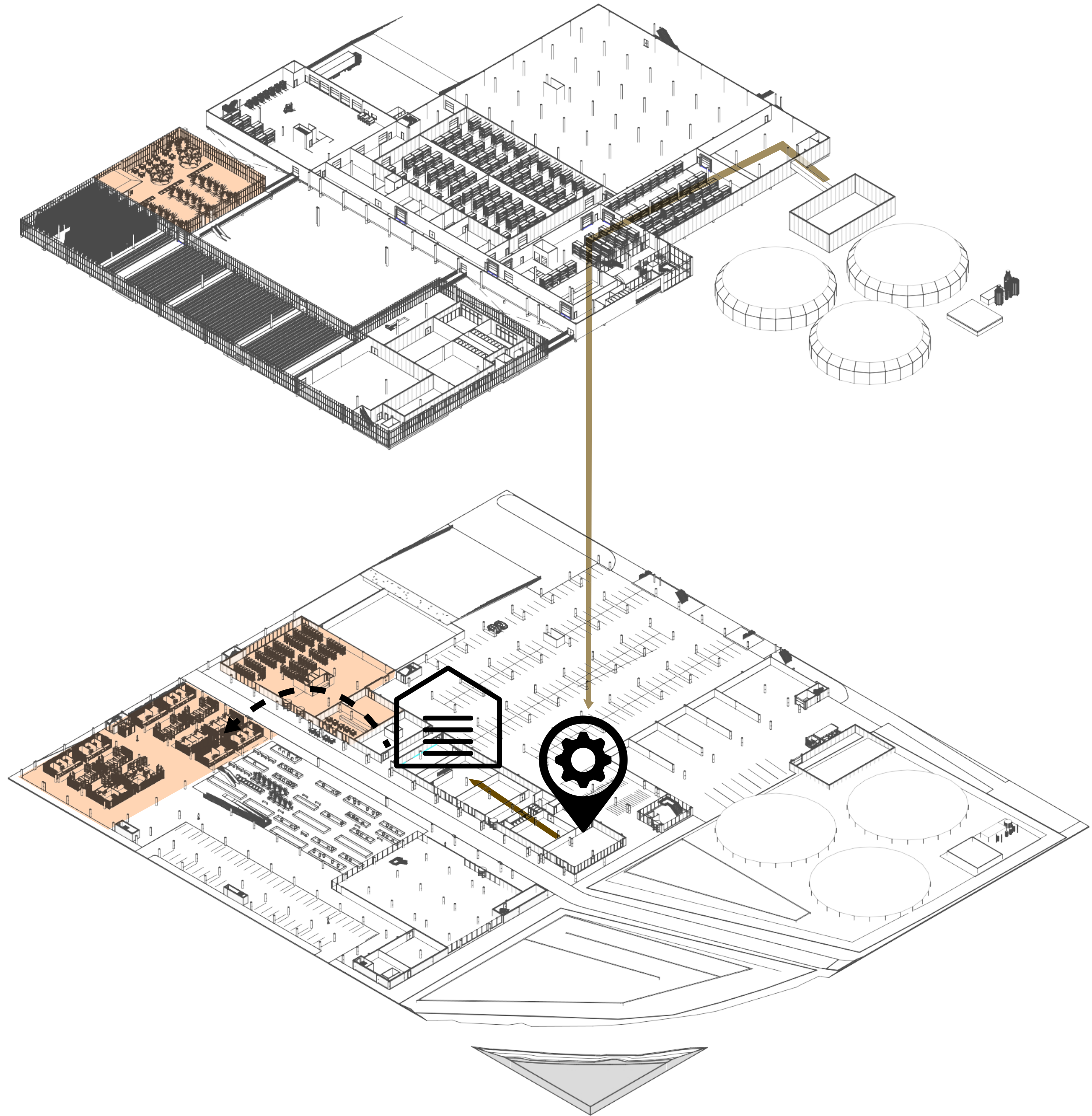


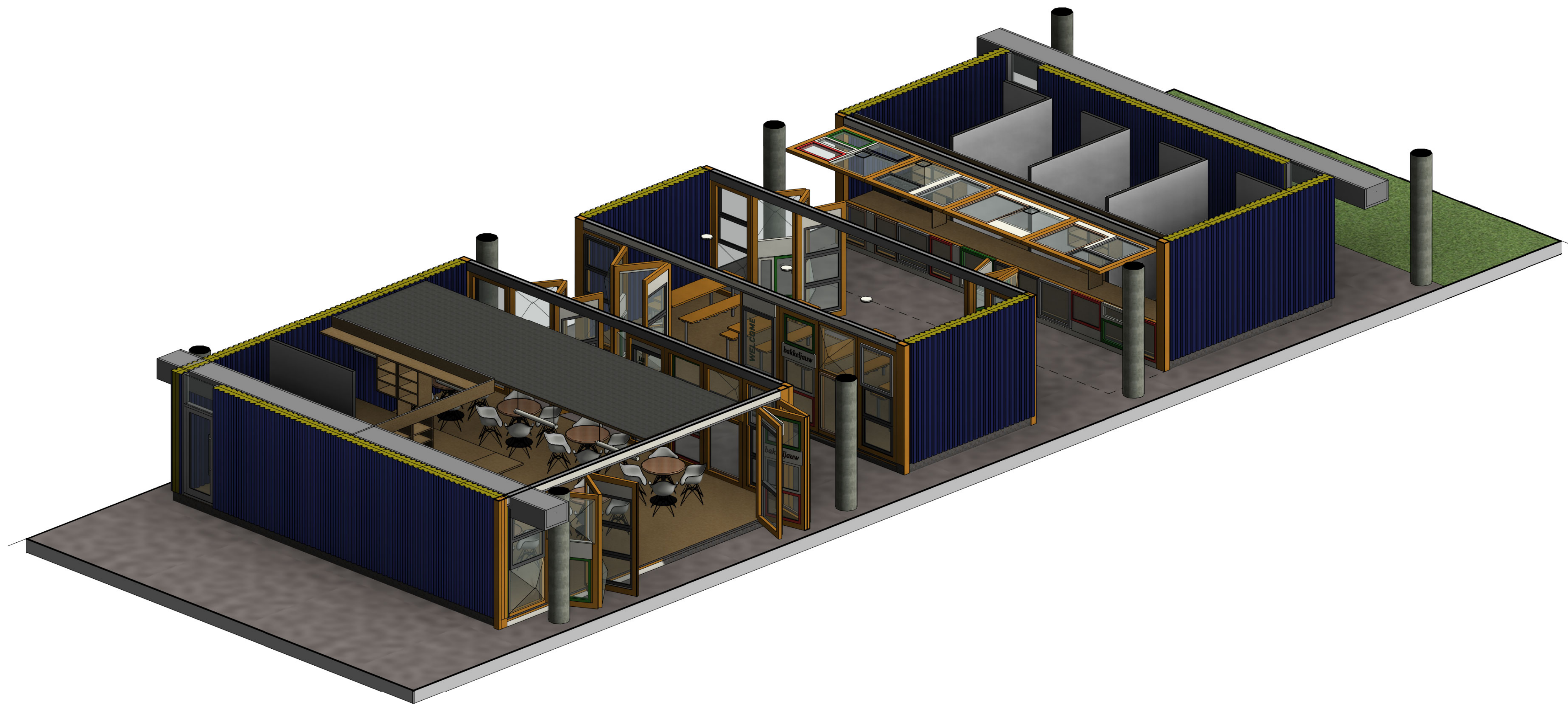
Module













ZENZEN

Vegetarisch
vegetarian
falafel wrap
+ aubergine €5,50
+ salade
(Speciale)
FALAFEL ZENZEN
huis salade 10,00
Zaïm Grill 12,50
cocosyste €2,-
home made:
passion fruit slush

