SYNERGISING ARCHITECTURE:

Integrating Food System Processes with Urban Functions Towards Liveable and Sustainable Agri-Food Business Parks in Westland

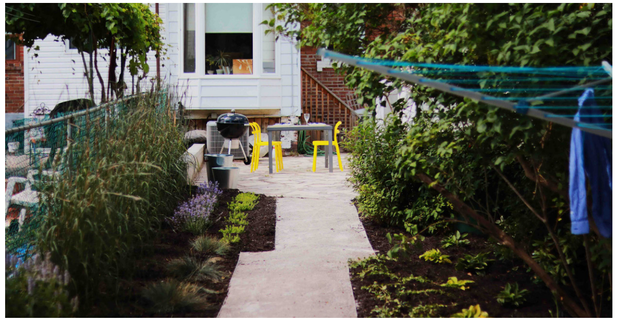
Daniel Bolesław Sobieraj | 5088917 | City of the Future Graduation Studio | AR3CS100
P5 Presentation | 09.07.2021

Main Mentor: Dr.ir. Roberto Cavallo
Research Mentor: Dr. Alex Wandl
Building Technology Mentor: Mauro Parravicini

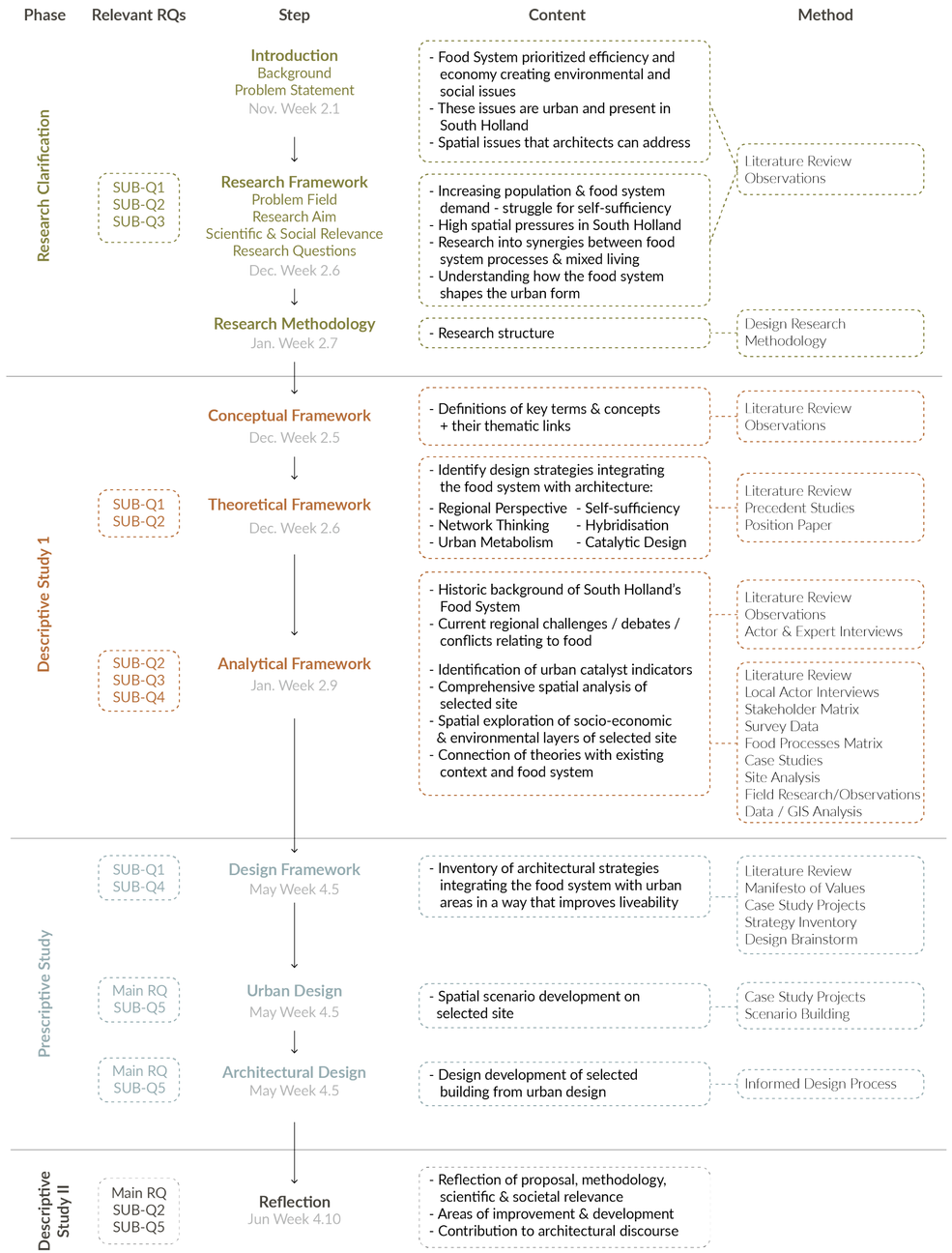
FASCINATION OF FOOD

Personal Interest:

- Lived in Toronto, Vancouver Island, Paris, Delft, and as a farmer in Australia
- Grew my own squashes, cucumbers, cayenne peppers, herbs, and a watermelon in Delft
- Commissioned to design and build productive gardens



Source: Author


Phase
Relevant RQs
Step
Content
Method
Research Clarification
Introduction
Background
Problem Statement
Nov. Week 2.1
- Food System prioritized efficiency and economy creating environmental and social issues
- These issues are urban and present in South Holland
- Spatial issues that architects can address
Literature Review
Observations
SUB-Q1
SUB-Q2
SUB-Q3
Research Framework
Problem Field
Research Aim
Scientific & Social Relevance
Research Questions
Dec. Week 2.6
- Increasing population & food system demand - struggle for self-sufficiency
- High spatial pressures in South Holland
- Research into synergies between food system processes & mixed living
- Understanding how the food system shapes the urban form
Research Methodology
Jan. Week 2.7
- Research structure
Design Research Methodology
Descriptive Study 1
Conceptual Framework
Dec. Week 2.5
- Definitions of key terms & concepts + their thematic links
Literature Review
Observations
SUB-Q1
SUB-Q2
Theoretical Framework
Dec. Week 2.6
- Identify design strategies integrating the food system with architecture:
- Regional Perspective
- Network Thinking
- Urban Metabolism
- Self-sufficiency
- Hybridisation
- Catalytic Design
Literature Review
Precedent Studies
Position Paper
SUB-Q2
SUB-Q3
SUB-Q4
Analytical Framework
Jan. Week 2.9
- Historic background of South Holland's Food System
- Current regional challenges / debates / conflicts relating to food
Literature Review
Observations
Actor & Expert Interviews
- Identification of urban catalyst indicators
- Comprehensive spatial analysis of selected site
- Spatial exploration of socio-economic & environmental layers of selected site
- Connection of theories with existing context and food system
Literature Review
Local Actor Interviews
Stakeholder Matrix
Survey Data
Food Processes Matrix
Case Studies
Site Analysis
Field Research/Observations
Data / GIS Analysis
Prescriptive Study
SUB-Q1
SUB-Q4
Design Framework
May Week 4.5
- Inventory of architectural strategies integrating the food system with urban areas in a way that improves liveability
Literature Review
Manifesto of Values
Case Study Projects
Strategy Inventory
Design Brainstorm
Main RQ
SUB-Q5
Urban Design
May Week 4.5
- Spatial scenario development on selected site
Case Study Projects
Scenario Building
Main RQ
SUB-Q5
Architectural Design
May Week 4.5
- Design development of selected building from urban design
Informed Design Process
Descriptive Study II
Main RQ
SUB-Q2
SUB-Q5
Reflection
Jun Week 4.10
- Reflection of proposal, methodology, scientific & societal relevance
- Areas of improvement & development
- Contribution to architectural discourse

PROBLEM FIELD

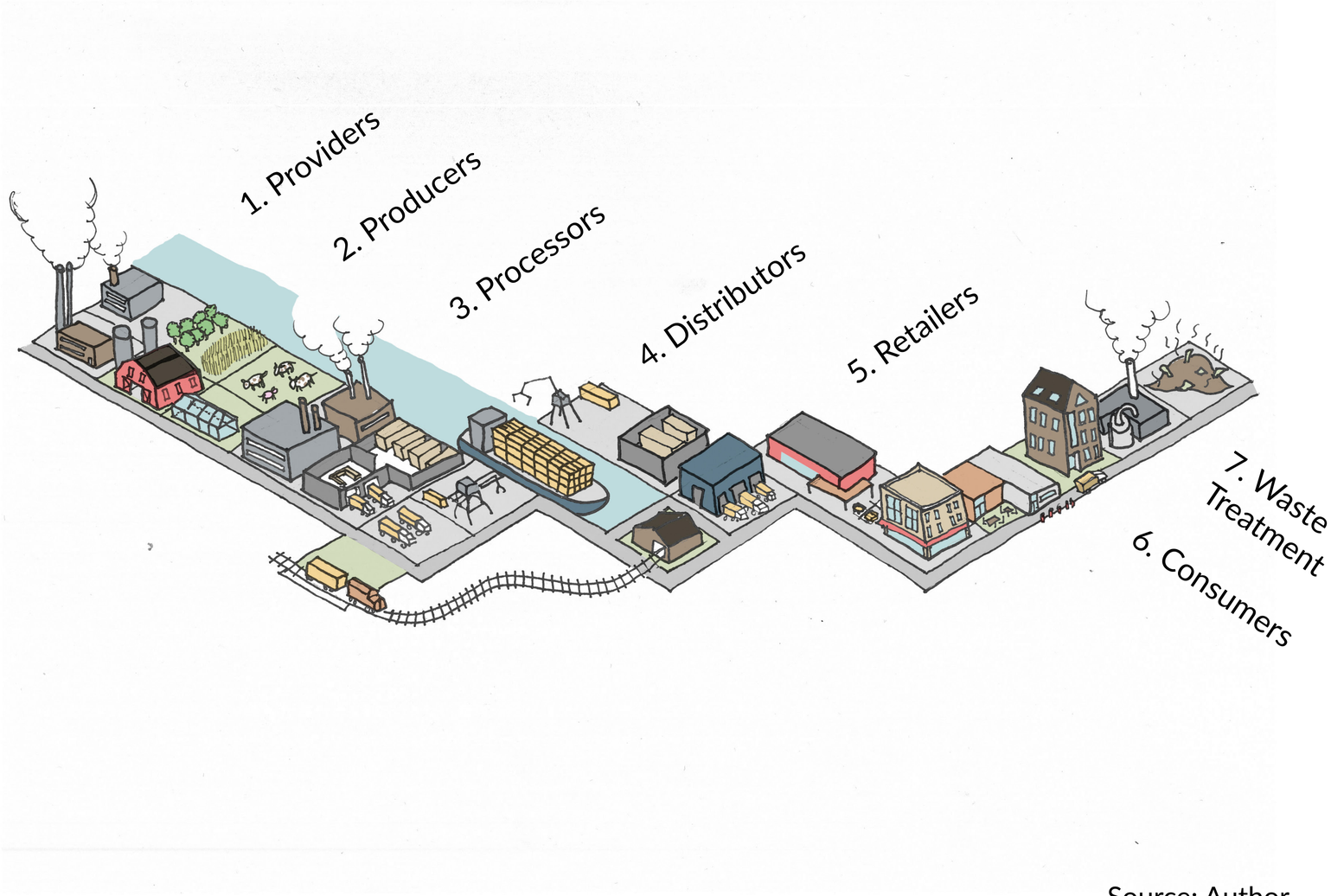
PROBLEM FIELD

Food System:

- All processes & infrastructure associated with feeding a population

Importance:

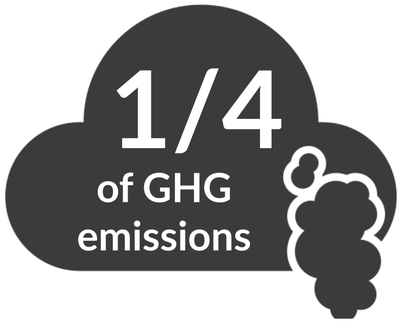
- Important driver in shaping our metropolitan regions
- Development prioritizes economy & efficiency
  - Creating social & environmental problems



Source: Author

PROBLEM FIELD

Current Food System - Environmental and Social Issues



Agri-food practices contribute to

20%

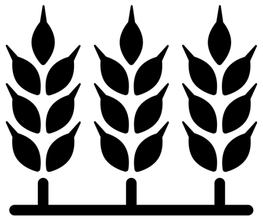
of air pollution

1/3

of all edible food is uneaten

>50%

of plant-derived protein

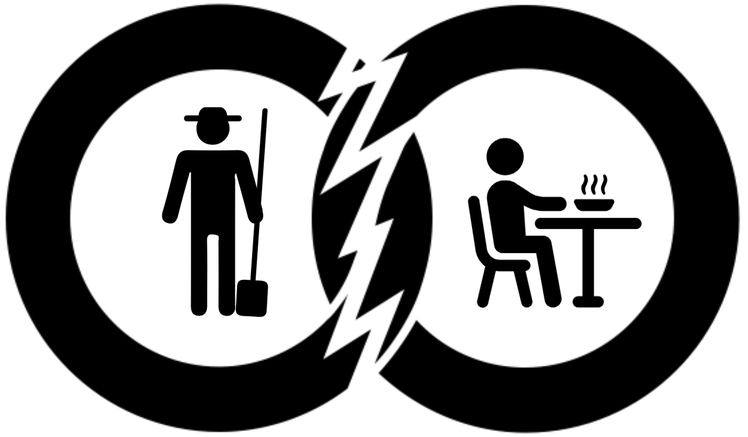


grown from

3

crops

Info Source: Ellen MacArthur Foundation: Cities and Circular Economy for Food



By 2050,

5 million

lives coud be lost due to current food production methods

Info Source: Ellen MacArthur Foundation: Cities and Circular Economy for Food

PROBLEM FIELD

Food Absent in Urbanism

(I) Food Issues Seen as Rural Concern

- Food supply chains limited to rural development studies
- Do not consider the city, where demand is greatest

(II) Food Security Seen as Rural Failure

- Not as an urban issue of availability, affordability, and accessibility

(III) Food Policy Promoted as Non-Urban Strategy

- Constrained to rural areas
- Delaying food research in sustainable urban development

North-Western Border of Rotterdam. Source: Google Earth

PROBLEM FIELD

Food as a Rural-Urban Concern

(I) Many urban issues are food-related

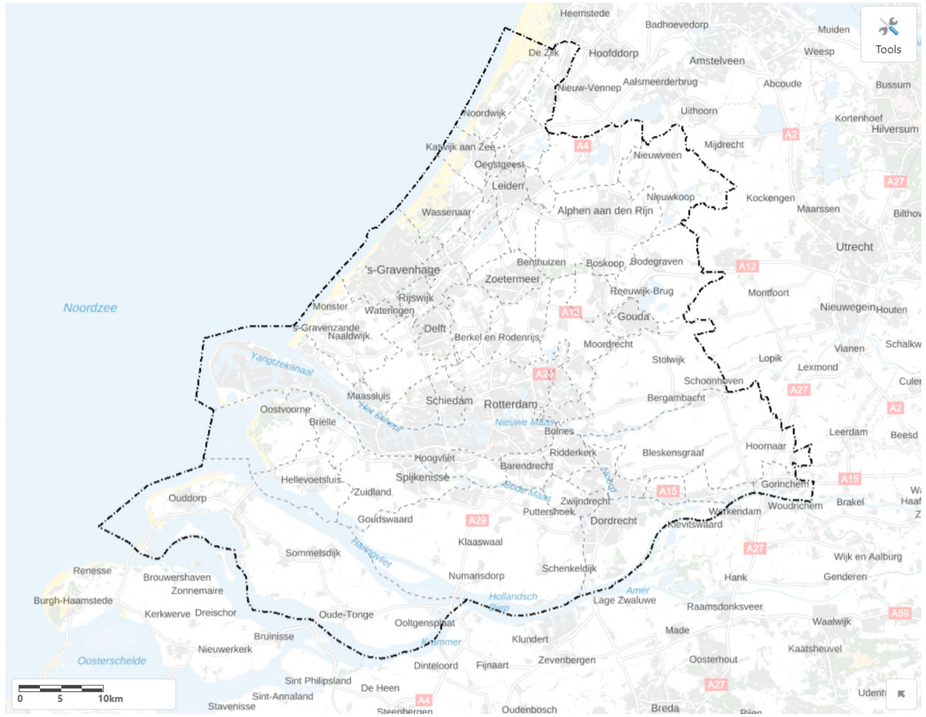
- Population Growth & Self-Sufficiency
- Health & Social Inequality
- Urbanization & Sprawl
- Environmental Degradation & Biodiversity
- Climate Change
- Energy, Resource Use, & Waste

(II) These issues are spatial

- Matters architects can address

(III) Relevant to many urban areas around the world

- Metropolitan Region of South Holland
  - Shaped by the agri-food industry



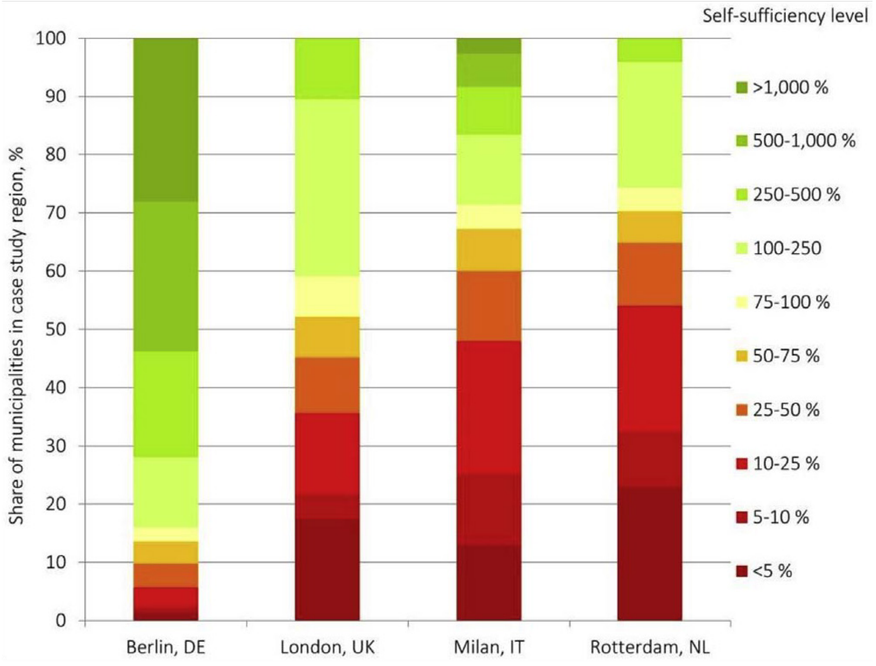
Source: Provincie Zuid Holland

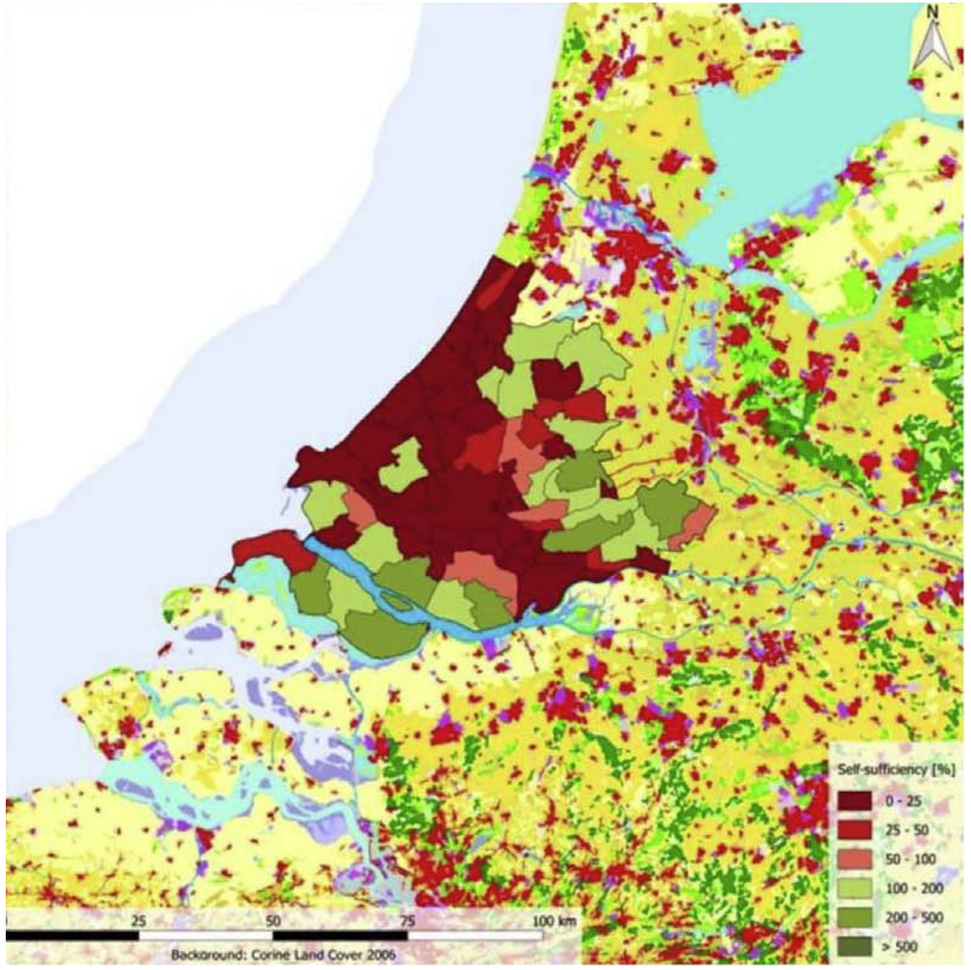
Source: Author

PROBLEM FIELD

Lack of Self-Sufficiency

- Majority of municipalities have a self-sufficiency level of below 50%
- Food production in Dutch cities can only meet 0.0018% of demand
- Continuous food stress to be expected
  - +2 billion people by 2050, 68% living in cities (UN DESA)





Source: Zasada (2019) Food beyond the city – Analysing foodsheds and self-sufficiency for different food system scenarios in European metropolitan regions

PROBLEM FIELD

Lack of Self-Sufficiency

(I) Large Diet-Related Area Demand

(II) Specialised Market-Driven Food System

(III) Urban Sprawl

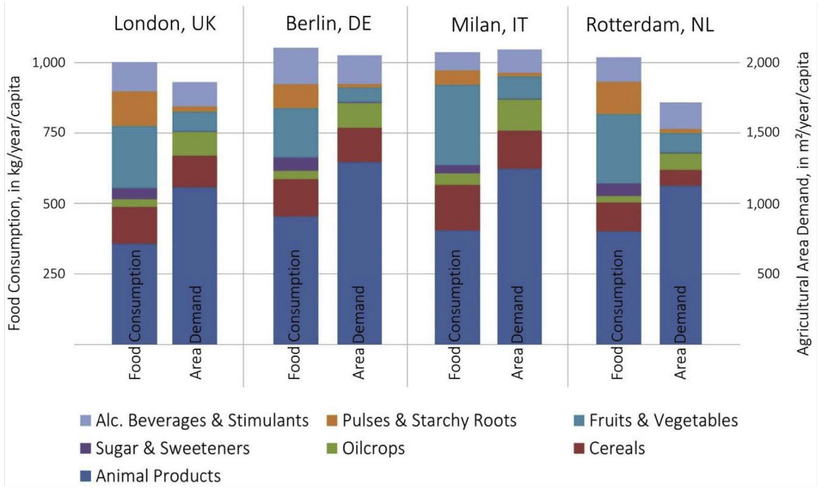
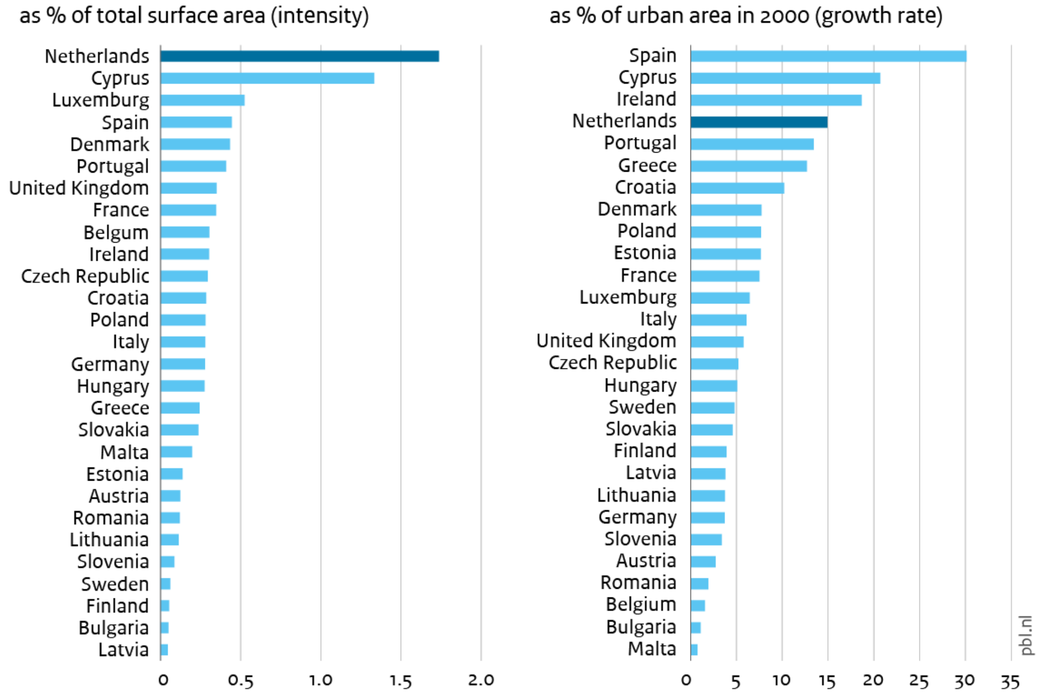


Fig. 2. Annual food consumption and associated agricultural area demand for the baseline scenario Base15, subdivided into food categories.

Urban development between 2000 and 2018



Source: Corine Land Cover, ESPON

NB: Corine Land Cover registers land cover units from a minimum size of 25 ha. This leads to an underrepresentation of small-scale developments in the data.

Source:

Zasada (2019) Food beyond the city – Analysing foodsheds and self-sufficiency for different food system scenarios in European metropolitan regions

Source: Evers, D. & van Schie, M “Putting Dutch ‘Urban Sprawl’ in a European Perspective.” PBL

PROBLEM FIELD

Low-Quality Areas Near Agri-Business Parks

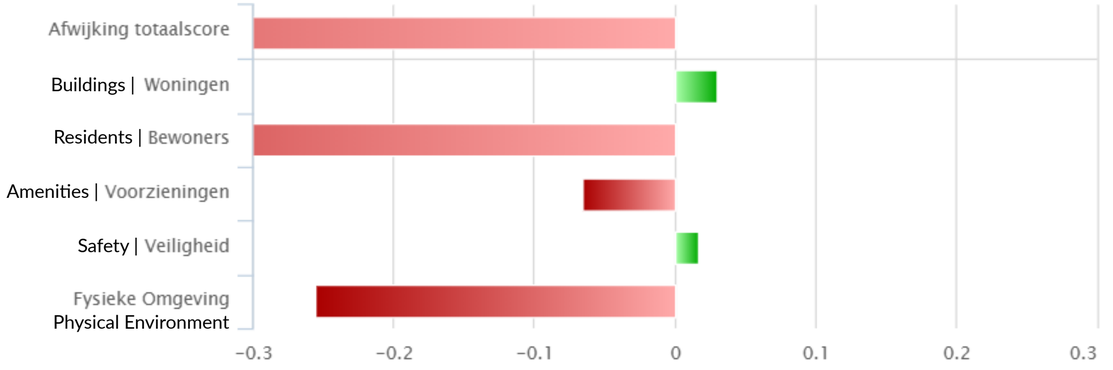
- Repercussion of spatial competition

Liveability situation - Neighborhoods - 2018

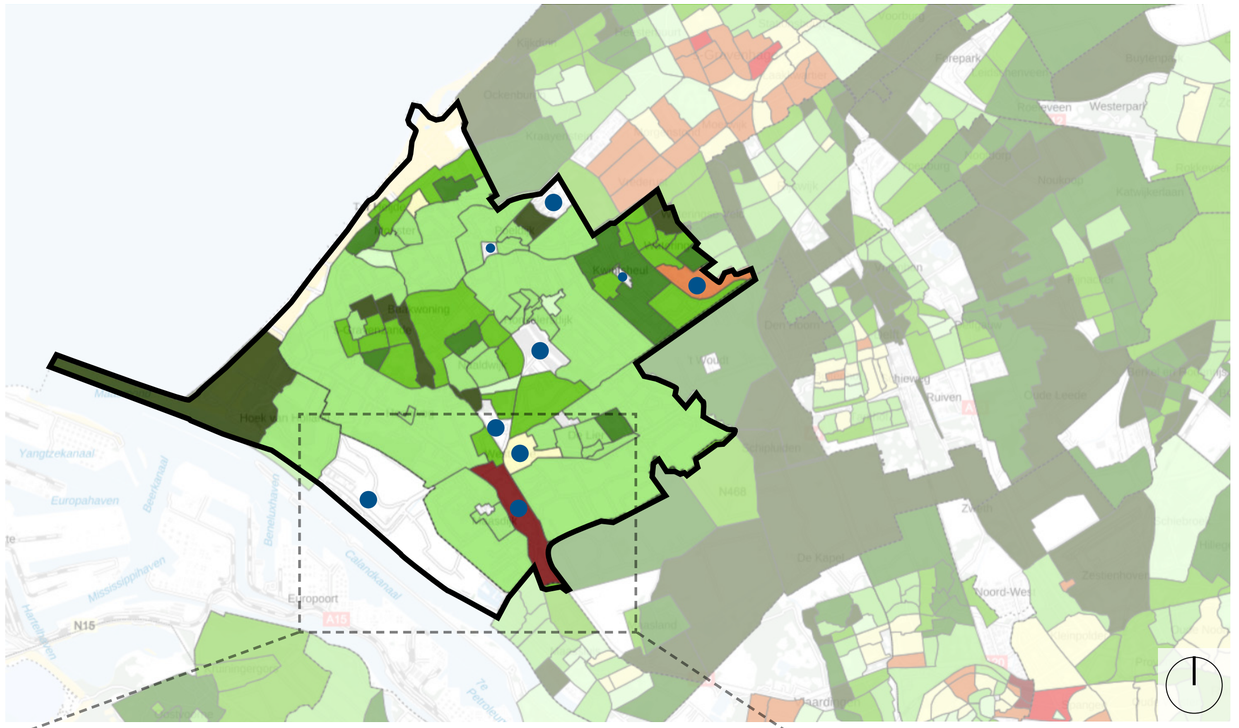
Area name: **Honderland & Coldenhove Business Park**

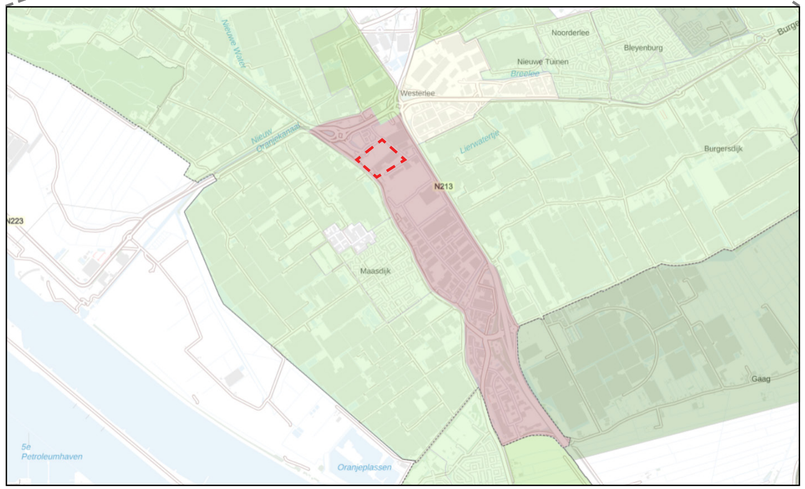
Township	Westland
Period	2018
Liveability score	Very insufficient

Deviation total score compared to the rest of the country, and the contribution to the deviation per dimension.
Select the individual columns for detailed information.



