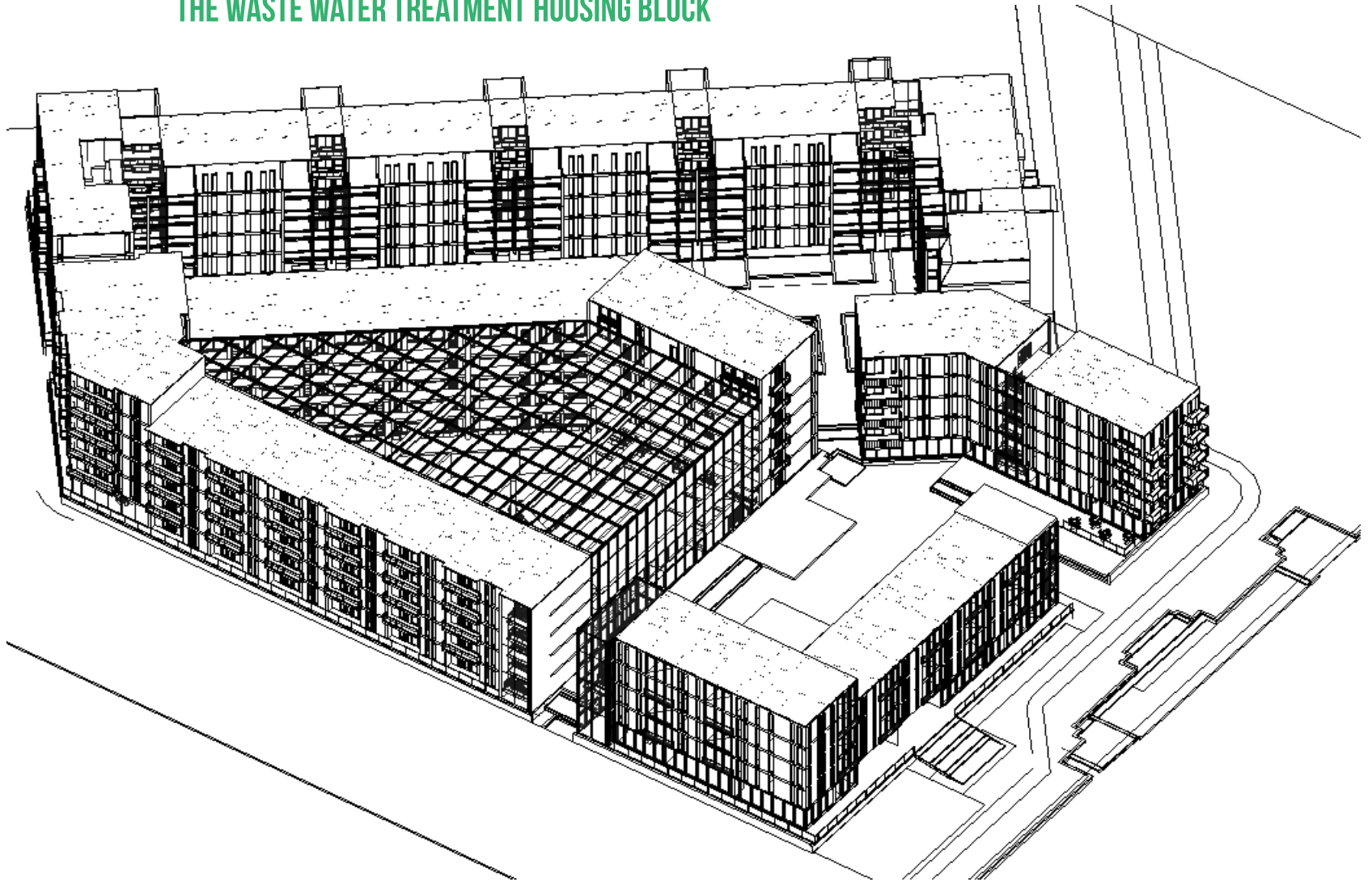


URBAN TREATMENT

THE WASTE WATER TREATMENT HOUSING BLOCK



Philosophy

Het huidige afval water systeem is gebaseerd op het idee om het vervuild water eerst uit de stad te leiden, en het daar dan zuivering, zo goed dit gaat.

Het probleem wordt beter bij de oorzaak aangepakt. Letterlijk op de plek van de vervuiling, in de stad. Hier liggen kansen voor de bebouwde omgeving.

CONTENT

- Research and goal
- Location
- **Design**
- construction
- watertreatment number
- conclusion

RESEARCH WATERCYCLE

Research goal:

Find a solution for a more sustainable waste water system, which can be integrated in the urban context, by a combination of dwellings.

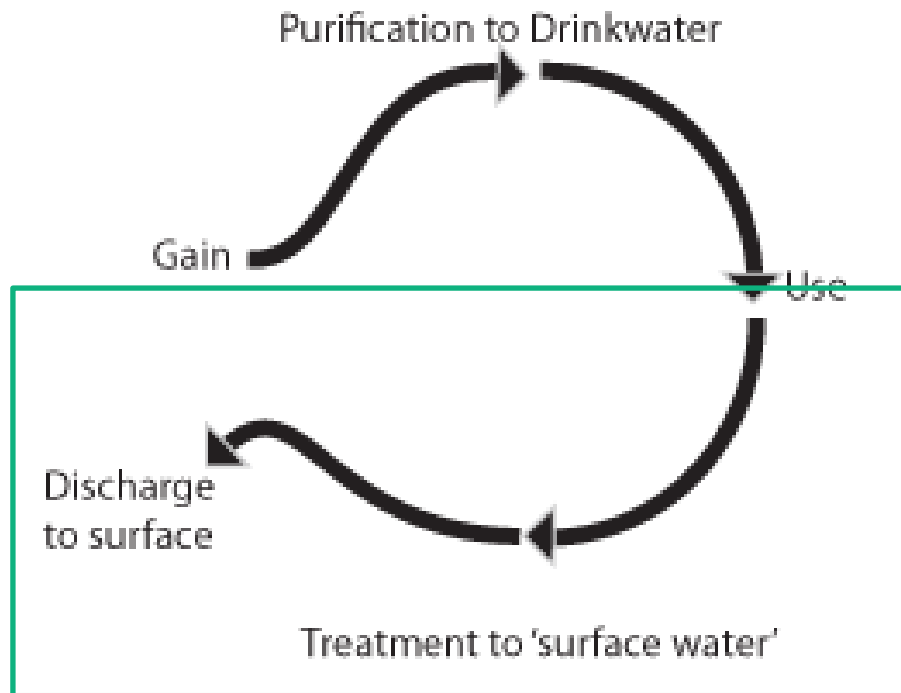


Image: Author

Problem statement

A: Spatial integration

B: Capacity Waste water system

- *Capacity of sewage system is too low* (Bentvelzen, 2008; Timmeren, 2006)
- *Capacity for treatment system too Low* (Bentvelzen, 2008)

C: Recovery of nutrients

Scarce nutrient as Phosphate in waste water end up

Located in sludge which is burnt for green energy.

(Wortmann& Kruseman, 2008), (Lugt,2009)

Integration of the current system?



Image: Author +,
google maps

Outcome research

Local waste water system with separation of the waste streams at the source.

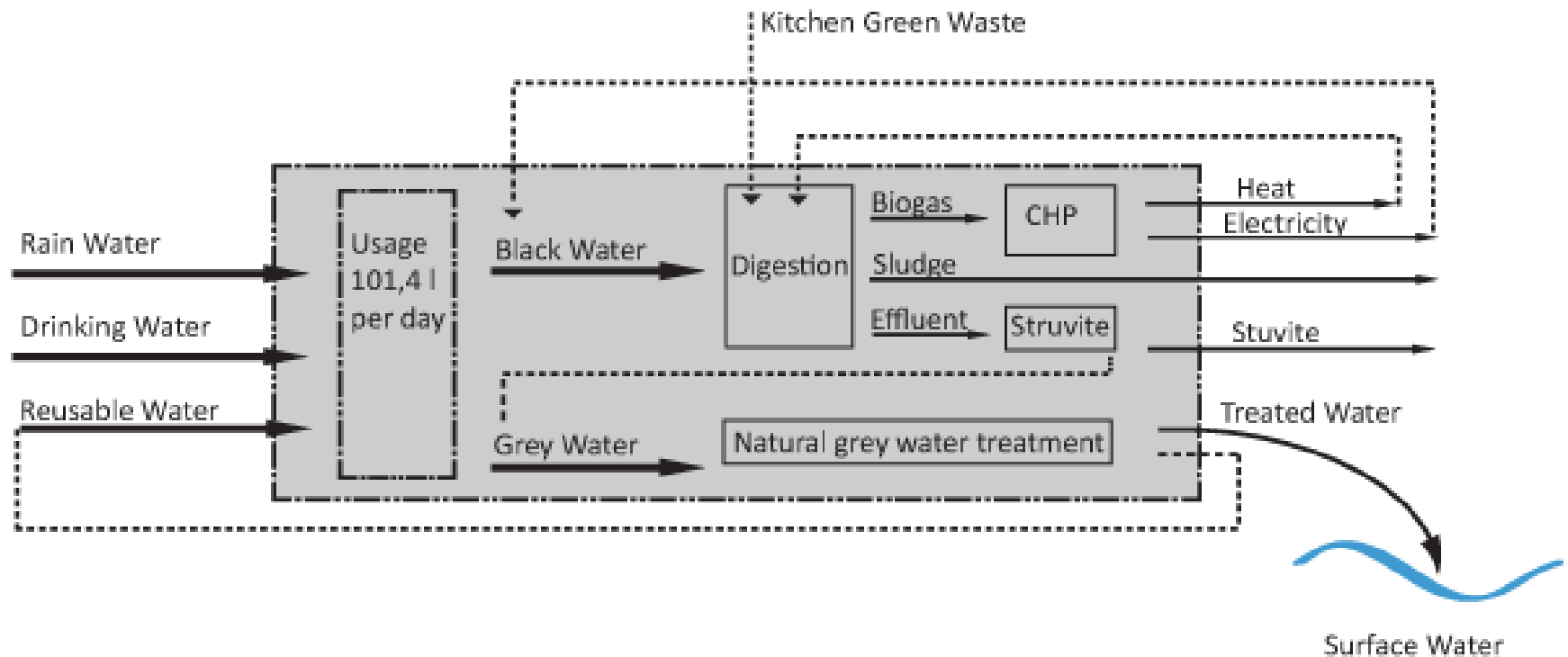


Image: Author

Outcome research

Local waste water system with separation of the waste streams at the source.

A: Locally: problem solving at the source

B: Locally: No sewage system with its capacity problems

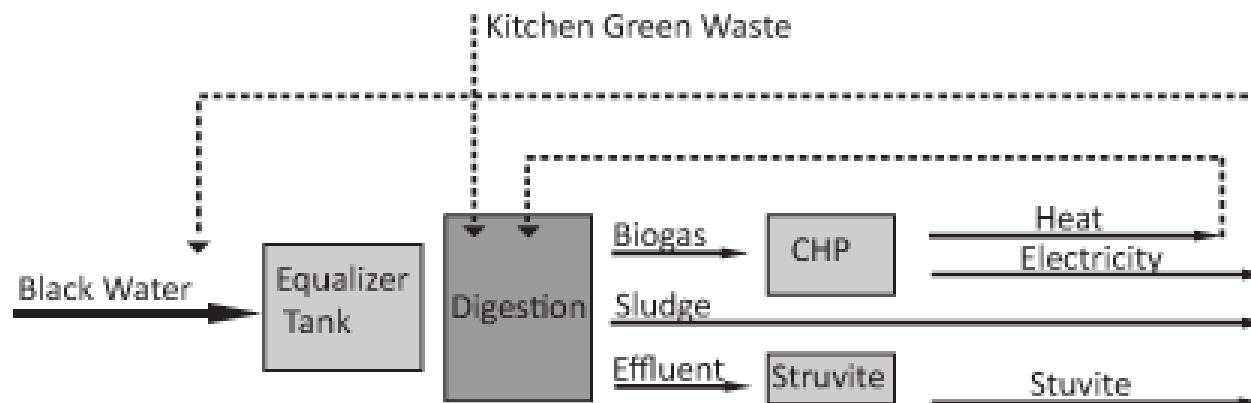
C: Separation : Recovery of nutrients

D: Locally: Water can be reused locally.

Recovery of nutrients

Most nutrients are located in Black water, which comes from toilets.

Black water system



Grey water system

Vertical flow wetlands



Living Machine



Organica Water System



Image: google

Vertical flow wetlands



Gele lis christ-riekie.nl nationalgeographic.com



Kalmoes kolvrinden.be natuurweejes.nl



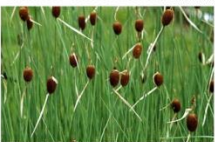
Beekpunge natuurnieuwegein.nl



Gewone watersnavel archief.ivn.nl



Slangenwortel tuinkrant.com



Dwerglissedodde nlasek.com



Watermunt natuurnieuwegein.nl



Moeraskers wildebloemen.info



Moerasaronkelk tuinkrant.com



Zegge mijntuin.org

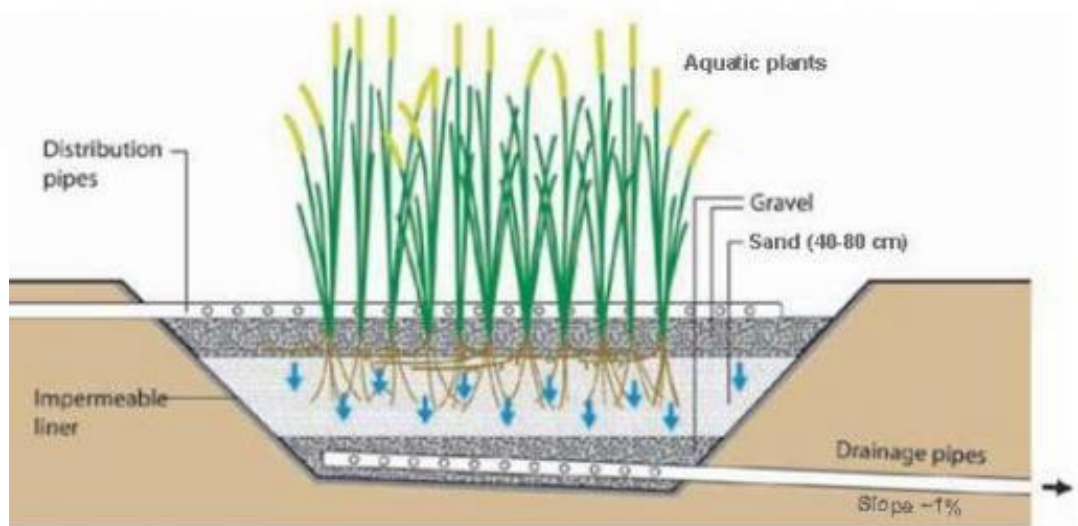


Image: SSWM

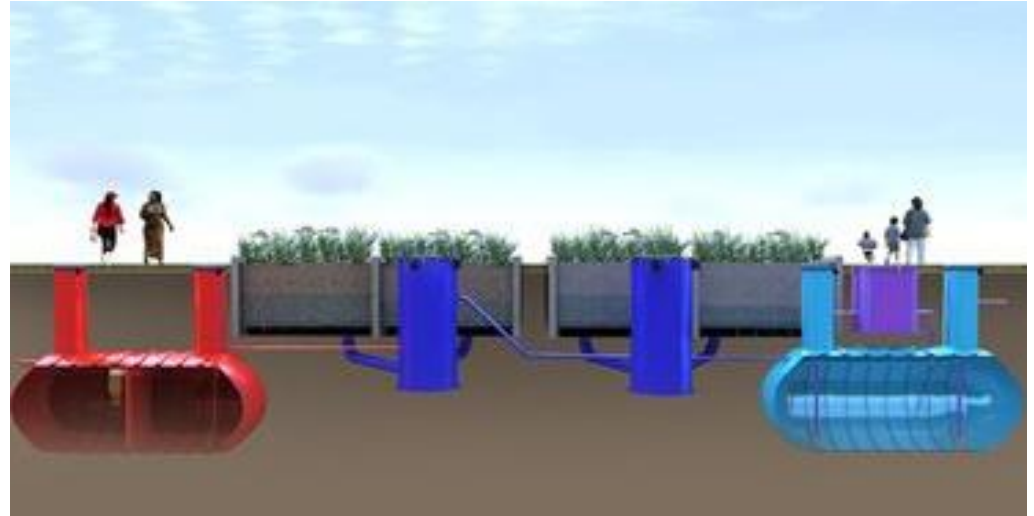


Image: ecofy.nl

Living Machine System

Tidal wetland system.