Loempia €1,75

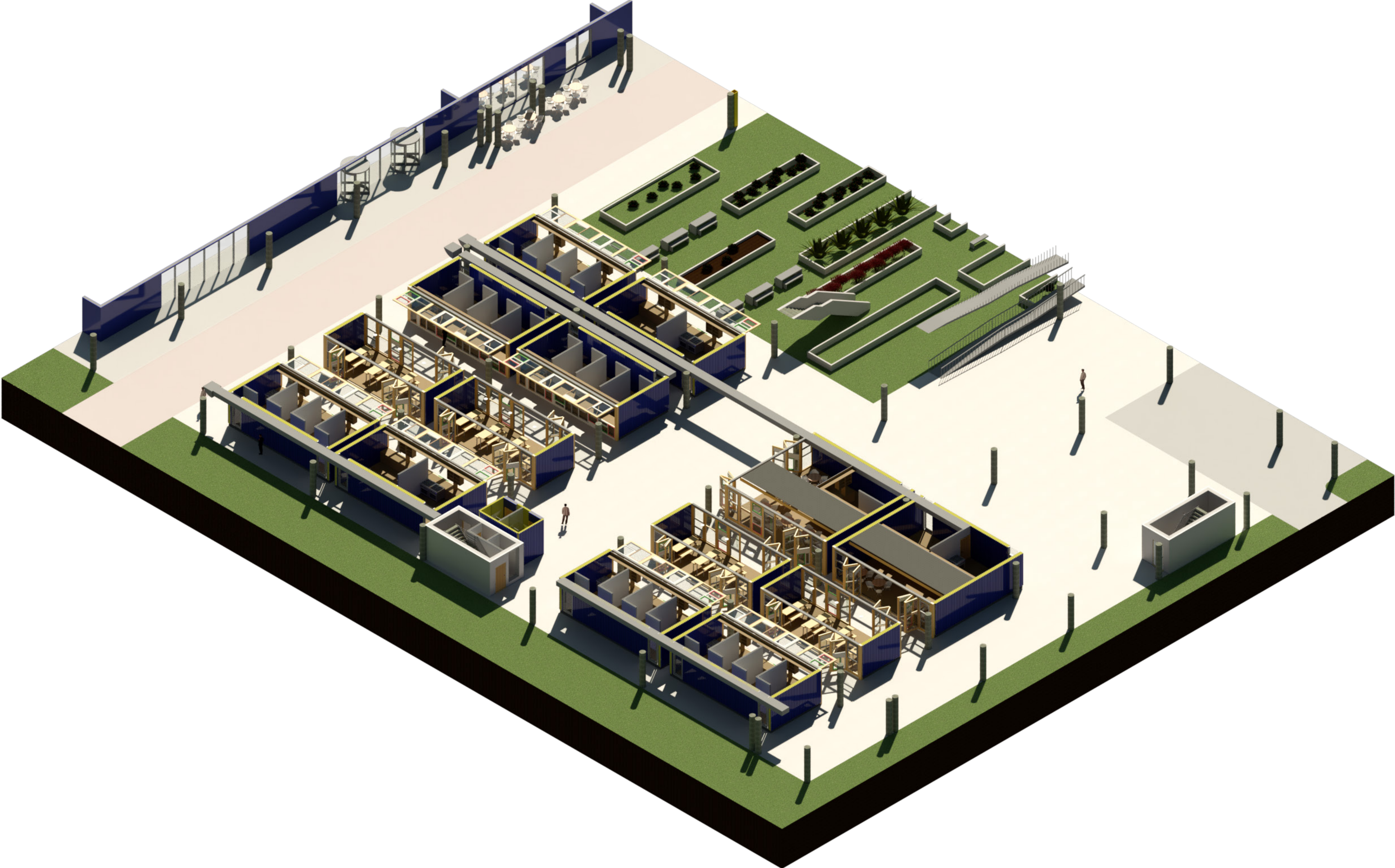
ZENZEN
Tea veel:
• Garnalen } met groente & Patate
• Dorade }
• Hebaars } €15,-

!! Cold Drinks
Makreel
met rijst, groente
en salade
Omega 3
€12,50
* Tonijnsalade €5,50
Loempia €1,75