Source: www.leefbaarometer.nl





Livability situation, Neighborhoods, 2018
Municipal boundaries
2018

- Zeer onvoldoende
- Ruim onvoldoende
- Onvoldoende
- Zwak
- Voldoende
- Ruim voldoende
- Goed
- Zeer goed
- Uitstekend

RESEARCH AIM, RELEVANCE, & QUESTIONS

Problem Statement

- Westland experiencing intense spatial competition
- This competition is creating areas of low-liveability near agri-food business parks
- Food-related issues are multi-faceted matters architects can address
- Research is required on integrating the food system with urban areas in a liveable and sustainable way
- Focusing on spatial synergies that address multiple issues

Research Aim

Better understand how the **synergistic integration** of **food system** processes with **urban** functions through **architecture** can create a more **liveable** and **sustainable** development of **agri-food business parks** in the **Westland**.

Relevance

Scientific Relevance

- Research of urban agriculture focused **exclusively on food production**
  - Proposals decentralise food system
  - Create small farms that fall into the “local trap”
  - Assume local is always sustainable
- Barrs (2002) **recommends to explore synergies** between food production with other food system processes
- This research takes it **beyond the food system** and focuses on synergies with urban functions

Relevance

Social and Practical Relevance

- Previous research saw urbanisation and agriculture as spatial competitors
- Interest in symbiosis between agriculture and urban growth
- Public increasingly engaged in local and urban agriculture
- Research and design of urban agriculture focused on
  - Uderused brownfield sites
  - Existing buildings
  - Greenfields
- Urban agriculture has not considered its effect on the urban scale
- This project aims to understand the food system's effects on the urban form and its liveable and sustainable development

MAIN RESEARCH QUESTION

HOW CAN THE **SYNERGISTIC INTEGRATION** OF **FOOD SYSTEM PROCESSES** WITH **URBAN FUNCTIONS** THROUGH **ARCHITECTURE** CREATE A MORE **LIVEABLE** AND **SUSTAINABLE** DEVELOPMENT OF **AGRI-FOOD BUSINESS PARKS** IN THE **WESTLAND** REGION?

SUBSIDIARY RESEARCH QUESTIONS

1. WHAT ARE THE **KEY STRATEGIES** FOR **INTEGRATING FOOD SYSTEM** PROCESSES WITH **URBAN AREAS**?

2. WHAT ARE THE **MATTERS** THAT **ARCHITECTS CAN** HAVE AN **IMPACT** ON IN THE **FOOD SYSTEM**?

3. WHAT **SPATIAL QUALITIES** HAS THE **FOOD SYSTEM SHAPED** IN **WESTLAND**?

4. WHAT **SPATIAL QUALITIES ARE MISSING** OR NEED TO BE RESTORED **TO IMPROVE LIVEABILITY** AROUND **AGRI-FOOD BUSINESS PARKS** IN WESTLAND?

5. HOW CAN AN **ARCHITECTURAL PROPOSAL** SERVE AS A **CATALYST** TO **DISRUPT** THE CURRENT **URBAN DEVELOPMENT** TRENDS AND CONTRIBUTE **TOWARDS** A MORE **LIVEABLE AND SUSTAINABLE** DEVELOPMENT OF **WESTLAND**?

METHODOLOGICAL FRAMEWORK

Methodological Framework

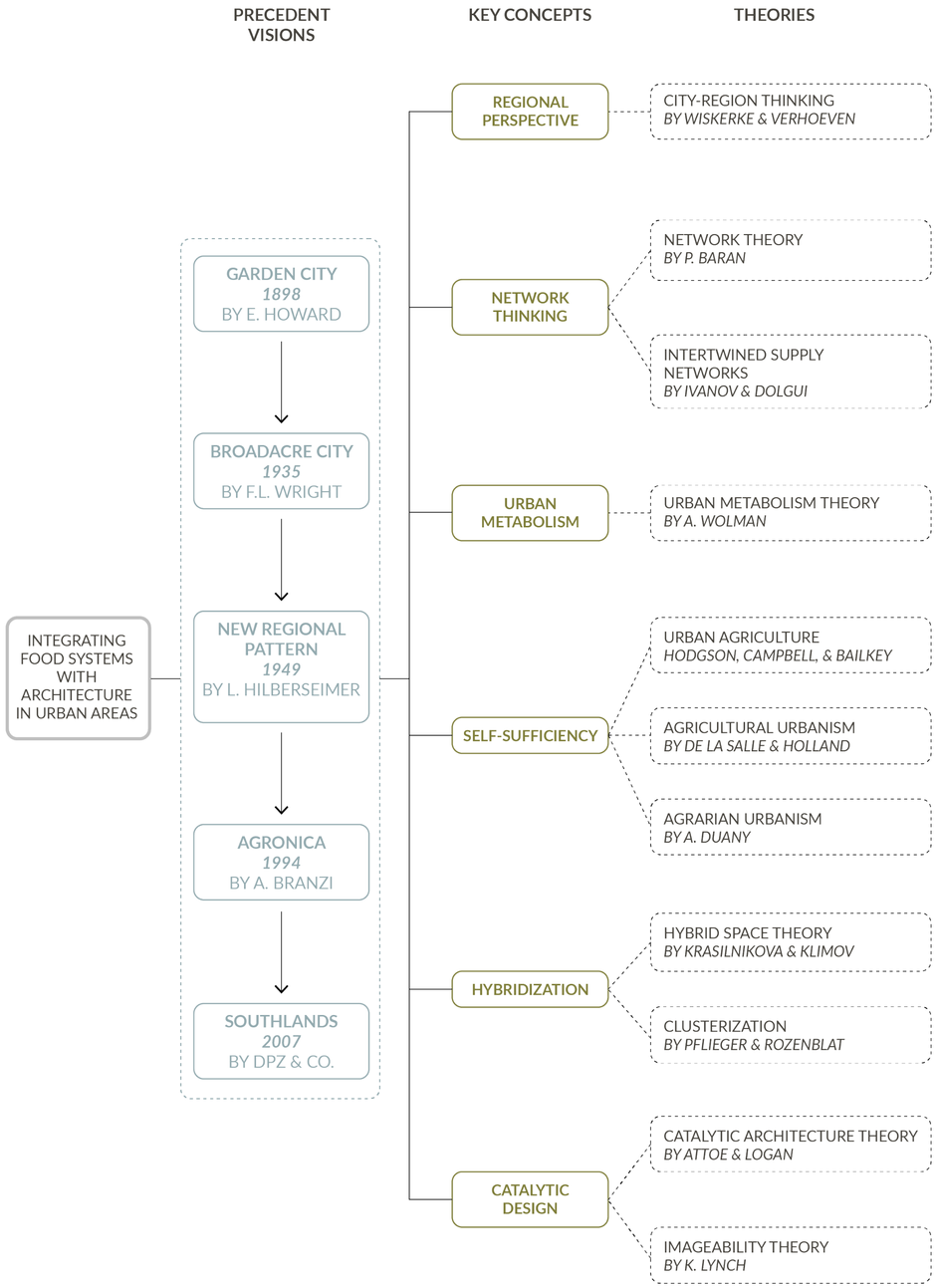
Primary Research Question

How can the synergistic integration of food system processes with urban functions through architecture create a more liveable and sustainable development of agri-food business parks in the Westland region?

Aspect / Scale	Subsidiary Questions	Objectives	Primary Methods	Secondary Methods	Outcomes
Design Approach Building / City	SUB-Q1 **What are the key strategies for integrating food system processes with urban areas?**	Develop understanding of past work and strategies that aimed to integrate the food system with urban areas through architecture	Theoretical & Analytical Framing Literature review of theories on integrating food system processes with urban areas	Analytical Framing Literature review of past projects that integrated the food system with architecture	List of key strategies to influence design framework
Scope Building / City / Region	SUB-Q2 **What are the matters that architects can have an impact on in the food system?**	Define the architect's role and influential scope in the food system	Research & Theoretical Framing Literature review of the role of spatial designers in the food system	Analytical Framing Literature review of past projects that integrated the food system with architecture	Position paper reviewing past projects integrating architecture and the food system, key concepts, and the architect's role
Context Site / City	SUB-Q3 **What spatial qualities has the food system shaped in Westland?**	Analyze the selected site and inform the actor interview questions	Analytical Framing Field research, observations, cartography, GIS and Data analysis, and literature review	Analytical Framing Review of literature on the site, and actor interviews	Collection of maps, drawings, photographs, and video of past and current spatial conditions of the site.
Context Site	SUB-Q4 **What spatial qualities are missing or need to be restored to improve liveability around agri-food business parks in Westland?**	Identify site-specific needs of local actors	Analytical Framing Actor interviews	Analytical Framing Review of relevant survey data and literature	Prioritized list of needs of various local actors comparing similarities and differences.
Design Proposal Building / City / Region	SUB-Q5 **How can an architectural design, part of a network of interventions, integrate food processes within a specific urban site while addressing the needs of various actors?**	Develop a set of strategies and tools that will improve liveability around agri-food business parks Create, analyze, and visualize a design that proposes alternative ways of merging food system processes & architecture in cities.	Architectural Design Proposal Research by design.	Architectural Strategies Literature and precedent studies	Toolbox of design strategies and spatial relationships to inform the design Architectural design intervention proposal and recommendations for future research and development

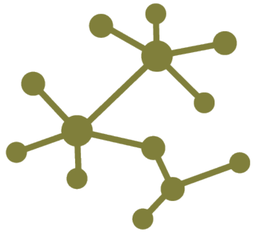
THEORETICAL FRAMEWORK

Theoretical Framework

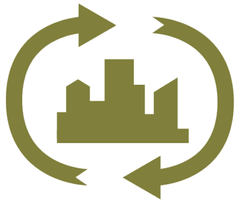


KEY STRATEGIES OF PAST PROJECTS INTEGRATING FOOD SYSTEM FUNCTIONS WITH URBAN AREAS

REGIONAL PERSPECTIVE



NETWORKS AND INFRASTRUCTURE



URBAN METABOLISM

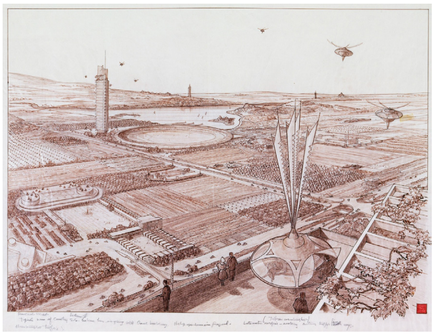
SELF-SUFFICIENCY

HYBRIDISATION AND CLUSTERISATION

CATALYTIC DESIGN

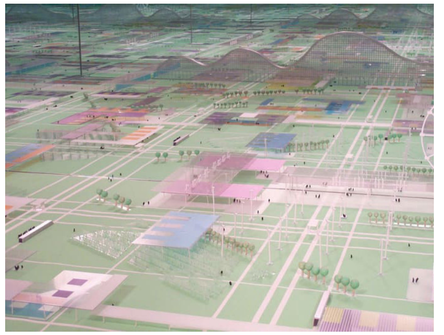
Theoretical Framework

GARDEN CITY
1898
BY E. HOWARD

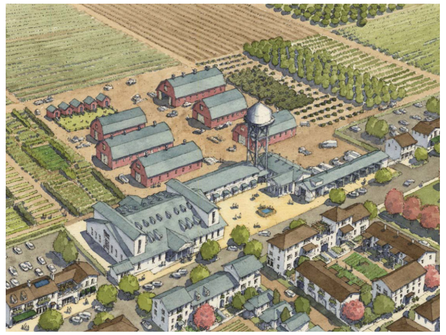


BROADACRE CITY
1935
BY F.L. WRIGHT

NEW REGIONAL PATTERN
1949
BY L. HILBERSEIMER



AGRONICA
1994
BY A. BRANZI



SOUTHLANDS
2007
BY DPZ & CO.

Theoretical Framework

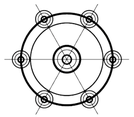
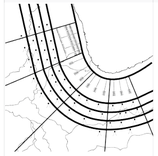
PROJECT	REGIONAL PERSPECTIVE	NETWORKS AND INFRASTRUCTURE	URBAN METABOLISM	SELF-SUFFICIENCY	HYBRIDISATION AND CLUSTERISATION	CATALYTIC DESIGN	PROJECT STATUS
 *GARDEN CITY* by Ebenezer Howard (1898)	●	●	●	●	●		Realised in Letchworth and Welwyn Garden Cities
 *BROADACRE CITY* by Frank Lloyd Wright (1934)	●	●	●	●	●	●	Partially realised in the construction of 140 individual houses, but not on large scale
 *THE NEW REGIONAL PATTERN* by Ludwig Hilberseimer (1949)	●	●	●	●	●		Not realised
 *AGRONICA* by Andrea Branzi (1995)	●	●		●	●	●	Not realised
 *THE SOUTHLANDS* by Duany Plater-Zyberk (2007)	●	●	●	●	●	●	Realised in a modified version of orginal plan

Table 1. Project implementation of key concepts for food system integration with urban areas. Source: Author.

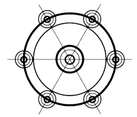
PROJECT	REGIONAL PERSPECTIVE	NETWORKS AND INFRASTRUCTURE
 *GARDEN CITY* by Ebenezer Howard (1898)	• Synergy between urban and rural spaces and resources • Garden Cities located within belts of agricultural and natural land	• Network of decentralised Garden Cities • Transportation networks to connect Garden Cities into one large community • Open green spaces to create social networks
 *BROADACRE CITY* by Frank Lloyd Wright (1934)	• Urban patchwork of different densities and functions that flow accross regional agicultural landscapes • Never illustrated how scheme would integrate into larger regional context	• Decentralised city with use of new technology and transportation • Decentralisation of government and resources, towards a more democratic city • Infrastructure as an integral aesthetic and function • Infrastructure as a means of connecting urban functions with agriculutral areas
 *THE NEW REGIONAL PATTERN* by Ludwig Hilberseimer (1949)	• Decentralised urban development informed by regional environment instead of being applied within an abstract grid • Integrating regional landscapes, agriculture, and infrastructures with rural and urban functions • Taking influence from natural environmental and geographical features	• Integrated landscape with infrastructure • Decentralised distribution of infrastructure, specifically transport networks • Better connection between urban and rural areas through transport systems • Decentralisation of urban form to create synergy between agriculture and industry • Decentralisation of government and industry to provide autonomy and self-sufficiency
 *AGRONICA* by Andrea Branzi (1995)	• "Weak Urbanisation" where the urban form is open and dynamic • Borders between urban and agricultural rural areas are removed • Continuous agriculture park spreading accross region	• Urban areas decentralised, low-density, and widespread • Landscape covered by columns that intertwine different infrastructural systems • Buildings and infrastructure are made adaptable and demountable on the flexible landscape • Infrastructure not a barrier
 *THE SOUTHLANDS* by Duany Plater-Zyberk (2007)	• Master plan with compact urban area to leave majority for agricultural and natural use • "Corrugated" border between rural and urban areas designed to intertwine regional agriculture with urban functions	• Agricultural infrastructure integrated into urban fabric and made accessible and visible to the public • Pedestrian and cycle networks prioritised • Incorporation of a blue-green network for water management and biodiversity • Market square as a hub for social, ecological, economic, and resource networks

Table 2. Project implementation of regional perspective and networks and infrastructure concepts. Source: Author.

Theoretical Framework

Fig. 30. Regional perspective and networks and infrastructure spatial design strategies. Source: Author.

Fig. 31. Urban metabolism spatial design strategies. Source: Author.

ANALYTICAL FRAMEWORK

Analytical Framework

Honderdland Business Park, Maasdijk

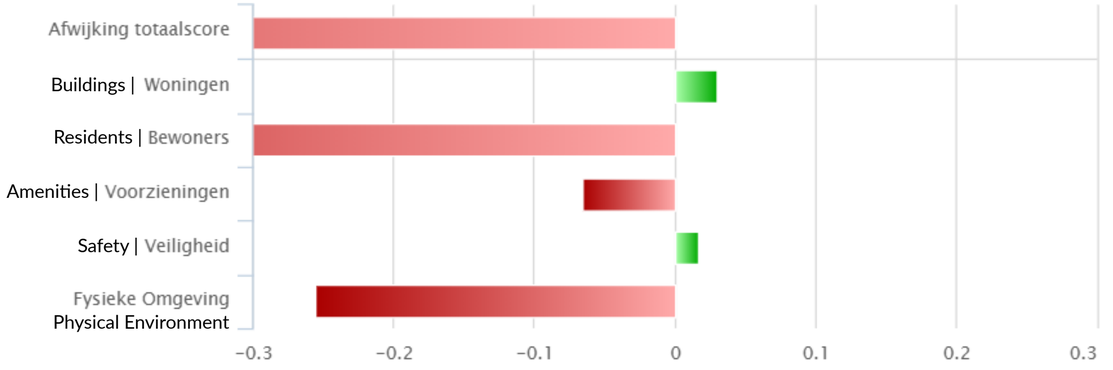
- Lowest liveability score in Westland

Liveability situation - Neighborhoods - 2018

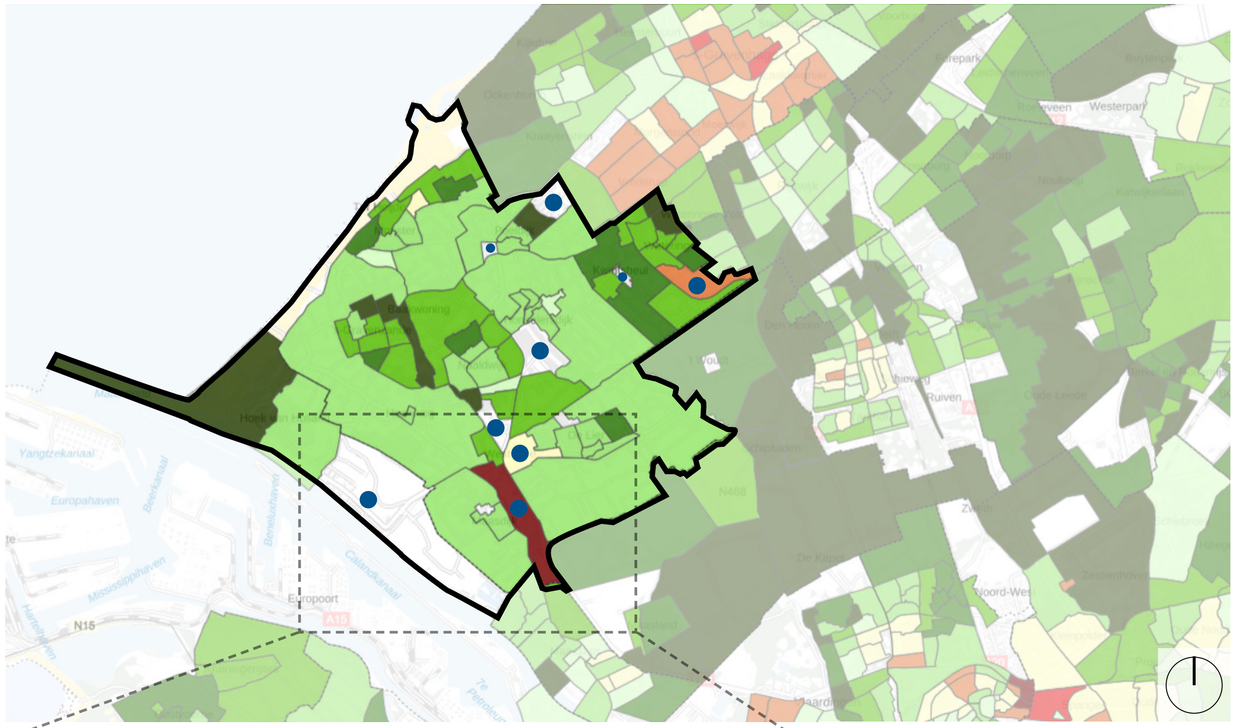
Area name: **Honderland & Coldenhove Business Park**

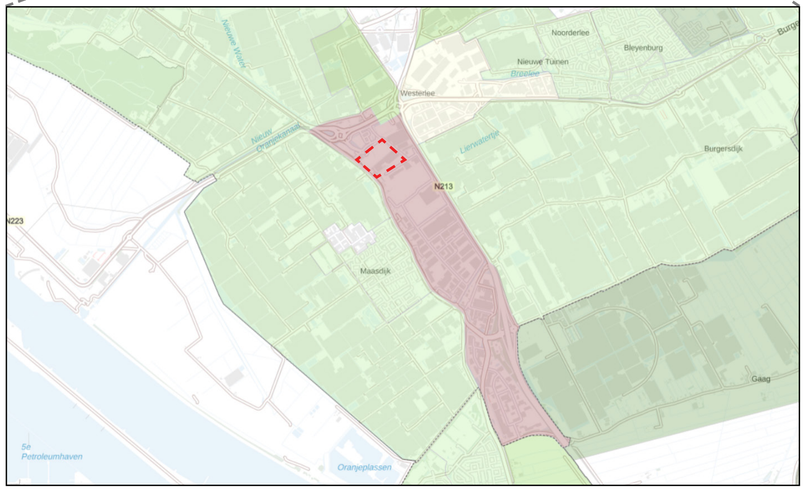
Township	Westland
Period	2018
Liveability score	Very insufficient

Deviation total score compared to the rest of the country, and the contribution to the deviation per dimension.
Select the individual columns for detailed information.



Source: www.leefbaarometer.nl



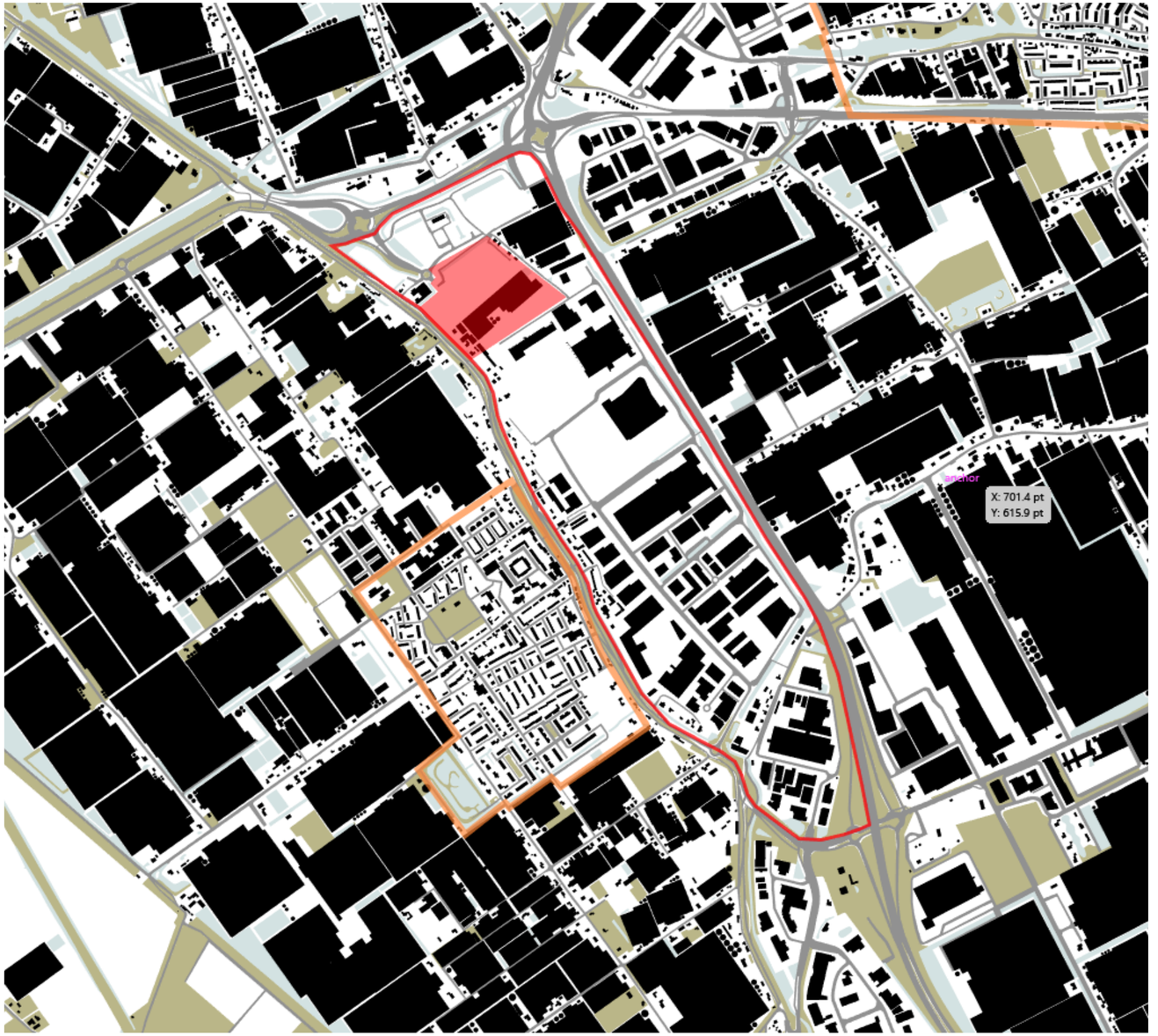


Livability situation, Neighborhoods, 2018
Municipal boundaries
2018

- Zeer onvoldoende
- Ruim onvoldoende
- Onvoldoende
- Zwak
- Voldoende
- Ruim voldoende
- Goed
- Zeer goed
- Uitstekend

Intersection Between 3 Towns

In Between:
- Naldwijk (North)
- De Lier (East)
- Maasdijk (West)



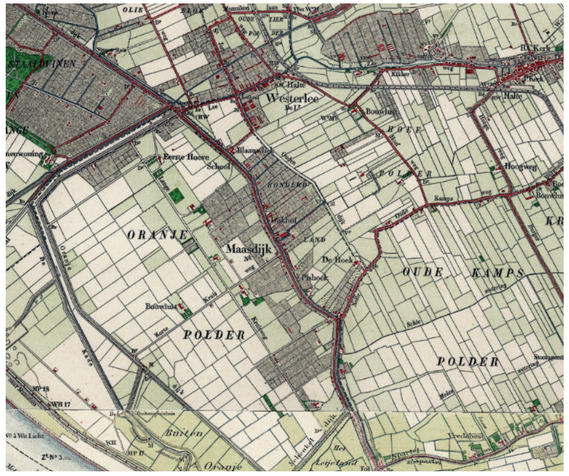
Analytical Framework

Historical Photos

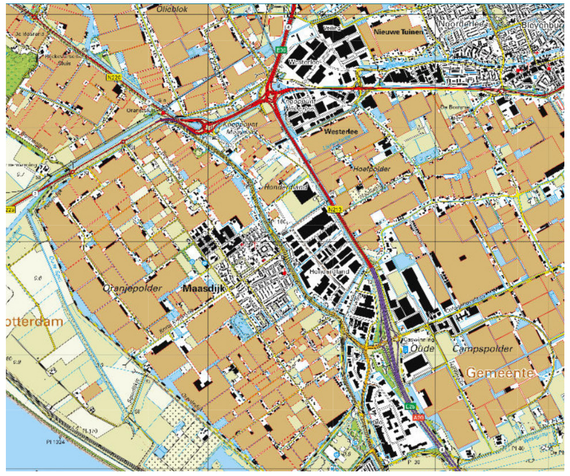
Once had a high degree of liveability

- Sense of community
- Apparent traditions and character
- Surrounded by green areas

Lost due to the area's industrialisation.



Source: Honderdland 1915 | www.topotijdreis.nl



Source: Honderdland 2019 | www.topotijdreis.nl

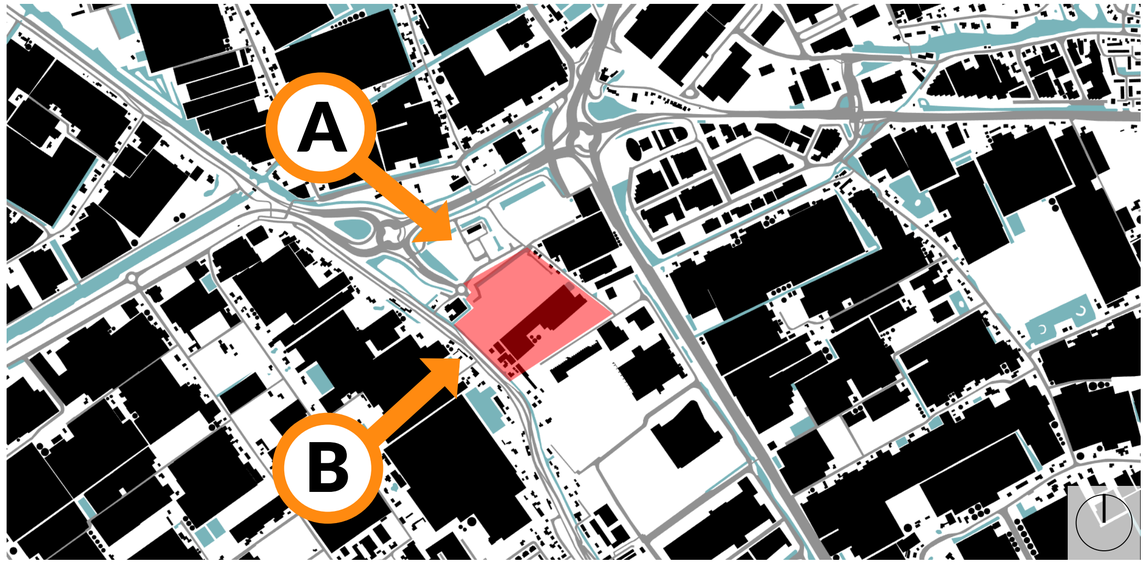
Photos of Maasdijk in the late 20th century showing a transition into a larger industrial food-producing landscape.
From: Gementee Westerland.

Analytical Framework

Honderdland Business Park

Current Development

- Area in the midst of large development
  - New roads
  - Large food logistic centres
  - Demolition of greenhouses



Drone Viewpoints. Source: Author.

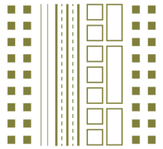
Drone Shot A - Honderdland looking South. Source: Author.

Drone Shot B - Honderdland looking North-East. Source: Author.