- Frost free
- Small building scale
- 0,48 m2 p.p



Images: The living Machine

Organica water System

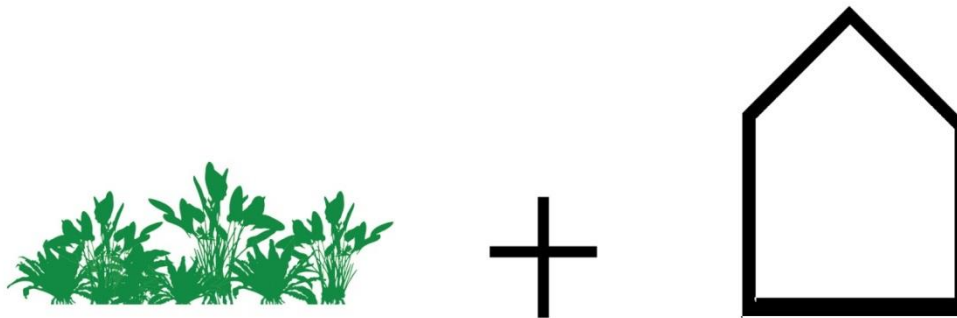
Tidal wetland system.

- Frost free
- Large building scale
- 0,17 m2 p.p



Design Goal

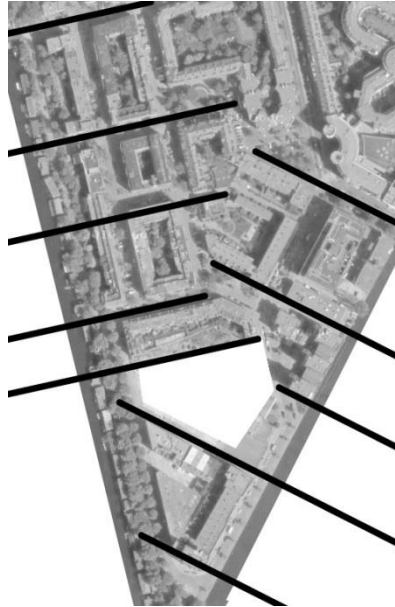
Design in a dense urban area a combination of the alternative treatment system and dwelling, in which the integration of the combination results in a surplus for the dwelling.