3,50

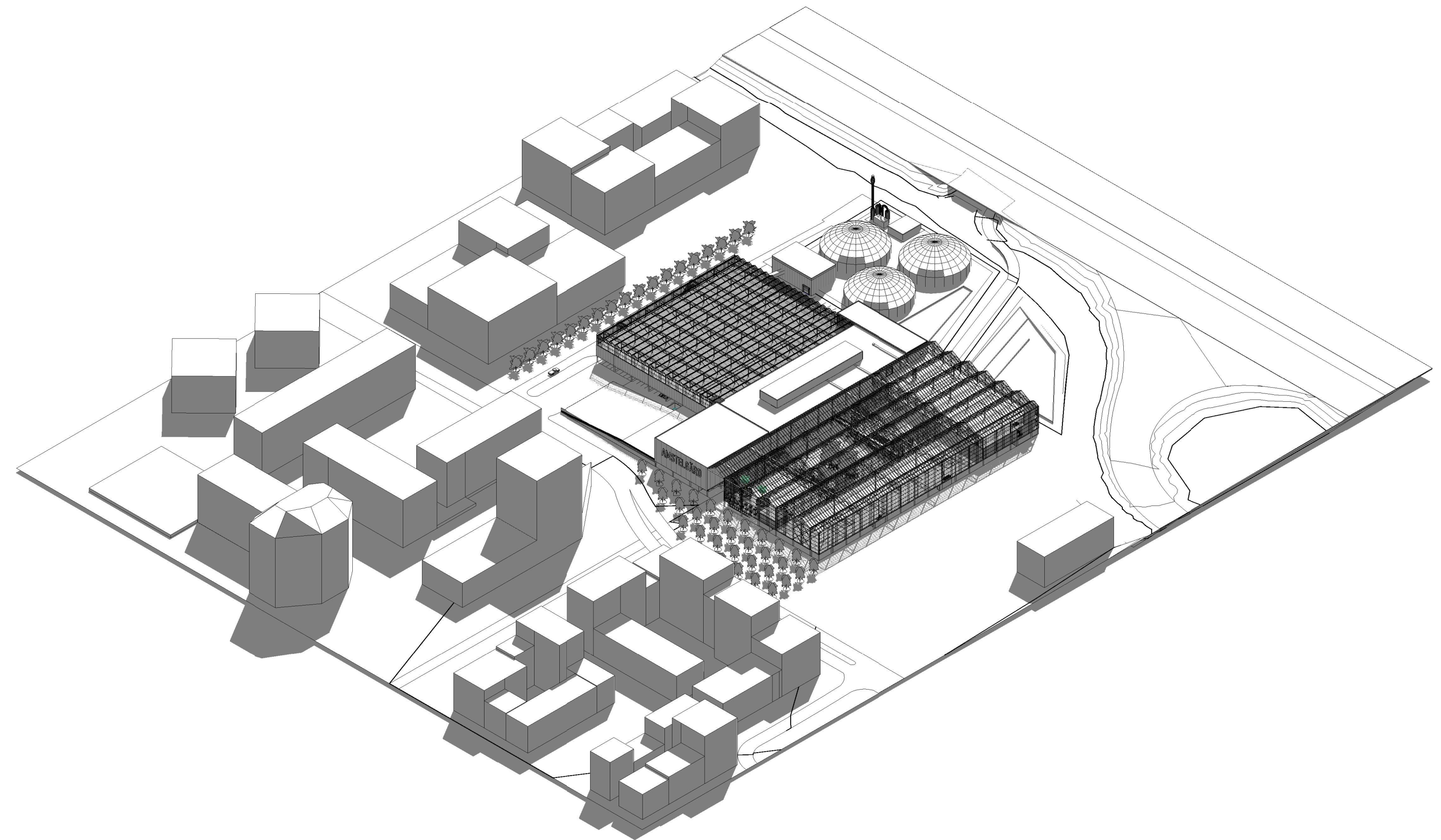






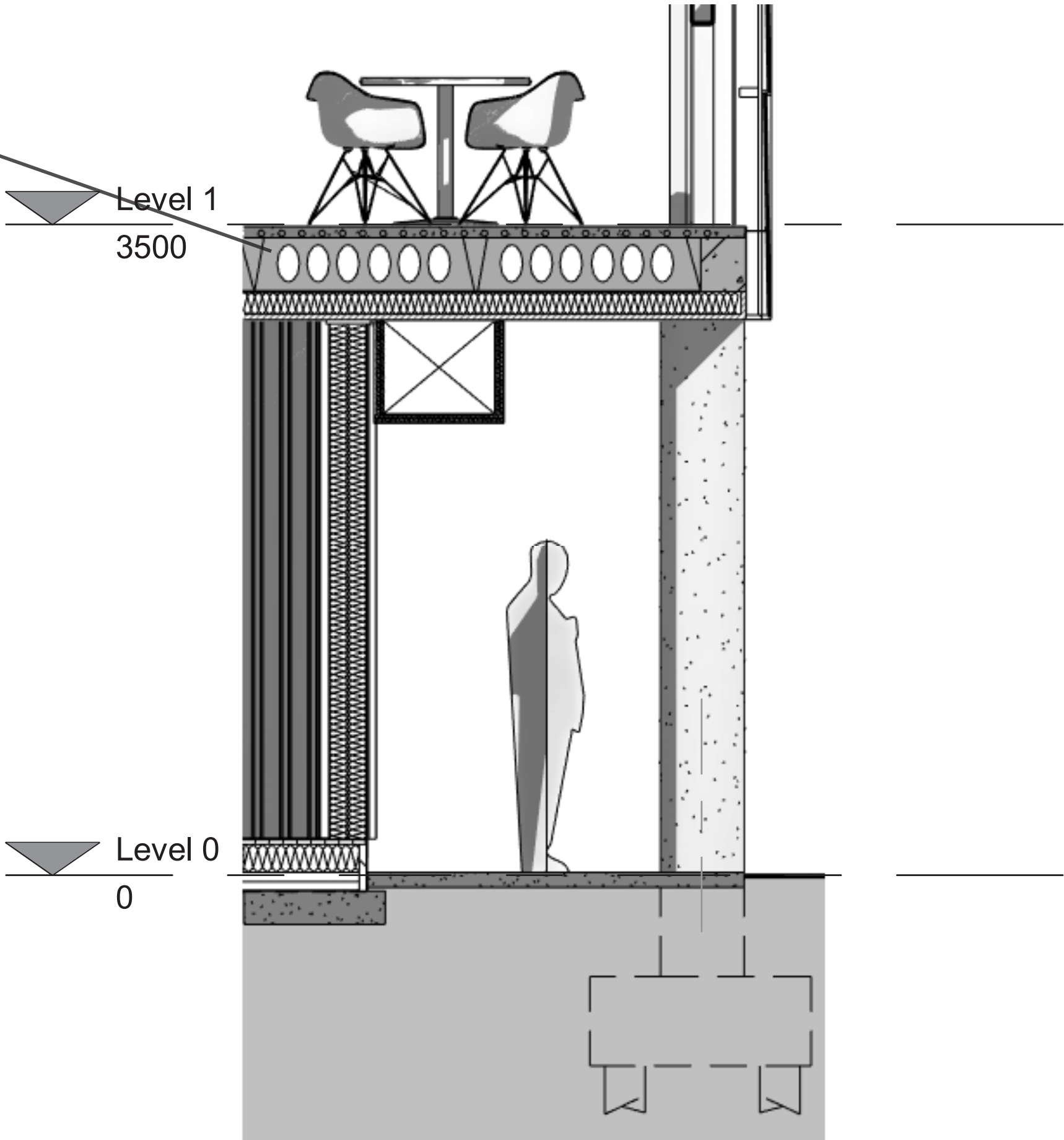