Identification of Spatial Issues

Rigid and Fragmented Urbanism

- 7 qualities contributing to low-liveability



Fragmented Mono-Functional Zoning

Isolated and Limited Greenspaces

Fixed Island Urbanism

Repulsive Urban Development

Disconnected Communities

Disproportionate and Disconnected Scales

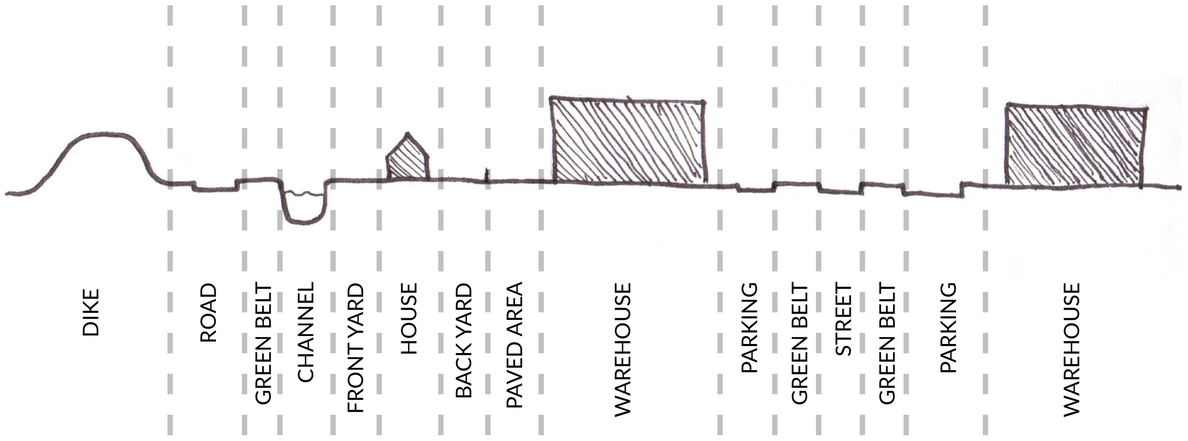
Identity Disconnected from Place

Analytical Framework

(1) Fragmented Mono-Functional Zoning

Hard Edges

- Layers of Single Use Zoning
- Impermeable borders
- Separation by roads, dikes, other infrastructure
- Lack of diversity and activity
- Slow traffic has low-priority



TYPICAL AREA SECTION. Source: Author.

Layers of urban fabric. Source: Google Earth.

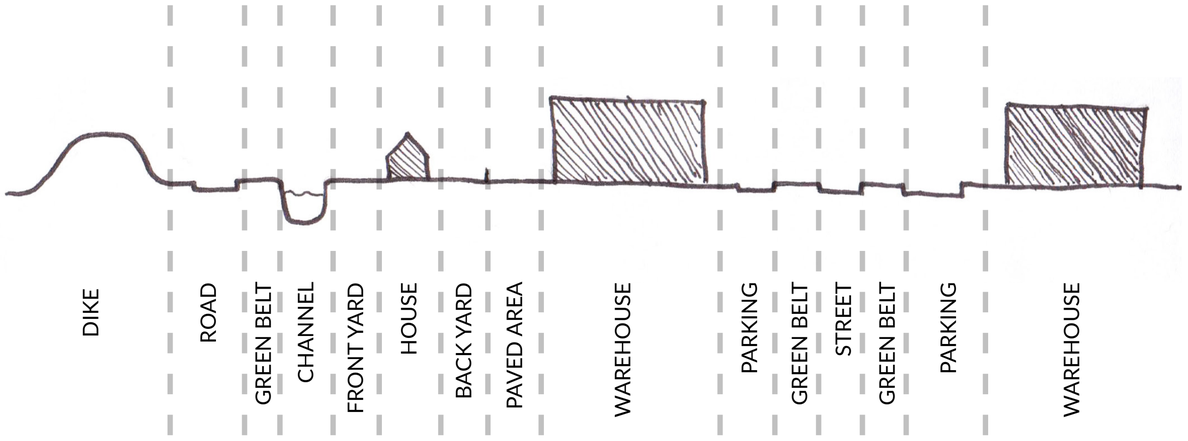
Drone Shot - Honderdland looking South. Source: Author.

Analytical Framework

(2) Disconnected Communities

Towns Separated by Infrastructure

- Agri-food expansion breaching residential areas
- Infrastructure hindering accessibility for slow-traffic



TYPICAL AREA SECTION. Source: Author.

Layers of urban fabric. Source: Google Earth.

Drone Shot - Honderdland looking South. Source: Author.

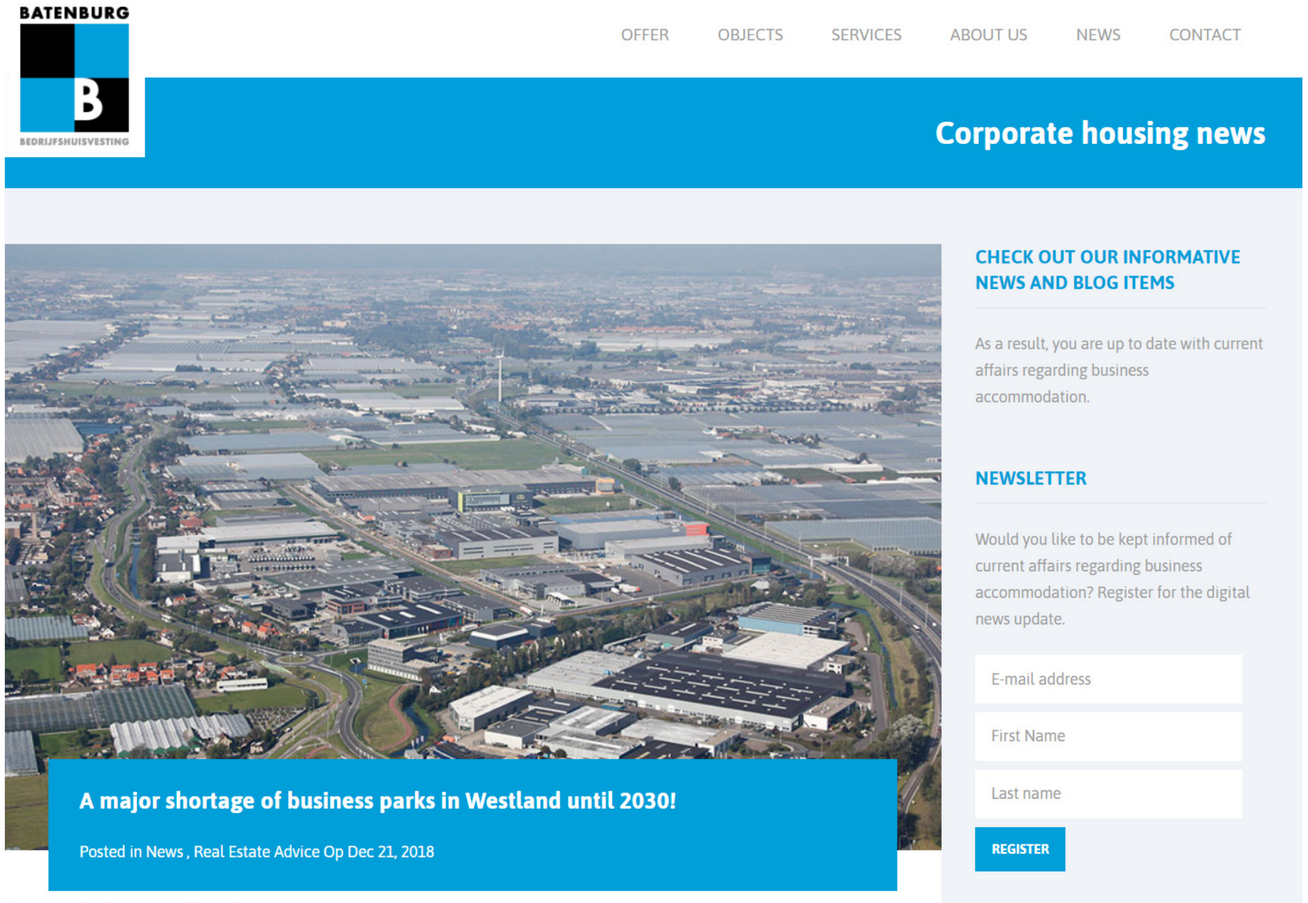
(2) Disconnected Communities

Limited Expansion Opportunities

- Demand for business parks
- Demolition of houses for greenhouses
- Demolition of greenhouses for distribution centers

*In the modernisation of greenhouse horticulture areas, **housing is often in the way**. The outer area is primarily dedicated to the greenhouse cluster, so we choose the relocation or **removal of these houses**.*

- Structuurvisie Westland 2025 (p.53)



Source: batenburg-bhv.nl

(2) Disconnected Communities

Increasing Loneliness in Elderly Population

According to *GGD Haaglanden:*

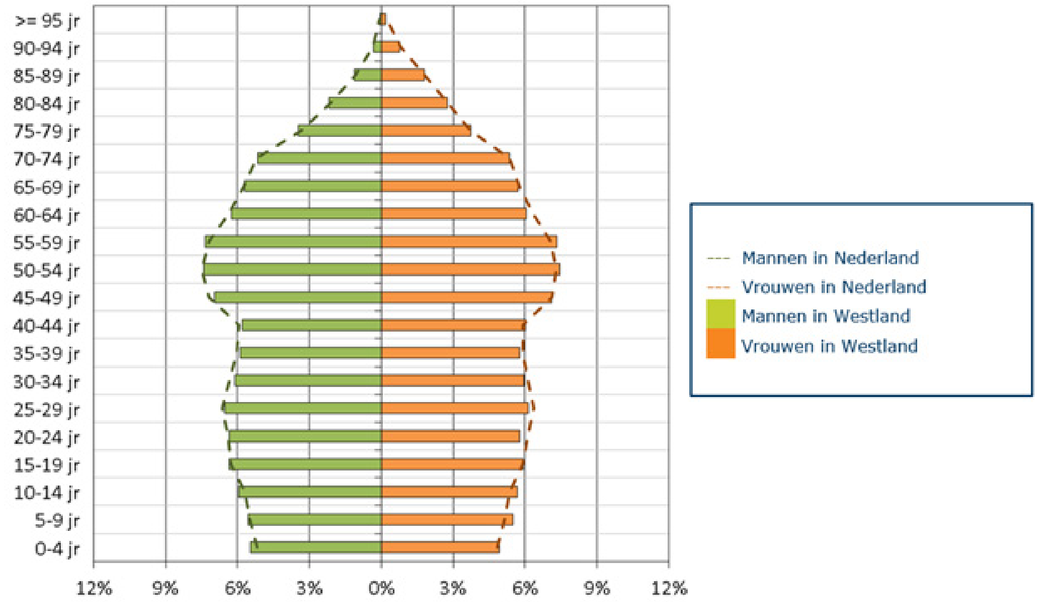
- Grey pressure in Westland is 33%
- Large percentage of population nearing retirement

According to *NL TIMES:*

- 700,000+ elderly lonely
- 54% of 75 and older
- 1.1 million lonely by 2030

Lack of Senior homes in the area

- Most seniors living in single-family homes in residential areas fractured by development



Source: gezondheidsmonitor.ggdhaaglanden.nl


NL#TIMES

TOP STORIES HEALTH CRIME POLITICS BUSINESS TECH

Elderly lady in a nursing home (Picture: Wikimedia Commons/Magnus Fröderberg) Elderly lady in a nursing home (Picture: Wikimedia Commons/Magnus Fröderberg)

HEALTH ELDERLY LONELINESS HELPLINE
MINISTRY OF PUBLIC HEALTH WELFARE AND SPORTS HUGO DE JONGE
TUESDAY, MARCH 20, 2018 - 13:50

SHARE THIS:

Dutch gov't invests €26 million to fight loneliness among elderly

Over 700 thousand elderly people in the Netherlands are sometimes lonely, according to a report by the Ministry of Public Health. That number is expected to increase to 1.1 million by 2030. Health Minister Hugo de Jonge presented a set of measures to combat loneliness among the elderly, and the government is investing 26 million euros into the plan over the

Source: nltimes.nl

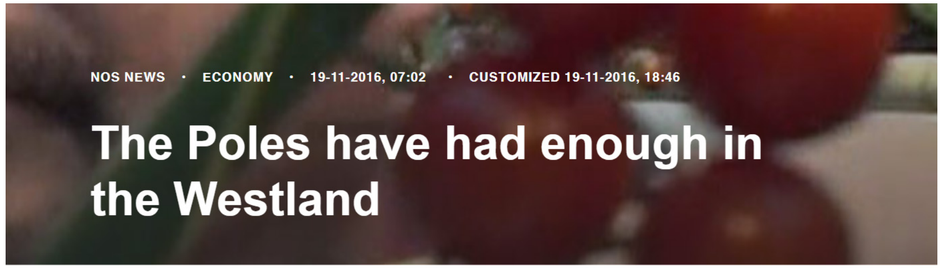
Analytical Framework

(2) Disconnected Communities

Divide between Dutch and Newcomers

Lack of integration and adequate housing for migrants

Source: nos.nl



Ben Meindertsma
Editor

Temporary employment agencies say that it is becoming increasingly difficult to recruit labor migrants in Poland for seasonal work in the Netherlands. Several temporary employment companies say that to the NOS.

Source: nos.nl

They pick cucumbers, cut asparagus, but they also work on the most innovative chip machines: labor migrants. They are indispensable for the Dutch economy.

Source: nos.nl

(3) Isolated and Limited Greenspaces

Atypical Pattern

- More green in dense city cores
- Less around food production areas

Westland vegetation map. Created by Author. Source: Google Earth.

(3) Isolated and Limited Greenspaces

Westland - Least Green Municipality

According to *Structuurvisie Westland 2025:*

- Municipality has no ambition for new green spaces
- Wants to connect existing green fragments

▲ In the many new housing estates in Westland, greenery is neglected. The only green patch to be seen above is the cemetery in Naaldwijk. © Photo: Thierry Schut

Call for more nature in the least green municipality

Parks and village courtyards are scarce in Westland. Wherever one person looks for nature in the forest, another fights for more greenery in the neighborhood.

Rianne de Zeeuw 06-08-17, 20:01

Source: www.ad.nl

(3) Isolated and Limited Greenspaces

Resident Interviews

"...na przestrzeń, *to raczy czego się cieszy ze troszeczkę miejsca zostało****..."***

"...for open space, one's rather glad there's a little space left..."

- Polish greenhouse worker living in Maasdijk

(3) Isolated and Limited Greenspaces

Lack of large open greenspaces for gathering and recreation

Residents exercising on the roads of Honderdland business park. Source: Google Streetview.

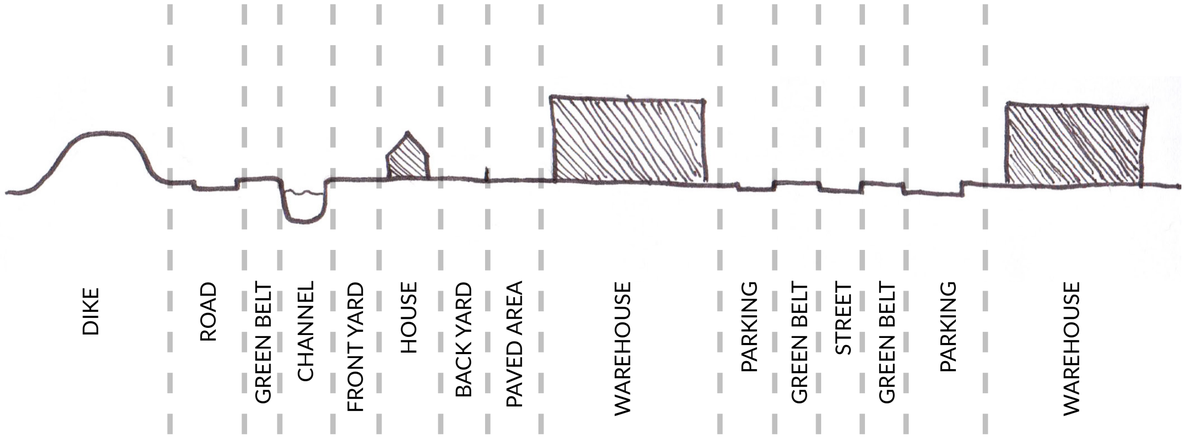
Horseback riders on the streets of Maasdijk. Source: Author.

(4) Disproportionate Scales

Large Warehouses Adjacent to Small Houses

- 20m tall warehouses and distribution centers
- Towering and overshadowing small houses
- No transitional spaces
- Private functions without public buffer

Warehouses and distribution centres dwarf small homes and pedestrians. Source: Author.



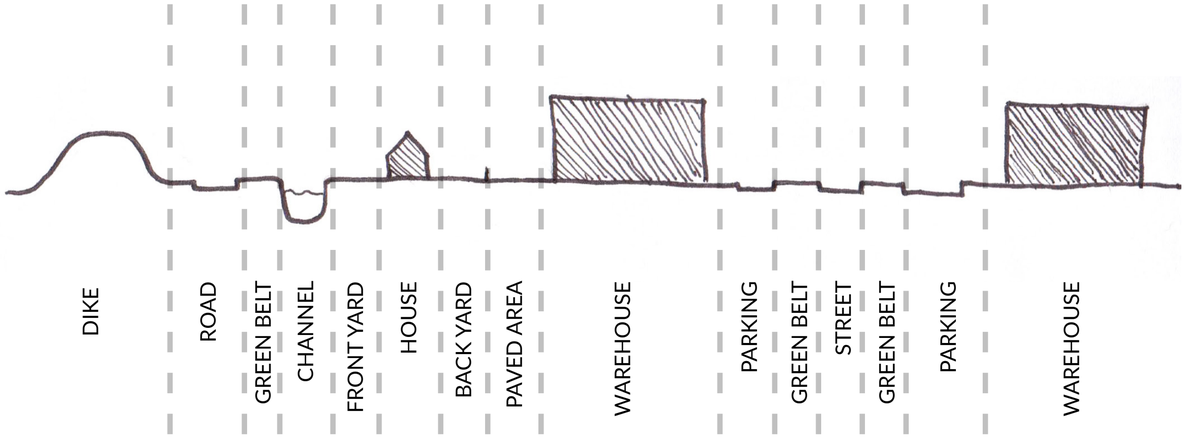
TYPICAL AREA SECTION. Source: Author.

(5) Rigid Island Urbanism

No Interaction Between Properties

- Planned to a fixed stage
- Developed in isolation
- Do not consider neighbours or public realm

Developments do not consider or interact with pedestrian realm or neighbours. Source: Author.



TYPICAL AREA SECTION. Source: Author.

Analytical Framework

(6) Identity Disconnected from Place

Towns Lost in a Sea of Infrastructure

- Hidden among large generic warehouses and greenhouses
- No wayfinding or means of orientation
- Lack of human activity
- No place for expression or tradition

Church Tower in Maasdijk

Industrial areas near Maasdijk. Source: Google Streetview.

(6) Identity Disconnected from Place

Resident Interviews

"To me it doesn't really feel like a free little village somewhere. It's very much an industrial area, but that's pretty much the whole west of Holland."

- Maasdijk Resident

(7) Repulsive Urban Development

Lack of Housing

According to *ABF Research & Capital Value*

- Delft & Westland are in **highest shortage**

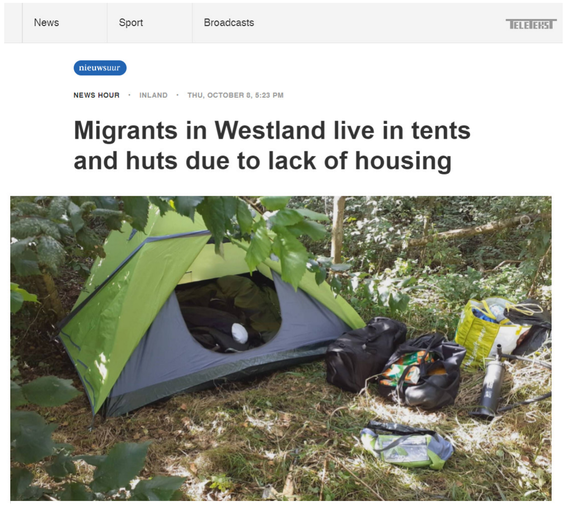
According to *Structuurvisie Westland 2025:*

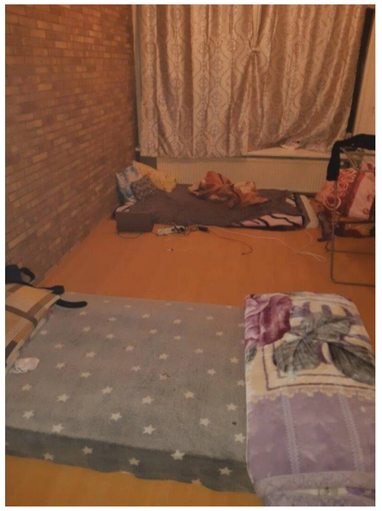
- Delayed development of residential areas until 2030
- Intensification of cores
- Need of housing for migrant labourers

Only a **small part** *of the* **housing market** *is currently really* **accessible** *in Westland for* **starters** *with a* **small budget**.

- Structuurvisie Westland 2025 (p.50)

Source: www.capitalvalue.nl





Source: cdn.nos.nl

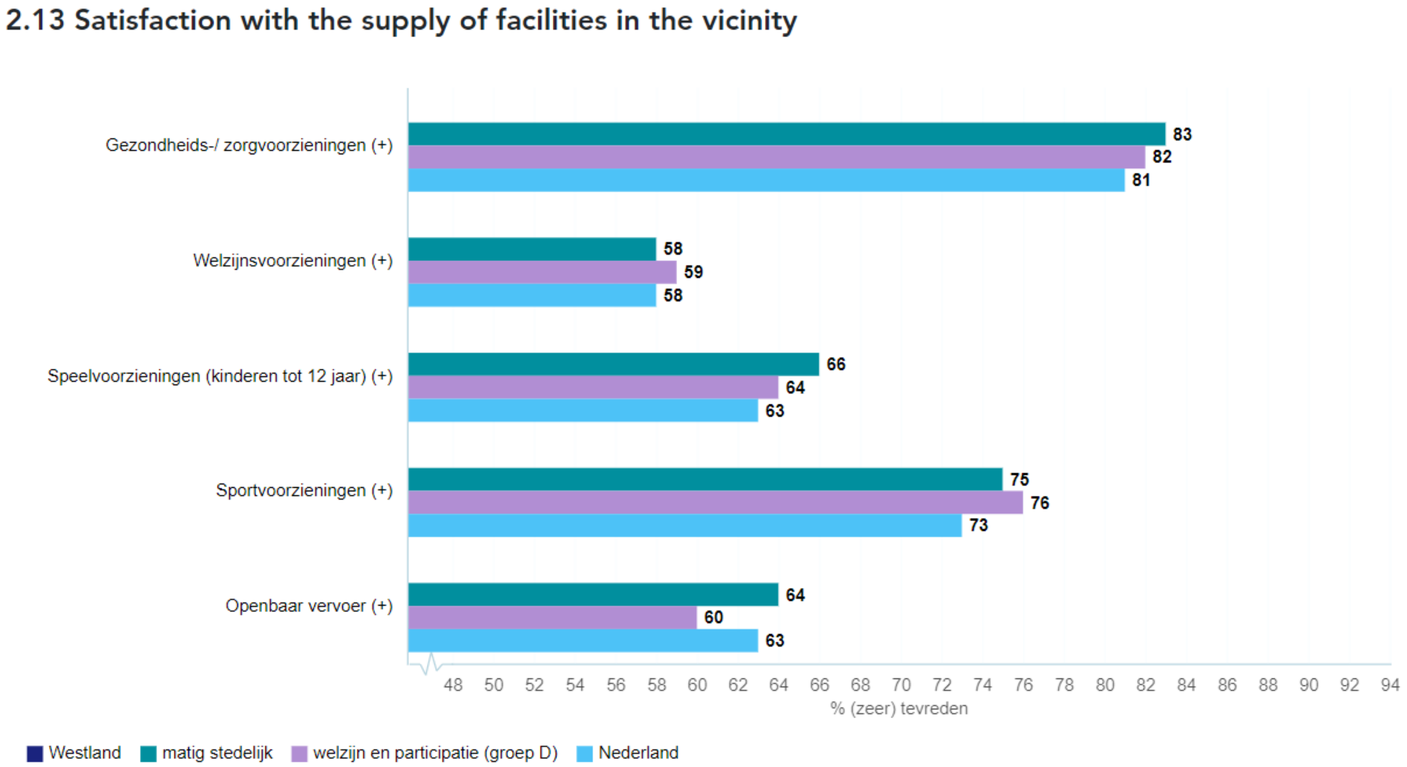
(7) Repulsive Urban Development

Lack of Public Amenities

According to a *VNG - Westland Resident Poll*

- Low Score
  - Welfare facilities
  - Play spaces
  - Public transit

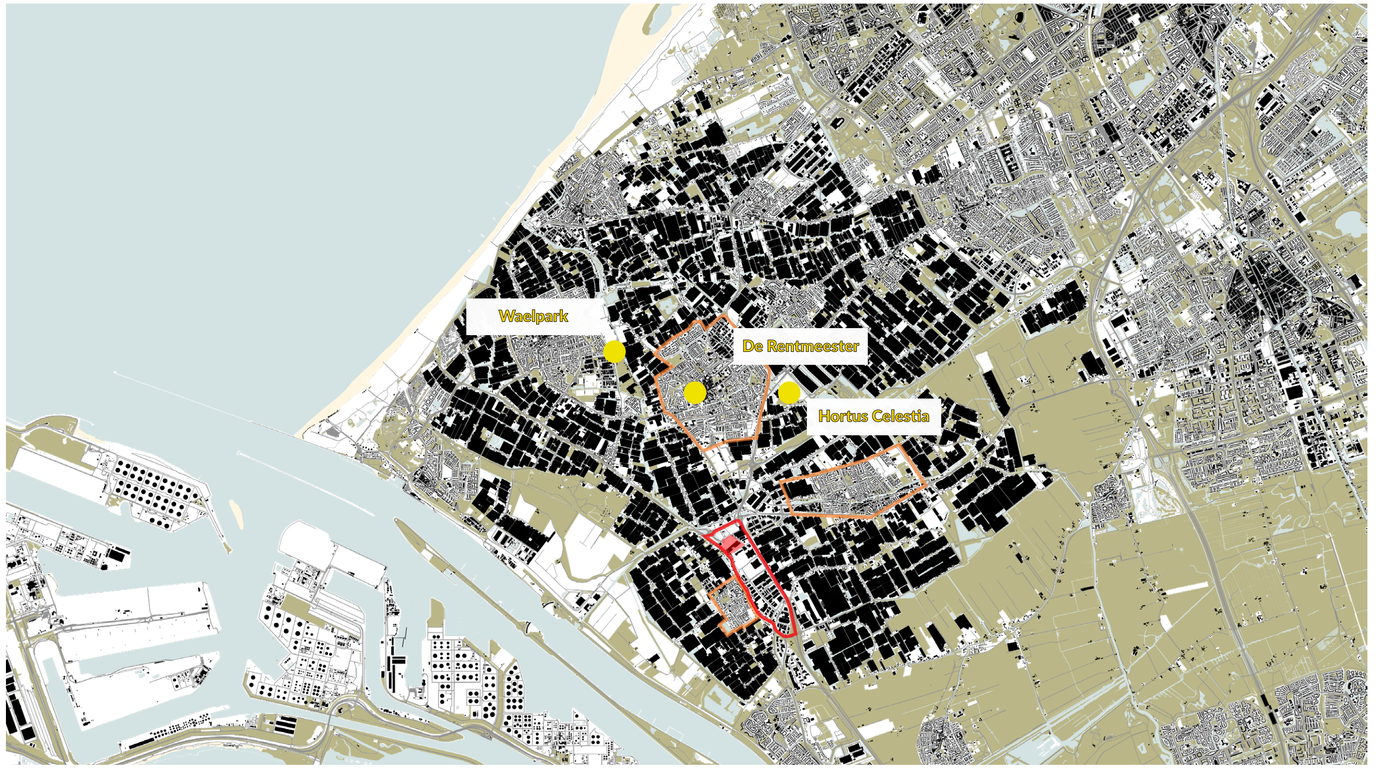
Compaction of cores will take up open space and lead to low-liveability.



Source: www.waarstaatjegemeente.nl

Current Interventions

Design Interventions in Westland



WAELPARK, ‘S-GRAVENZANDE

DE RENTMEESTER, NAALDWIJK

HORTUS CELESTIA, NAALDWIJK

Waelpark, ‘s-Gravenzande

Overview

- Redevelopment of Poelpolder
- Between ‘s-Gravenzande and Naaldwijk
- Adjacent to residential area, greenhouses, and 2 business parks
- Programme: Housing and Ecology

Source: Masterplan Waelpark

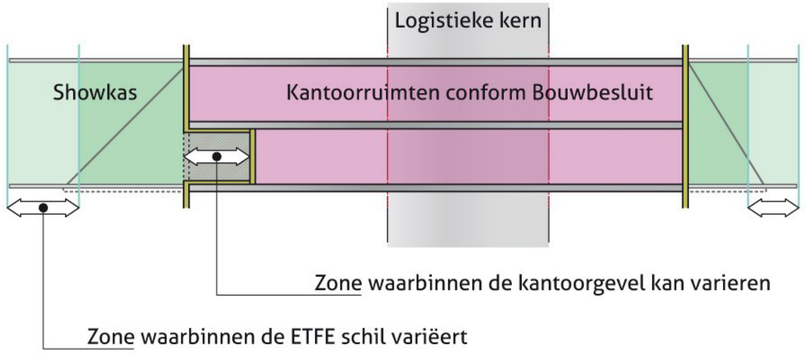
4

Hortus Celestia, Naaldwijk

Overview

- Ecological park adjacent to FloraHolland
- 80m-tall tower
- Programme: Greenhouse, Offices, Exposition Space

Source: Hortus Celestia



De Rentmeester, Naaldwijk

Overview

- Mixed-use mid-rise building
- Housing and Jumbo Food Market
- 47 Apartments

Source: De Rentmeester

What is needed?