Amsterdam, Staatsliedenbuurt



Enclosure



Traffic



Research

Location

Design

Construction

Numbers

Conclusion

Quay



Research

Location

Design

Construction

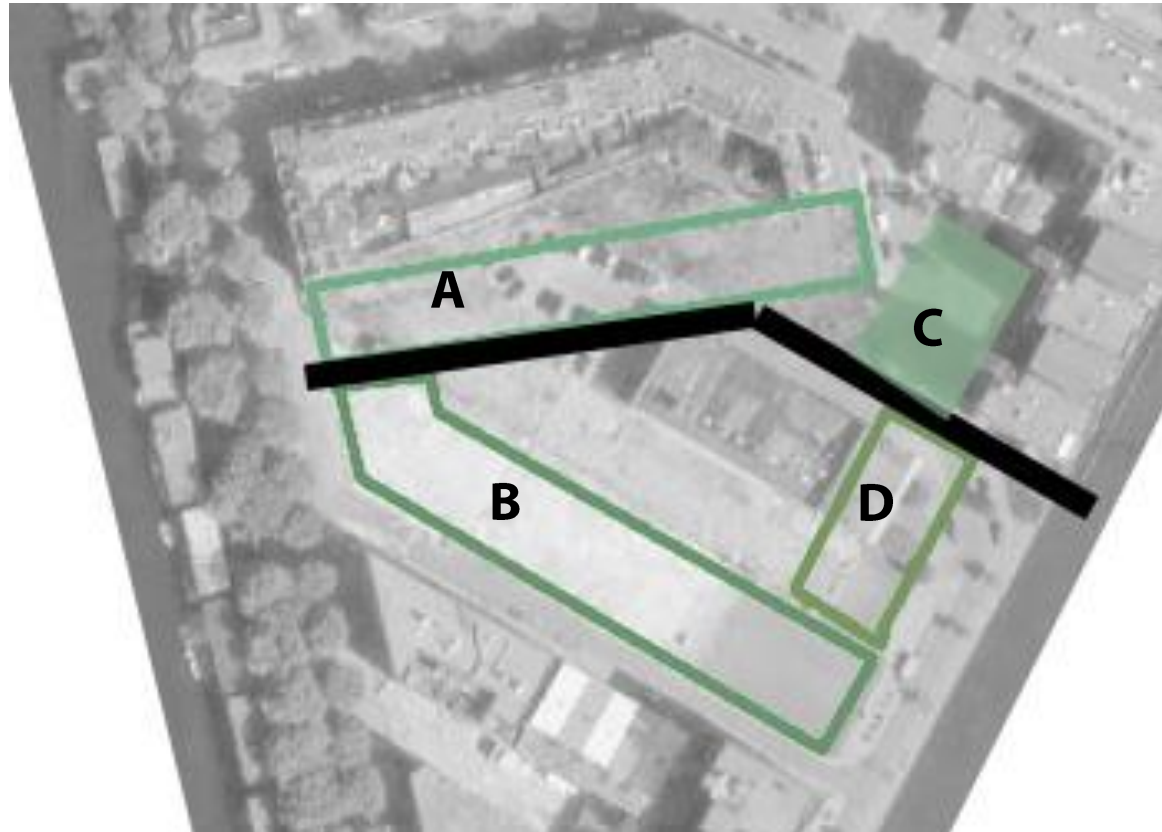
Numbers

Conclusion

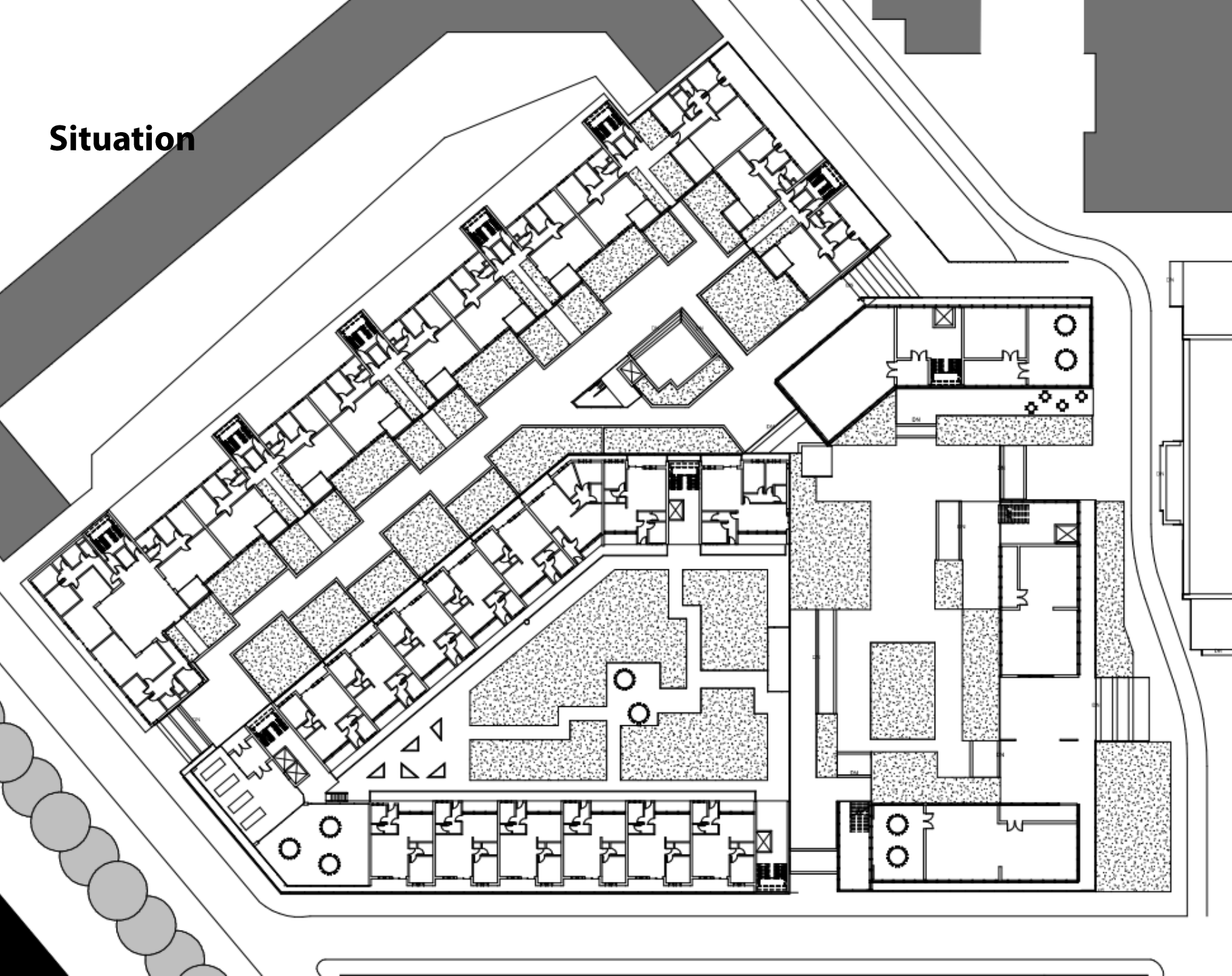
Location



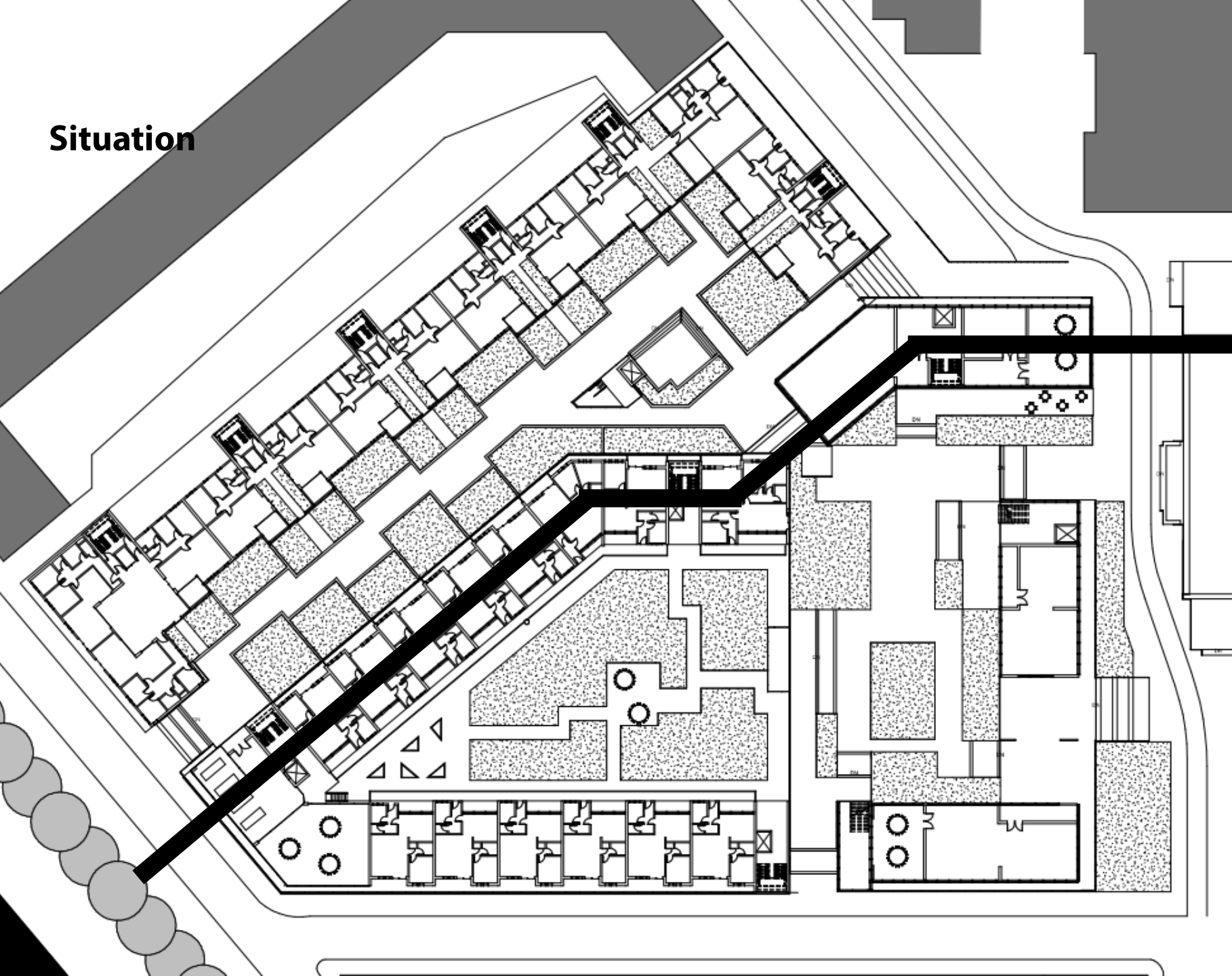
Location



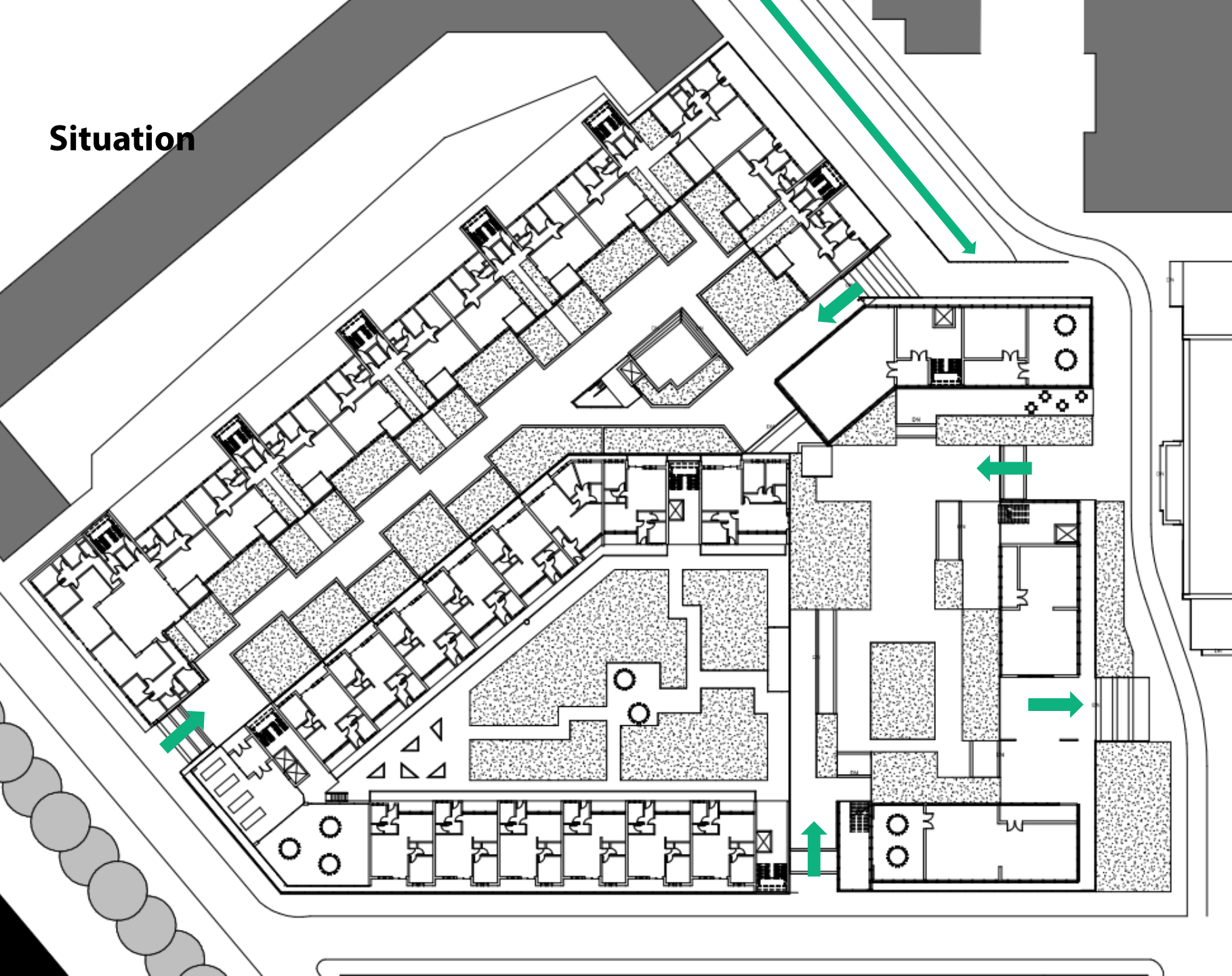
Situation



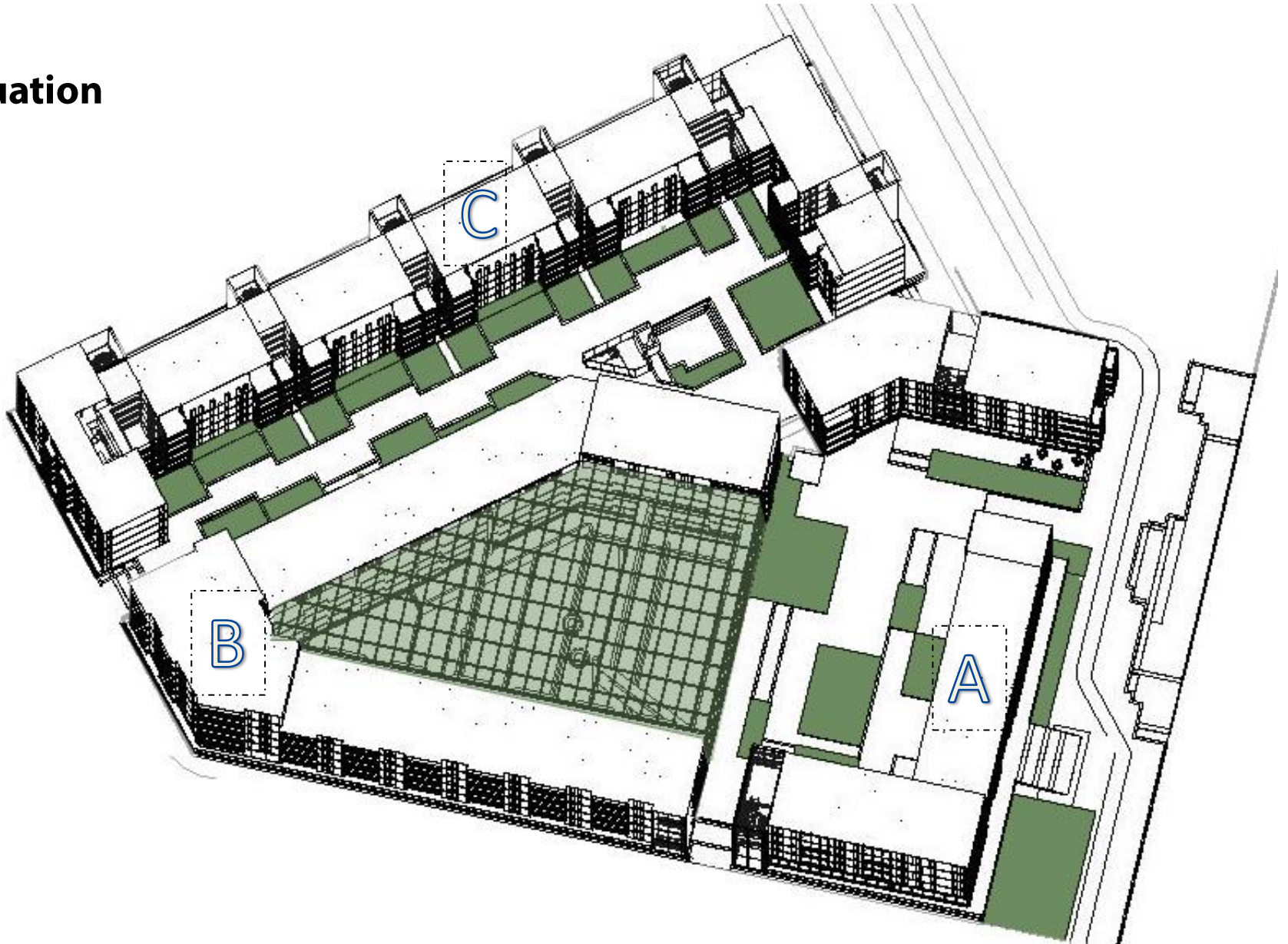
Situation



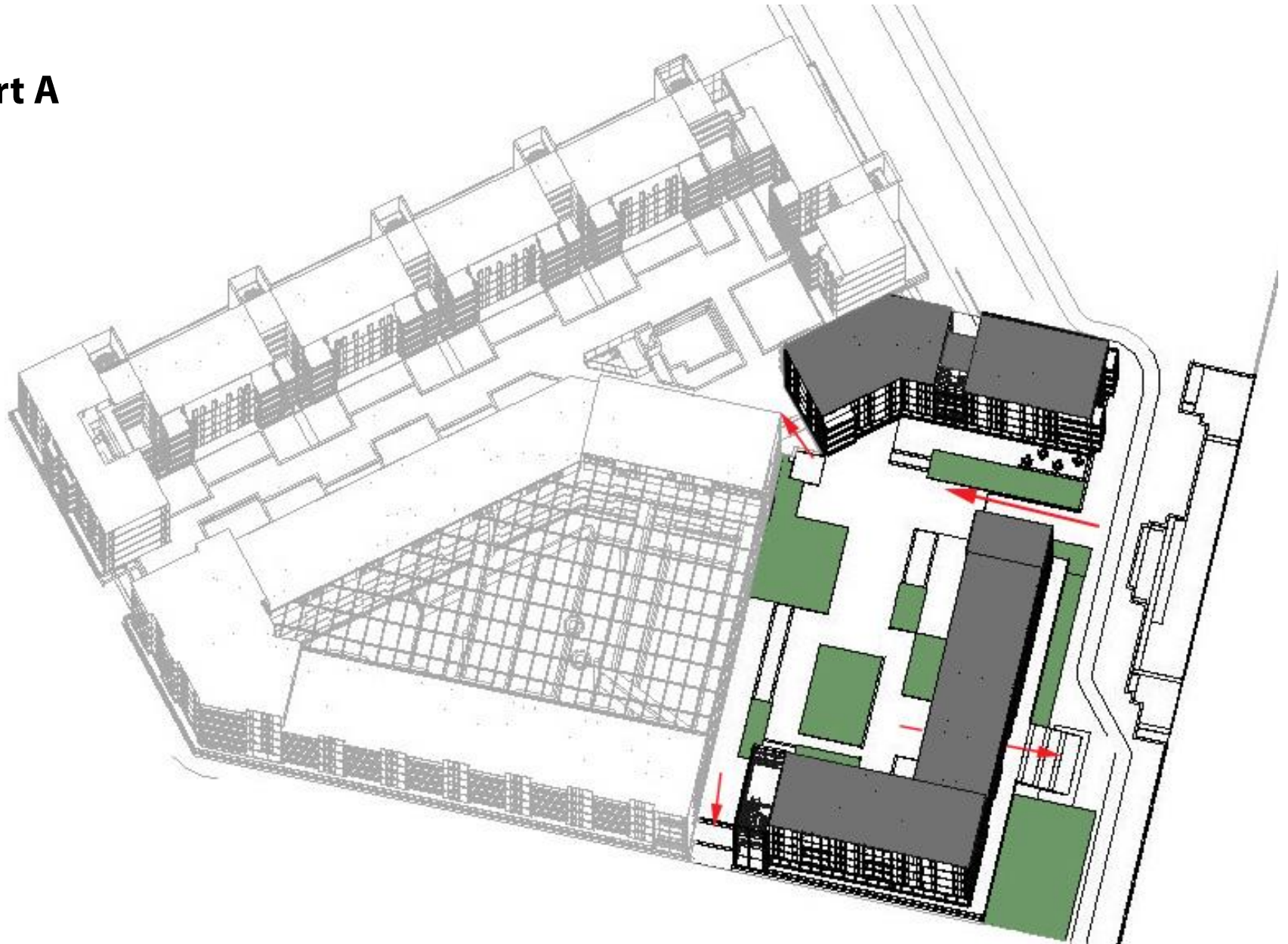
Situation



Situation



Part A



Research

Location

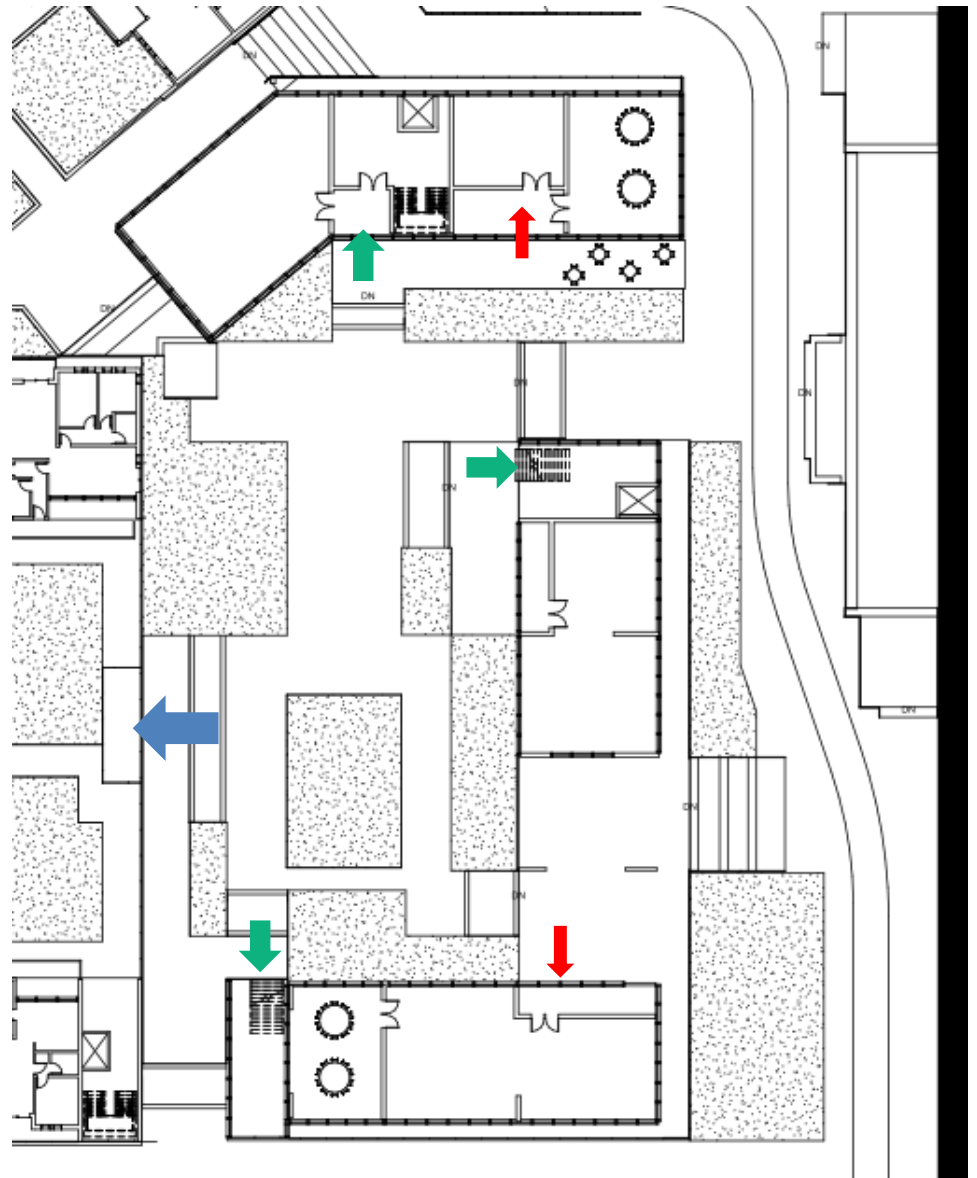
Design

Construction

Numbers

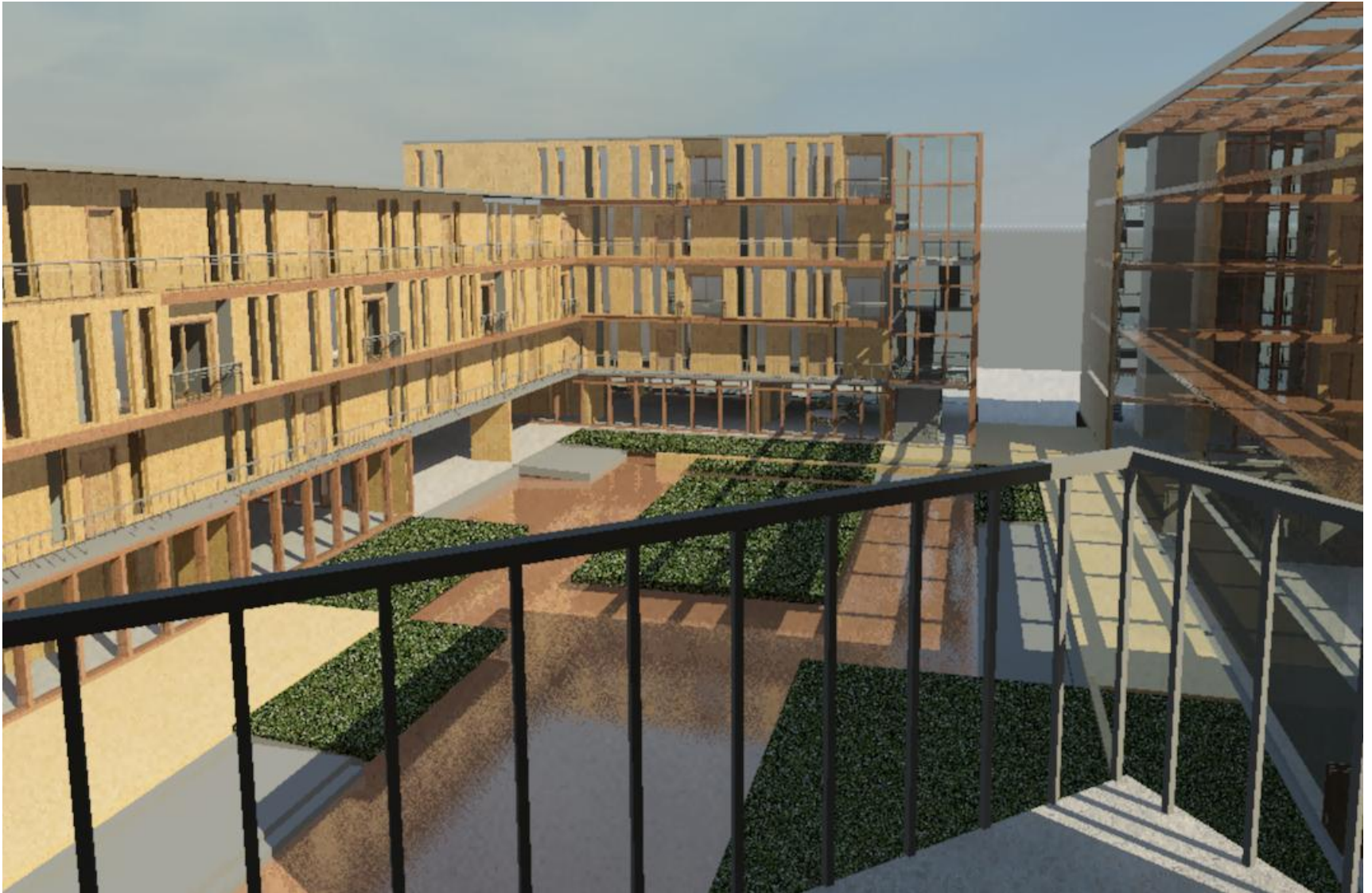
Conclusion

Innercourt



Innercourt







Research

Location