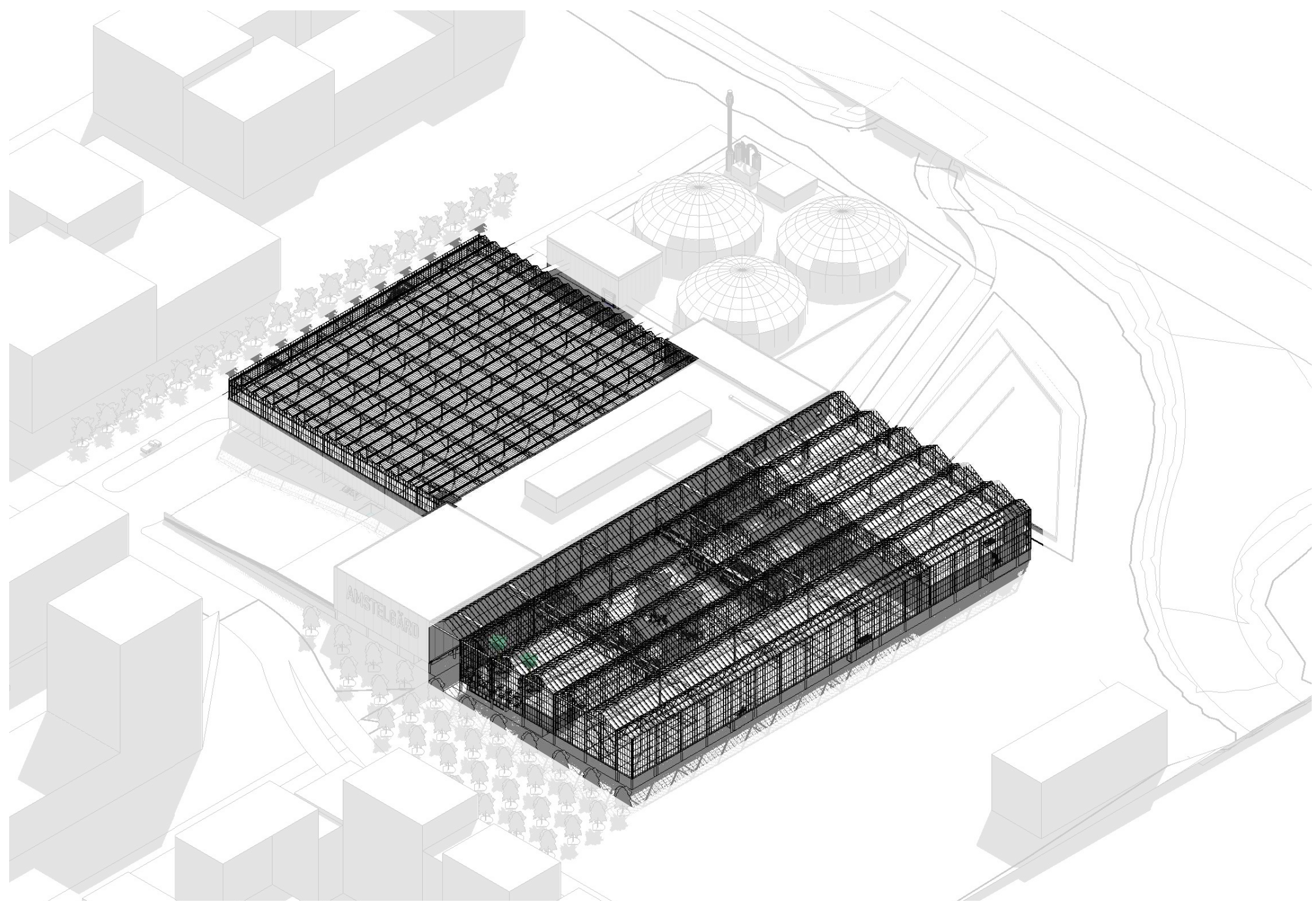
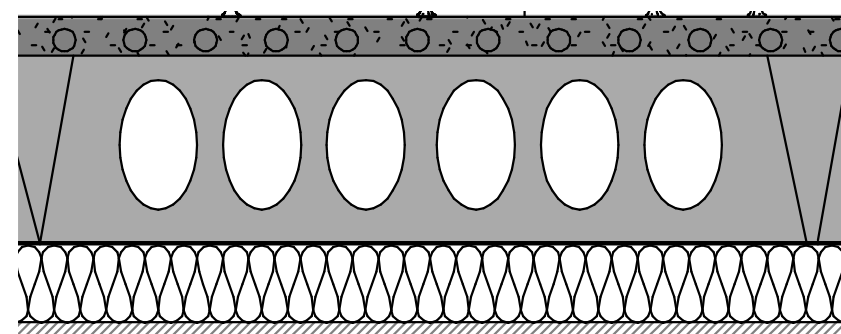
Climate and energy strategy