- Synergistic integration of 3 most demanded land uses
  - Agri-food business parks
  - Housing
  - Ecological space

DESIGN FRAMEWORK

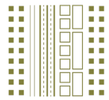
Design Framework

Spatial Intentions

List of missing qualities to restore liveability

Addressing Rigid and Fragmented Urbanism

- Focusing on connection and adaptability

Westland Spatial Issues	*Westland Spatial Intentions*
 *Fragmented Mono-Functional Zoning*	 *Interconnected Hybrid Areas*
 *Disconnected Communities*	 *Connected Communities*
 *Isolated and Limited Greenspaces*	 *Intertwined Blue-Green Networks*
 *Disproportionate and Disconnected Scales*	 *Introduction of Human Mid-Scale*
 *Fixed Island Urbanism*	 *Adaptable Connected Urbanism*
 *Identity Disconnected from Place*	 *Identity Connected to Place*
 *Repulsive Urban Development*	 *Attractive and Livable Urban Node*

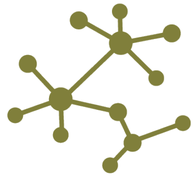
Comparison

Key Strategies with Spatial Intentions

- Connection is a common theme

KEY STRATEGIES OF PAST PROJECTS INTEGRATING FOOD SYSTEM FUNCTIONS WITH URBAN AREAS

REGIONAL PERSPECTIVE



NETWORKS AND INFRASTRUCTURE

URBAN METABOLISM

SELF-SUFFICIENCY

HYBRIDISATION AND CLUSTERISATION

CATALYTIC DESIGN

WESTLAND SPATIAL INTENTIONS

Identity Connected to Place

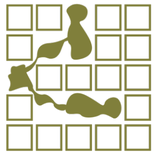
Introduction of Human Mid-Scale

Connected Communities

Interconnected Hybrid Areas

Attractive and Livable Urban Node

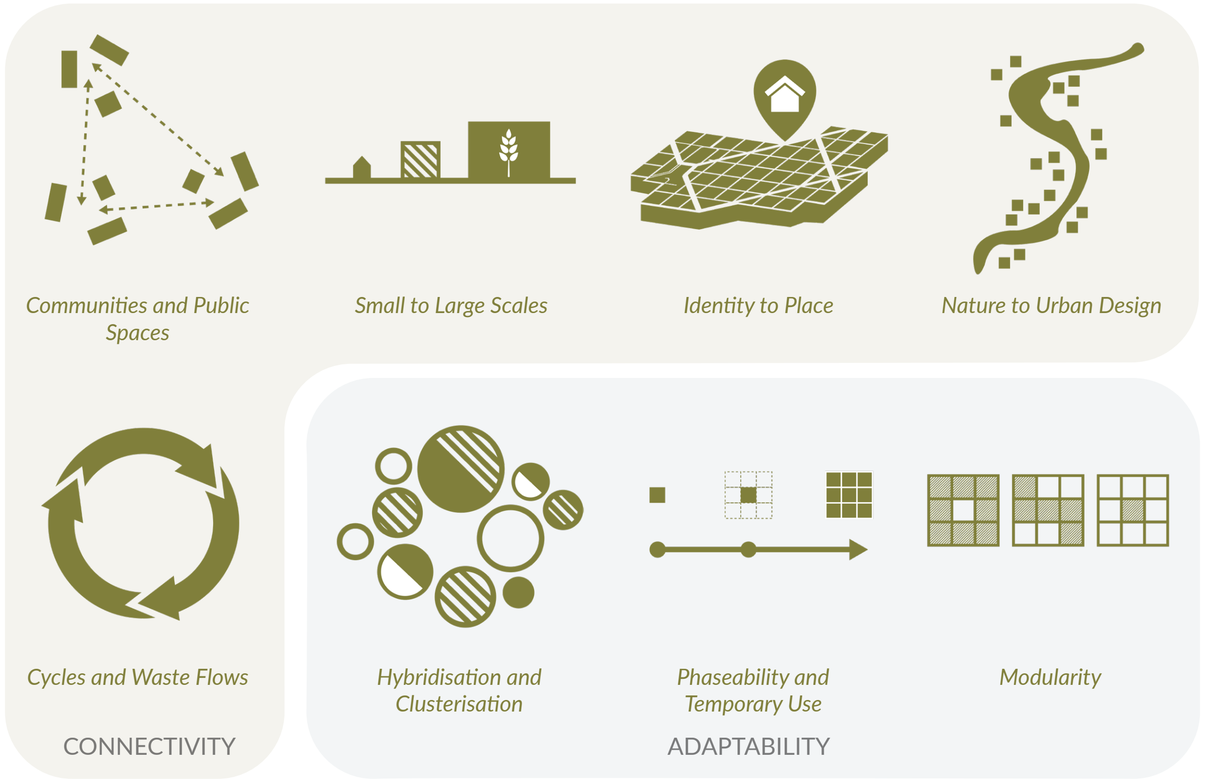
Adaptable Connected Urbanism



Intertwined Blue-Green Networks

Synthesis

Strategies and Intentions Reduced to 8 Objectives



Spatial Urban Design Tools

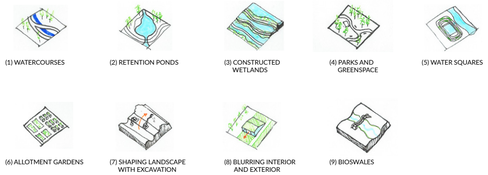
Design Framework

Spatial Urban Design Tools: Connecting Communities and Public Spaces

Spatial Urban Design Tools: Connecting Small Residential to Large Agri-food Scales

Spatial Urban Design Tools: Connecting Identity to Place

Spatial Urban Design Tools: Connecting Nature to Urban Design



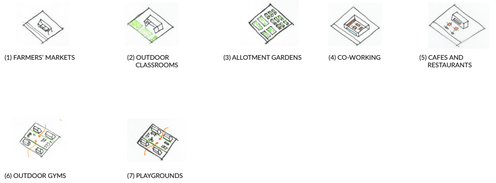
Spatial Urban Design Tools: Connecting Cycles and Wasteflows

Spatial Urban Design Tools: Hybridisation and Clusterisation

Spatial Urban Design Tools: Phaseability and Temporary Use

Spatial Urban Design Tools: Phaseability and Temporary Use

TEMPORARY USES



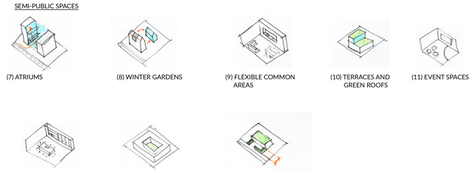
Spatial Urban Design Tools: Modularity

Spatial Architectural Design Tools: Connecting Communities and Public Spaces

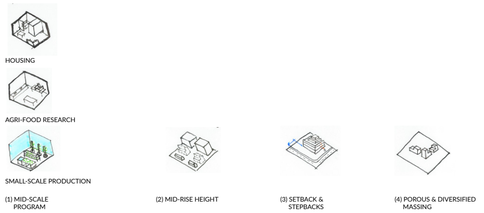
PUBLIC SPACES

Spatial Architectural Design Tools: Connecting Communities and Public Spaces

SEMI-PUBLIC SPACES

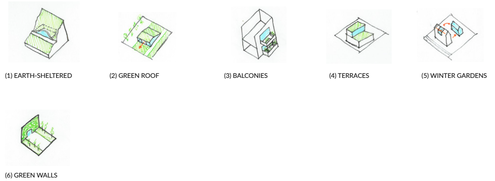


Spatial Architectural Design Tools: Connecting Small Residential to Large Agri-food Scales

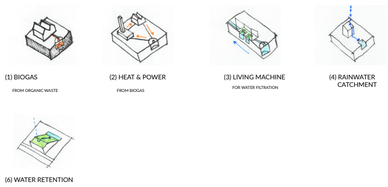


Spatial Architectural Design Tools: Connecting Identity to Place

Spatial Architectural Design Tools: Connecting Nature to Urban Design



Spatial Architectural Design Tools: Connecting Cycles and Wasteflows

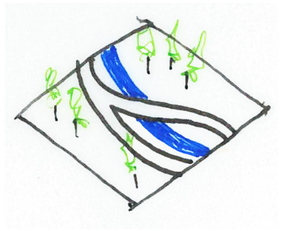


Spatial Architectural Design Tools: Hybridisation and Clusterisation

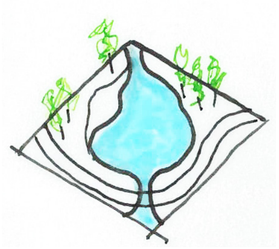
Spatial Architectural Design Tools: Phaseability and Temporary Use

Spatial Architectural Design Tools: Modularity

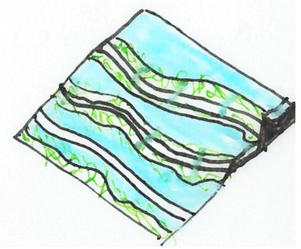
Spatial Urban Design Tools: Connecting Nature to Urban Design



(1) WATERCOURSES

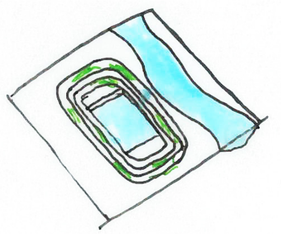


(2) RETENTION PONDS

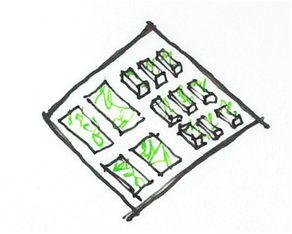


(3) CONSTRUCTED WETLANDS

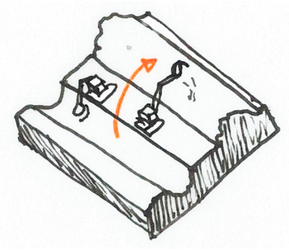
(4) PARKS AND GREENSPACE



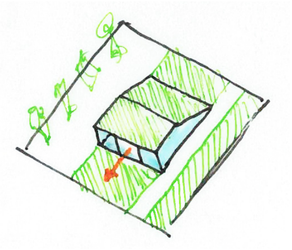
(5) WATER SQUARES



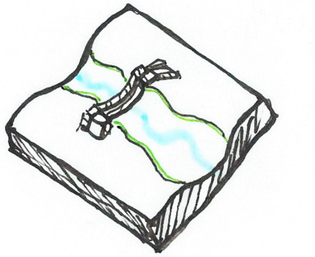
(6) ALLOTMENT GARDENS



(7) SHAPING LANDSCAPE WITH EXCAVATION

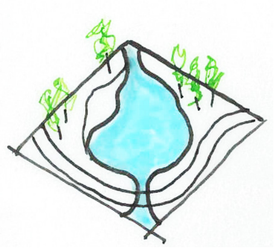


(8) BLURRING INTERIOR AND EXTERIOR



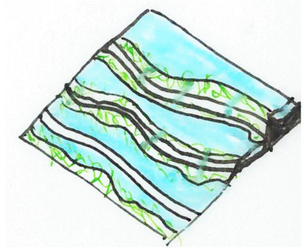
(9) BIOSWALES

Spatial Urban Design Tools: Connecting Cycles and Wasteflows



(1) RETENTION PONDS

FOR WATER INFILTRATION

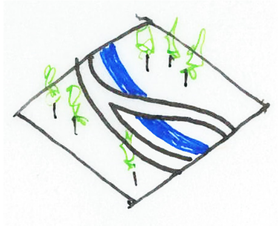


(2) CONSTRUCTED WETLANDS

FOR WATER PURIFICATION

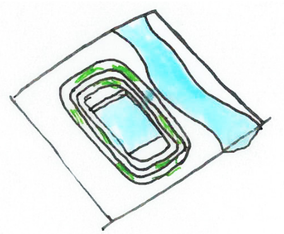
(3) PARKS AND GREENSPACE

FOR WATER RETENTION



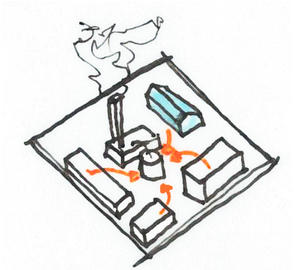
(4) WATERCOURSES

FOR WATER CATCHMENT



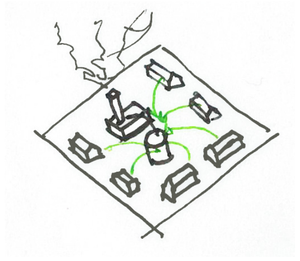
(5) WATER SQUARES

FOR WATER INFILTRATION



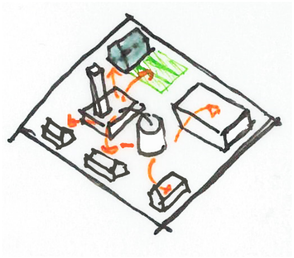
(6) BY-PRODUCT FLOWS

FROM AGRI INDUSTRY TO BIOGAS



(7) ORGANIC WASTE FLOWS

FROM RESIDENTIAL AREAS TO BIOGAS

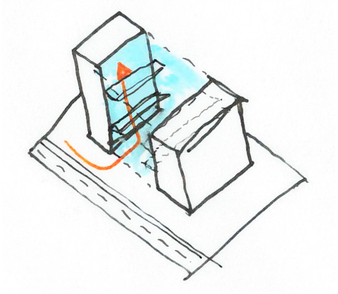


(8) OUTPUT BACK TO NEIGHBOURS

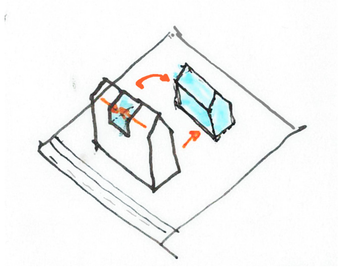
HEAT, ELECTRICITY, FERTILIZER, CO2

Spatial Architectural Design Tools: Connecting Communities and Public Spaces

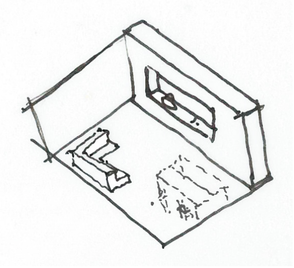
SEMI-PUBLIC SPACES



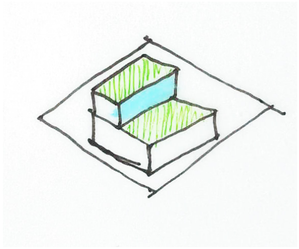
(7) ATRIUMS



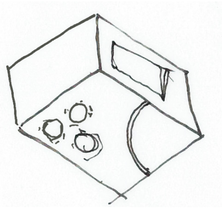
(8) WINTER GARDENS



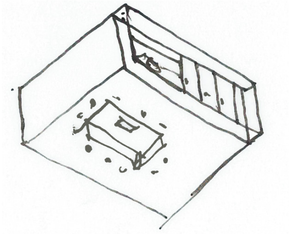
(9) FLEXIBLE COMMON AREAS



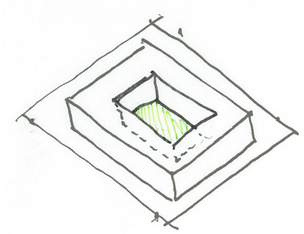
(10) TERRACES AND GREEN ROOFS



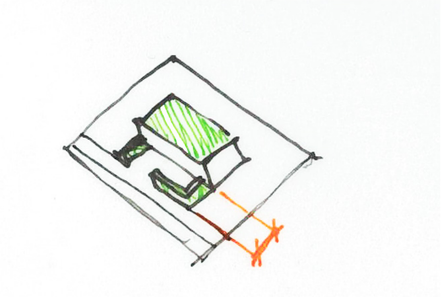
(11) EVENT SPACES



(12) COMMUNAL KITCHEN

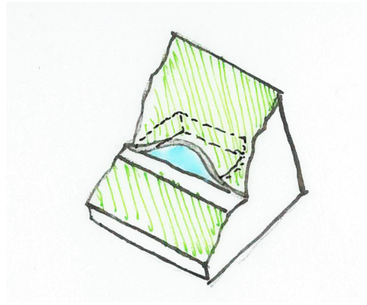


(13) CLOSED COURTYARDS

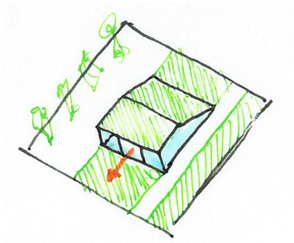


(14) HYBRID ZONES

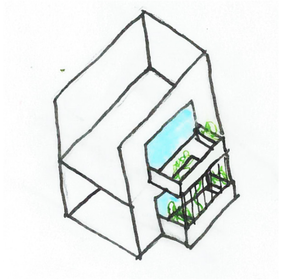
Spatial Architectural Design Tools: Connecting Nature to Urban Design



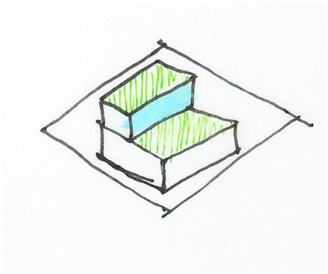
(1) EARTH-SHELTERED



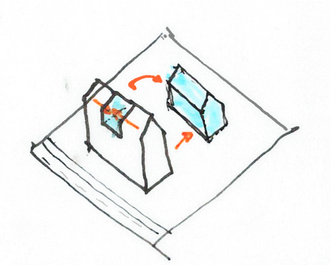
(2) GREEN ROOF



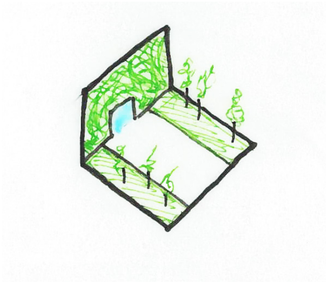
(3) BALCONIES



(4) TERRACES



(5) WINTER GARDENS



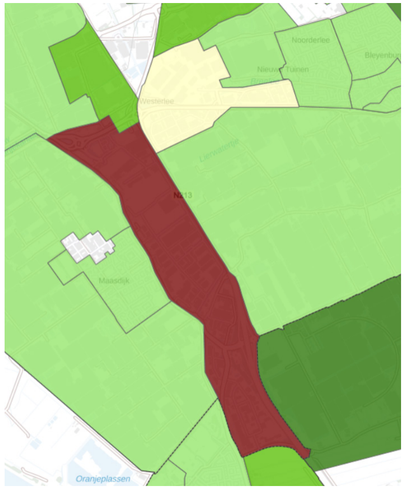
(6) GREEN WALLS

URBAN DESIGN

URBAN CONNECTIVITY: (1) Communities and Public Spaces

Network of Interventions

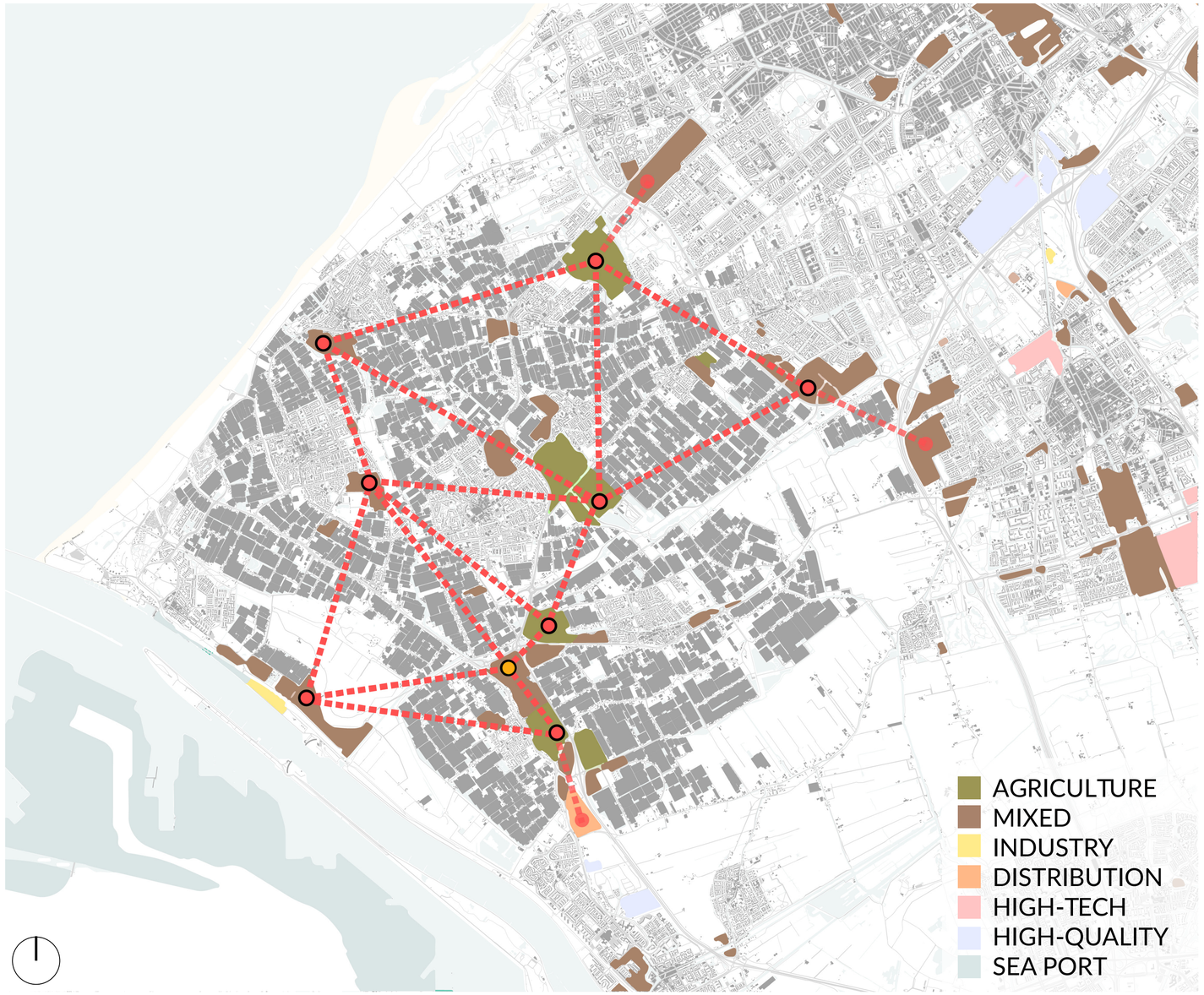
- Improve the quality of the current business parks
- Emphasize the identity of existing cores
- Provide wayfinding & orientation



Honderdland & Westerlee Business Parks

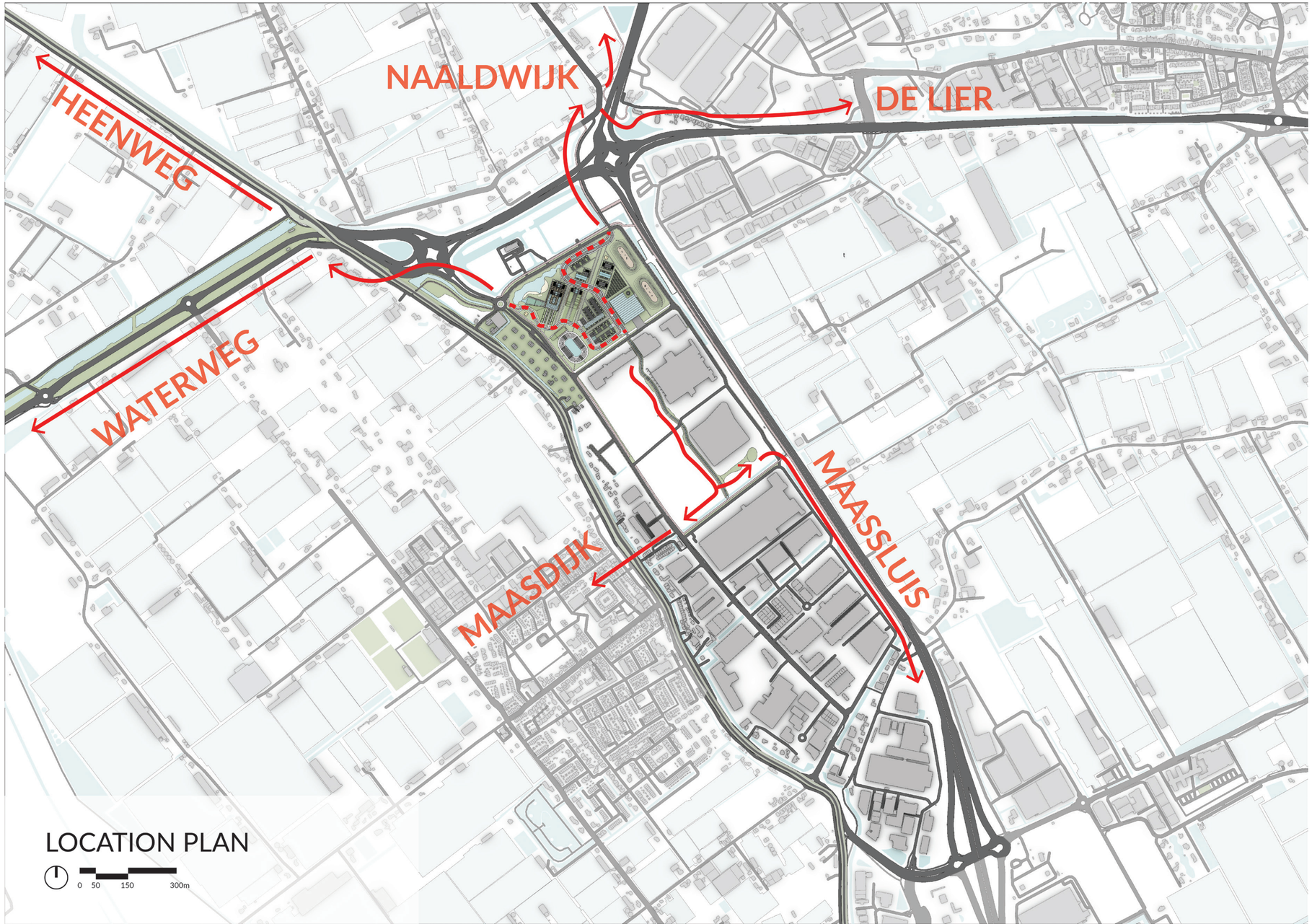
Source: Leefbarometer

Wateringen Business Park

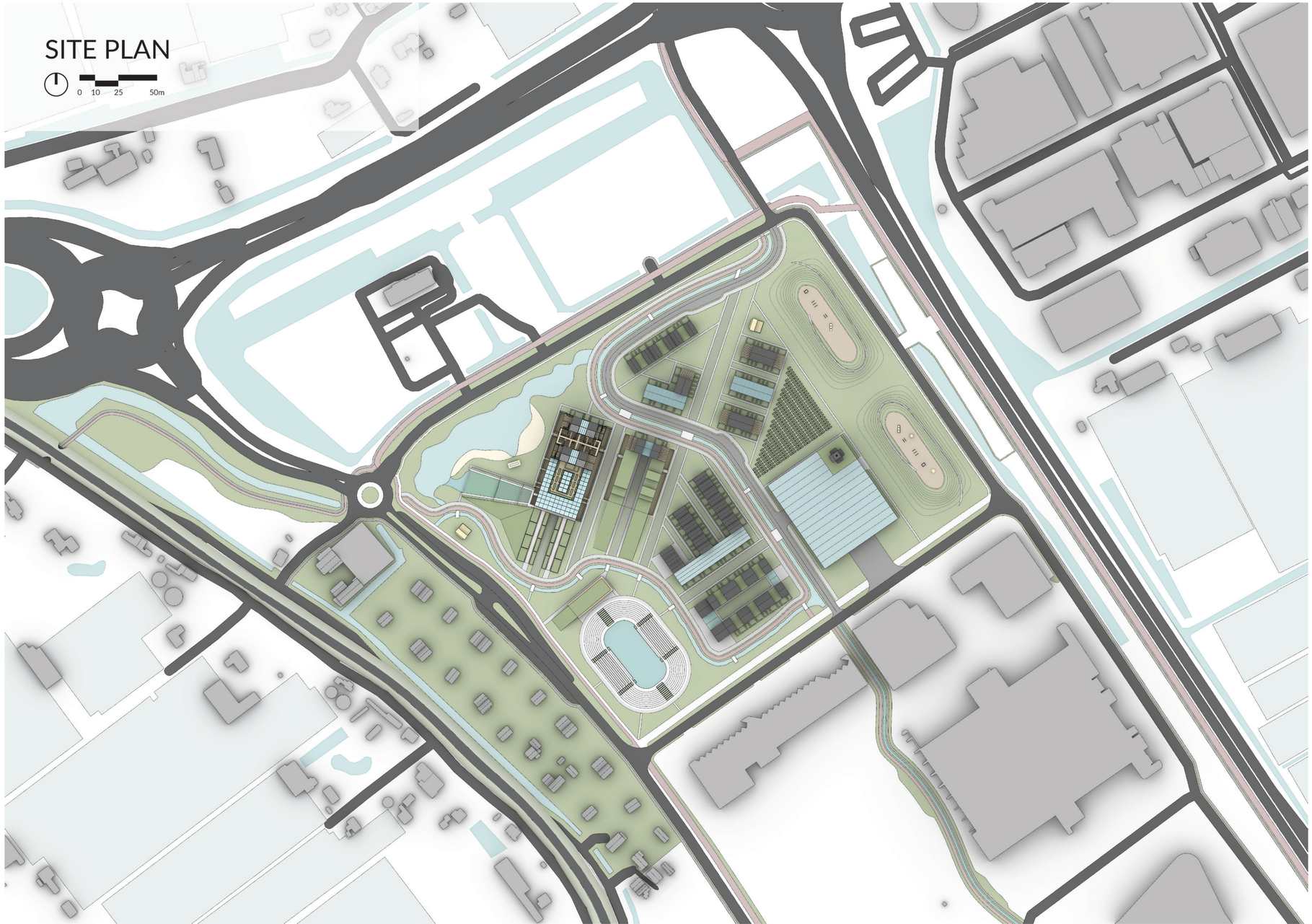


Westland Business Parks. Source: Author rendition of data from the Province of South Holland.