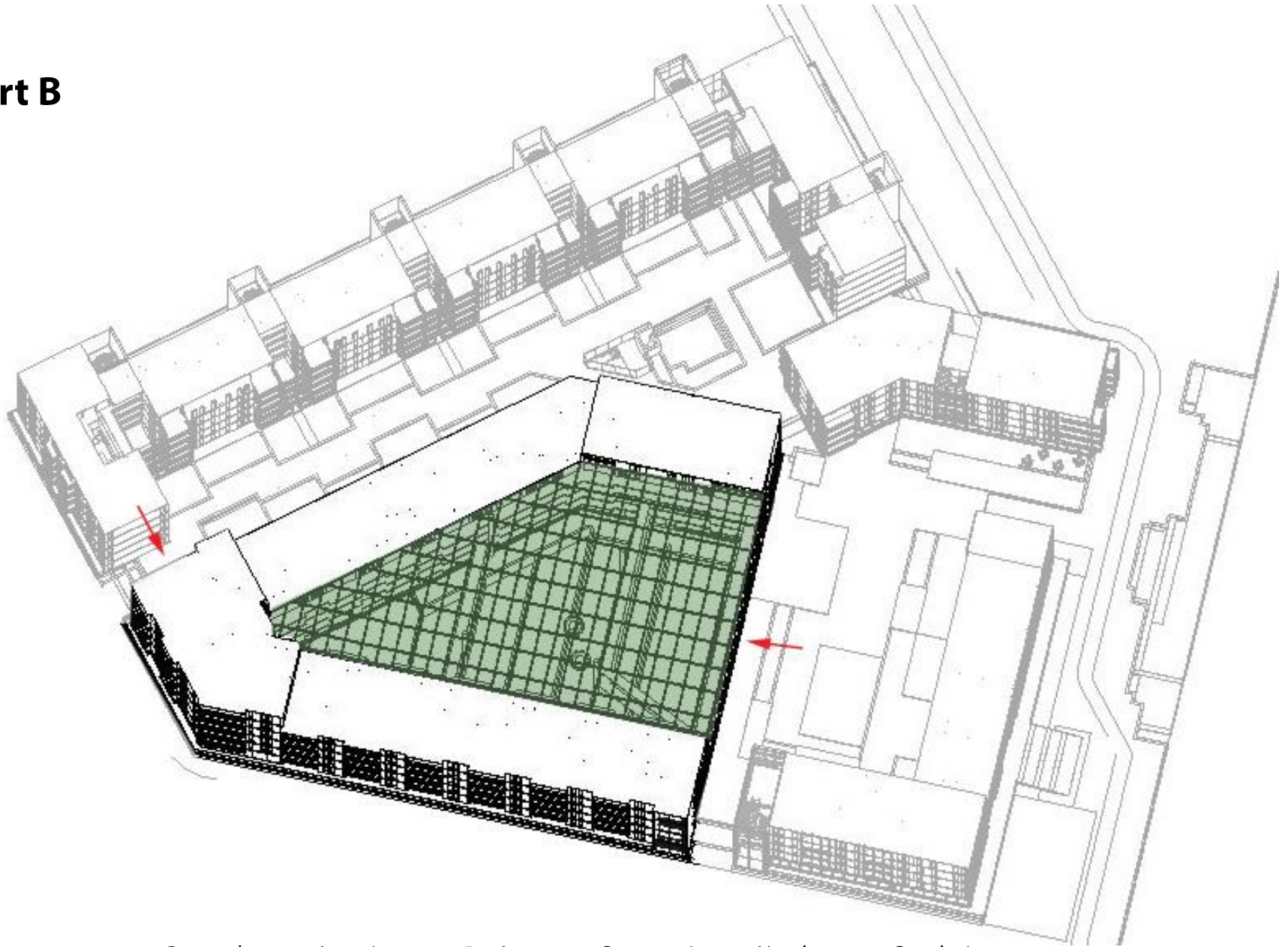
Design

Construction

Numbers

Conclusion

Part B



Research

Location

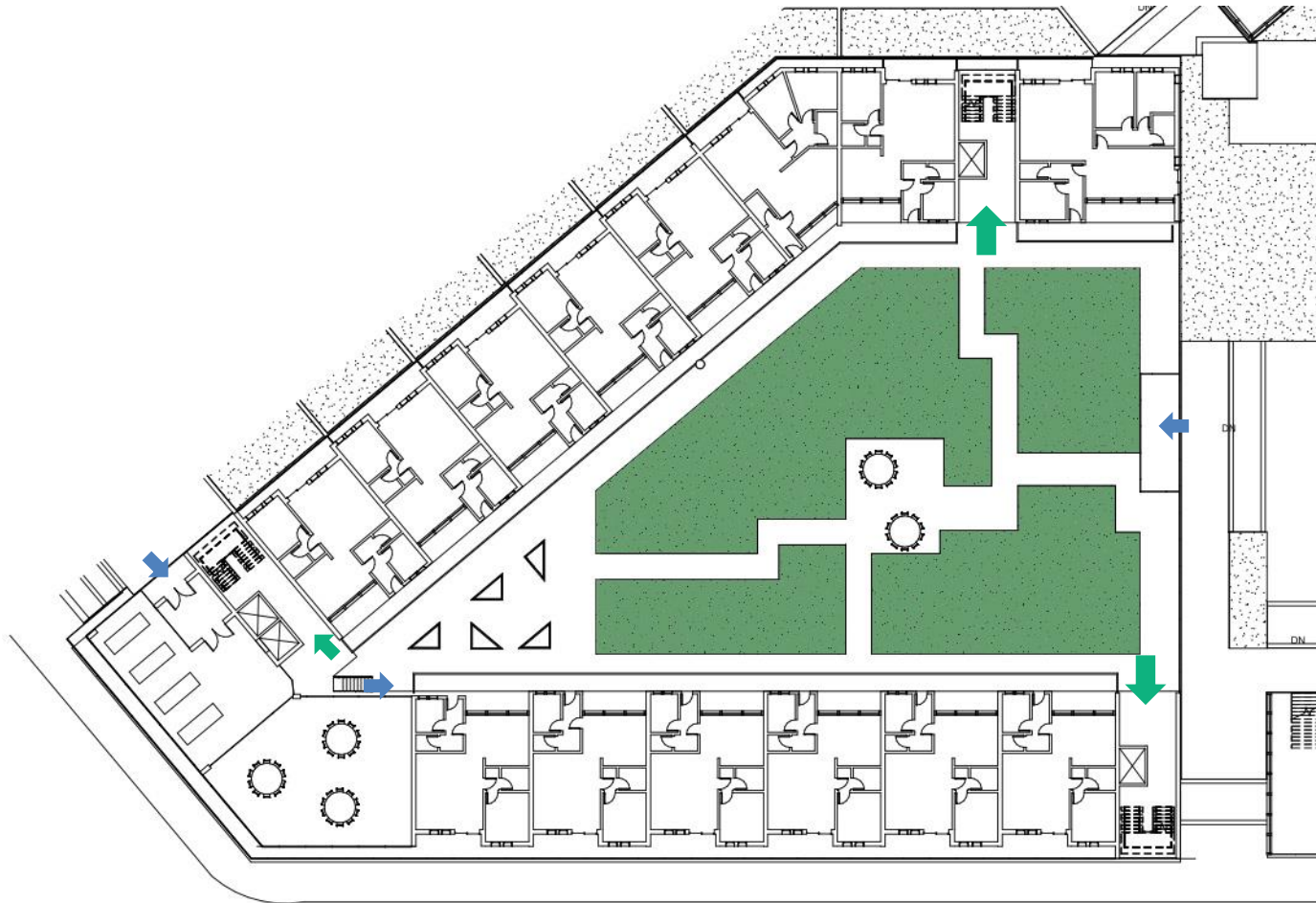
Design

Construction

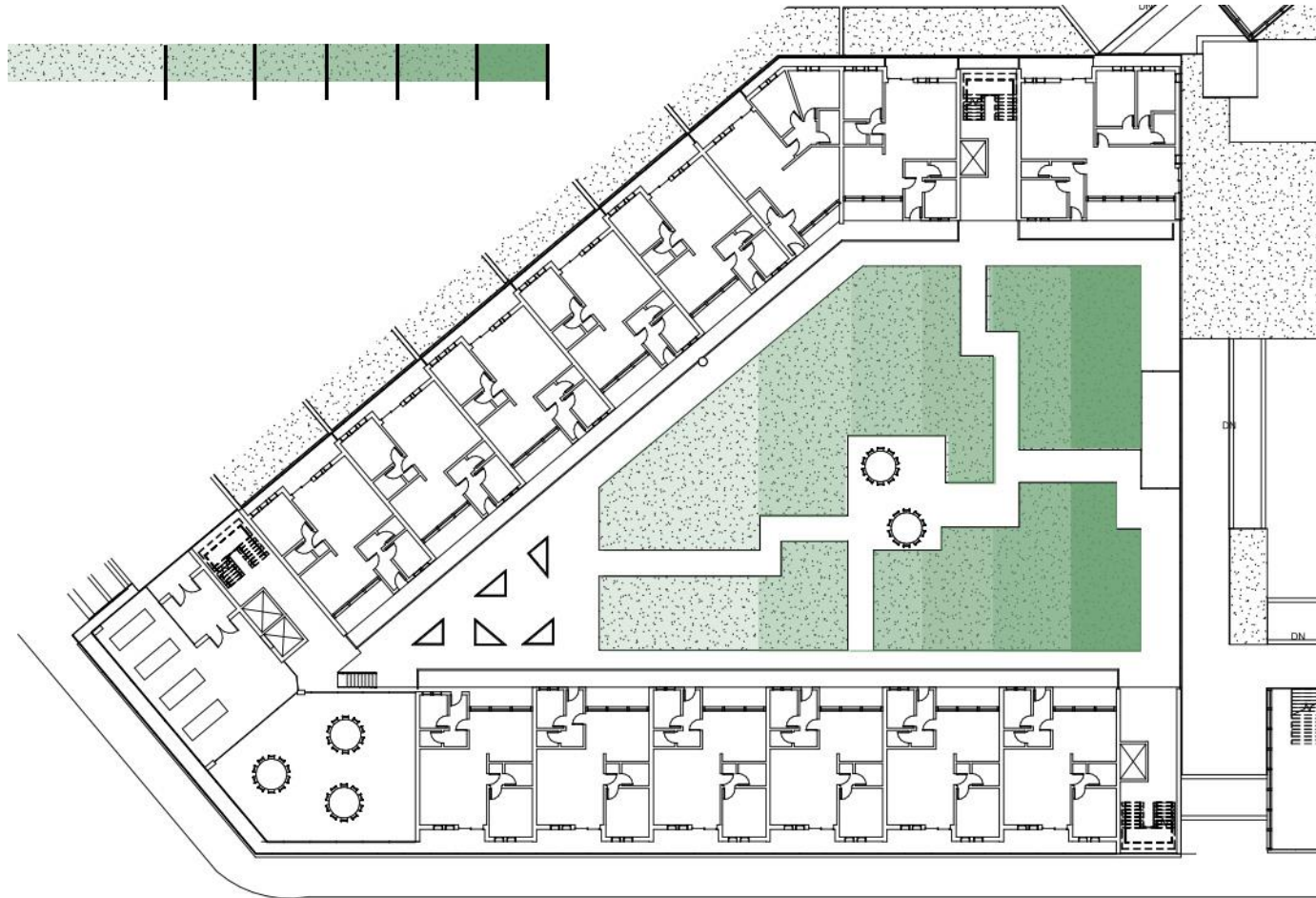
Numbers

Conclusion

Entrance



Water treatment system



Circulation



Research

Location

Design

Construction

Numbers

Conclusion

Walk over



Research

Location

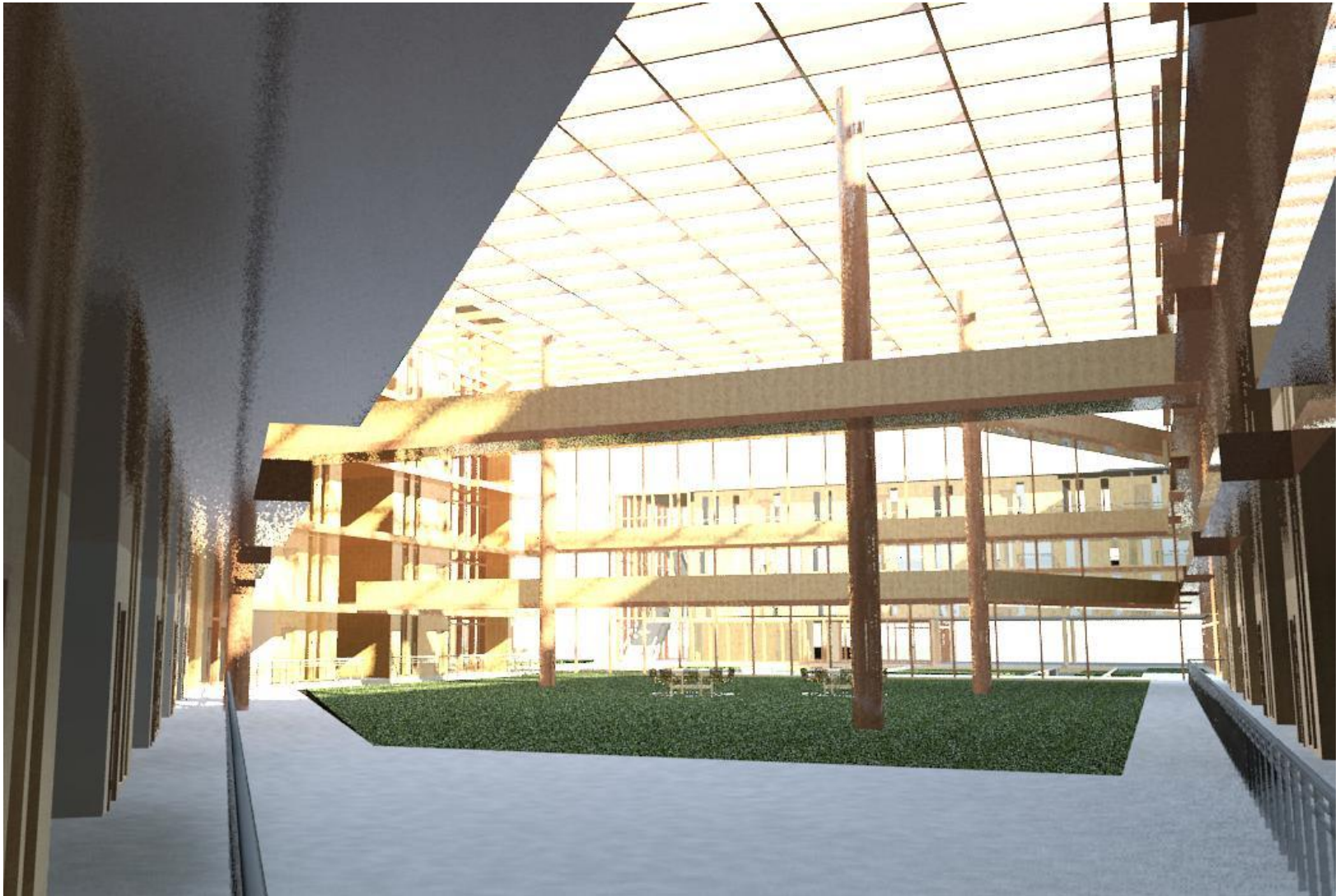
Design

Construction

Numbers

Conclusion

Interior



Research

Location

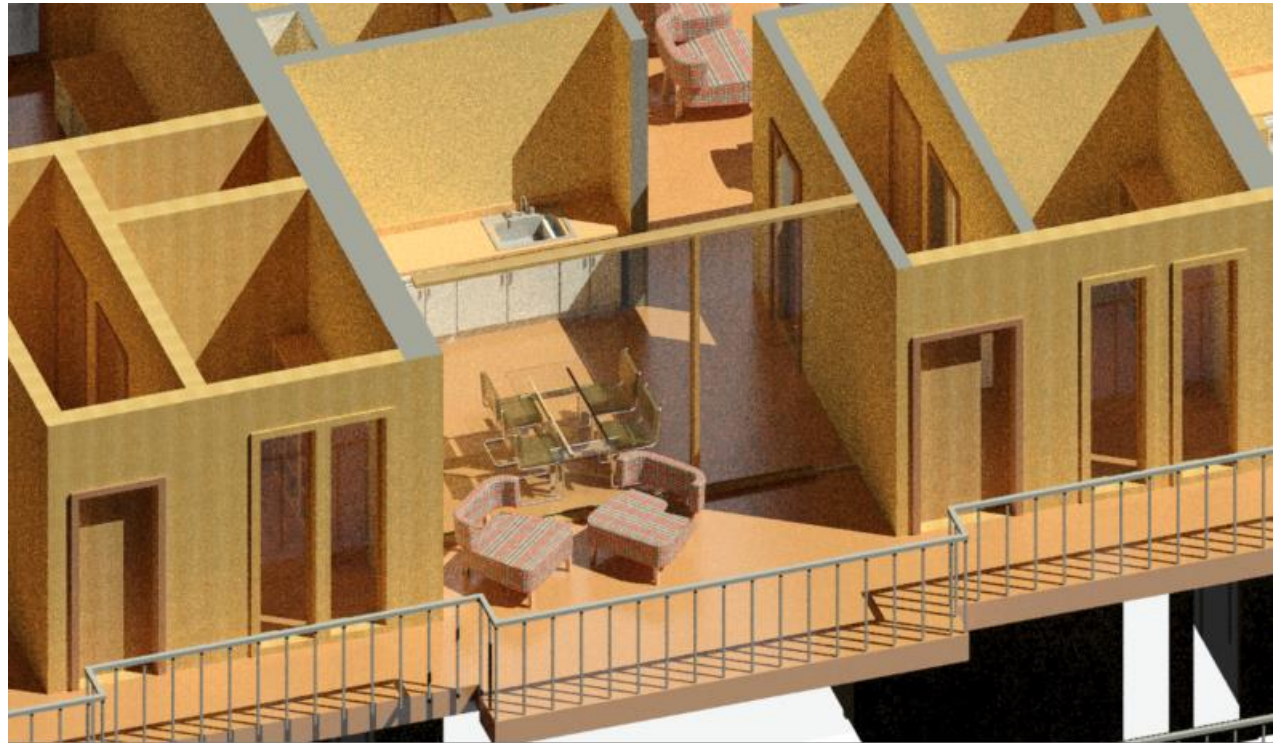
Design

Construction

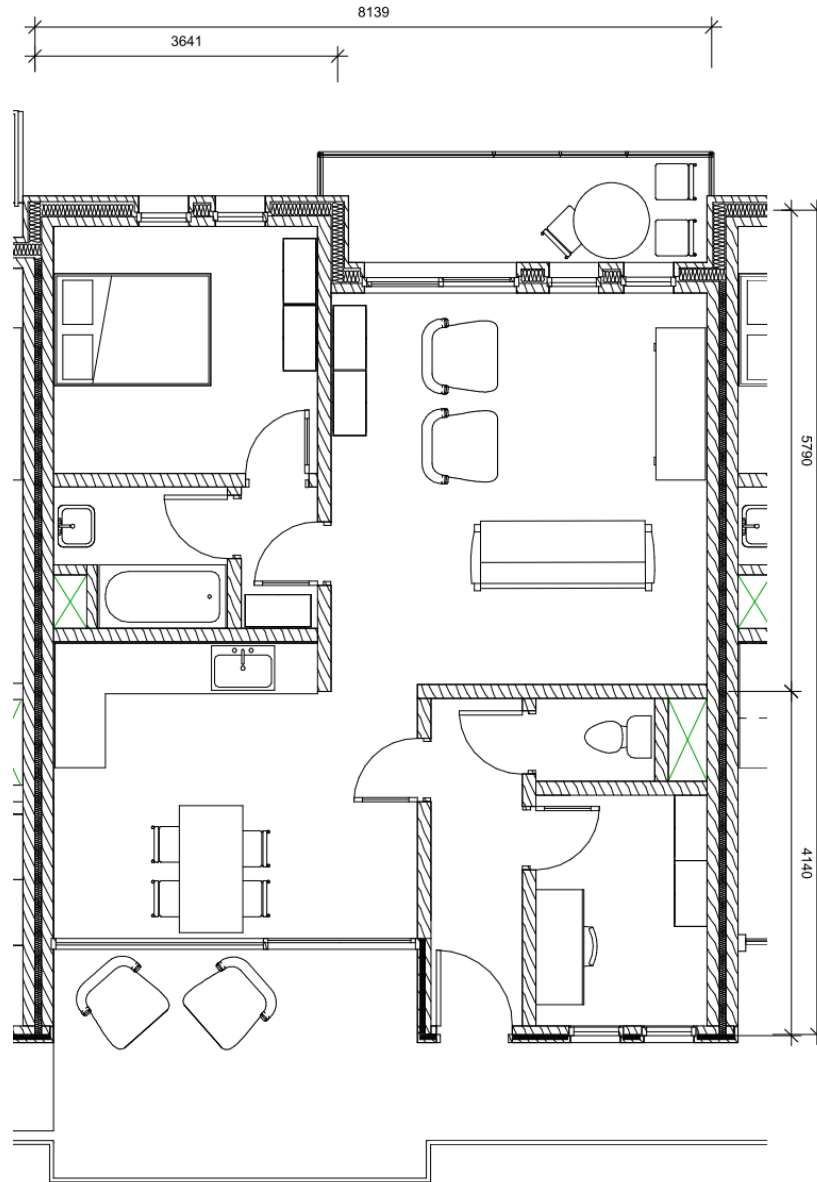
Numbers

Conclusion

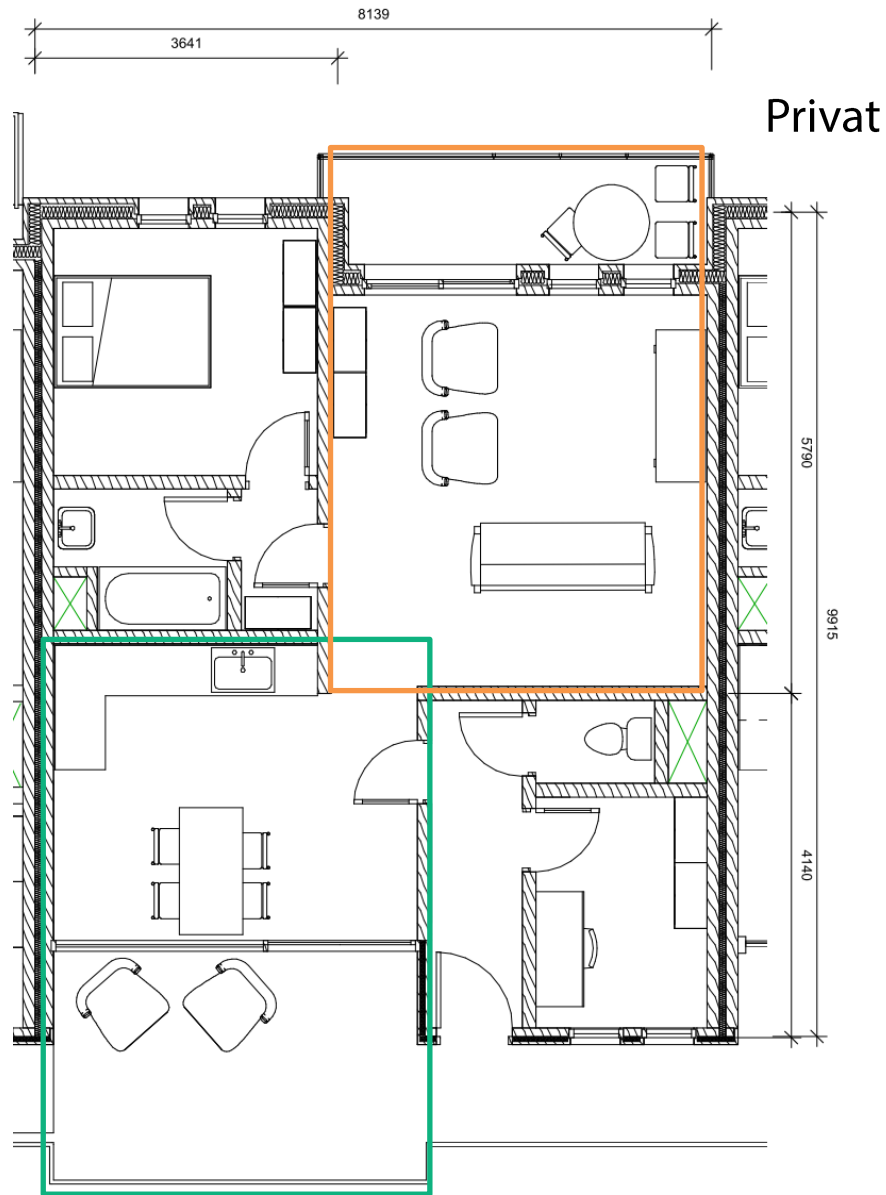
Dwelling A



Dwelling A



Dwelling A



Communal