1. Utilize surface area in combination with concrete structure and greenhouse effect.
2. Make use of existing thermal batteries and heat grid.
3. Use existing HVAC.
4. Synergy between different functions.



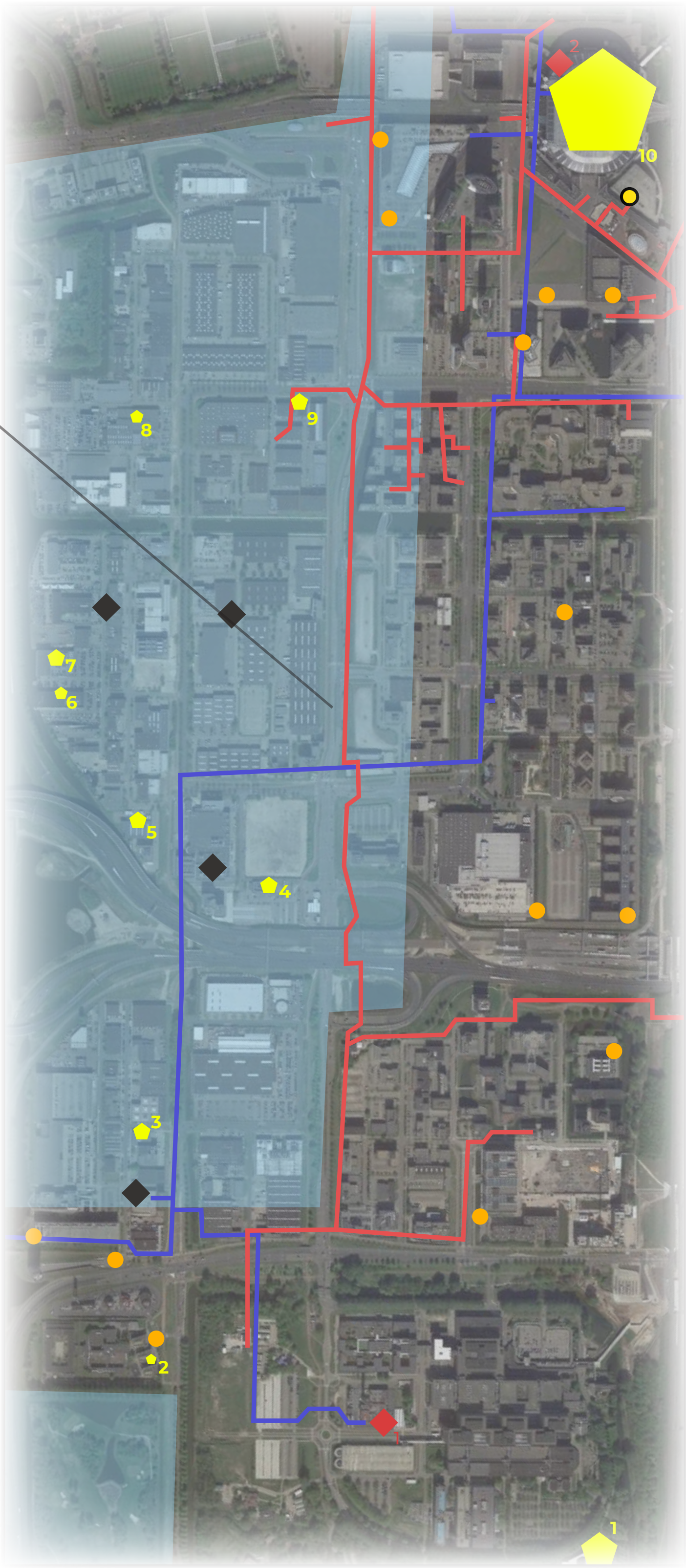
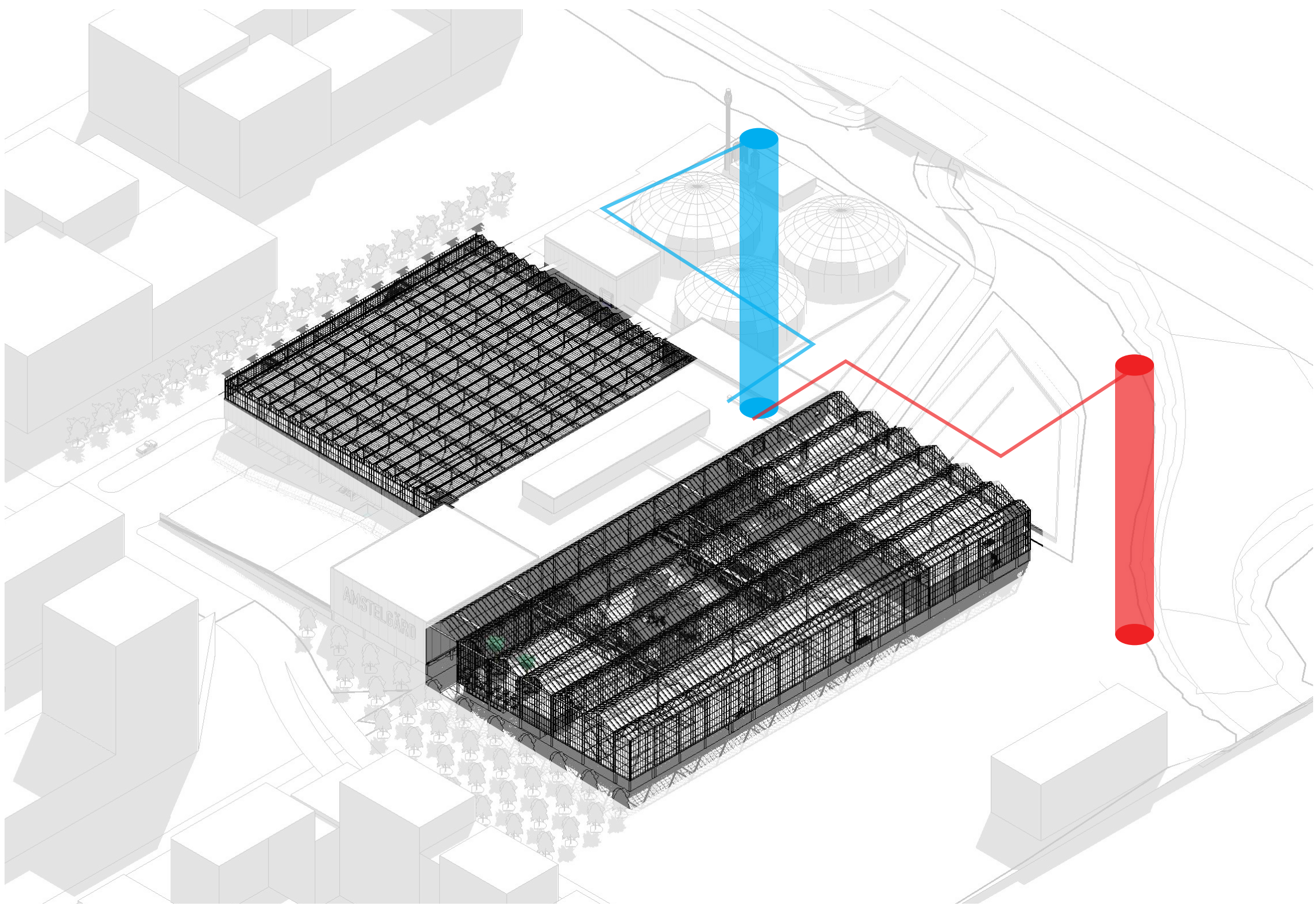