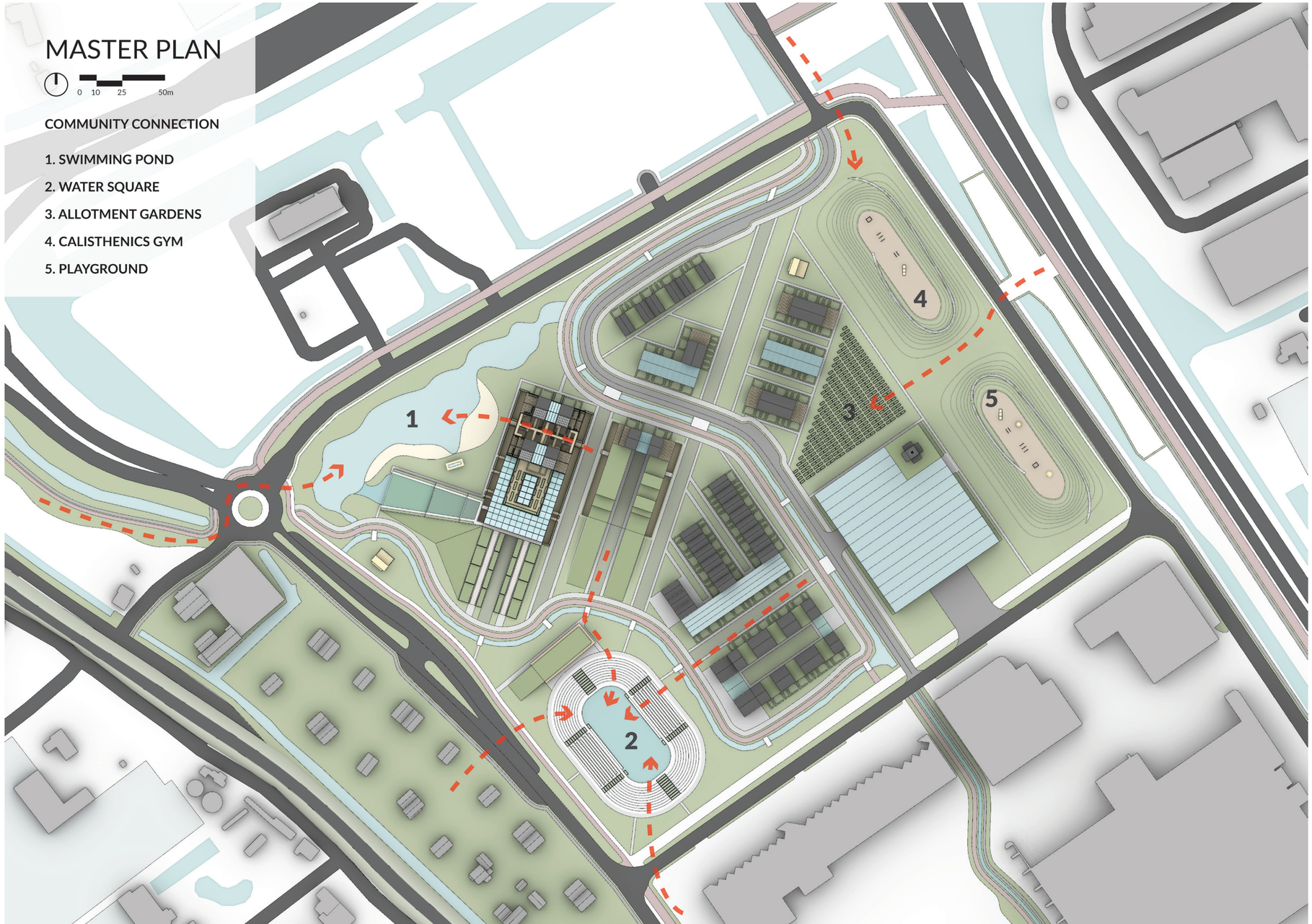
URBAN CONNECTIVITY: (1) Communities and Public Spaces



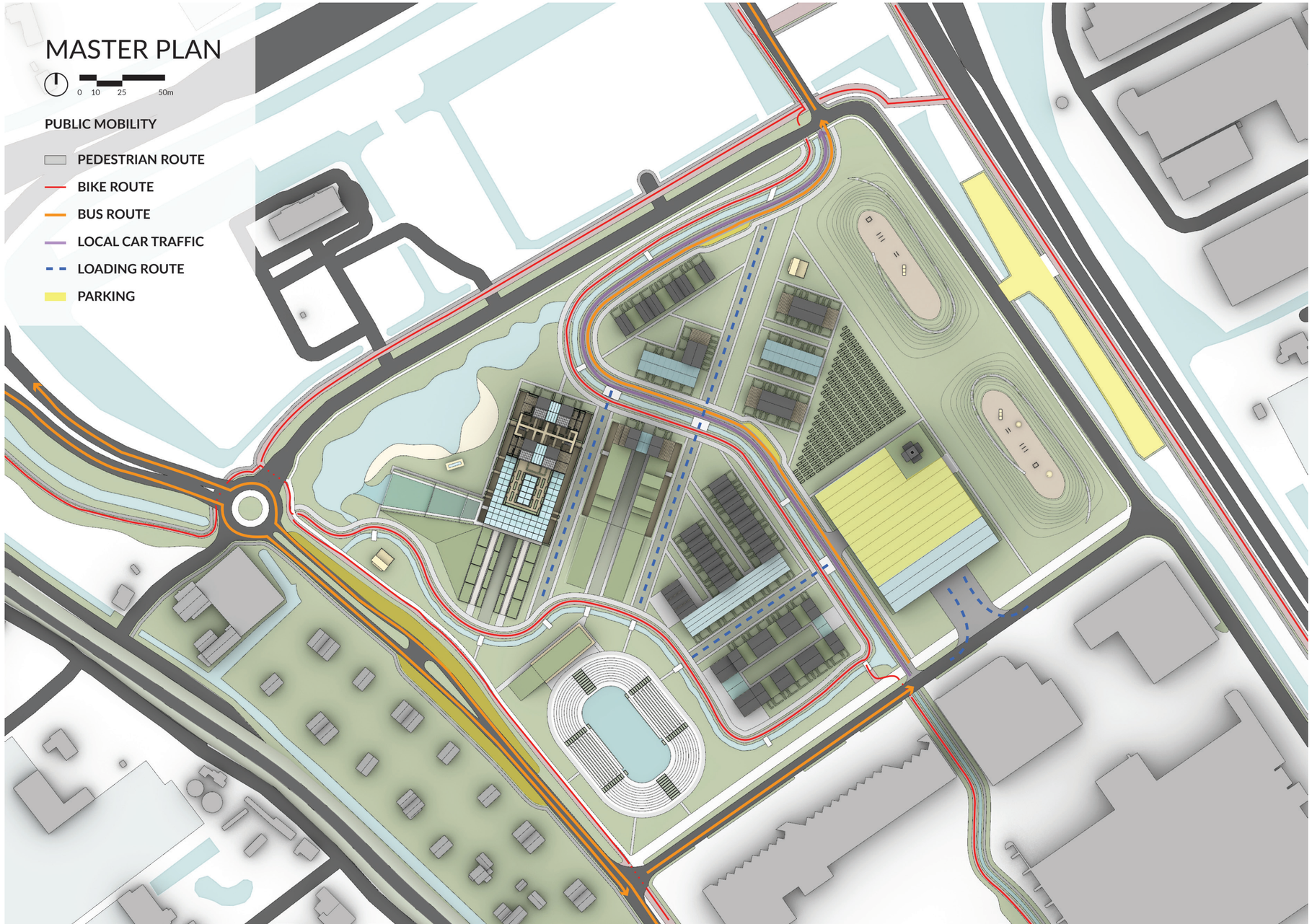
URBAN CONNECTIVITY: (1) Communities and Public Spaces



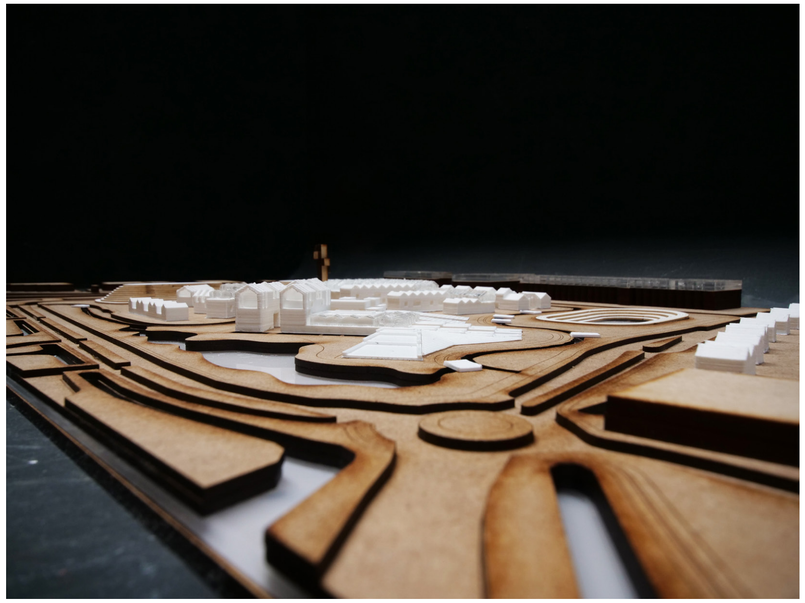
URBAN CONNECTIVITY: (1) Communities and Public Spaces

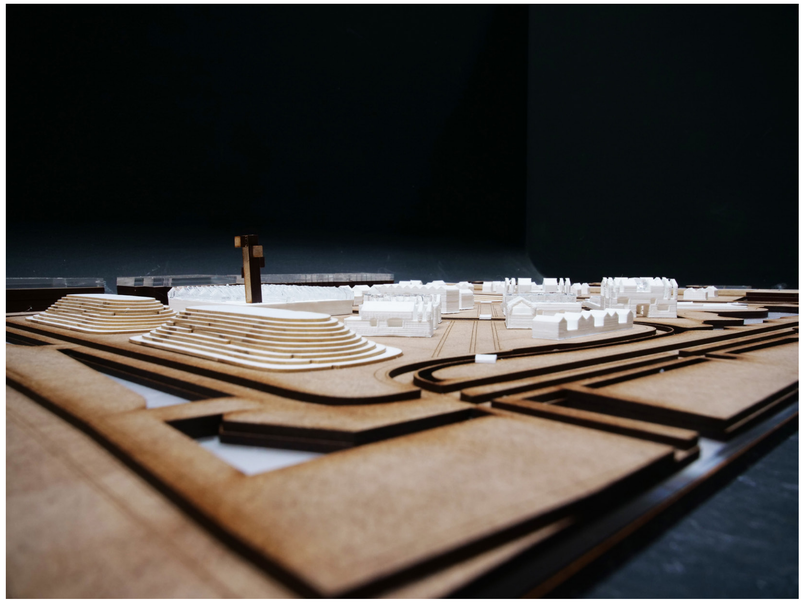


URBAN CONNECTIVITY: (1) Communities and Public Spaces

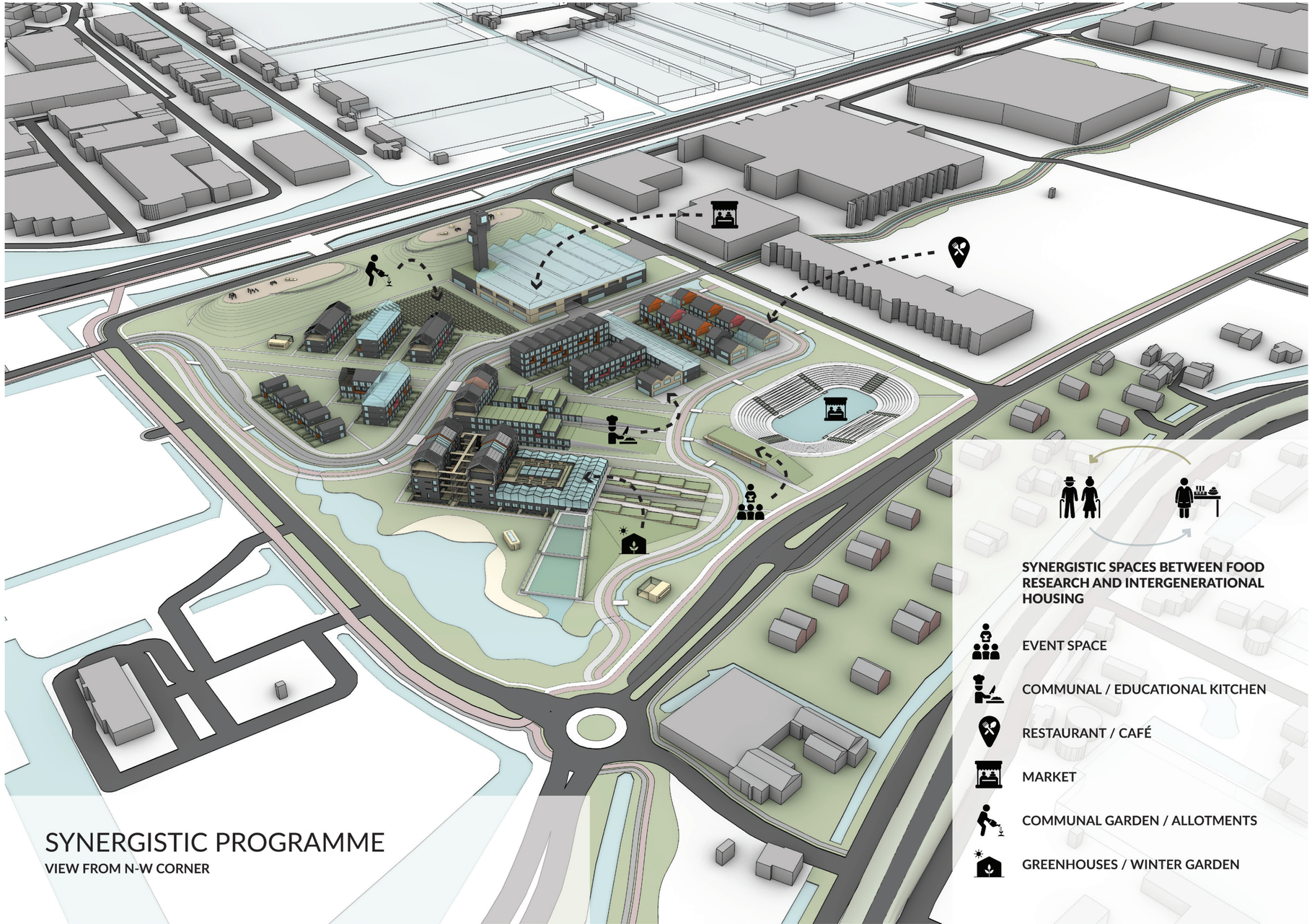


URBAN CONNECTIVITY: (1) Communities and Public Spaces

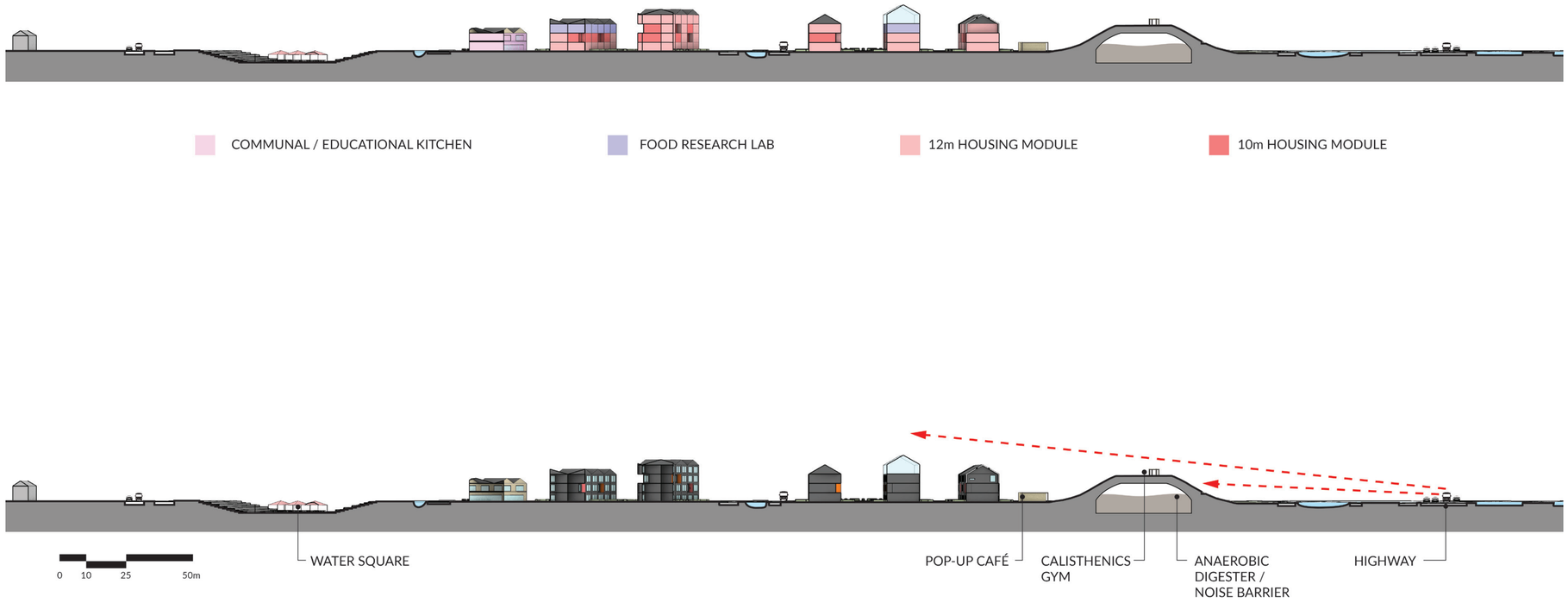





URBAN CONNECTIVITY: (2) Small Residential to Large Agri-Food Scales



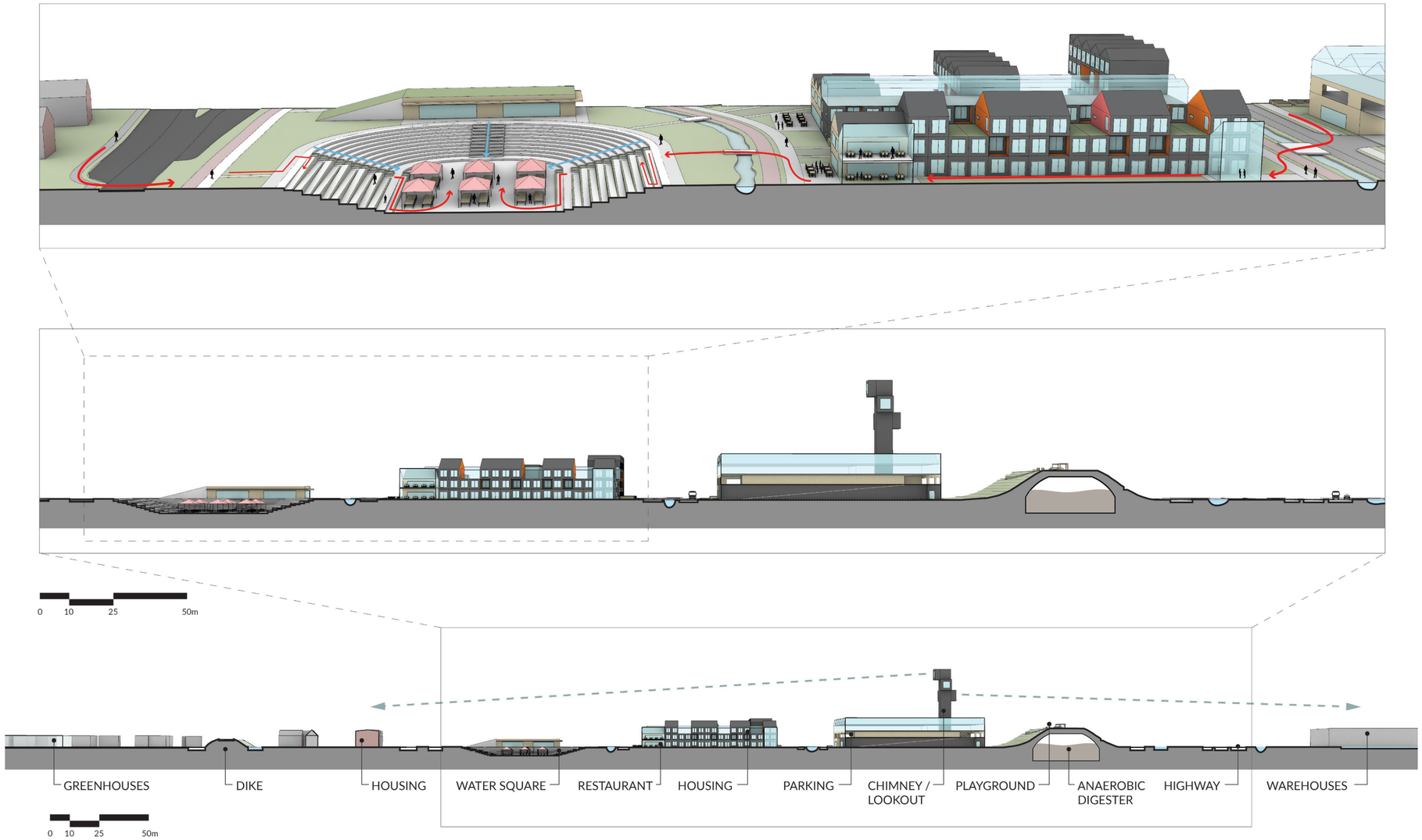
URBAN CONNECTIVITY: (3) Identity to Place



SITE SECTION A

EAST-WEST LOOKING NORTH

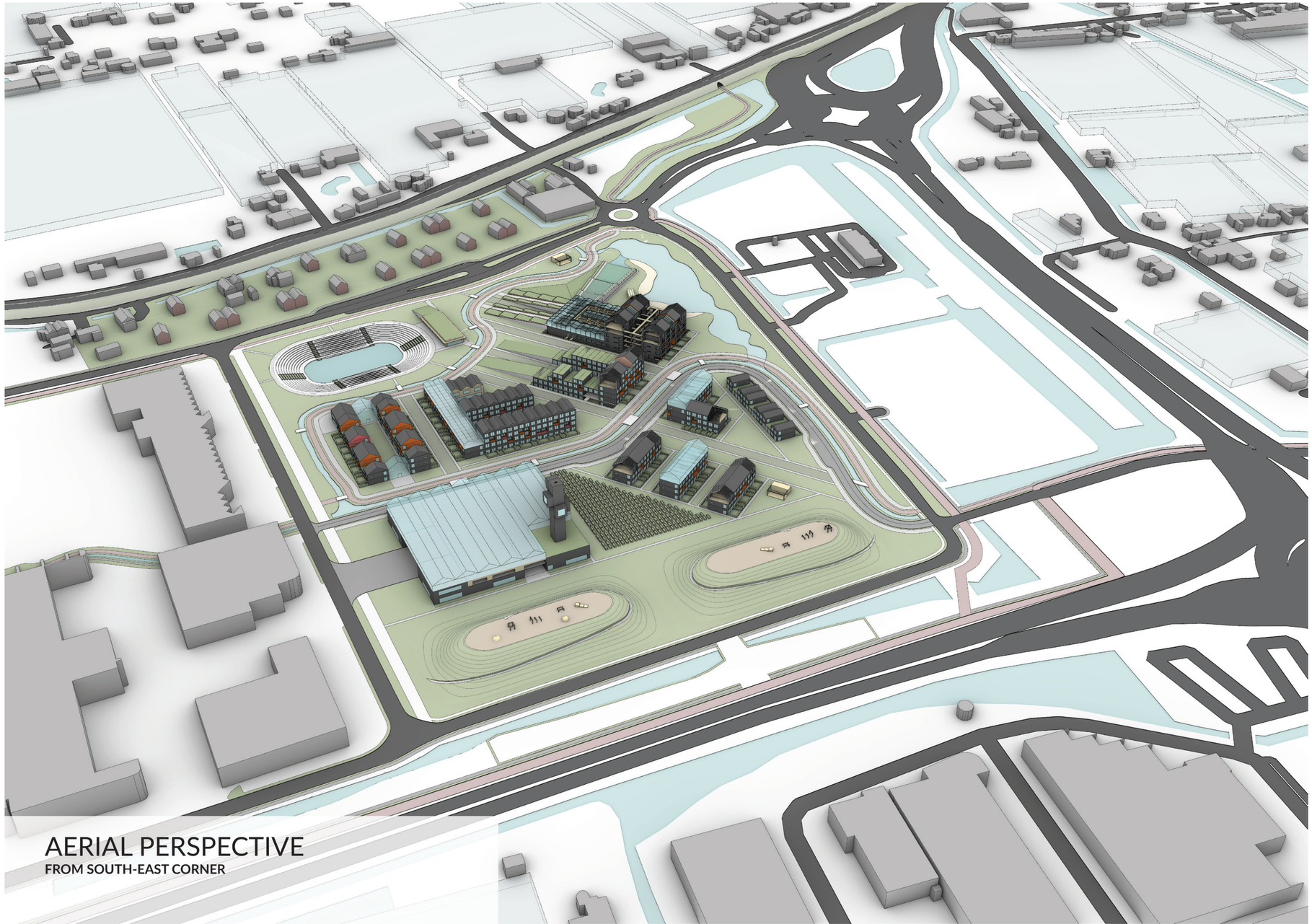
URBAN CONNECTIVITY: (3) Identity to Place



SITE SECTION B

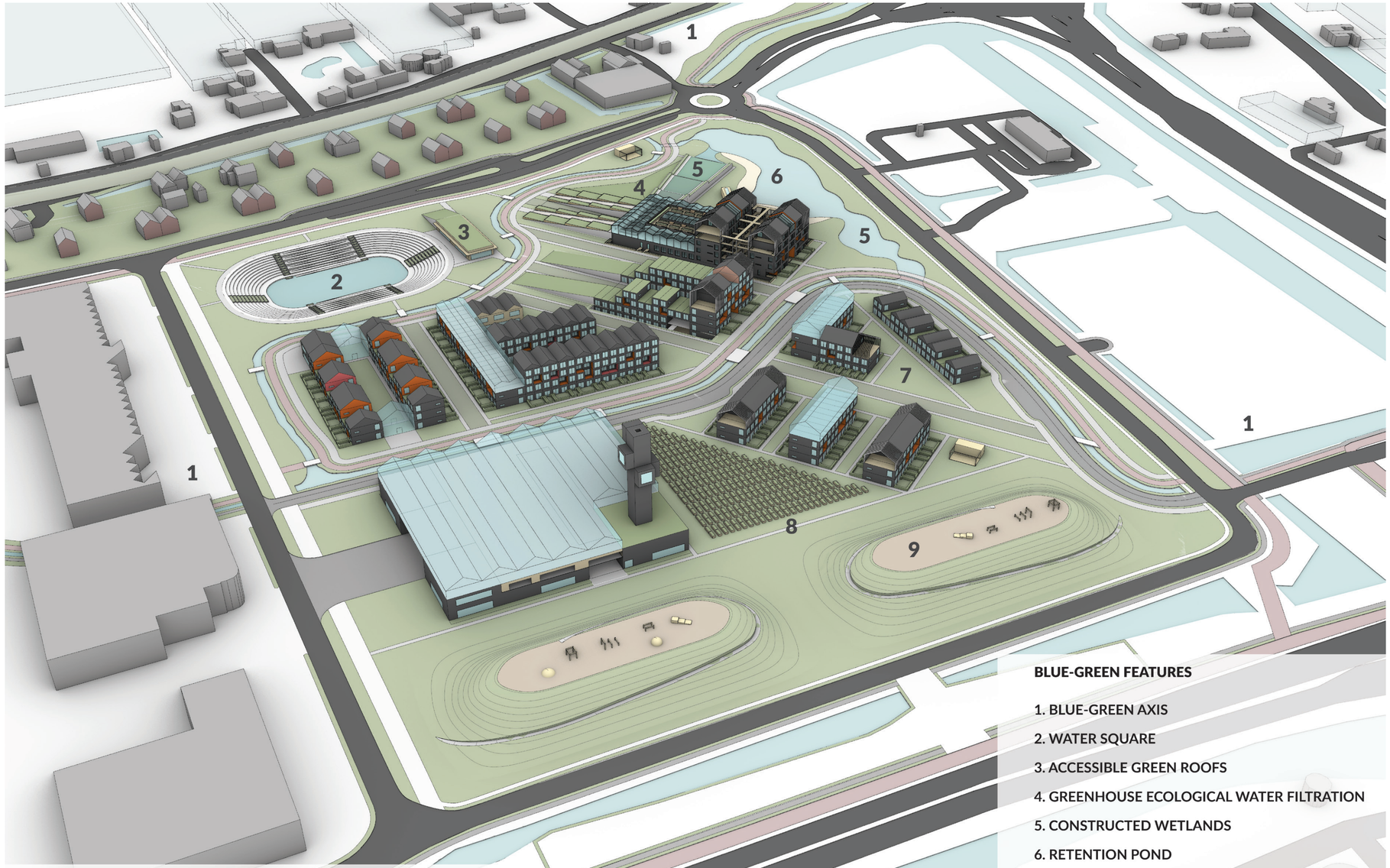
EAST-WEST LOOKING NORTH

URBAN CONNECTIVITY: (4) Nature to Urban Design



AERIAL PERSPECTIVE
FROM SOUTH-EAST CORNER

URBAN CONNECTIVITY: (4) Nature to Urban Design

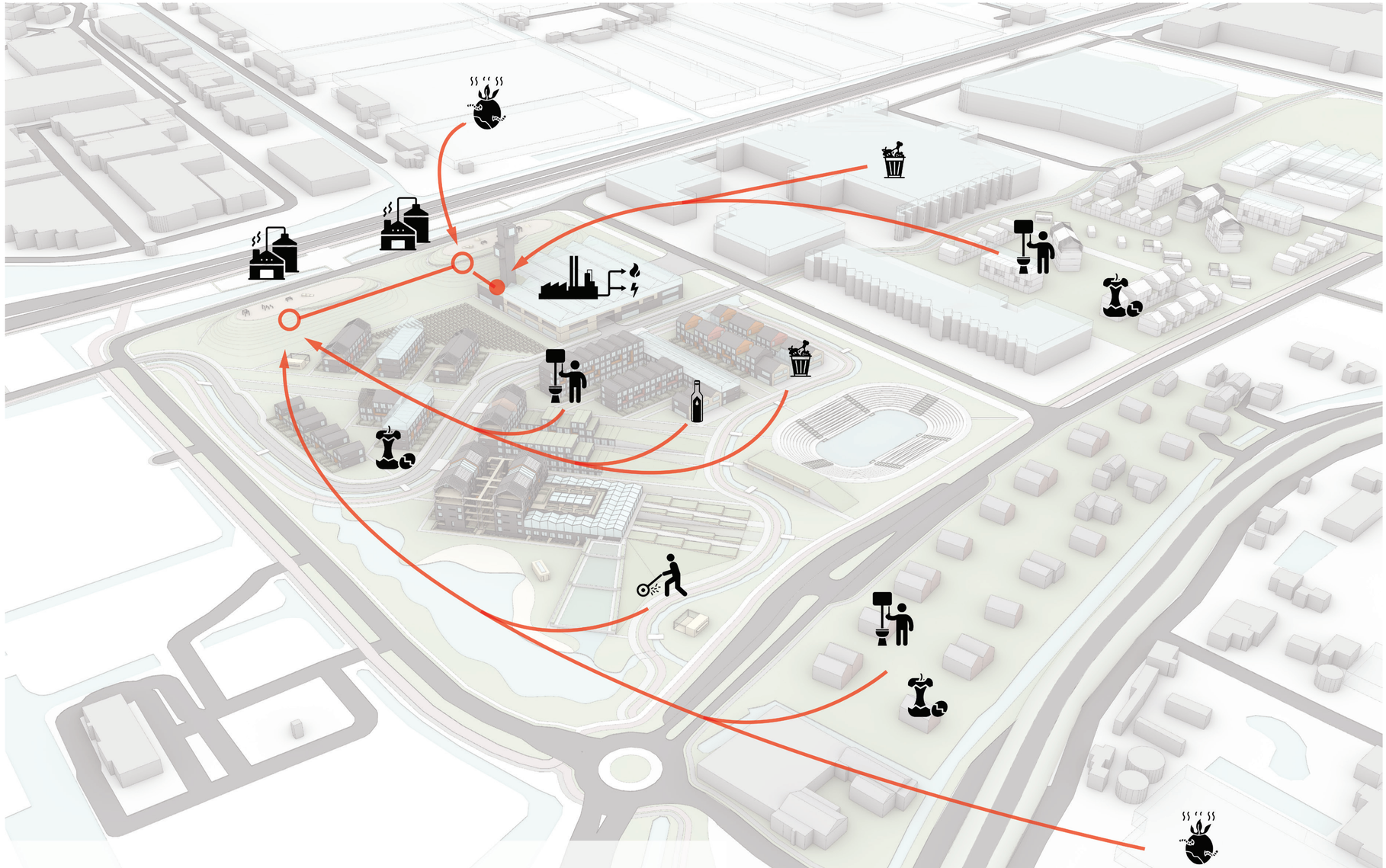


AERIAL PERSPECTIVE
FROM SOUTH-EAST CORNER

BLUE-GREEN FEATURES

1. BLUE-GREEN AXIS
2. WATER SQUARE
3. ACCESSIBLE GREEN ROOFS
4. GREENHOUSE ECOLOGICAL WATER FILTRATION
5. CONSTRUCTED WETLANDS
6. RETENTION POND
7. COURTYARDS
8. ALLOTMENT GARDENS
9. RAISED TOPOGRAPHY