Research

Location

Design

Construction

Numbers

Conclusion

Dwelling A



Research

Location

Design

Construction

Numbers

Conclusion

Dwelling A



Research

Location

Design

Construction

Numbers

Conclusion

Kas Construction

Sloped glazing

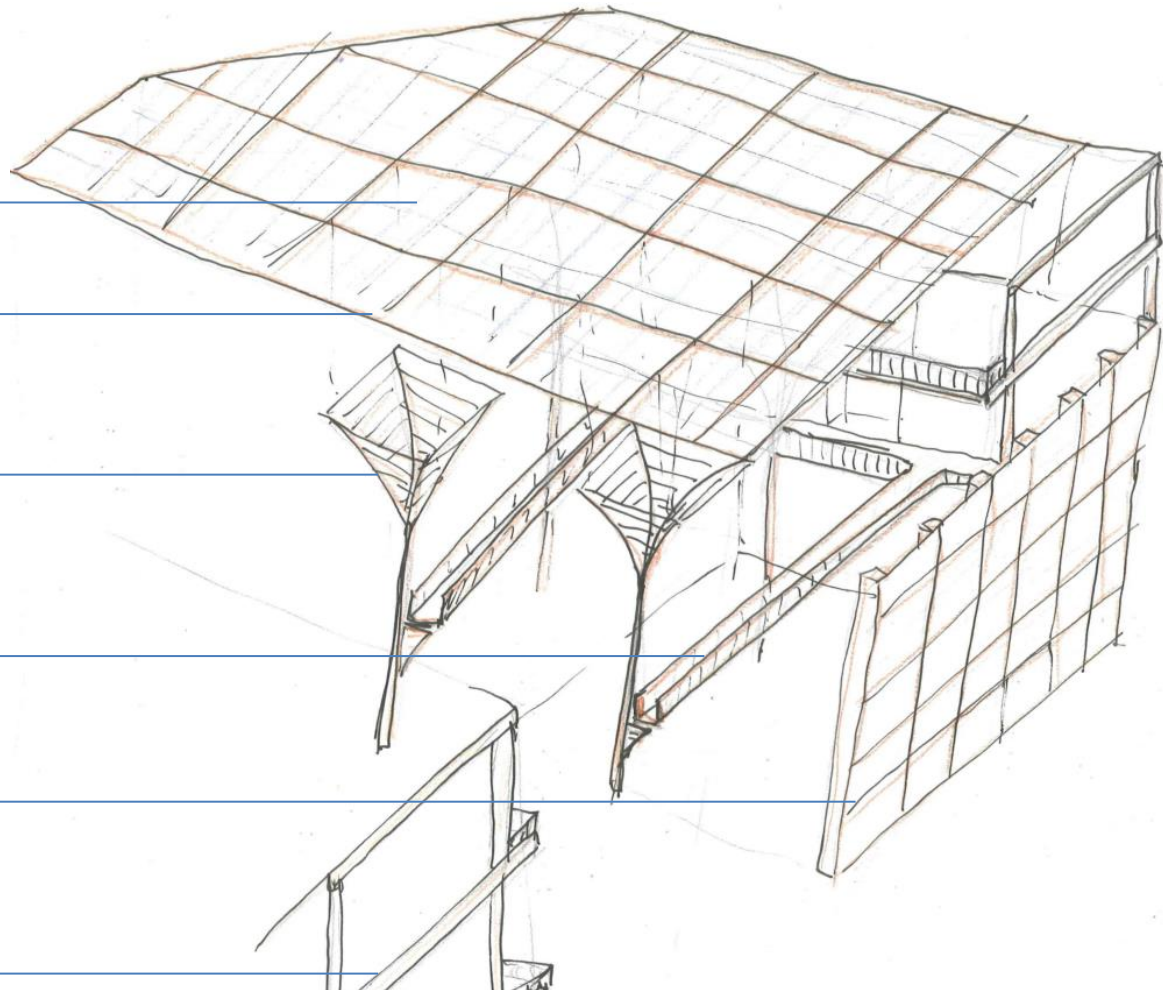
Roof structure

Tree Columns

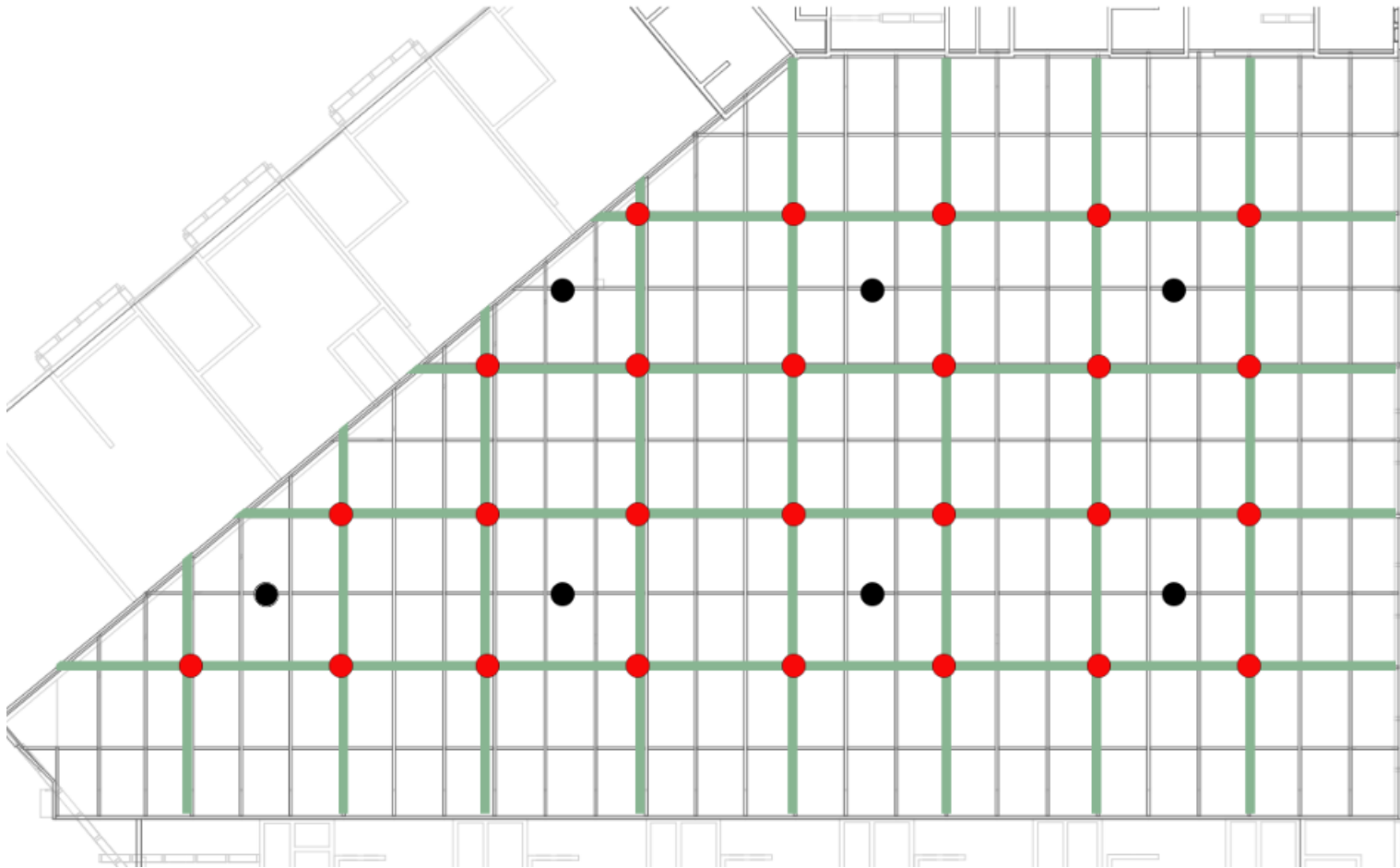
Walk over

Facade Glazing

Dwelling structure



Roof



Research

Location

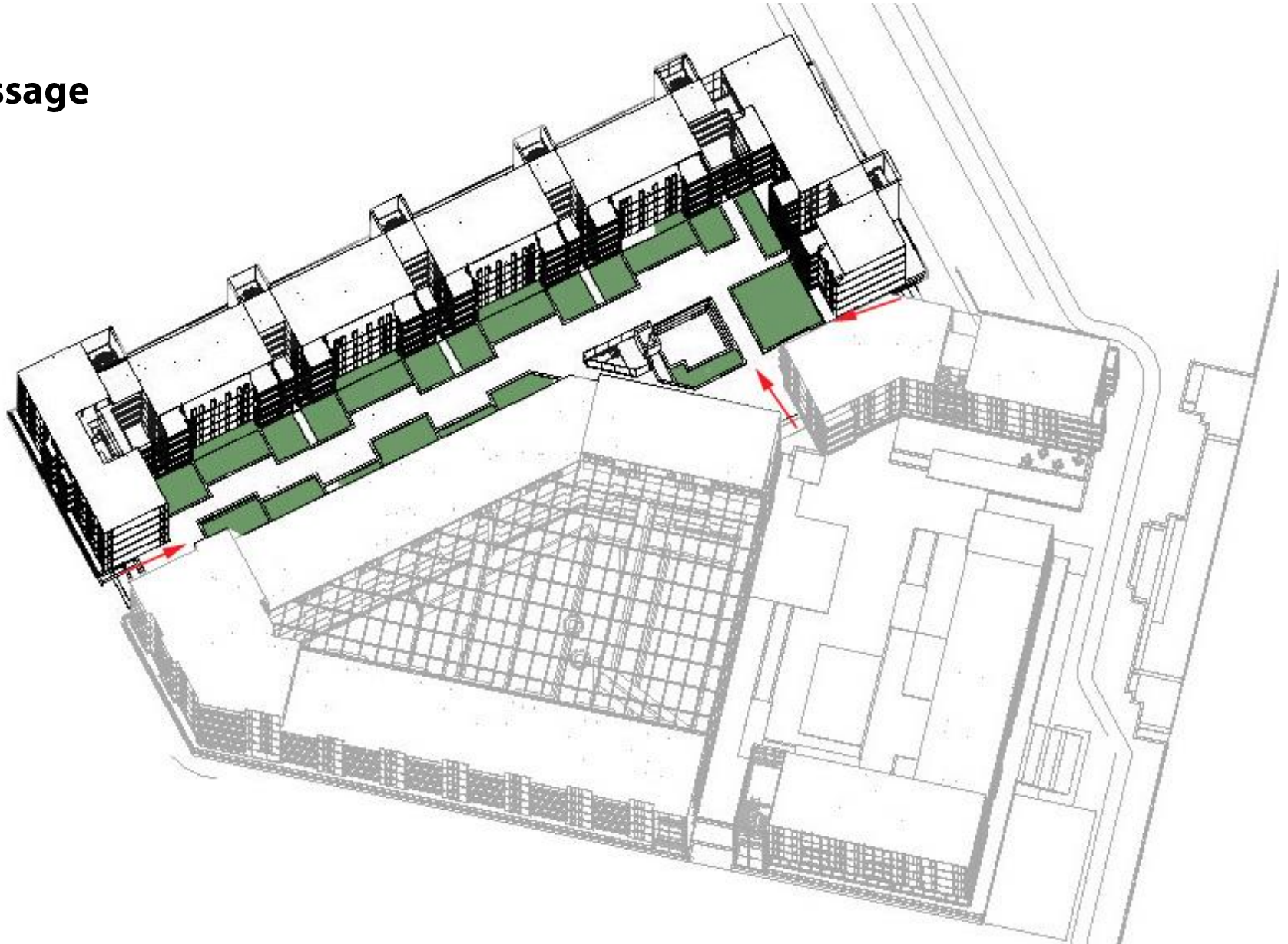
Design

Construction

Numbers

Conclusion

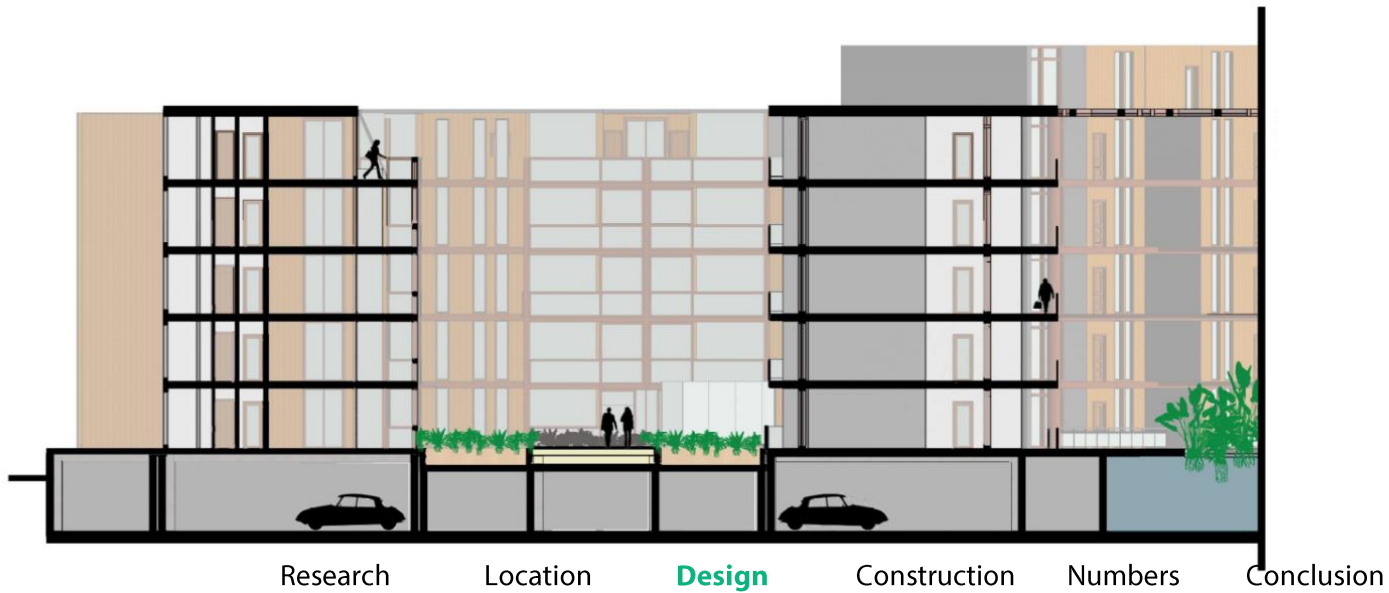
Passage



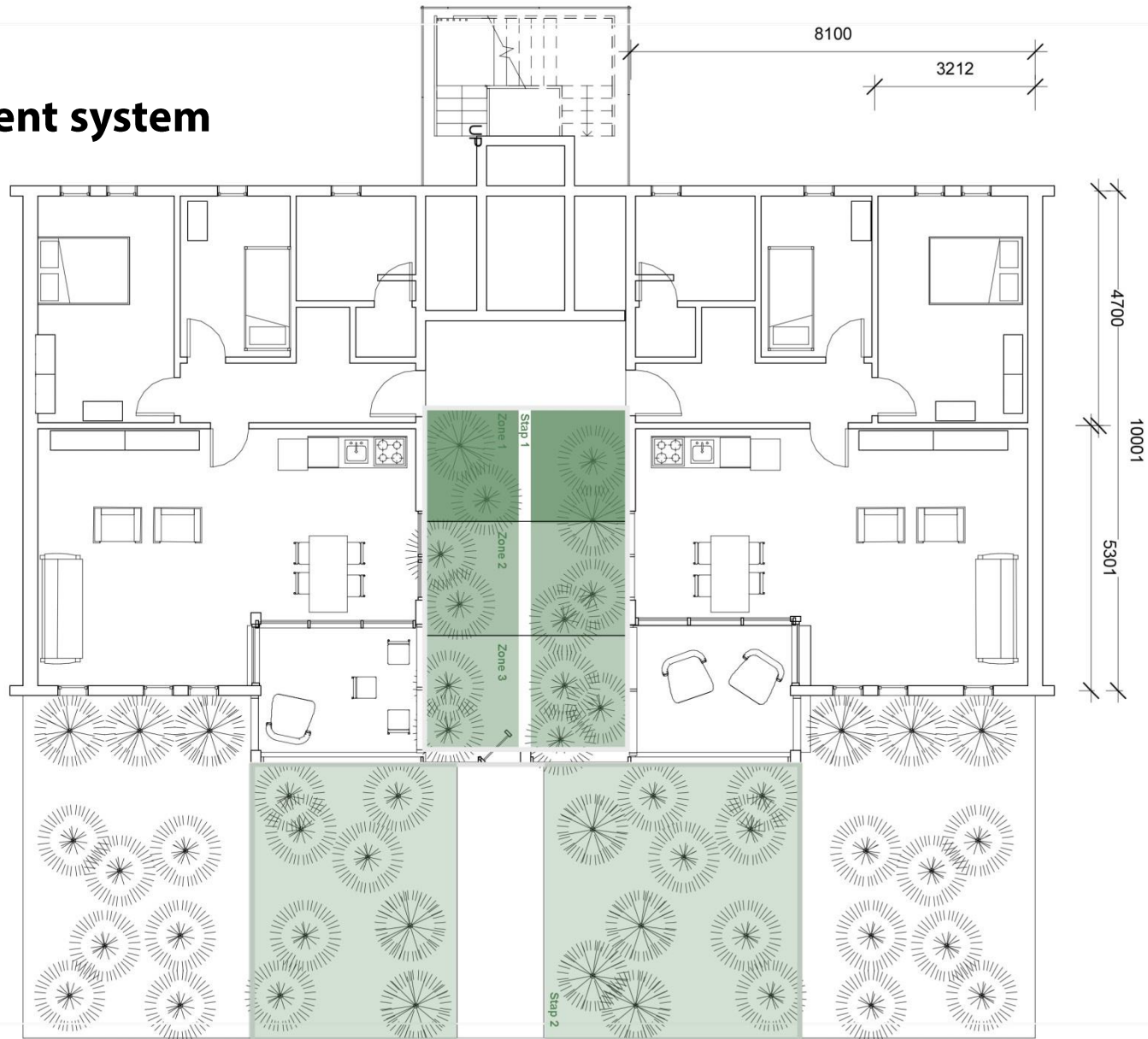
Circulation



Passage



Water treatment system



Research

Location

Design

Construction