1. Concrete floor as solar collector

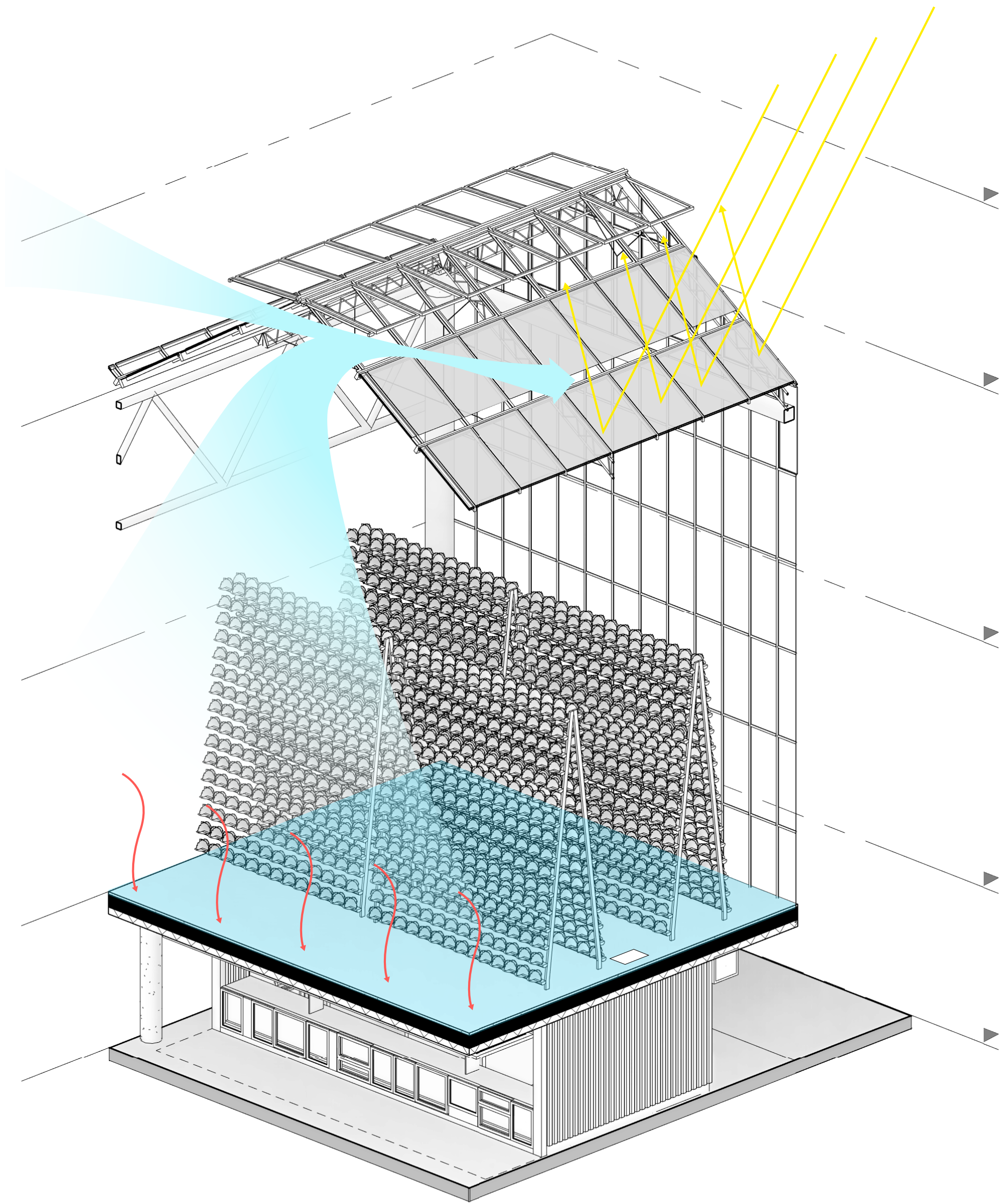


Heat grid Amstel III

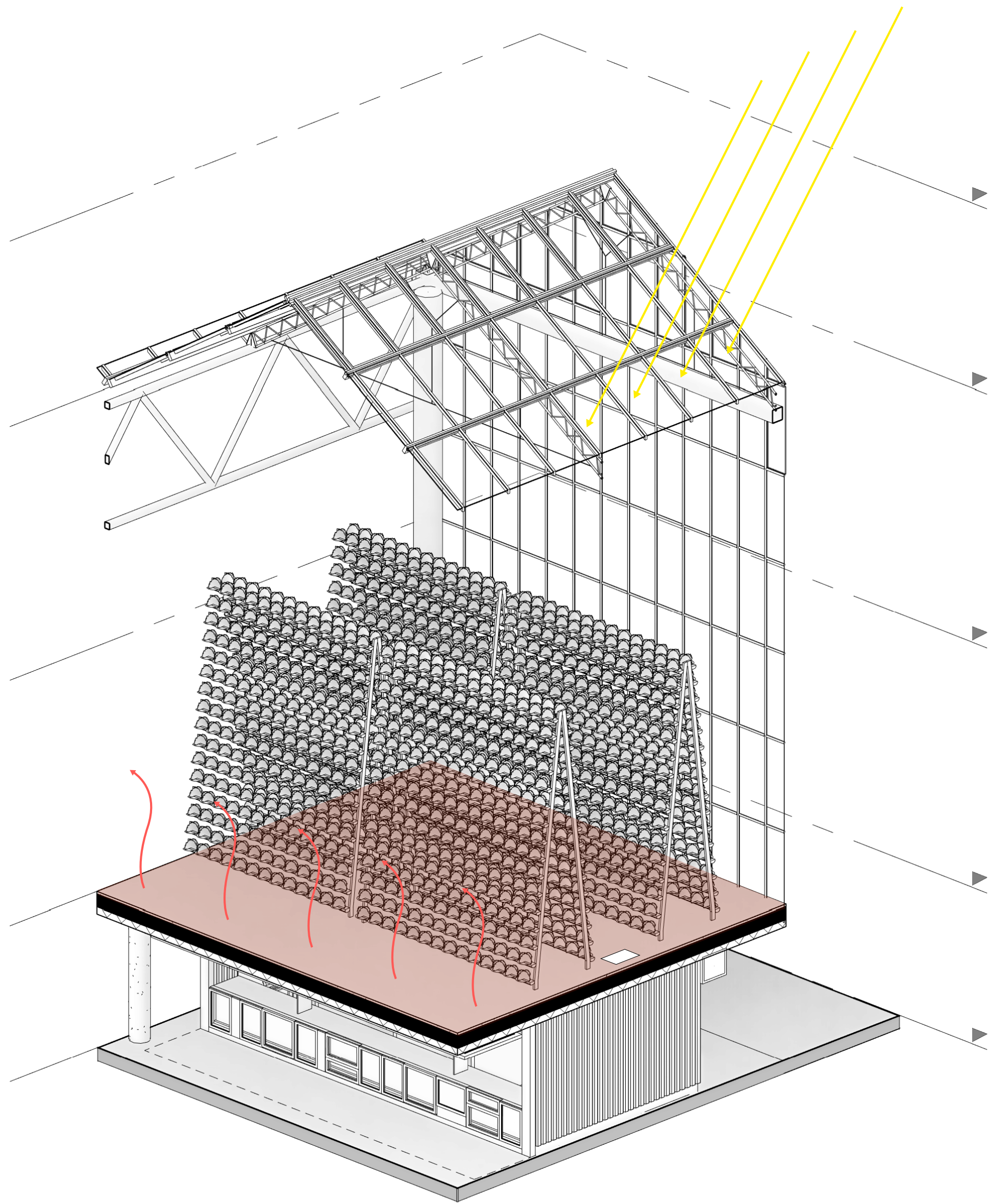
Existing thermal energy battery



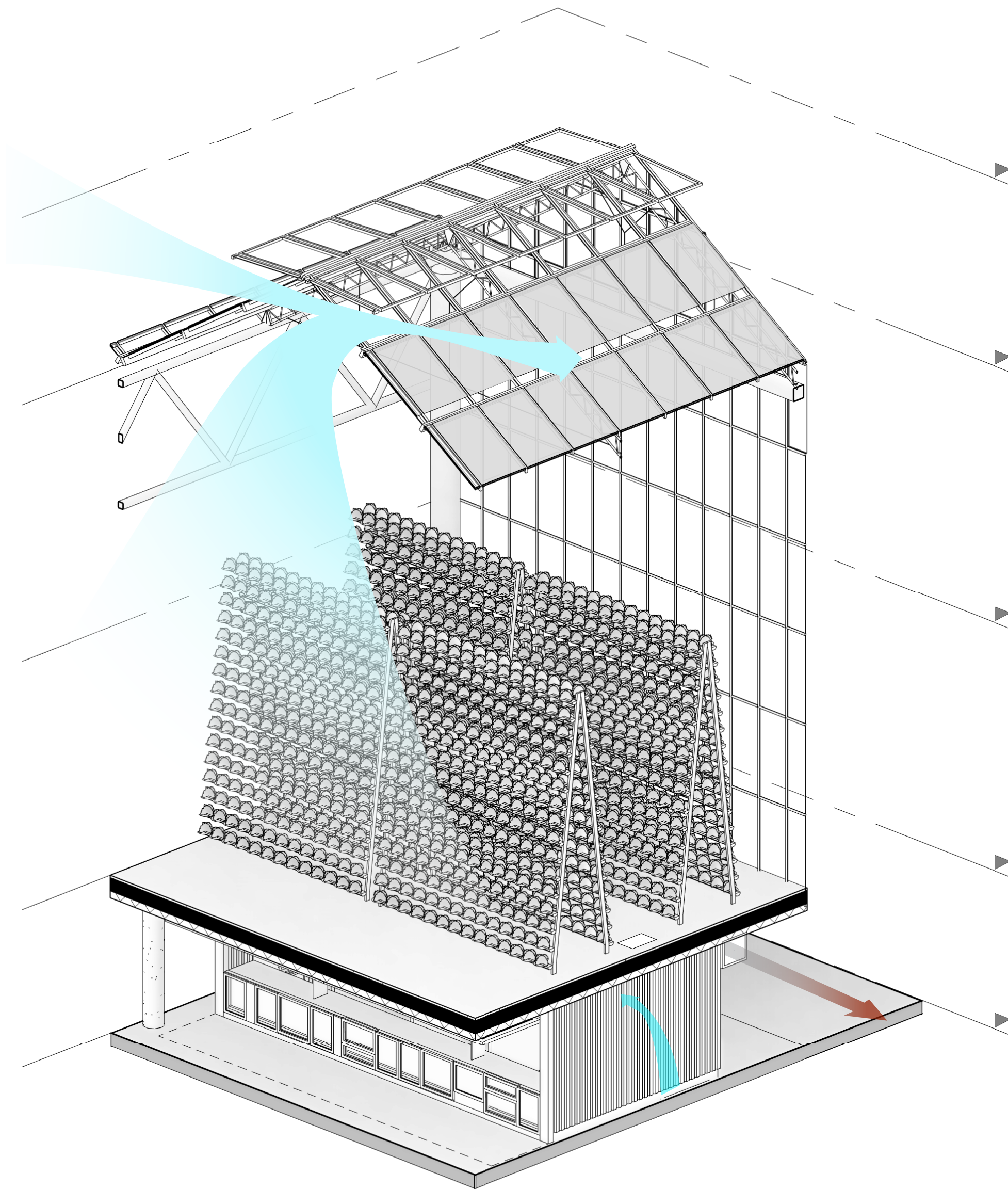