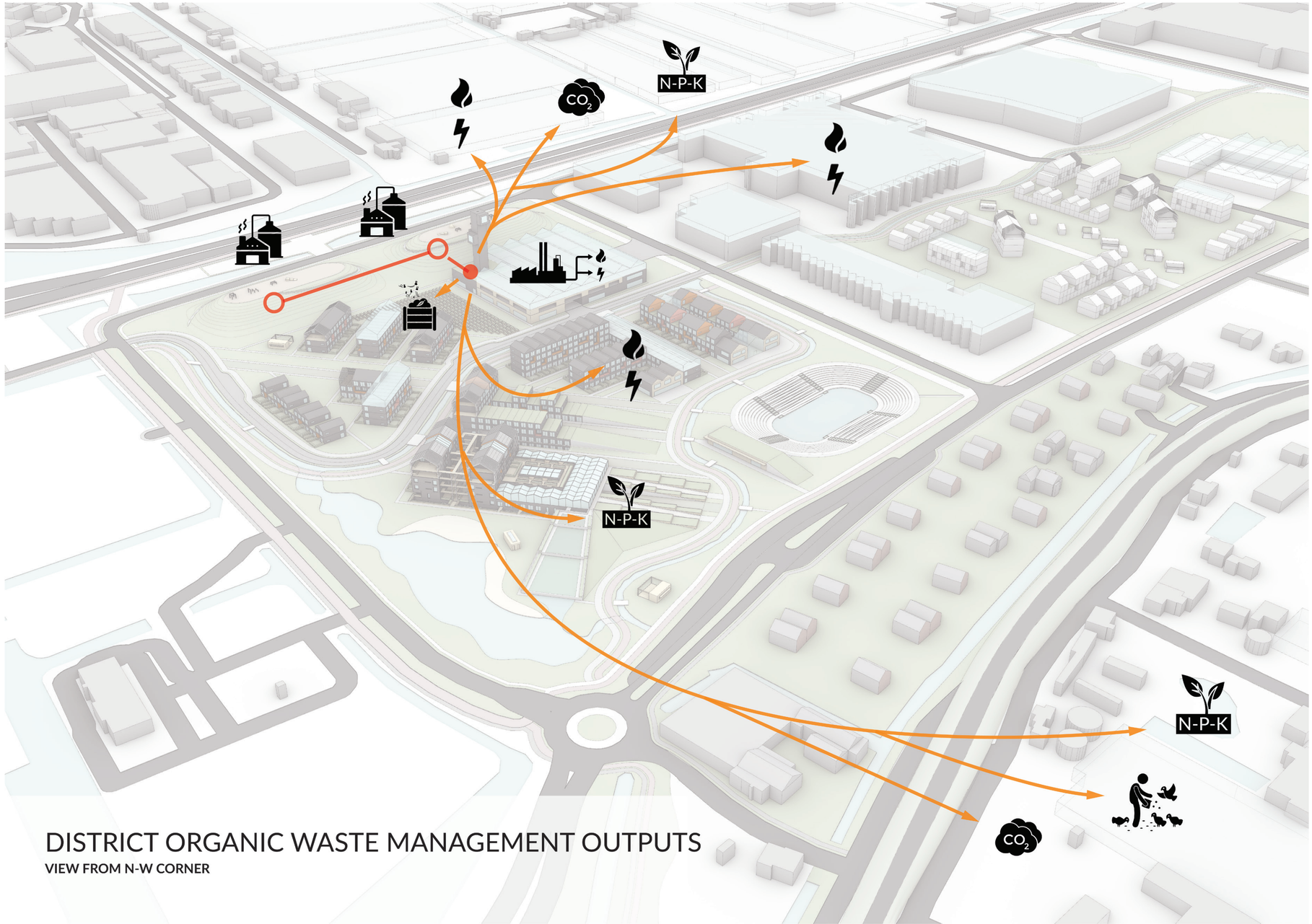
URBAN CONNECTIVITY: (5) Cycles and Waste Flows



DISTRICT ORGANIC WASTE MANAGEMENT INPUTS

VIEW FROM N-W CORNER

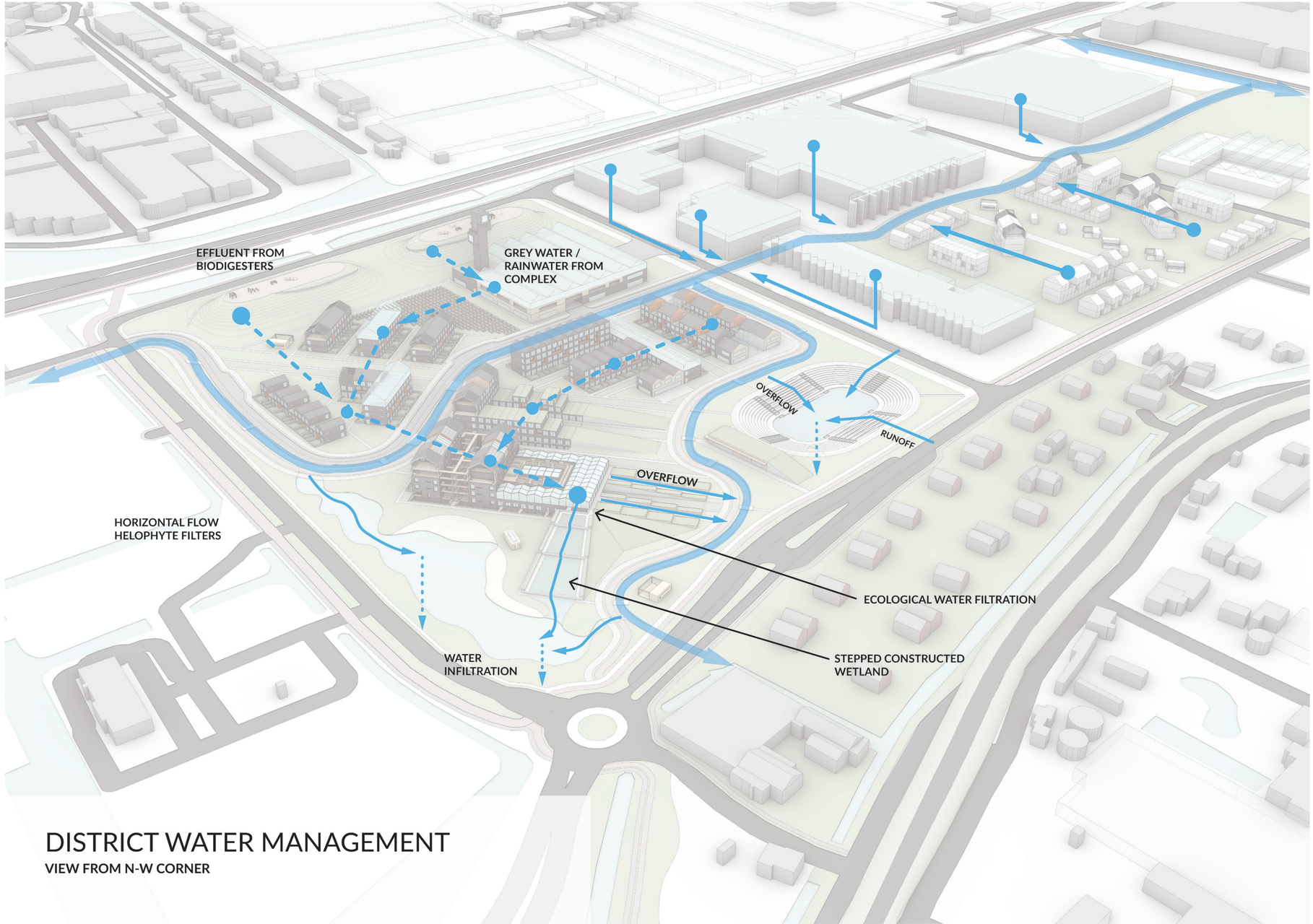
URBAN CONNECTIVITY: (5) Cycles and Waste Flows



DISTRICT ORGANIC WASTE MANAGEMENT OUTPUTS

VIEW FROM N-W CORNER

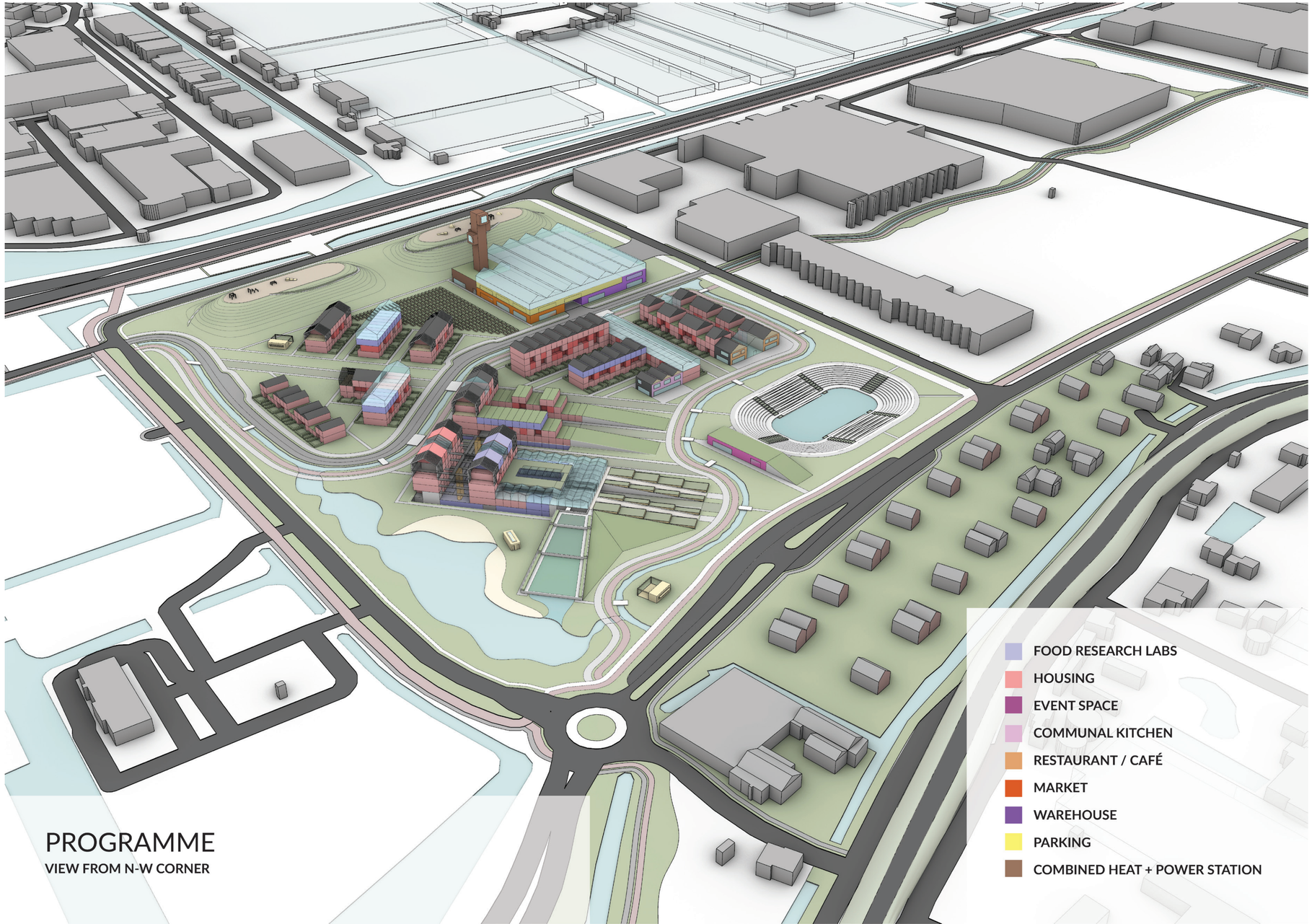
URBAN CONNECTIVITY: (5) Cycles and Waste Flows



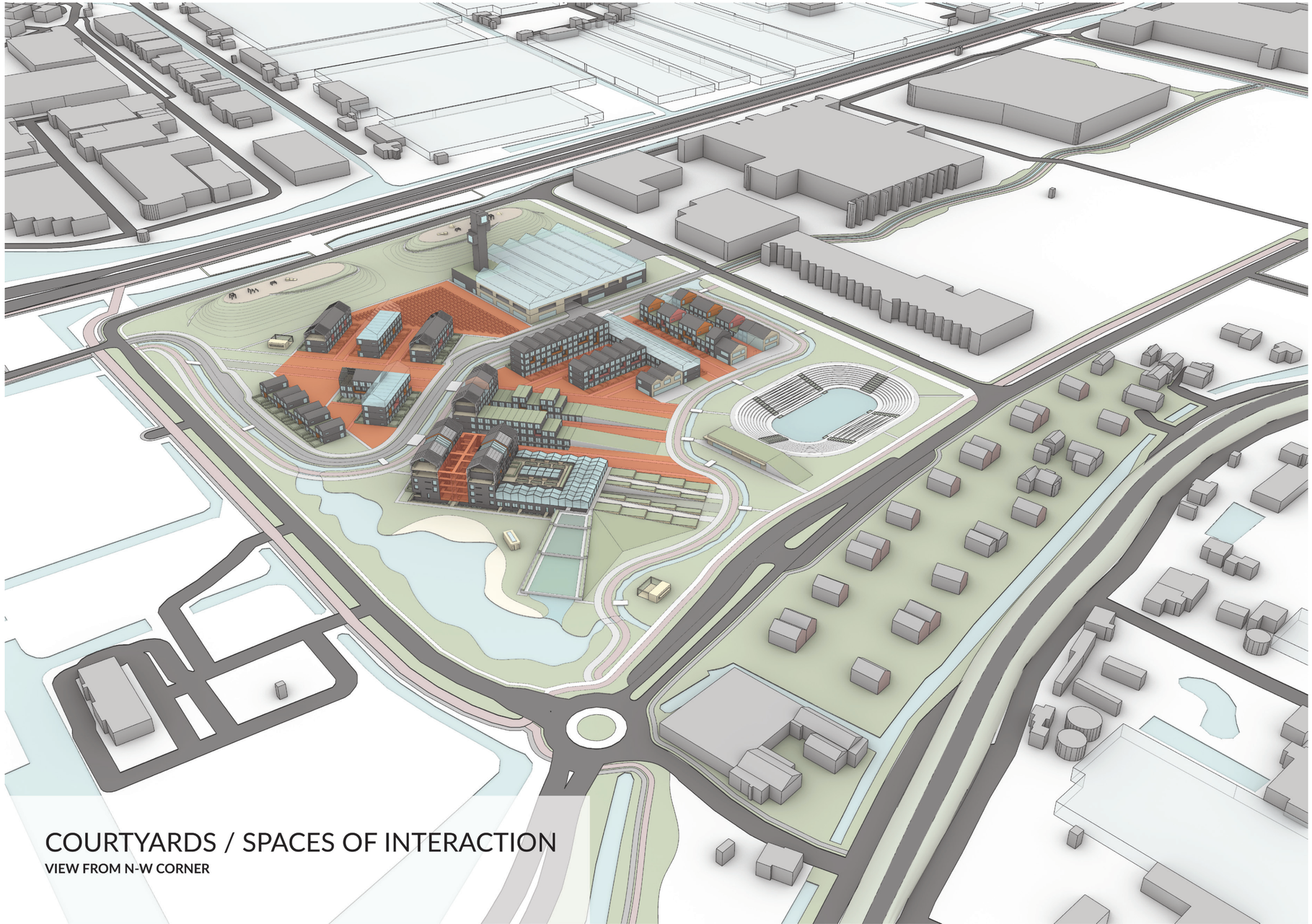
DISTRICT WATER MANAGEMENT

VIEW FROM N-W CORNER

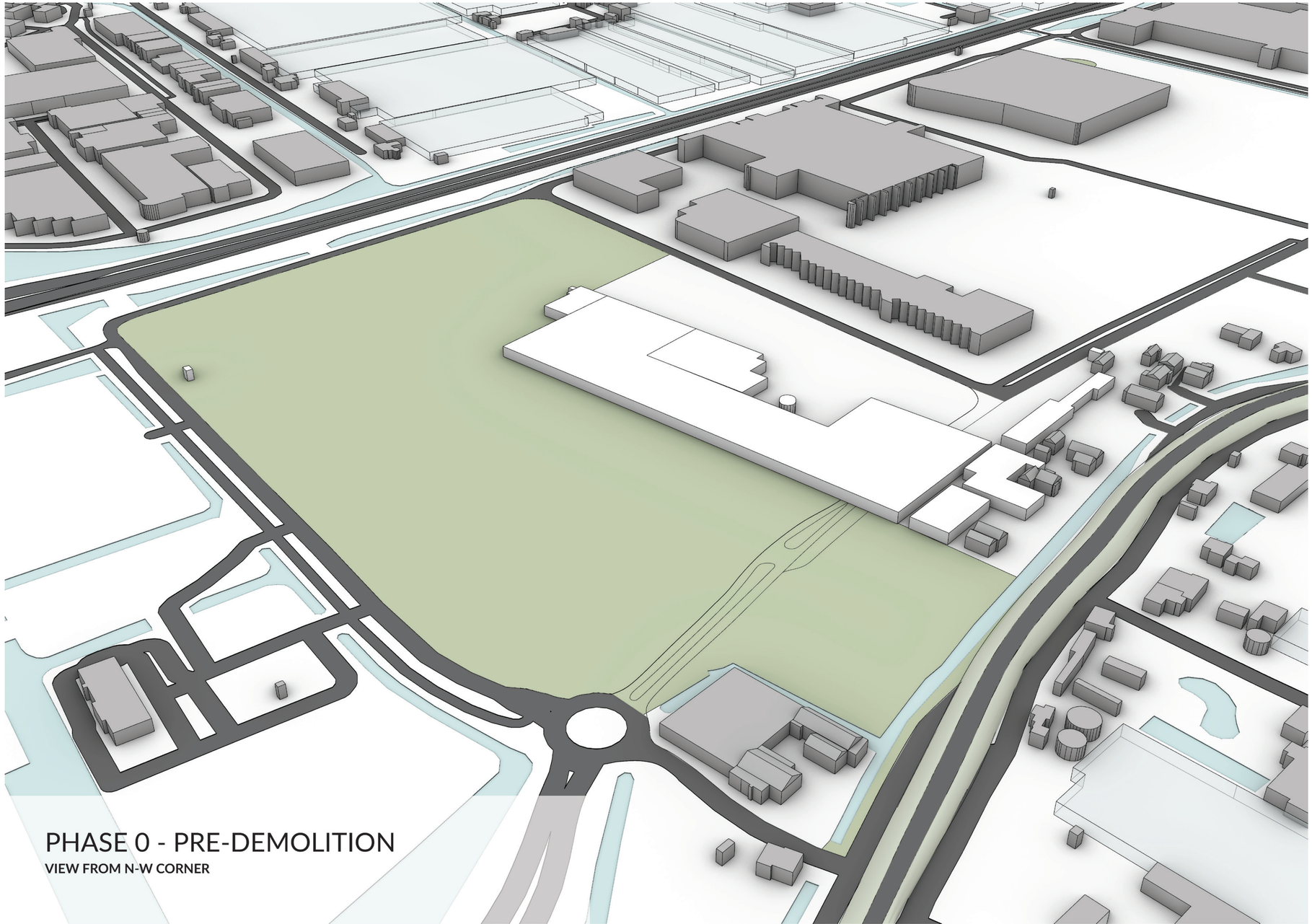
URBAN ADAPTABILITY: (6) Hybridisation and Clusterisation



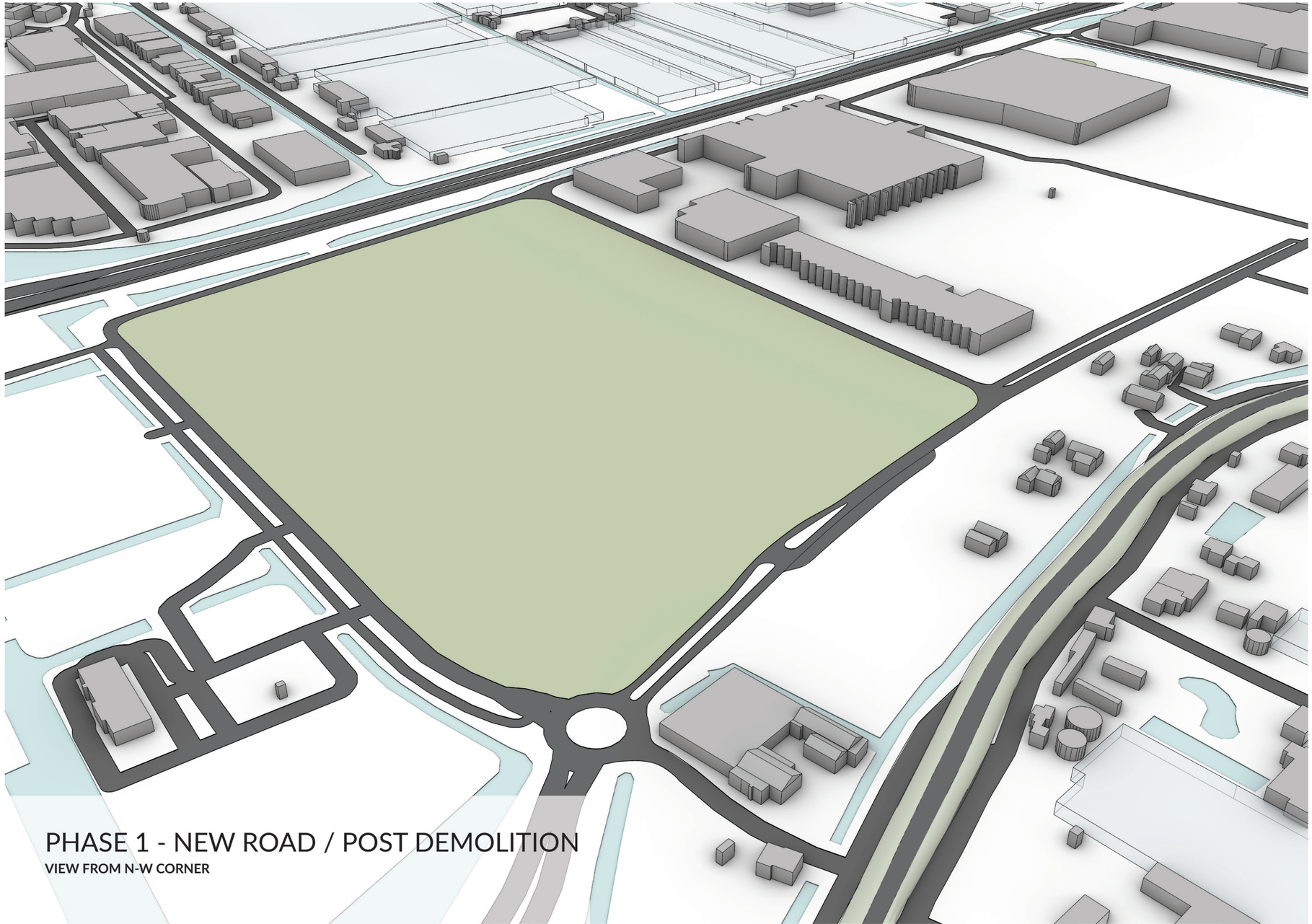
URBAN ADAPTABILITY: (6) Hybridisation and Clusterisation



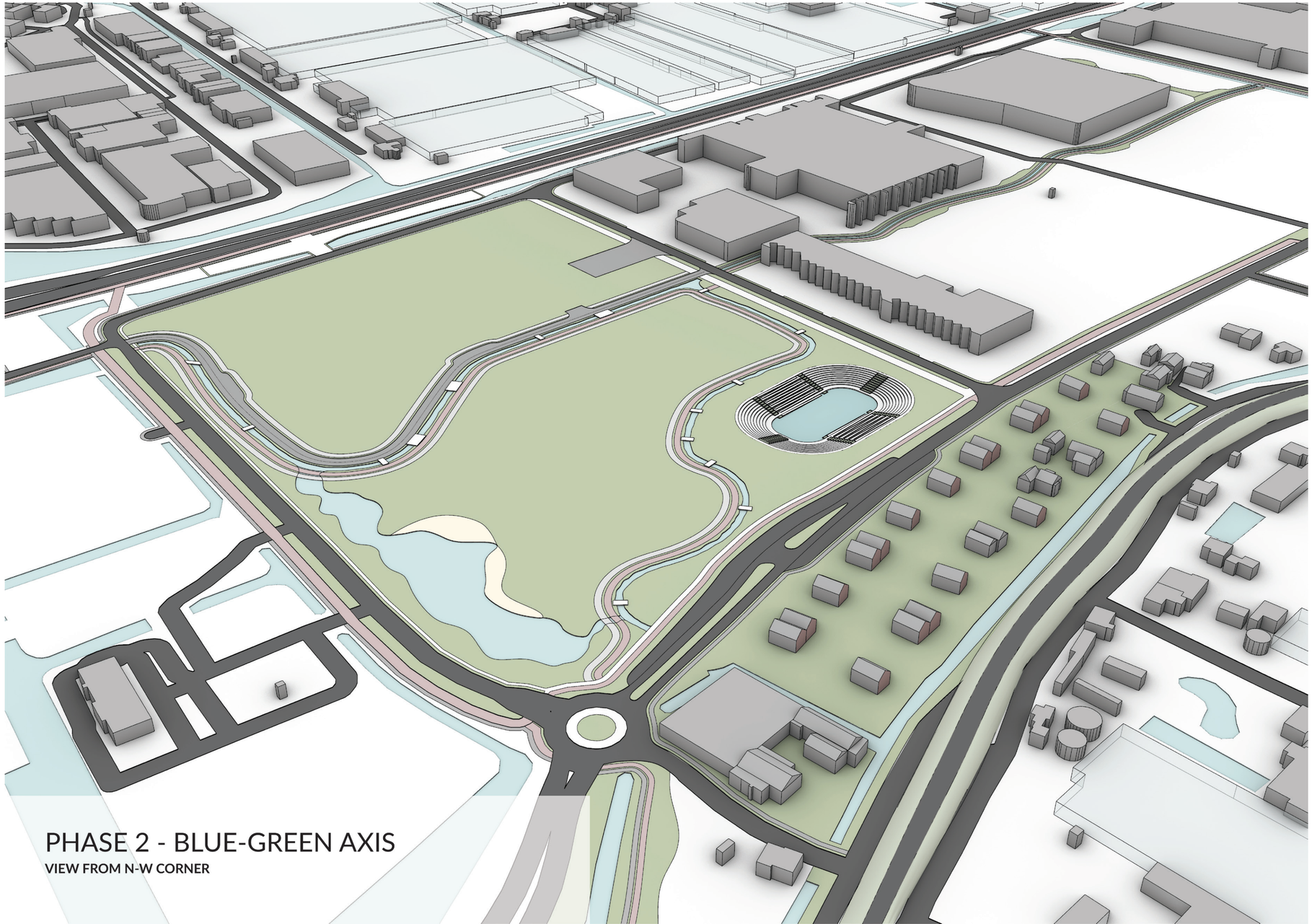
URBAN ADAPTABILITY: (7) Phaseability and Temporary Use



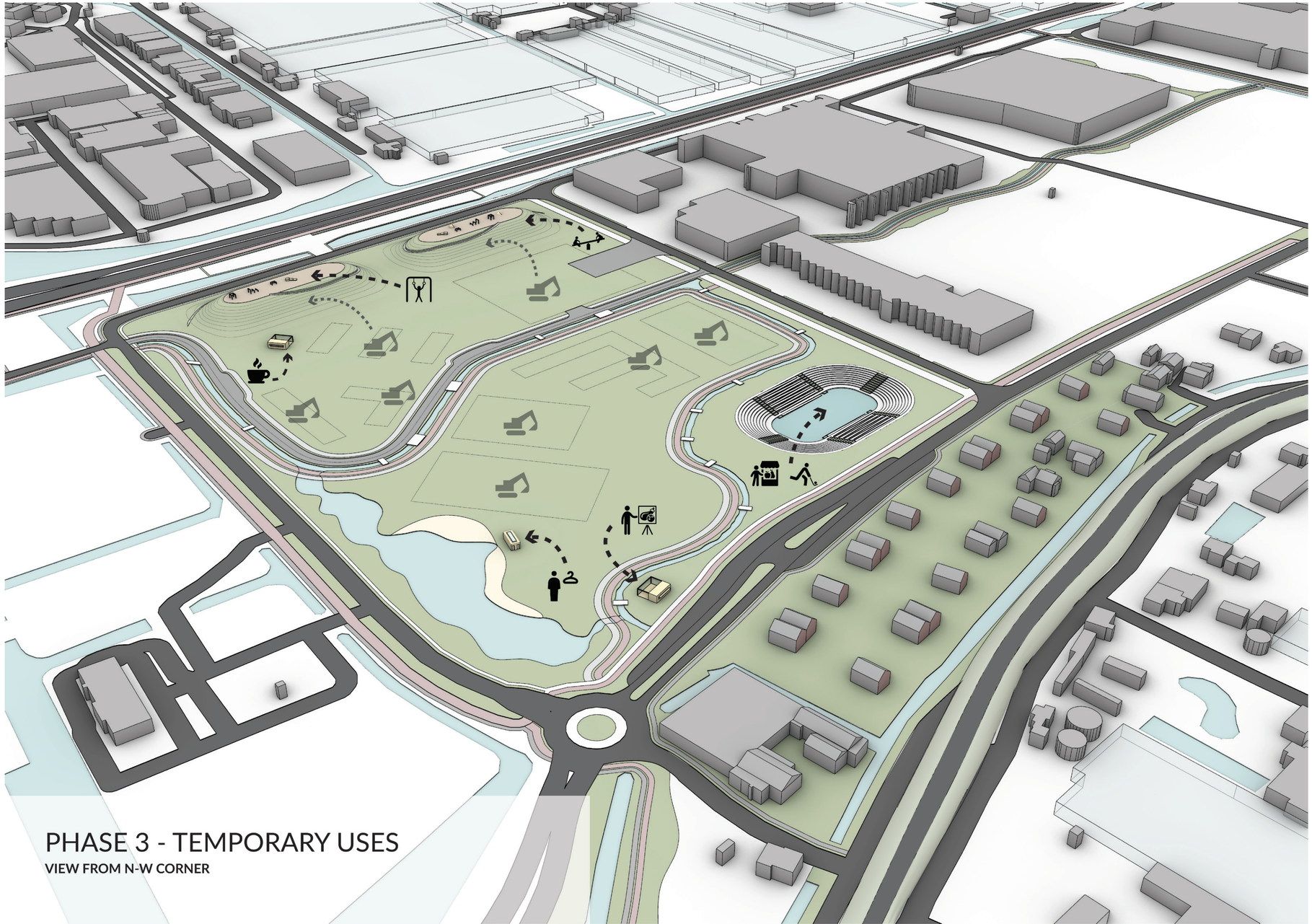
URBAN ADAPTABILITY: (7) Phaseability and Temporary Use