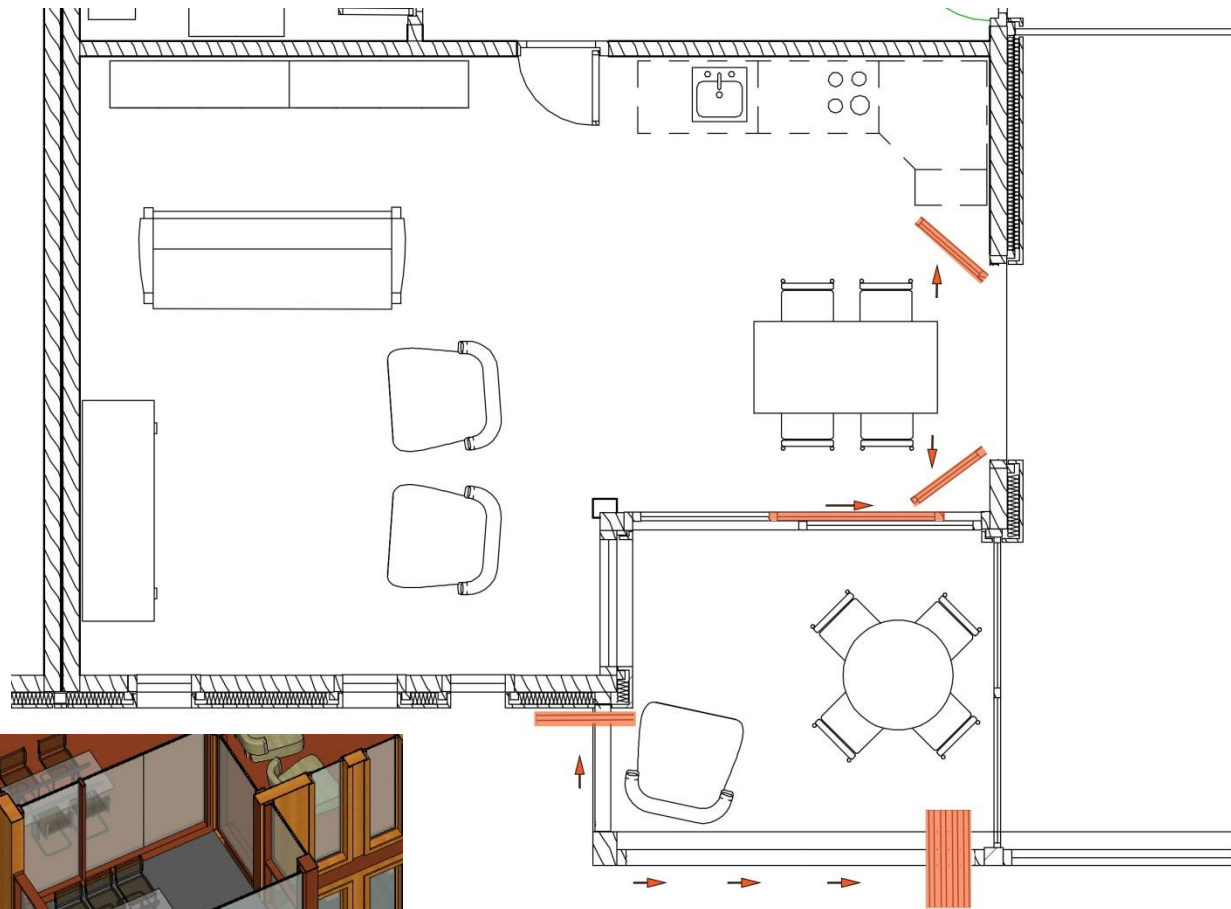
Numbers

Conclusion

Dwelling B



Adjustable



Research

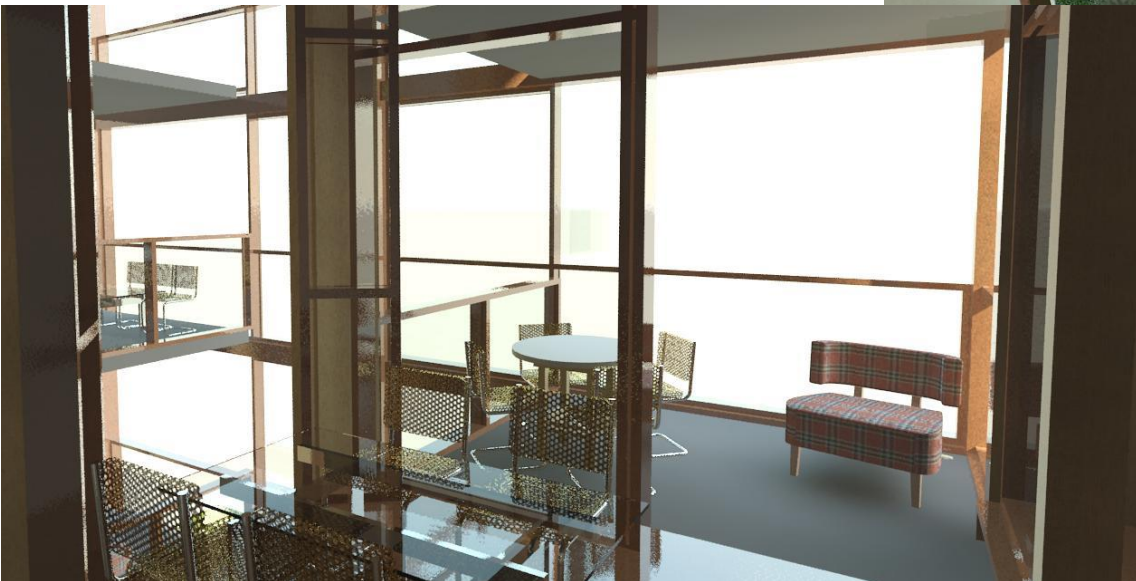
Location

Design

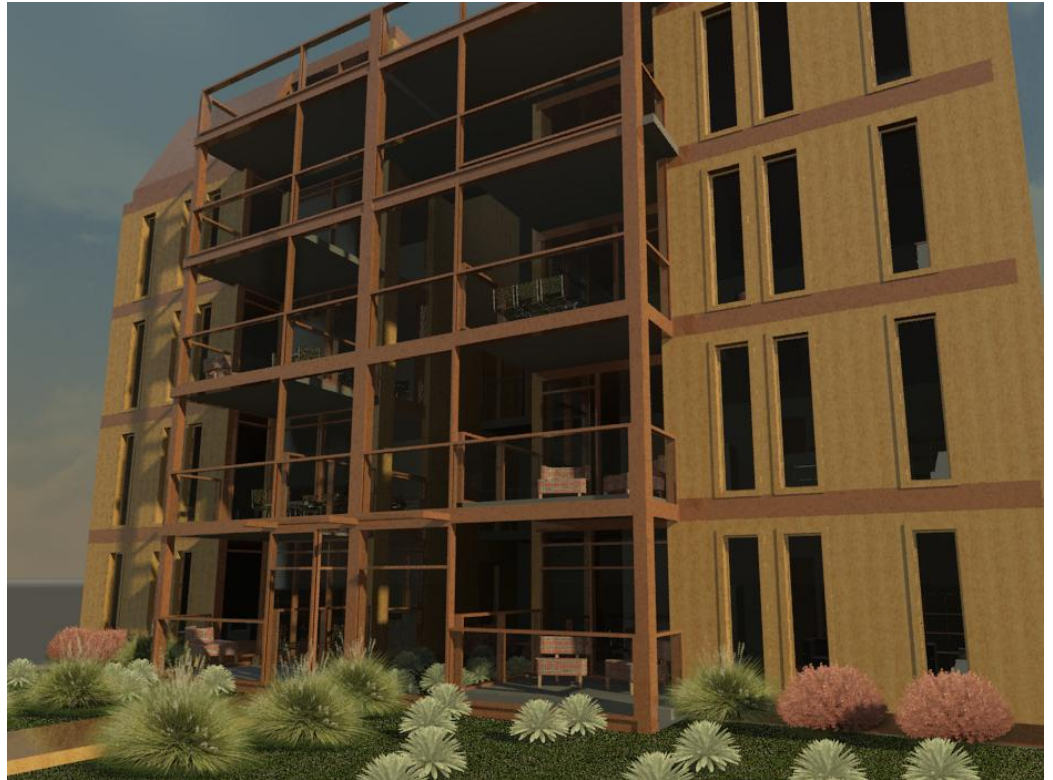
Construction

Numbers

Conclusion



Facade



Research

Location

Design

Construction

Numbers

Conclusion

Construction

Vegetation roof

Wooden structure

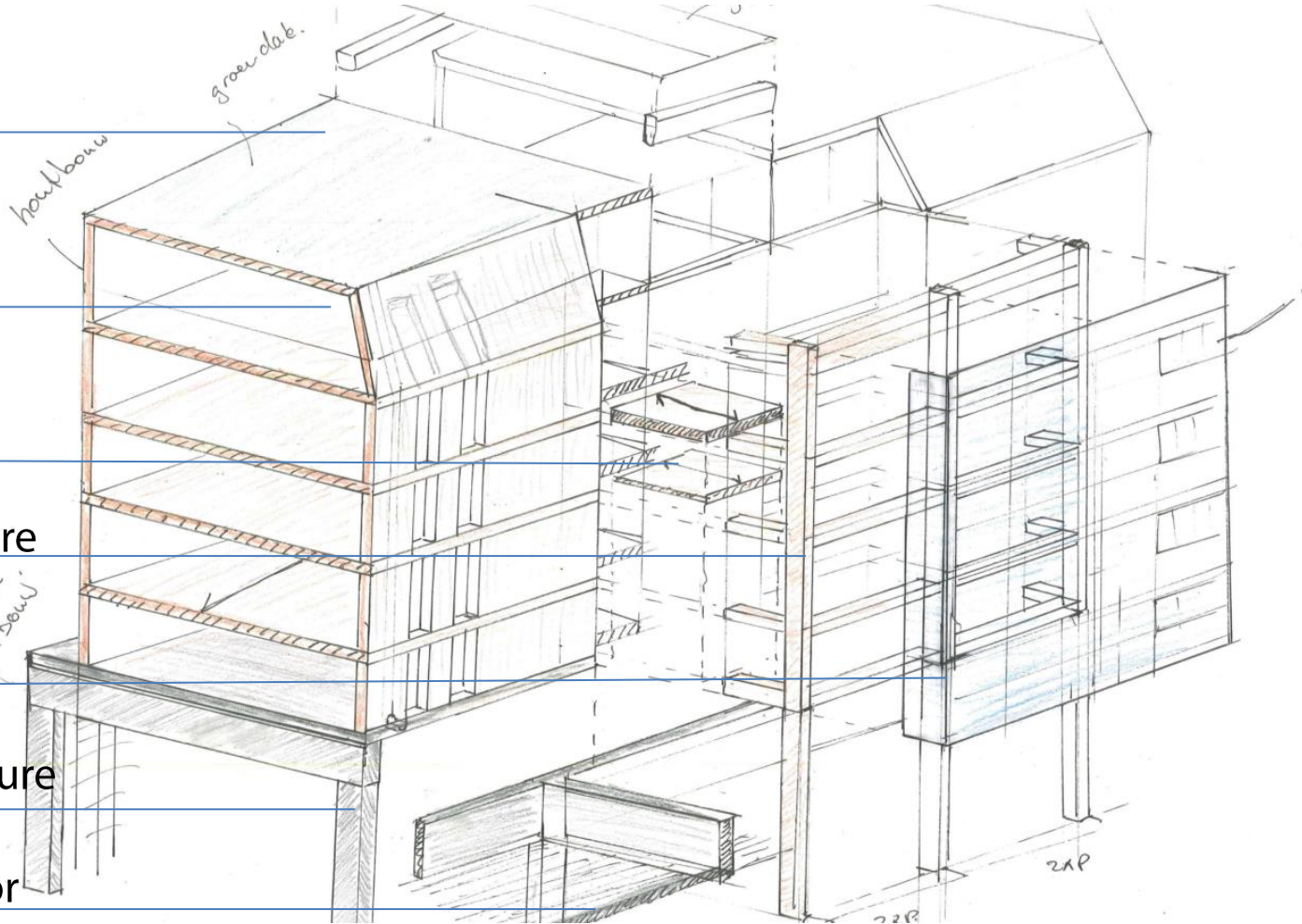
Balcony flooring

Kas facade structure

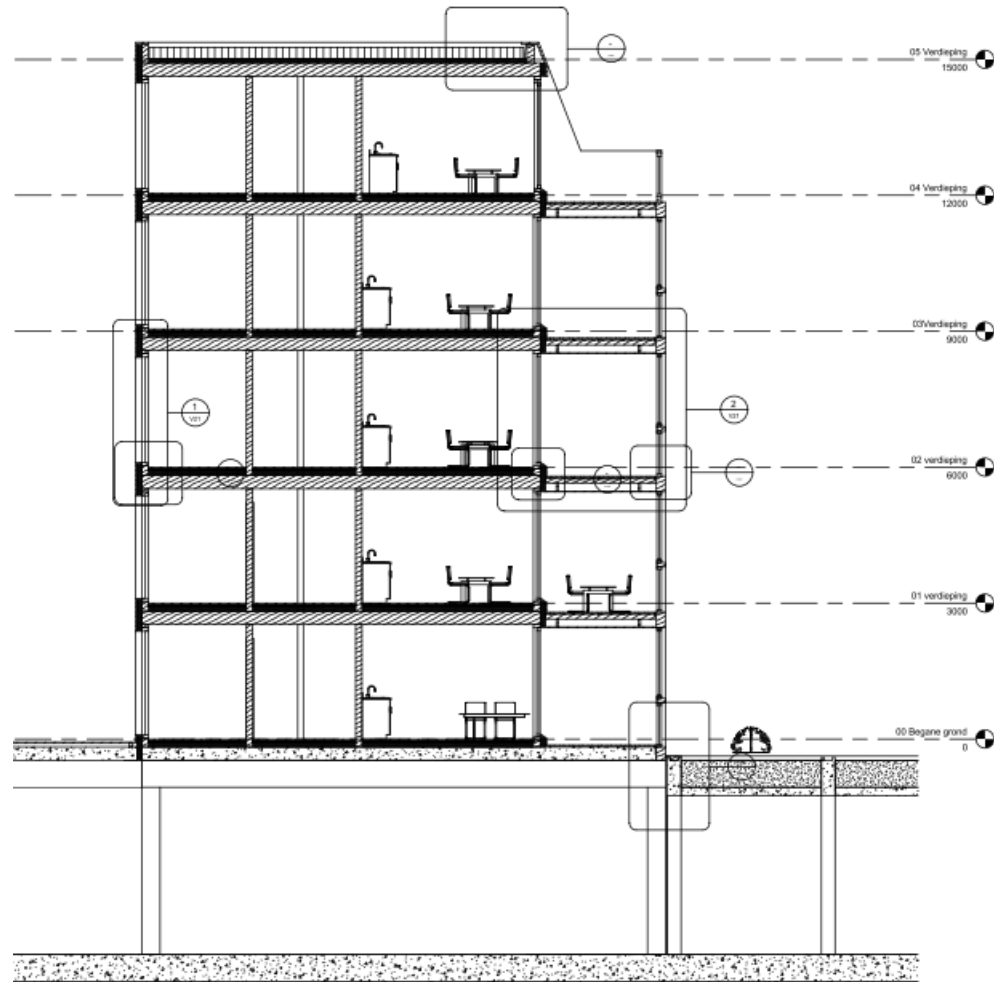
Kas Facade Glazing

Concrete 'Table' structure

Concrete structure for wetlands



Construction



Research

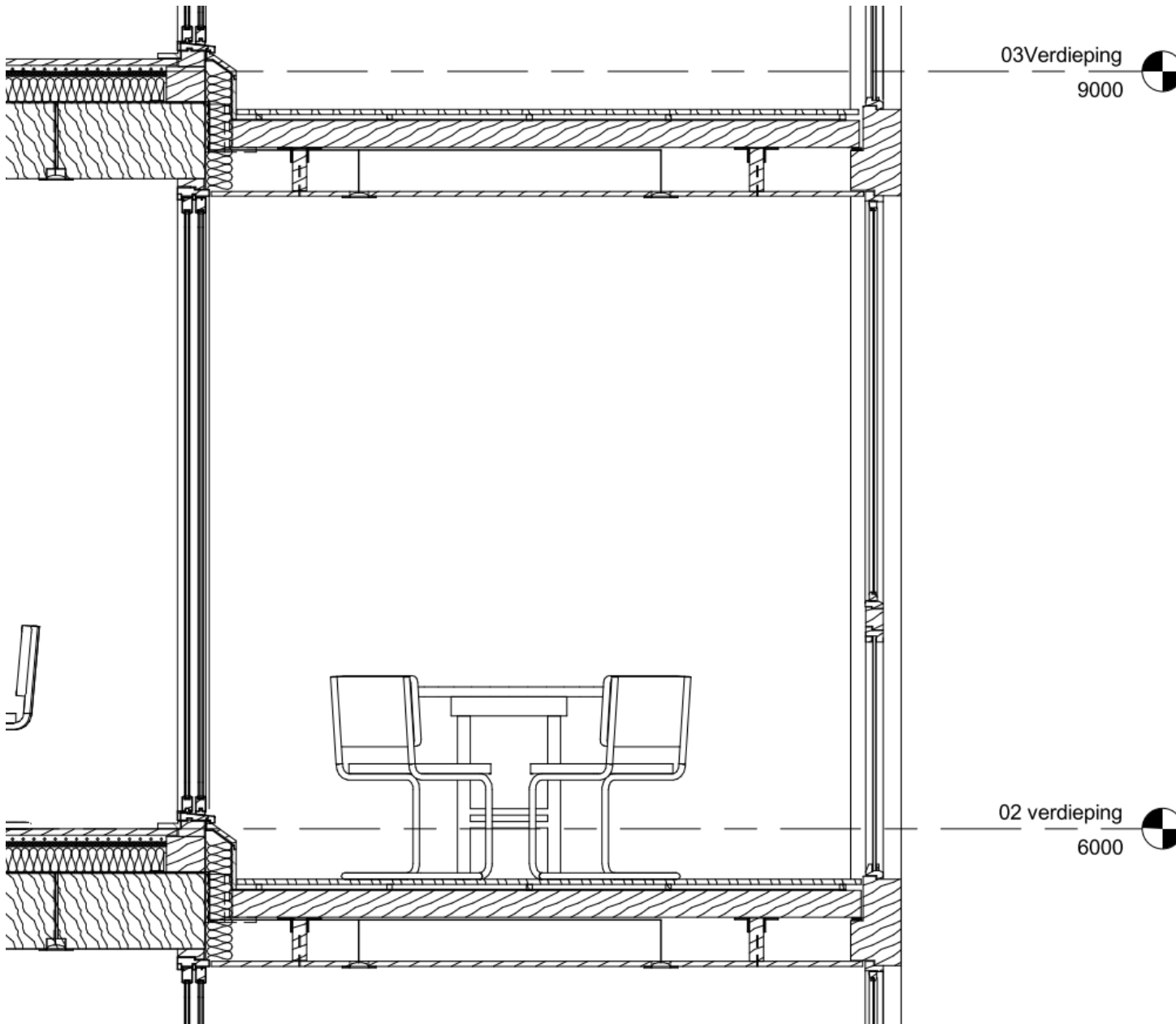
Location

Design

Construction

Numbers

Conclusion



Research

Location

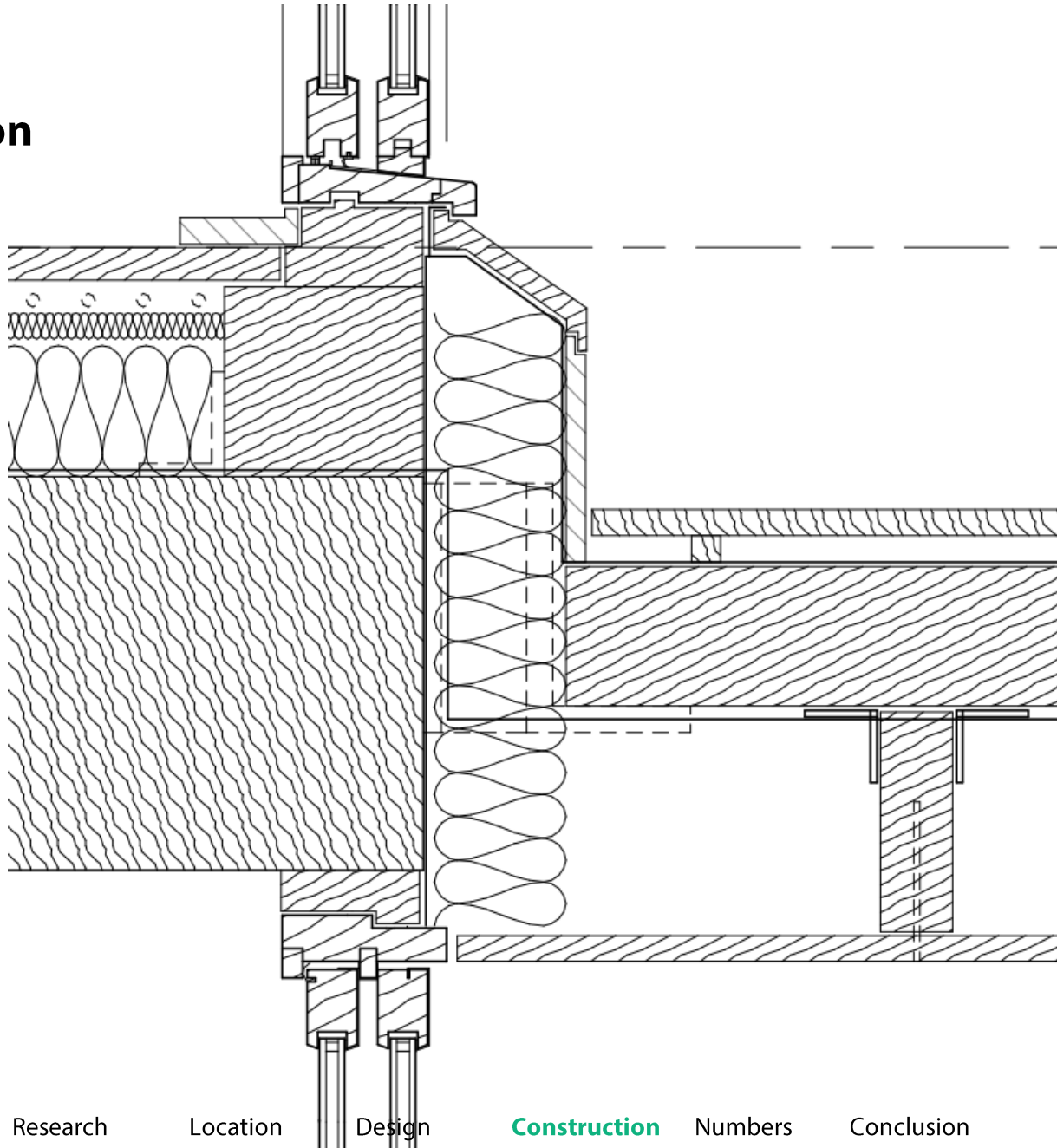