summer



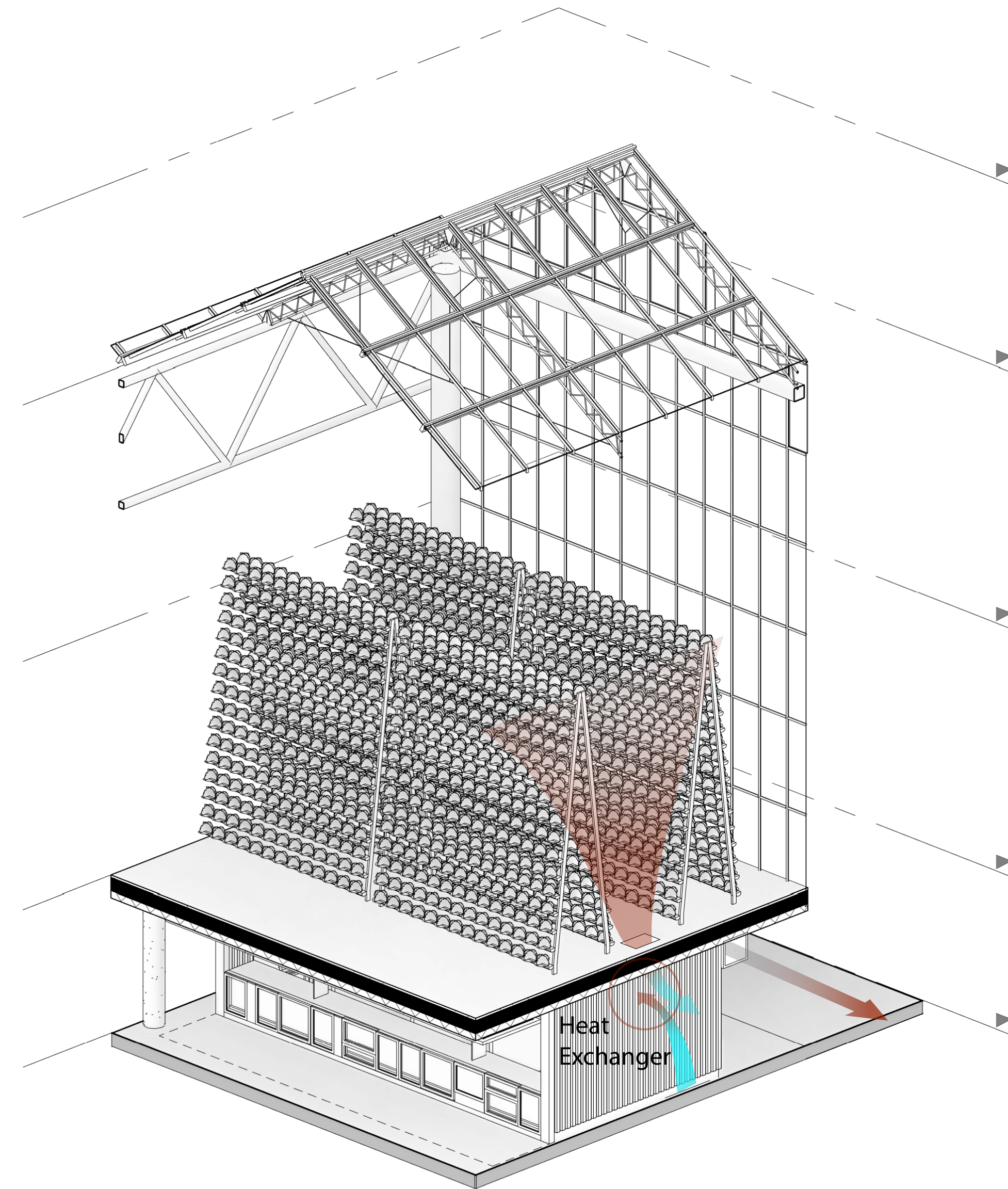
winter

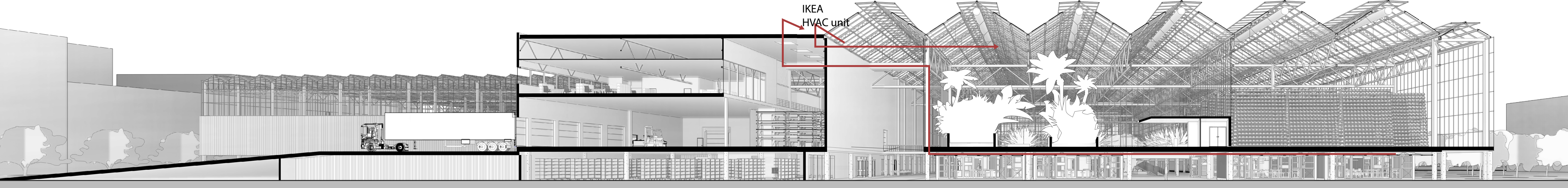


summer



winter







TROPICAL GARD

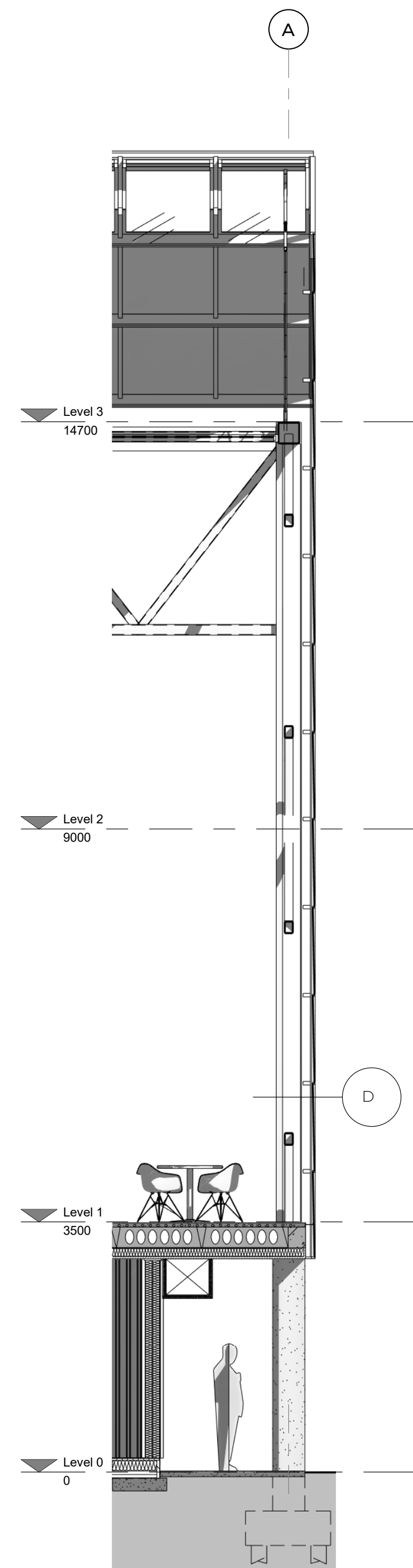