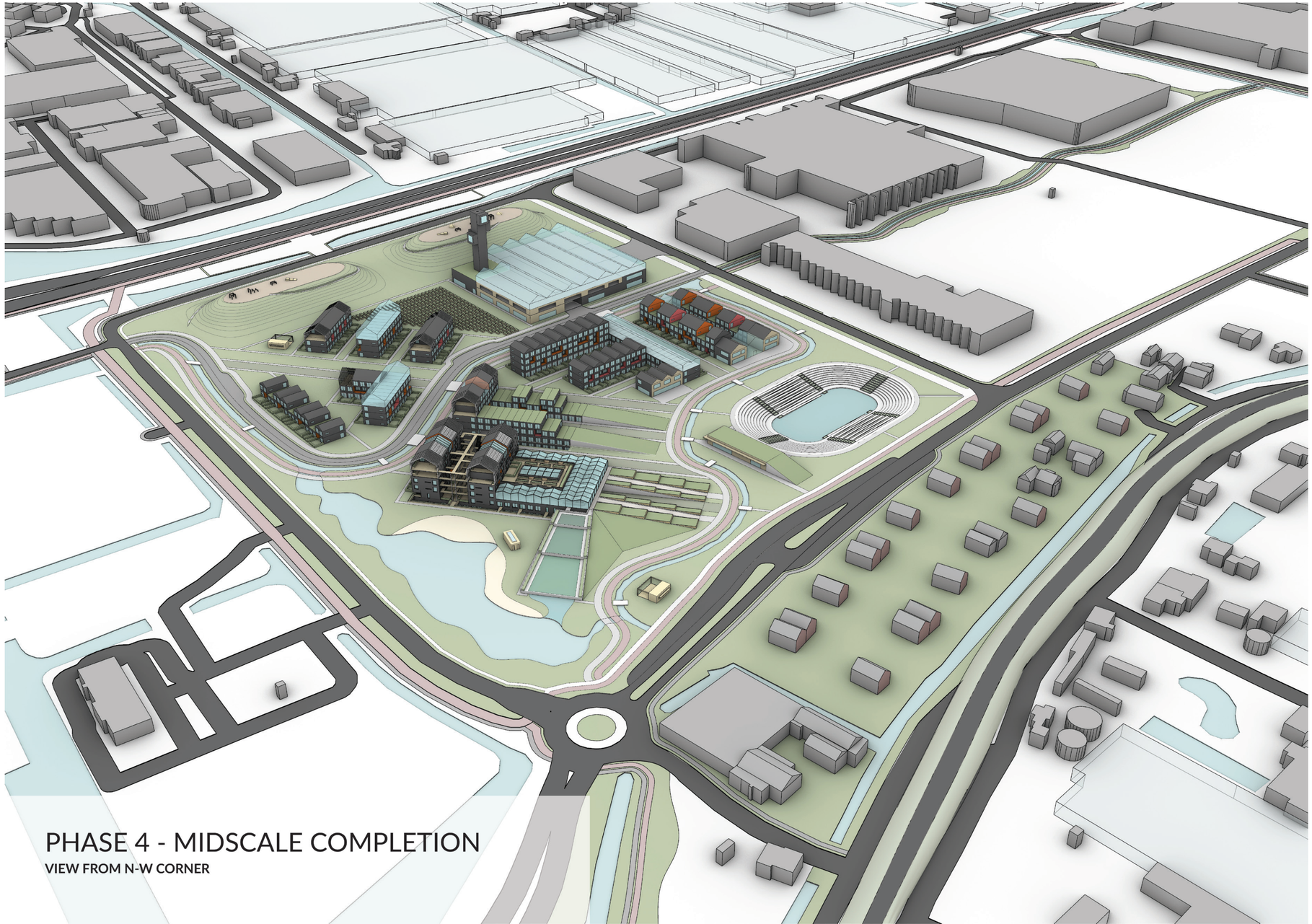
URBAN ADAPTABILITY: (7) Phaseability and Temporary Use



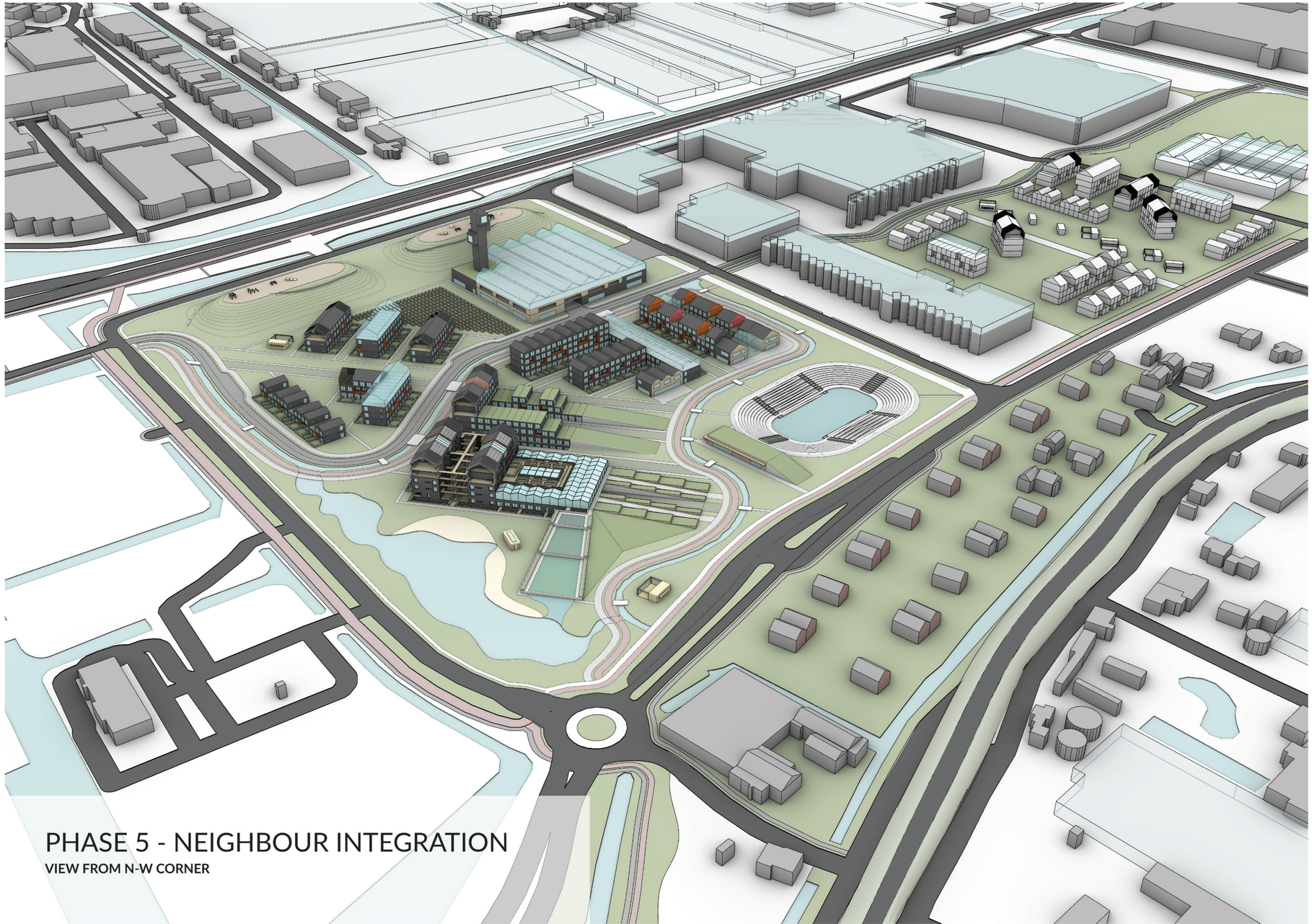
URBAN ADAPTABILITY: (7) Phaseability and Temporary Use



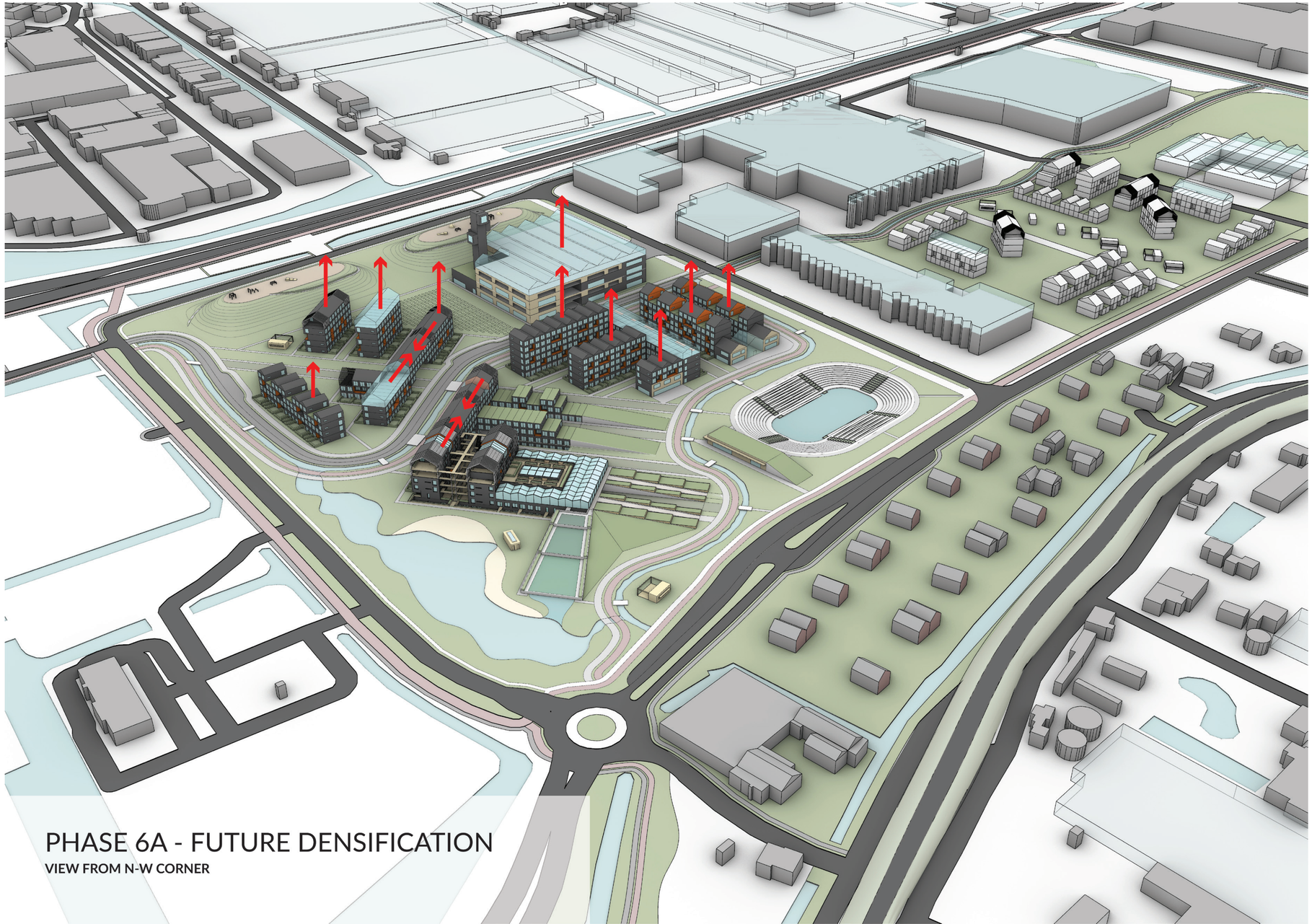
URBAN ADAPTABILITY: (7) Phaseability and Temporary Use



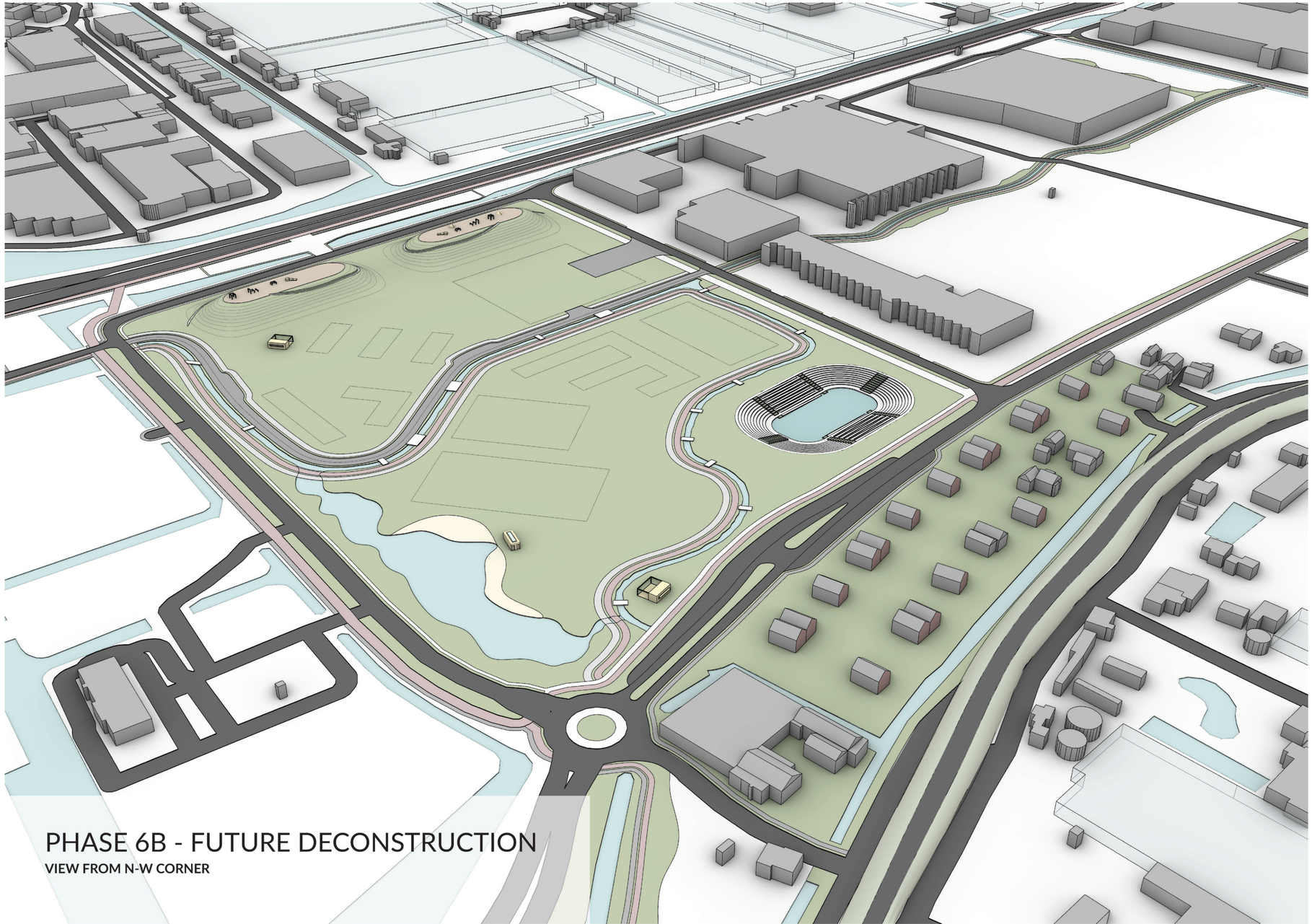
URBAN ADAPTABILITY: (7) Phaseability and Temporary Use



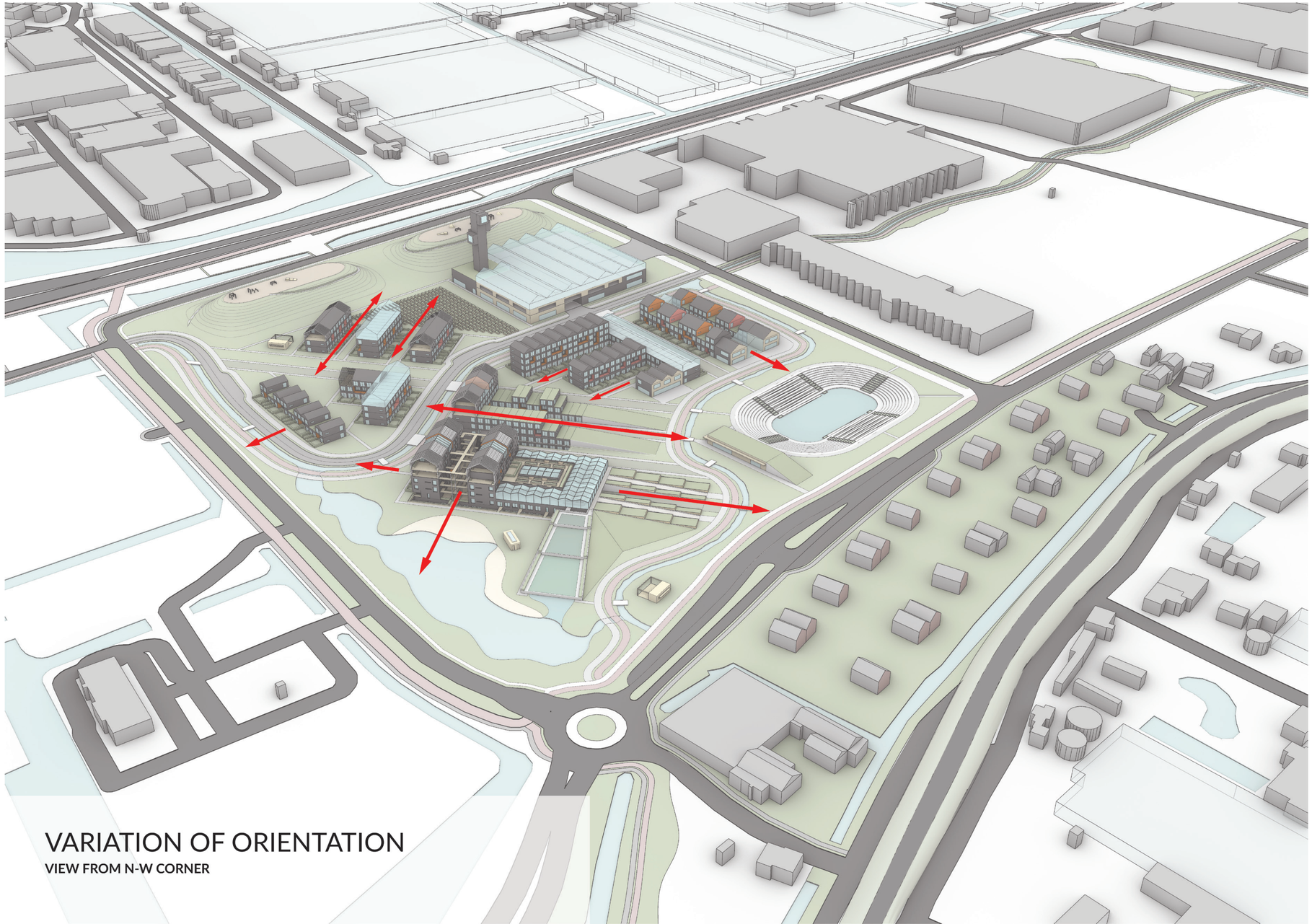
URBAN ADAPTABILITY: (7) Phaseability and Temporary Use



URBAN ADAPTABILITY: (7) Phaseability and Temporary Use

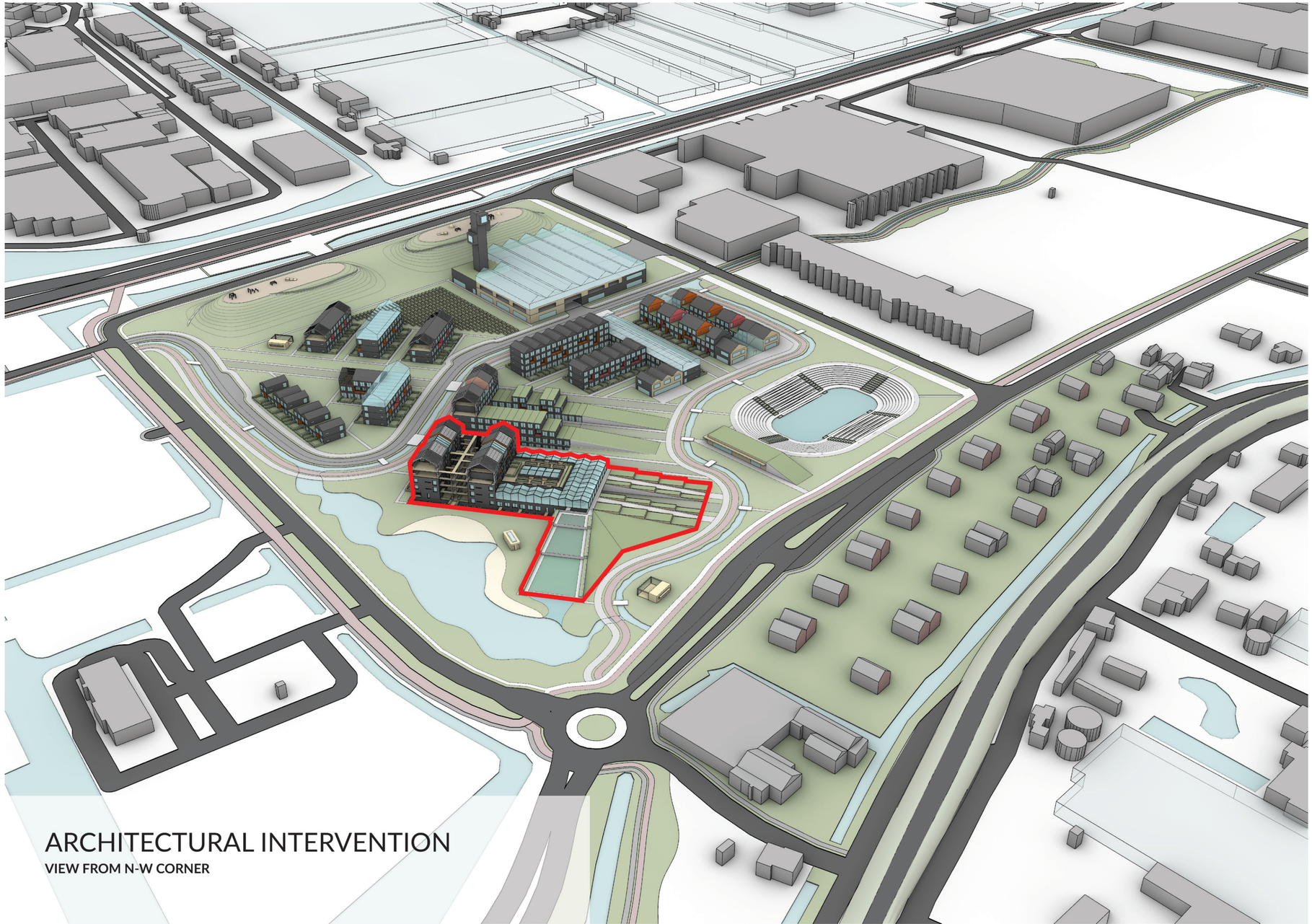


URBAN ADAPTABILITY: (8) Adaptable Modularity

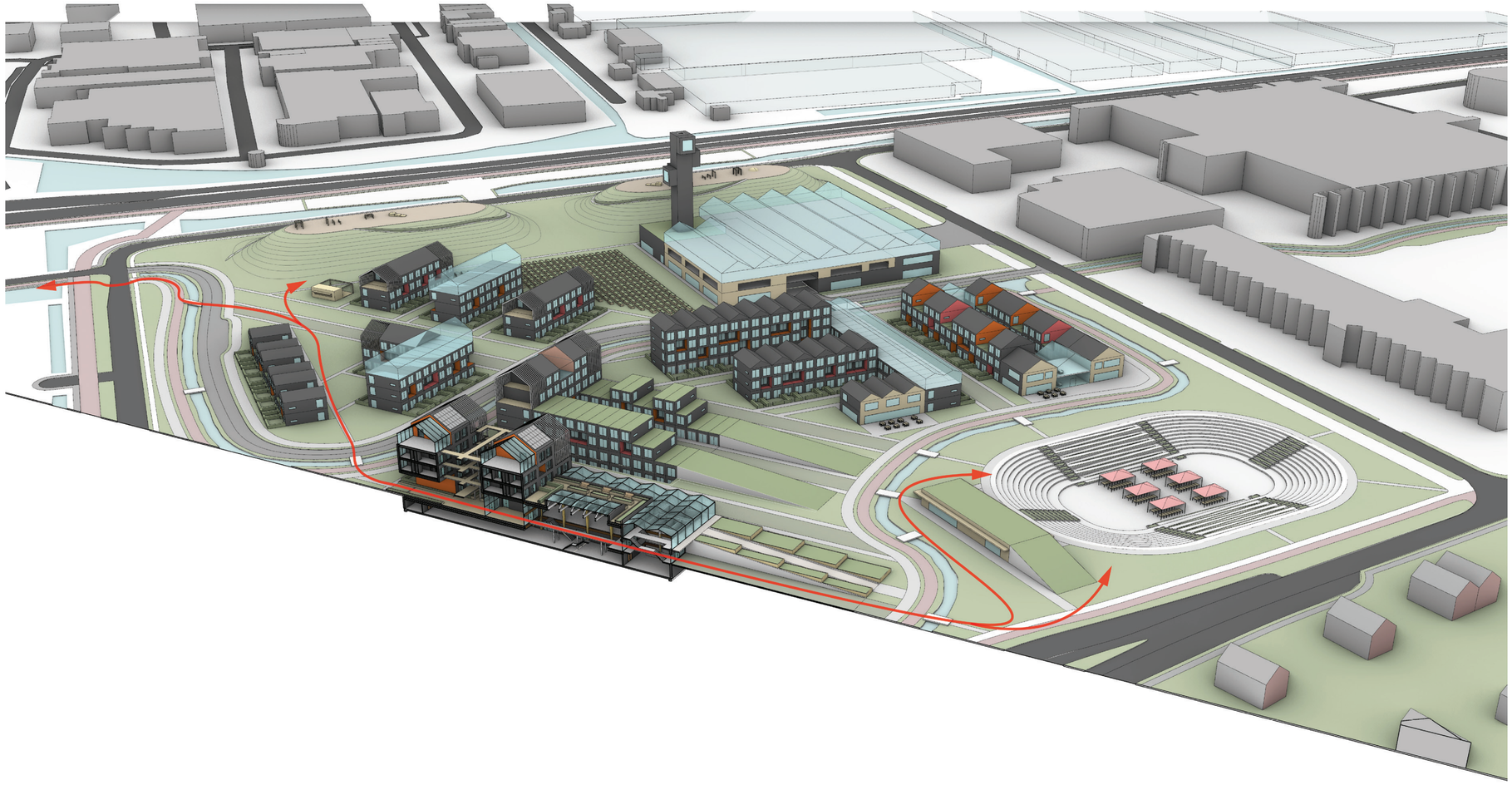


ARCHITECTURAL DESIGN

ARCHITECTURAL INTERVENTION: Selected Building

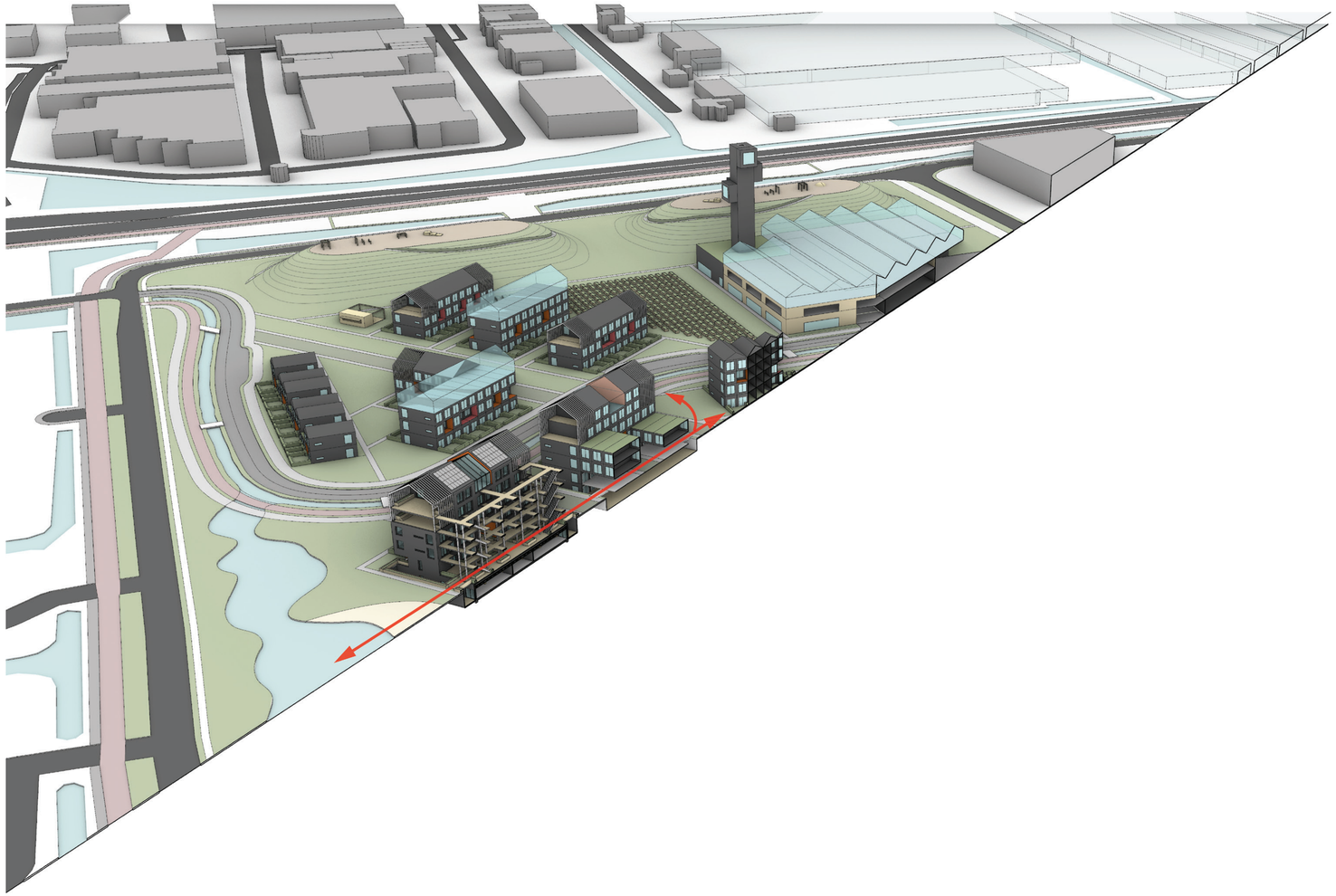


ARCHITECTURAL CONNECTIVITY: (1) Communities and Public Spaces



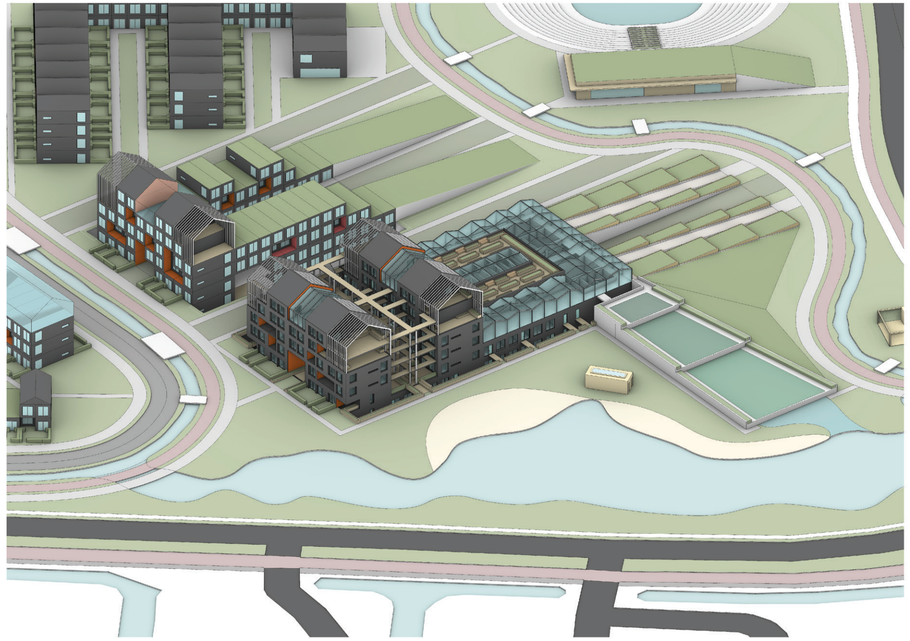
LONGITUDINAL SECTION PERSPECTIVE
OF ARCHITECTURAL INTERVENTION FROM NORTH-WEST CORNER