Design

Construction

Numbers

Conclusion

Construction



Research

Location

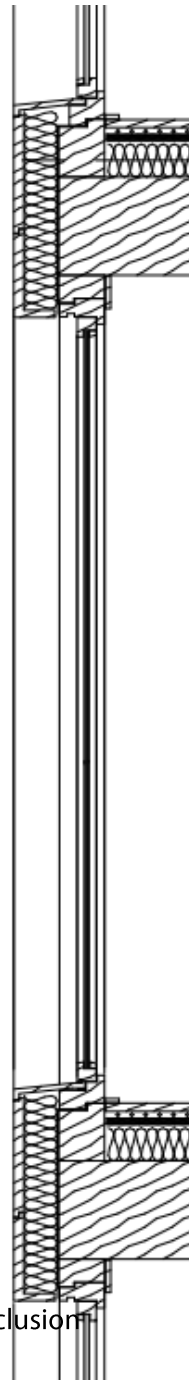
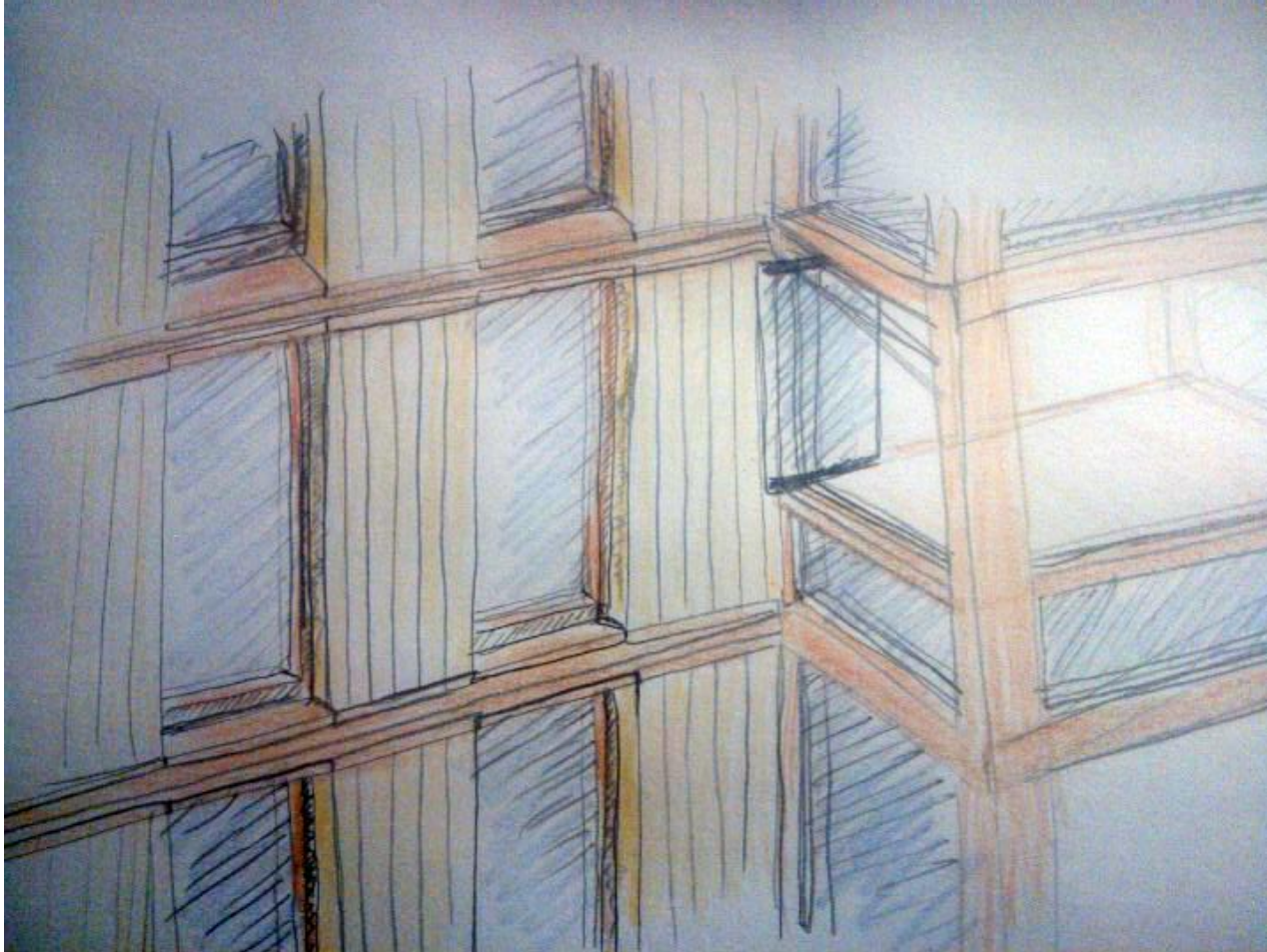
Design

Construction

Numbers

Conclusion

Facade



Research

Location

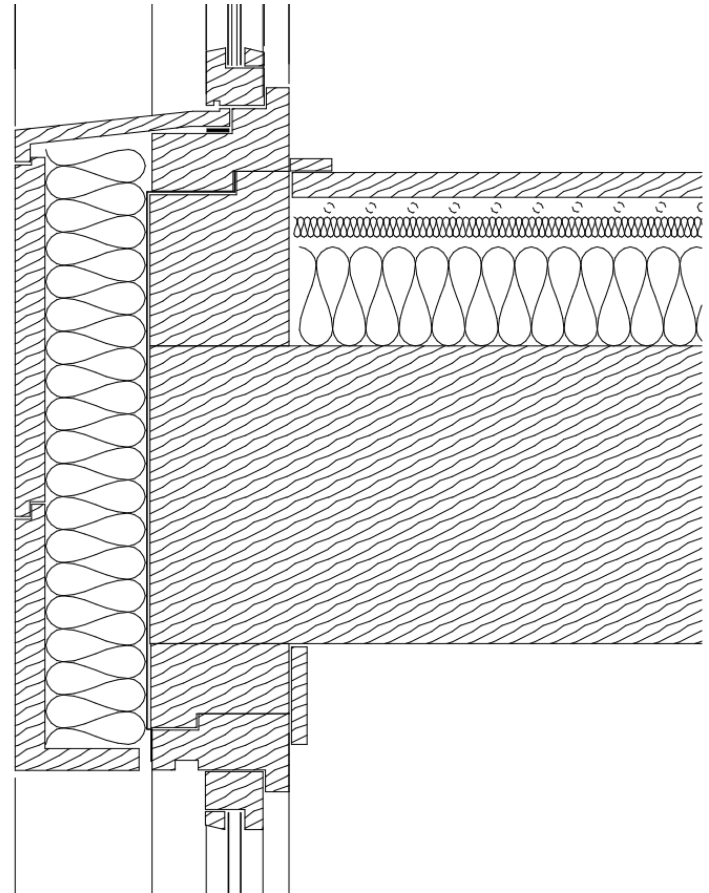
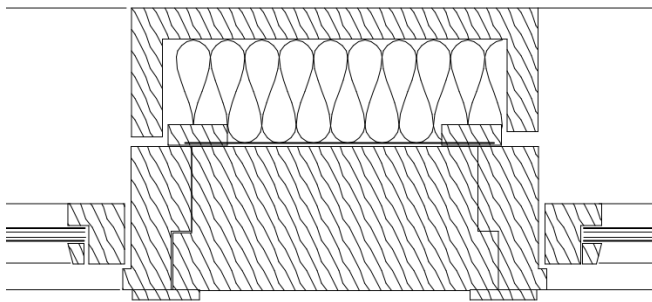
Design

Construction

Numbers

Conclusion

Facade



Research

Location

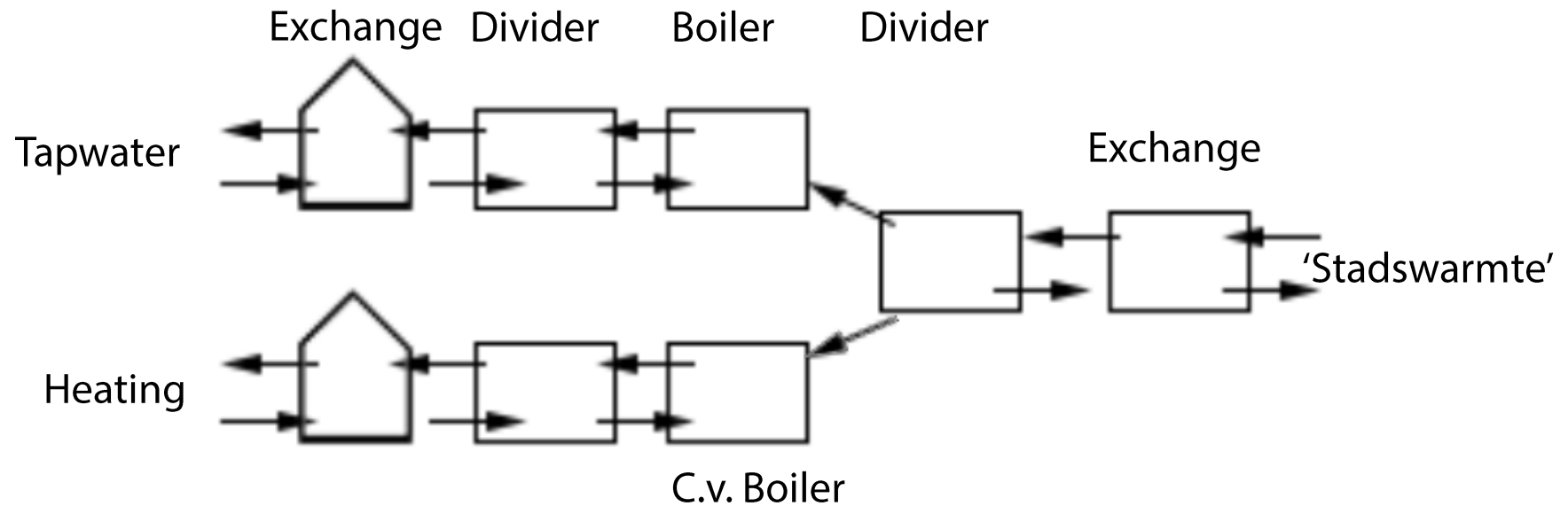
Design

Construction

Numbers

Conclusion

Heating Concept



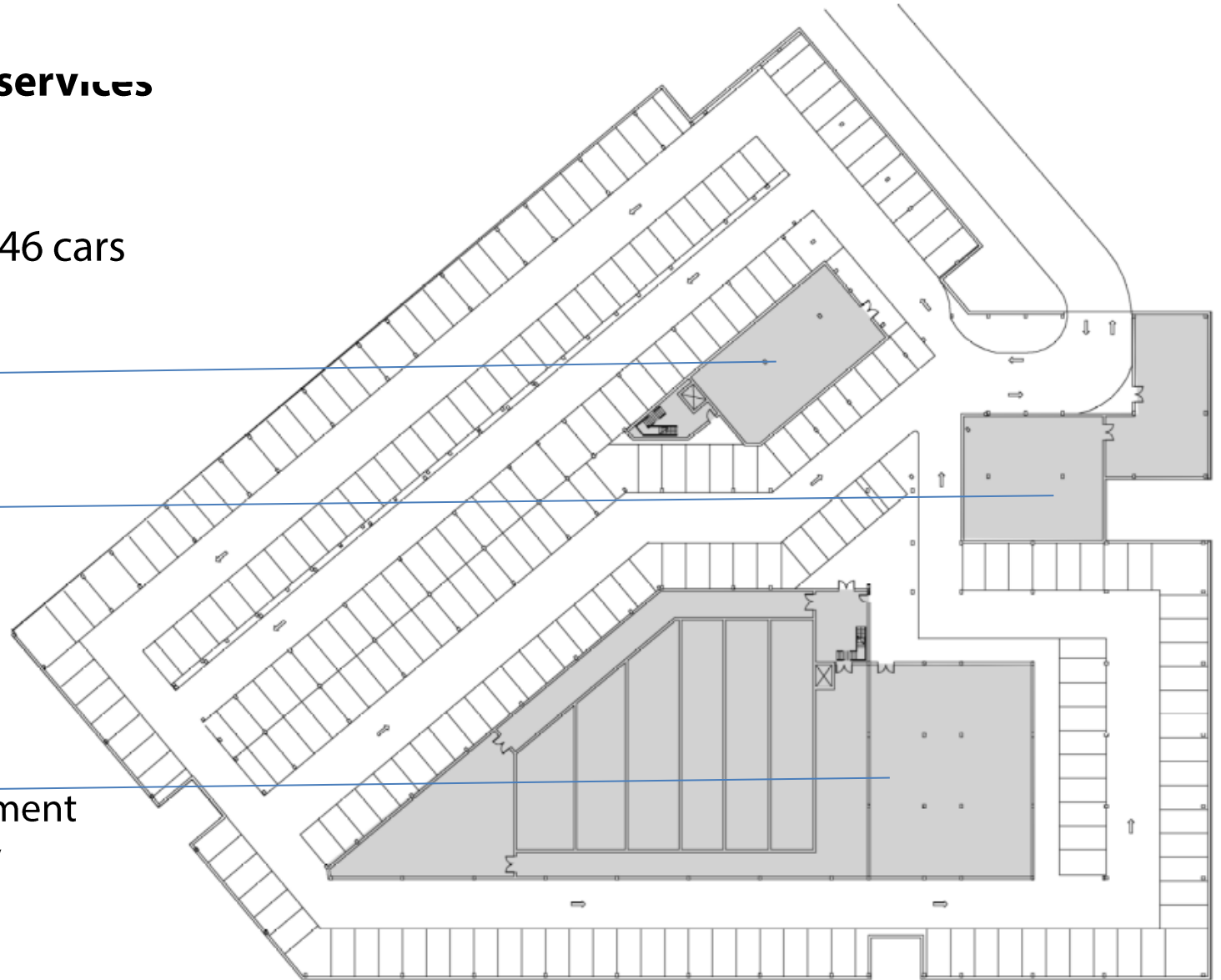
Parking and services

Parking : 246 cars

Electrical

Water

Water Treatment
Black & grey



Capacity

Vertical flow wetlands 3,0 m² p.e

m²: 550 total capacity: 180p.e.