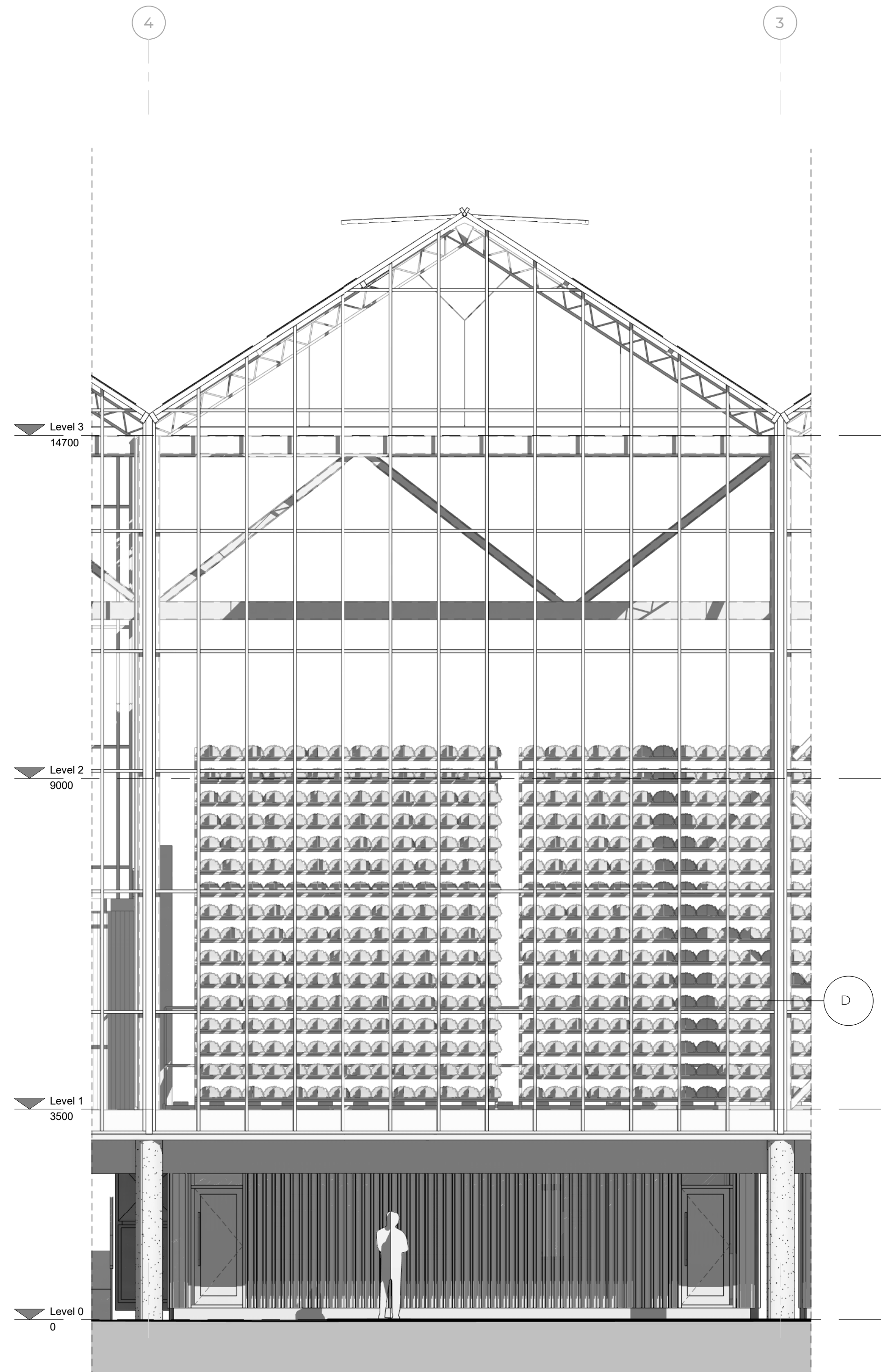
AMSTELFOOD

Great Prices
To Enjoy More on Top

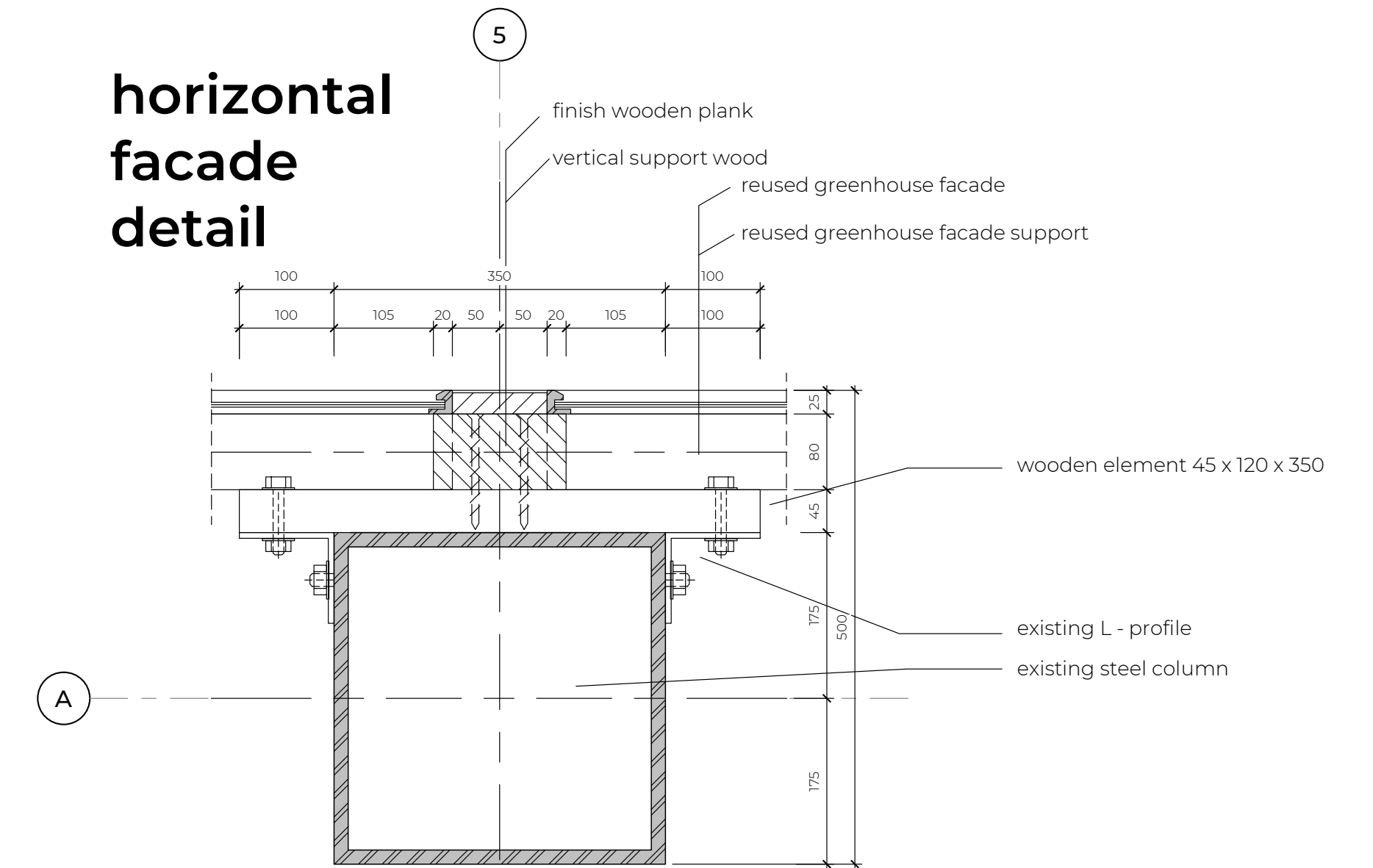
Smack!ing!

AMSTELGÄRD

Tack!



horizontal facade detail



vertical facade detail