Living machine 0,48 m² p.e.

m²: 110 total capacity: 230 p.e.



Organica Water System 0,17 m² p.e

m²: 400 Total capacity: 2352 p.e.



TOTAL: 2765 p.e.

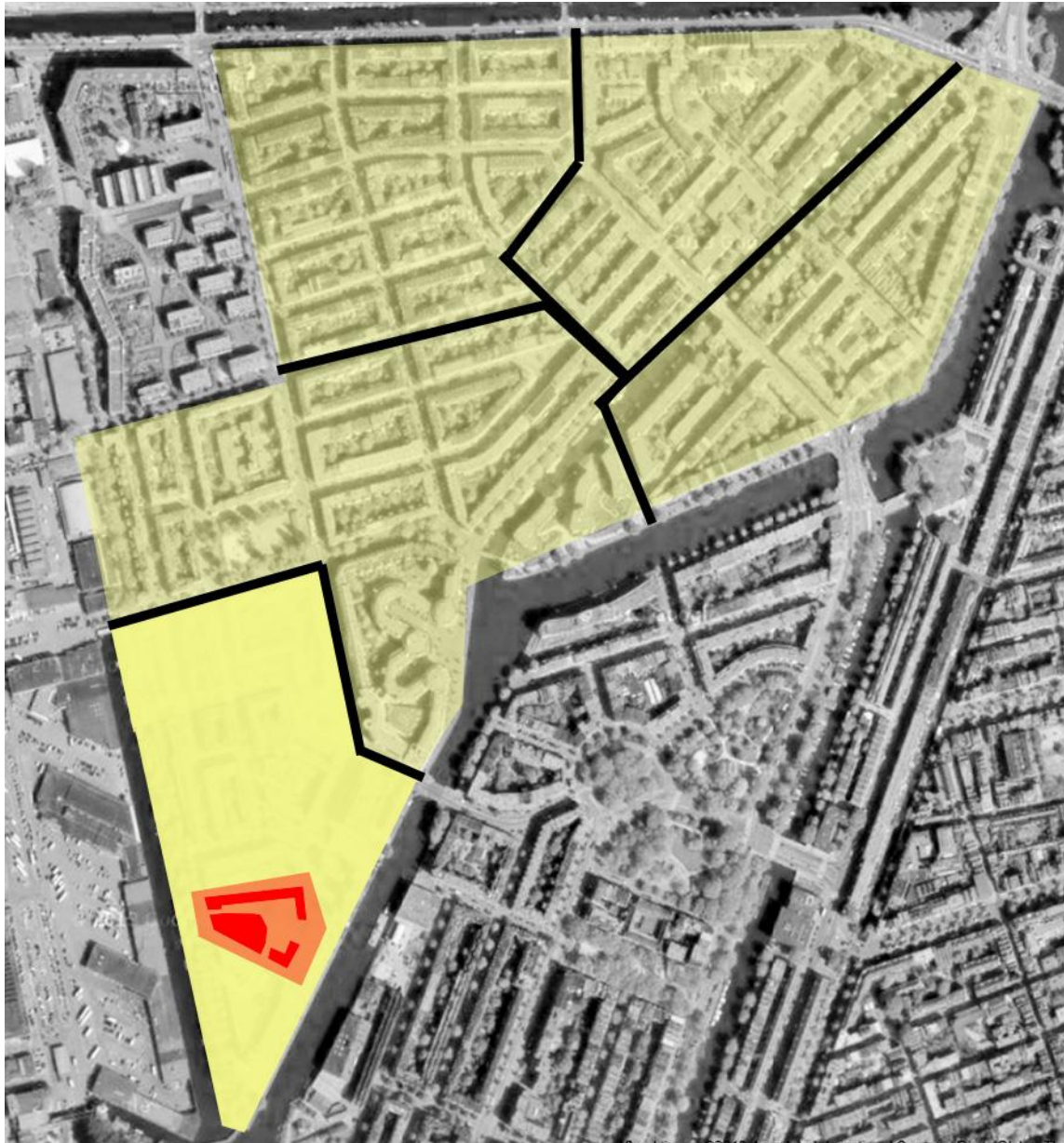
Capacity

Court:	30 dwellings	60	p.e.
Kas :	82 dwellings	164	p.e.
Passage :	75 dwellings	185	p.e.

Total:	187 dwellings	409	p.e.
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Capacity:	2762	p.e.
Required:	409	p.e.

Total: + **2353 P.e.**



Impact

Staatliedenbuurt:
12.050 inhabitants

5-6 x total Capacity

Conclusion

- A project with 180 Dwellings
- Water treatment systems integrated in plan. Diversity in the combination of dwellings and watertreatment systems.
- Capacity high enough for serving the close neighbourhood.