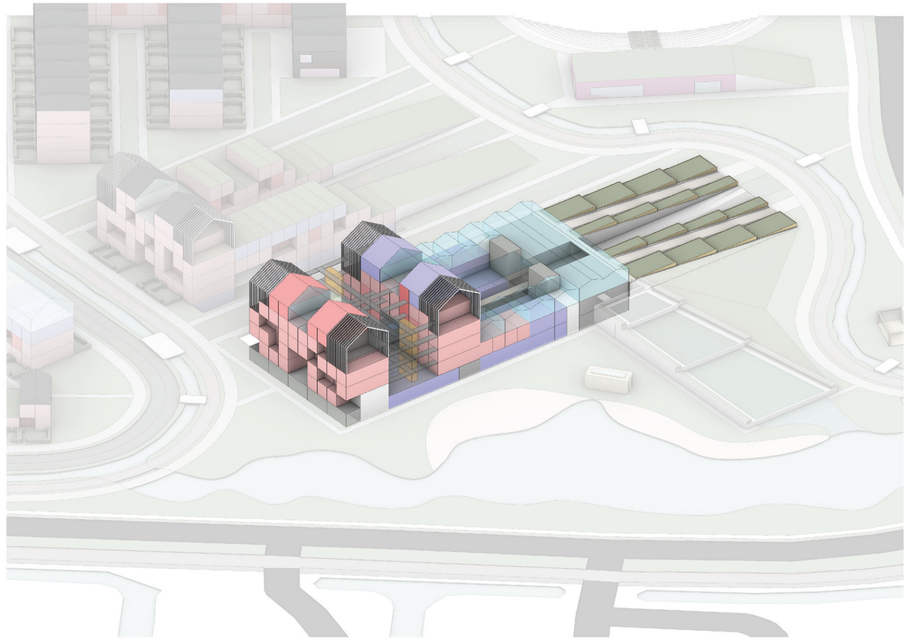
ARCHITECTURAL CONNECTIVITY: (1) Communities and Public Spaces



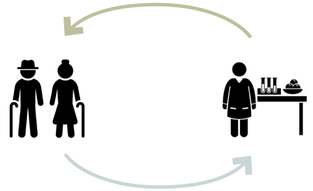
TRANSVERSAL SECTION PERSPECTIVE
OF ARCHITECTURAL INTERVENTION FROM NORTH-WEST CORNER

ARCHITECTURAL CONNECTIVITY: (1) Communities and Public Spaces





FOOD RESEARCH LAB
HOUSING
COMMON AREA
GREENHOUSE
MECHANICAL ROOM
STAIR
ELEVATOR
GREEN ROOF



BUILDING PROGRAMME

VIEW FROM N-W CORNER

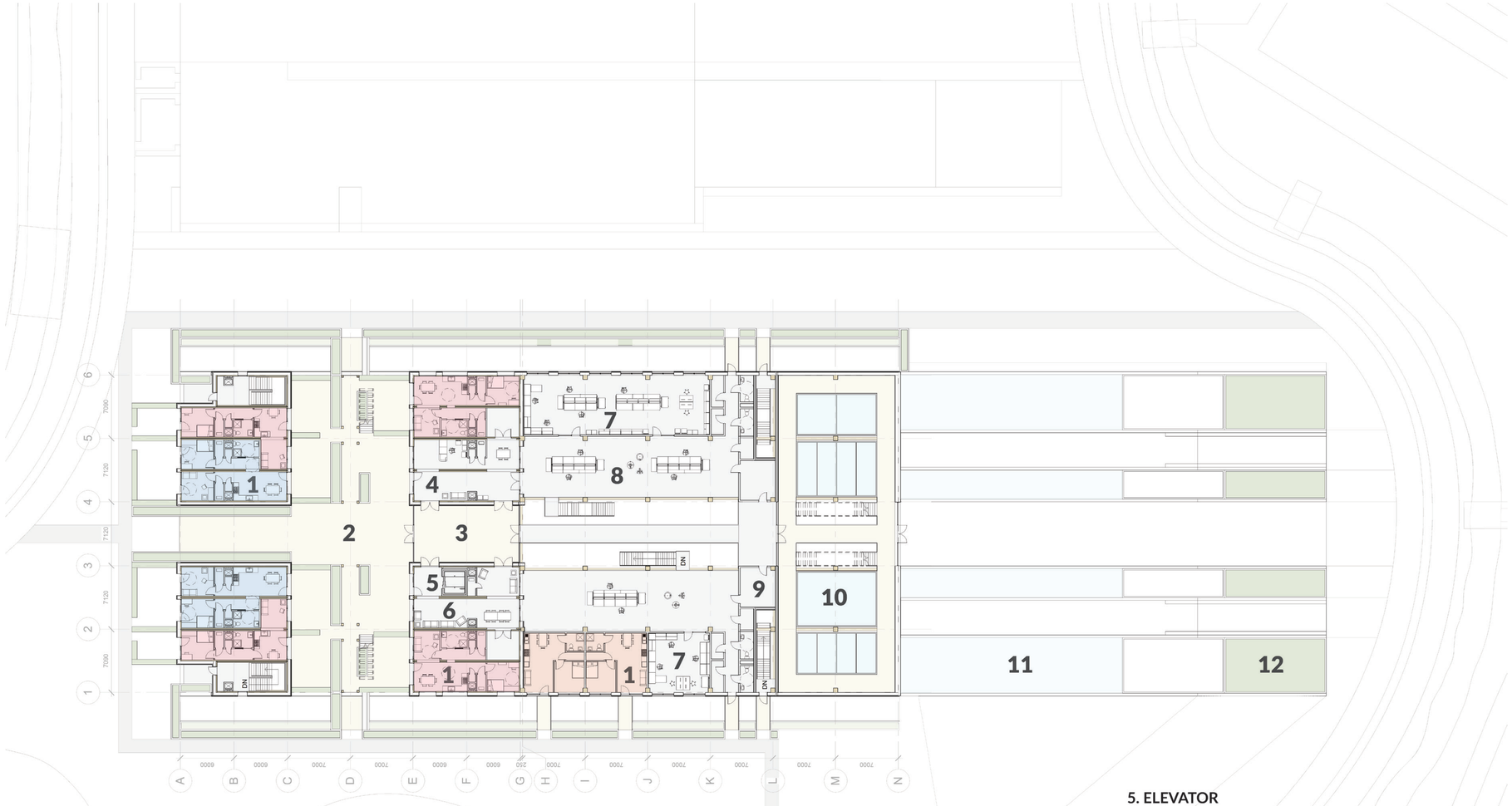
ARCHITECTURAL CONNECTIVITY: (1) Communities and Public Spaces

BASEMENT PLAN

0 5 10 20m

1. MECHANICAL ROOM
2. FOOD RESEARCH LABS
   - SENSORY EVALUATION TASTING AND PREP
   - ENTOMOLOGY LAB
   - COMPUTER WATER MODELING
   - MICROBIOLOGY LAB
   - GENOMICS LAB
   - PLANT PATHOLOGY LAB
   - MUSHROOM / INSECT LAB
3. COLLABORATIVE WORKSPACE
4. STORAGE / TOILET

ARCHITECTURAL CONNECTIVITY: (1) Communities and Public Spaces



GROUND FLOOR PLAN

0 5 10 20m

1. HOUSING MODULES
   - 1 BEDROOM
   - 1 BEDROOM - TYPE 2
   - 1 BEDROOM - CONVERTIBLE
2. COURTYARD
3. ATRIUM
4. LAB RECEPTION
5. ELEVATOR
6. RESIDENT COMMON AREA
7. BIOENERGY SYSTEMS LAB
8. INSTRUMENT / ROBOTICS LAB
9. LOCKERS / SECURITY VESTIBULE
10. ECOLOGICAL WATER FILTRATION
11. WATER STORAGE TANK
12. TERRACED GARDEN BEDS

ARCHITECTURAL CONNECTIVITY: (1) Communities and Public Spaces

1. HOUSING MODULES
   - 1 BEDROOM
   - 2 BEDROOM
   - 2 BEDROOM - BALCONY
2. LAB WORKSPACE
3. RESIDENT LOUNGE
4. VERTICAL FARM
5. MECHANICAL ROOM
6. ANOXIC REACTOR
7. CLOSED AEROBIC REACTOR
8. OPEN REACTORS I-IV
9. CLARIFIER
10. FLUIDISED BEDS
11. TERRACED GARDEN BEDS

FIRST FLOOR PLAN

0 5 10 20m

ARCHITECTURAL CONNECTIVITY: (1) Communities and Public Spaces

1. HOUSING MODULES
   - 1 BEDROOM
   - 1 BEDROOM - TYPE 2
   - 2 BEDROOM
   - 2 BEDROOM - BALCONY
2. RESIDENT LOUNGE
3. TOOL SHED
4. RESIDENT COMMON AREA
5. RESIDENT YARD
6. SHARED ROOF GARDEN

SECOND FLOOR PLAN

0 5 10 20m

ARCHITECTURAL CONNECTIVITY: (1) Communities and Public Spaces

THIRD FLOOR PLAN

0 5 10 20m

1. HOUSING MODULES
- 1 BEDROOM
- 1 BEDROOM - TYPE 2
- 2 BEDROOM
- 2 BEDROOM - BALCONY
- 3 BEDROOM - BALCONY

2. SHARED TERRACE

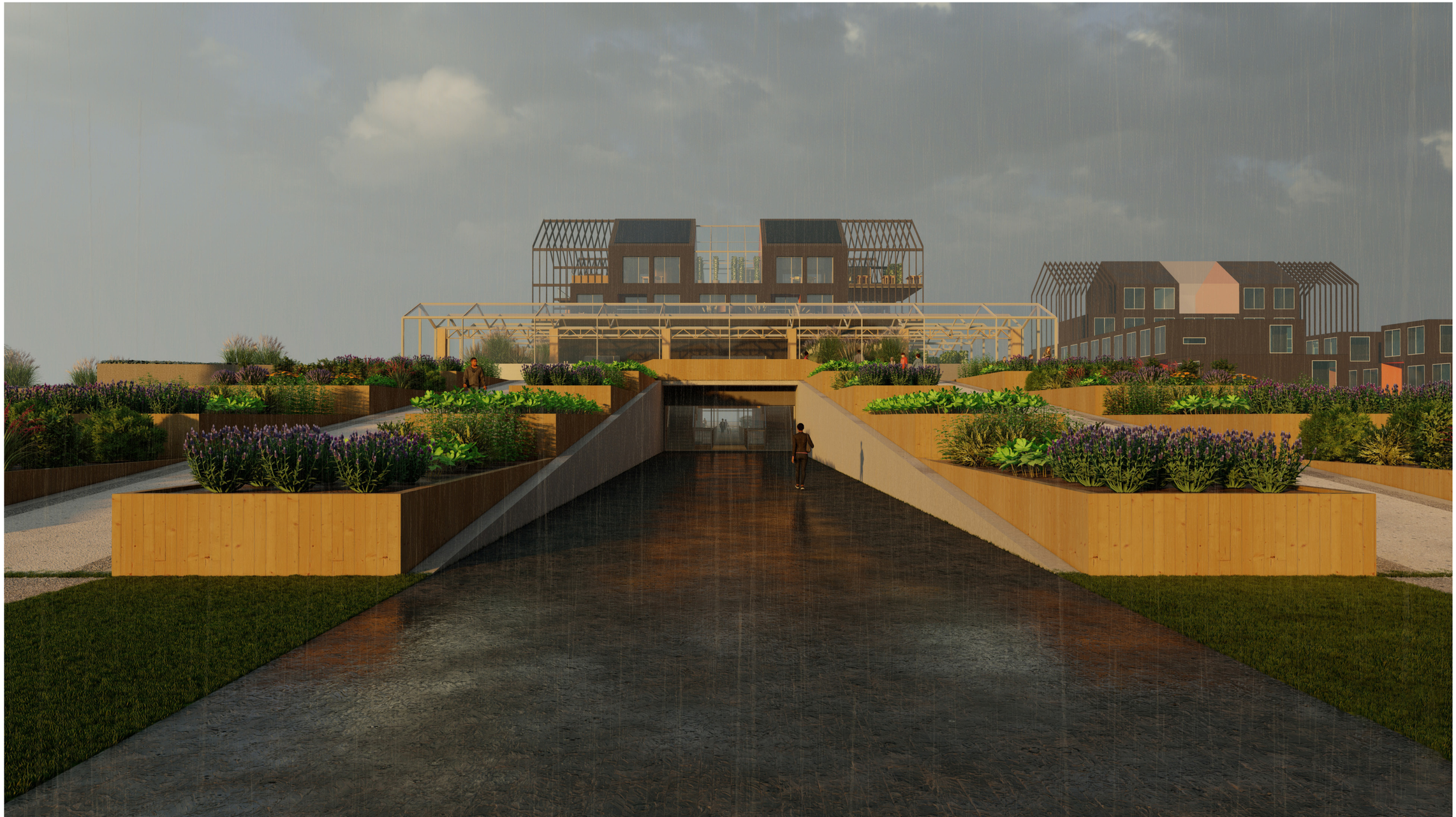
ARCHITECTURAL CONNECTIVITY: (1) Communities and Public Spaces

FOURTH FLOOR PLAN

0 5 10 20m

1. ROOF MODULES
   - COWORKING SPACES
   - WINTER GARDEN
   - COMMUNAL KITCHEN
   - PLANT PHYSIOLOGY LAB
2. SHARED TERRACES
3. OUTDOOR FOOD PRODUCTION

ARCHITECTURAL CONNECTIVITY: (1) Communities and Public Spaces



ARCHITECTURAL CONNECTIVITY: (2) Small Residential to Large Agri-Food Scales

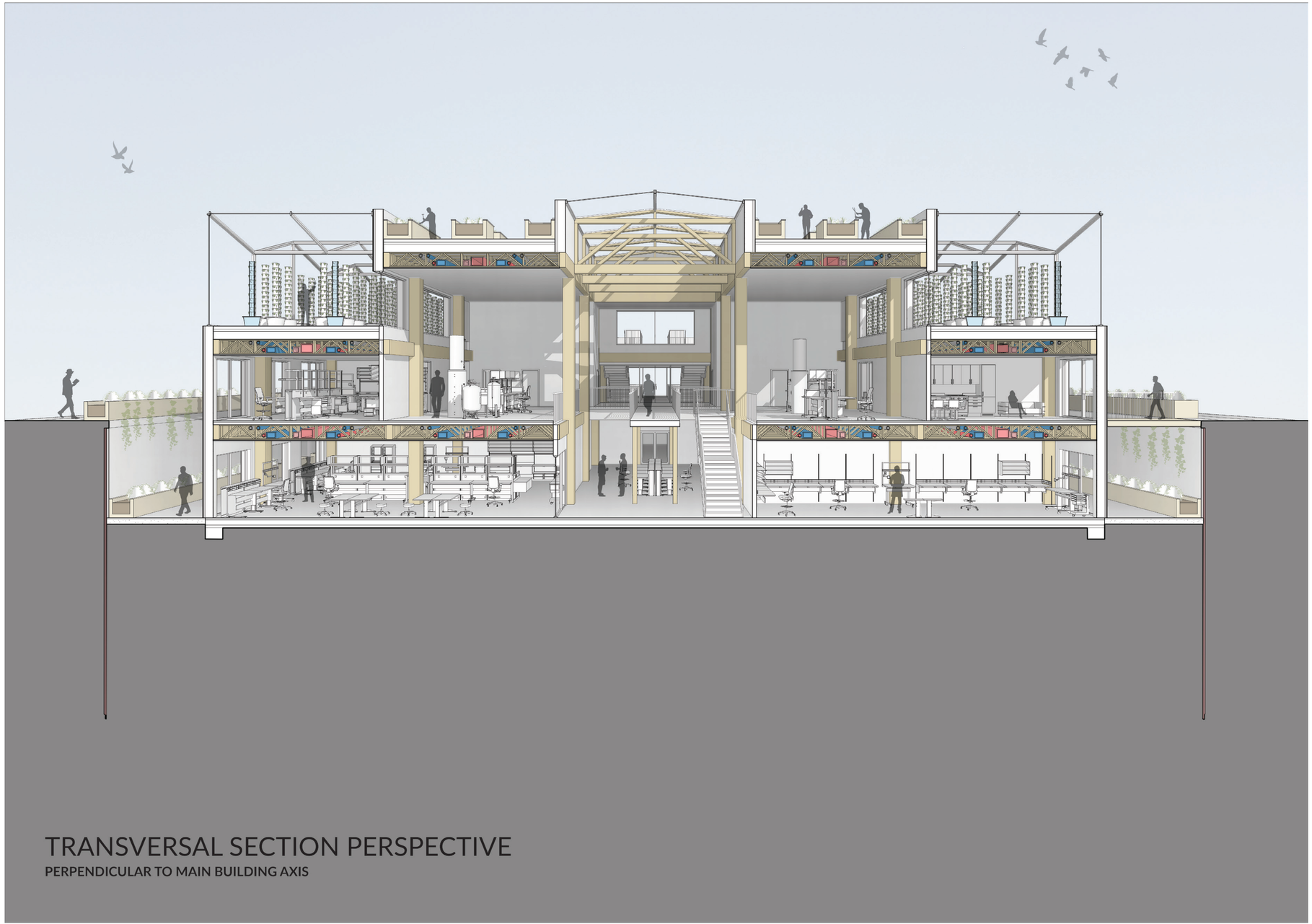
ARCHITECTURAL CONNECTIVITY: (2) Small Residential to Large Agri-Food Scales

ARCHITECTURAL CONNECTIVITY: (2) Small Residential to Large Agri-Food Scales

LONGITUDINAL SECTION PERSPECTIVE
THROUGH MAIN BUILDING AXIS

ARCHITECTURAL CONNECTIVITY: (2) Small Residential to Large Agri-Food Scales

ARCHITECTURAL CONNECTIVITY: (2) Small Residential to Large Agri-Food Scales



TRANSVERSAL SECTION PERSPECTIVE

PERPENDICULAR TO MAIN BUILDING AXIS

ARCHITECTURAL CONNECTIVITY: (3) Identity to Place

NORTH ELEVATION

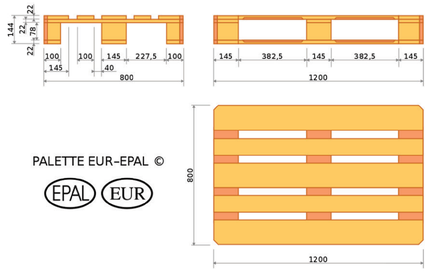
0 5 10 20m

ARCHITECTURAL CONNECTIVITY: (3) Identity to Place

WEST ELEVATION

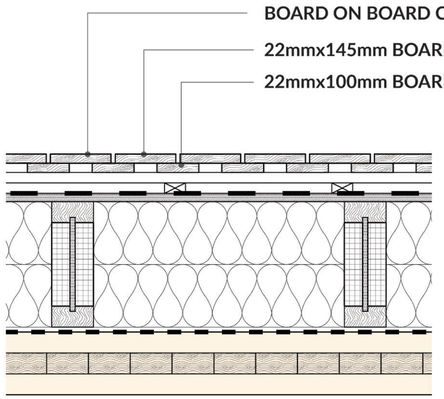
0 5 10 20m

ARCHITECTURAL CONNECTIVITY: (3) Identity to Place



STANDARD PALLET DIMENSIONS
SOURCE: EPALNL.NL

CHARRING WOOD FOR WEATHERPROOFING
SOURCE: NAKOMOTOFORESTRY.COM



FACADE ASSEMBLY

EXTERIOR

22mm RECLAIMED AND CHARRED WOOD BOARD
22mm RECLAIMED AND CHARRED WOOD BOARD
25mm HORIZONTAL FURRING STRIP
25mm VERTICAL FURRING STRIP
WEATHER BARRIER
18mm ORIENTED STRAND BOARD
300mm DENSE CELLULOSE INSULATION PANELS BE-
TWEEN TIMBER I-JOISTS
12mm VAPOUR BARRIER BOARD
120mm CLT PANEL

INTERIOR

FACADE MATERIALITY

CIRCULAR APPROACH HARVESTING FROM NEARBY INDUSTRY

ARCHITECTURAL CONNECTIVITY: (3) Identity to Place

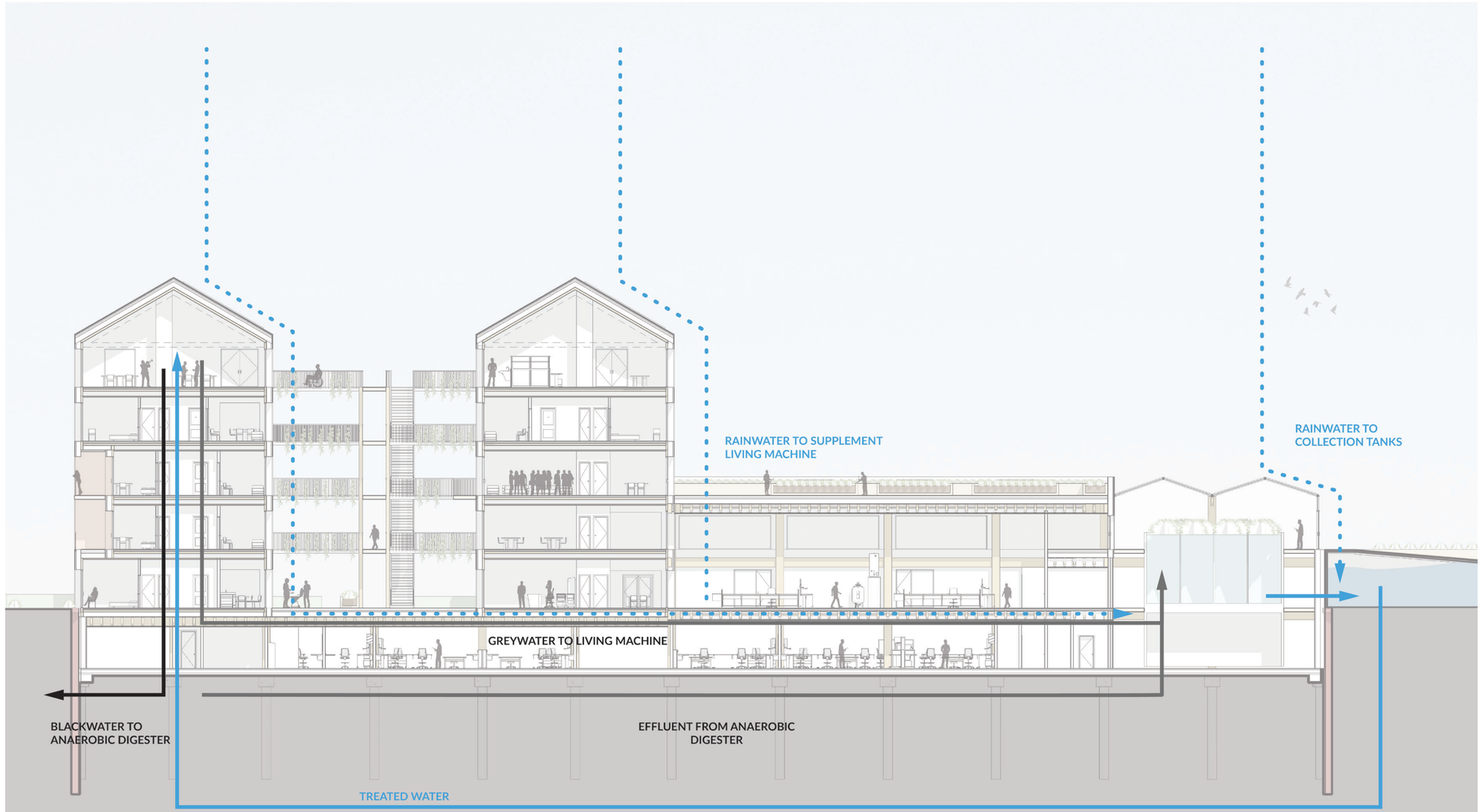
ARCHITECTURAL CONNECTIVITY: (4) Nature to Urban Design

ARCHITECTURAL CONNECTIVITY: (4) Nature to Urban Design

ARCHITECTURAL CONNECTIVITY: (5) Cycles and Waste Flows

ARCHITECTURAL CONNECTIVITY: (5) Cycles and Waste Flows

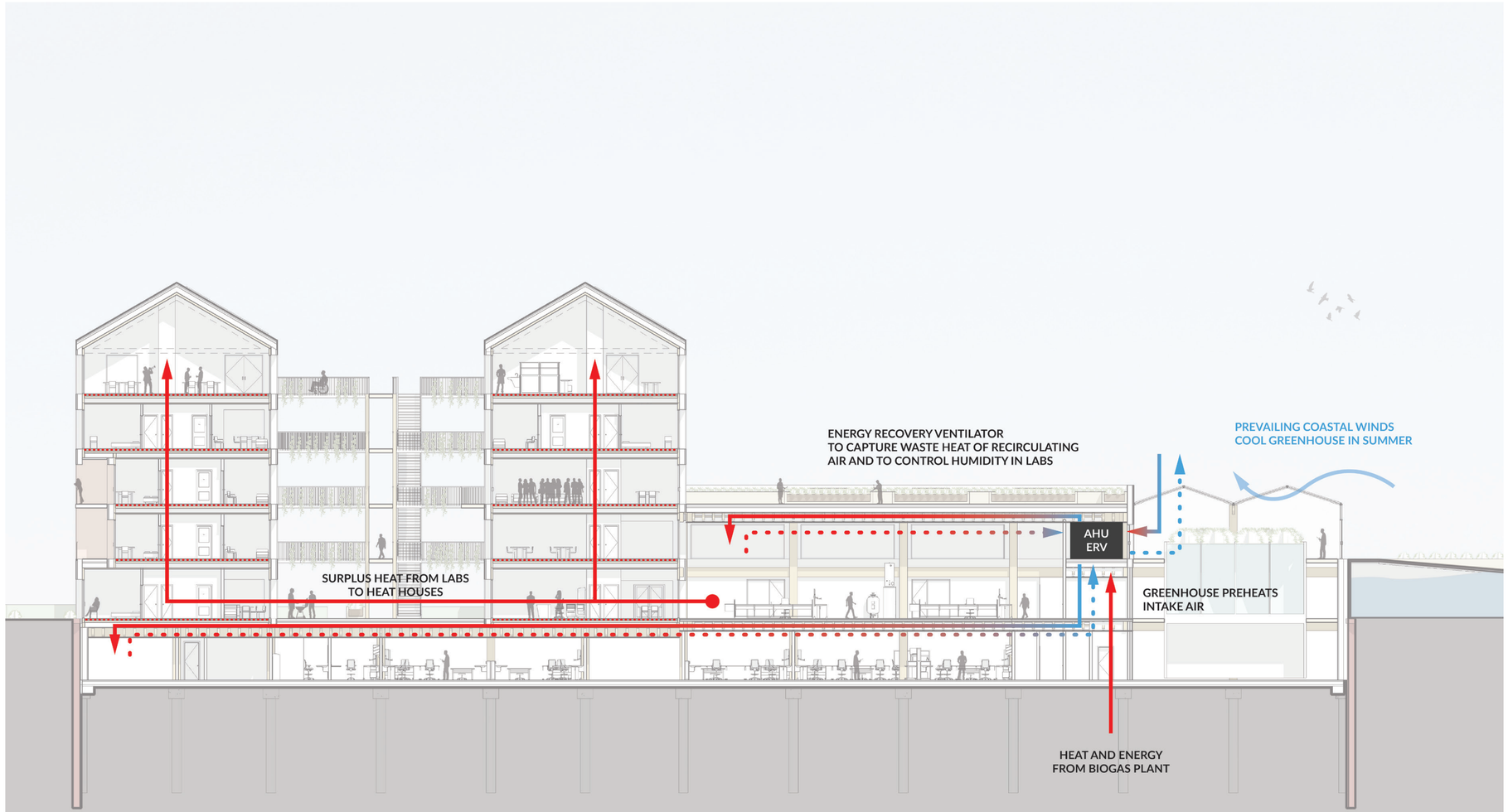
ARCHITECTURAL CONNECTIVITY: (5) Cycles and Waste Flows



LONGITUDINAL SECTION

WATER TREATMENT

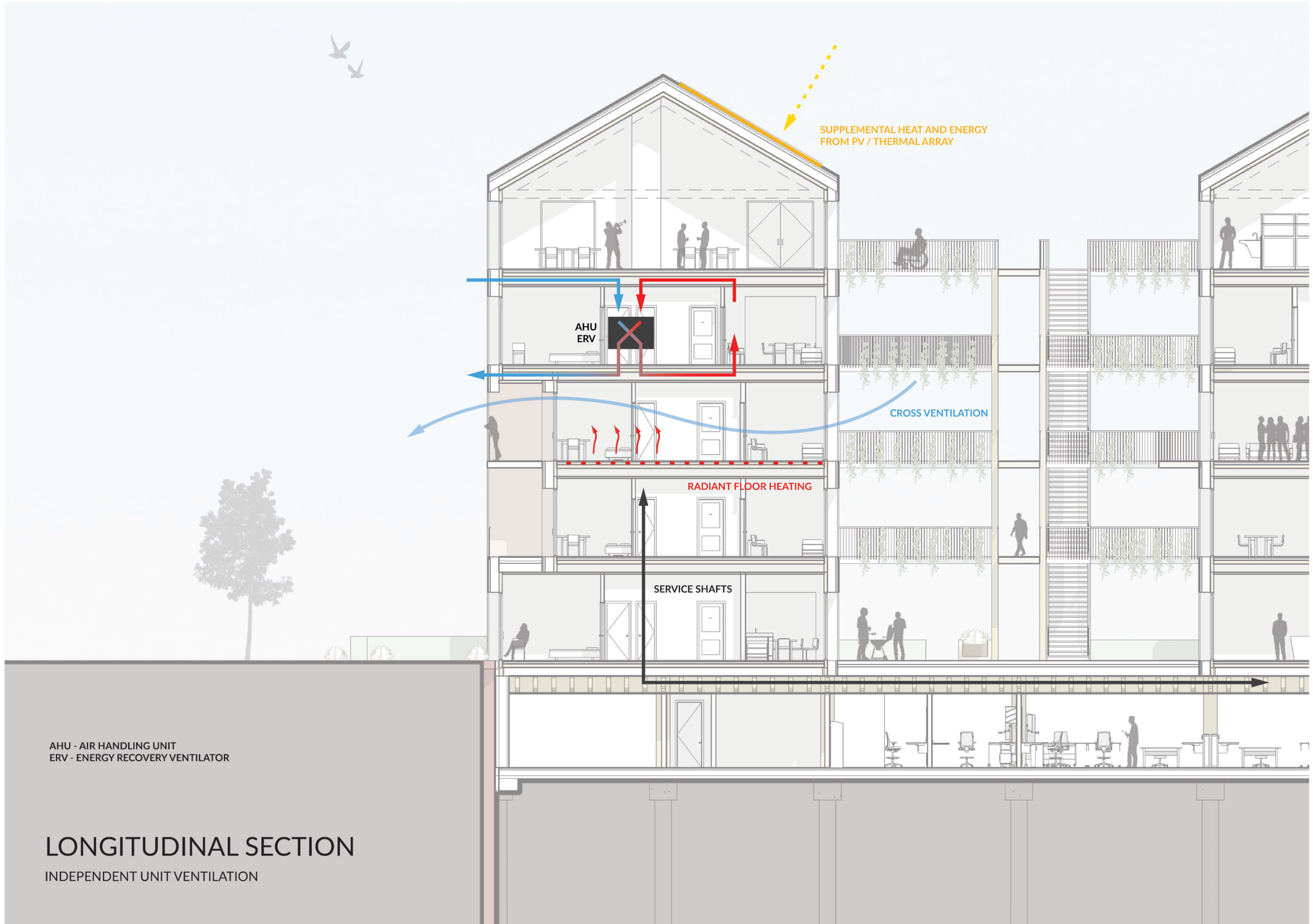
ARCHITECTURAL CONNECTIVITY: (5) Cycles and Waste Flows



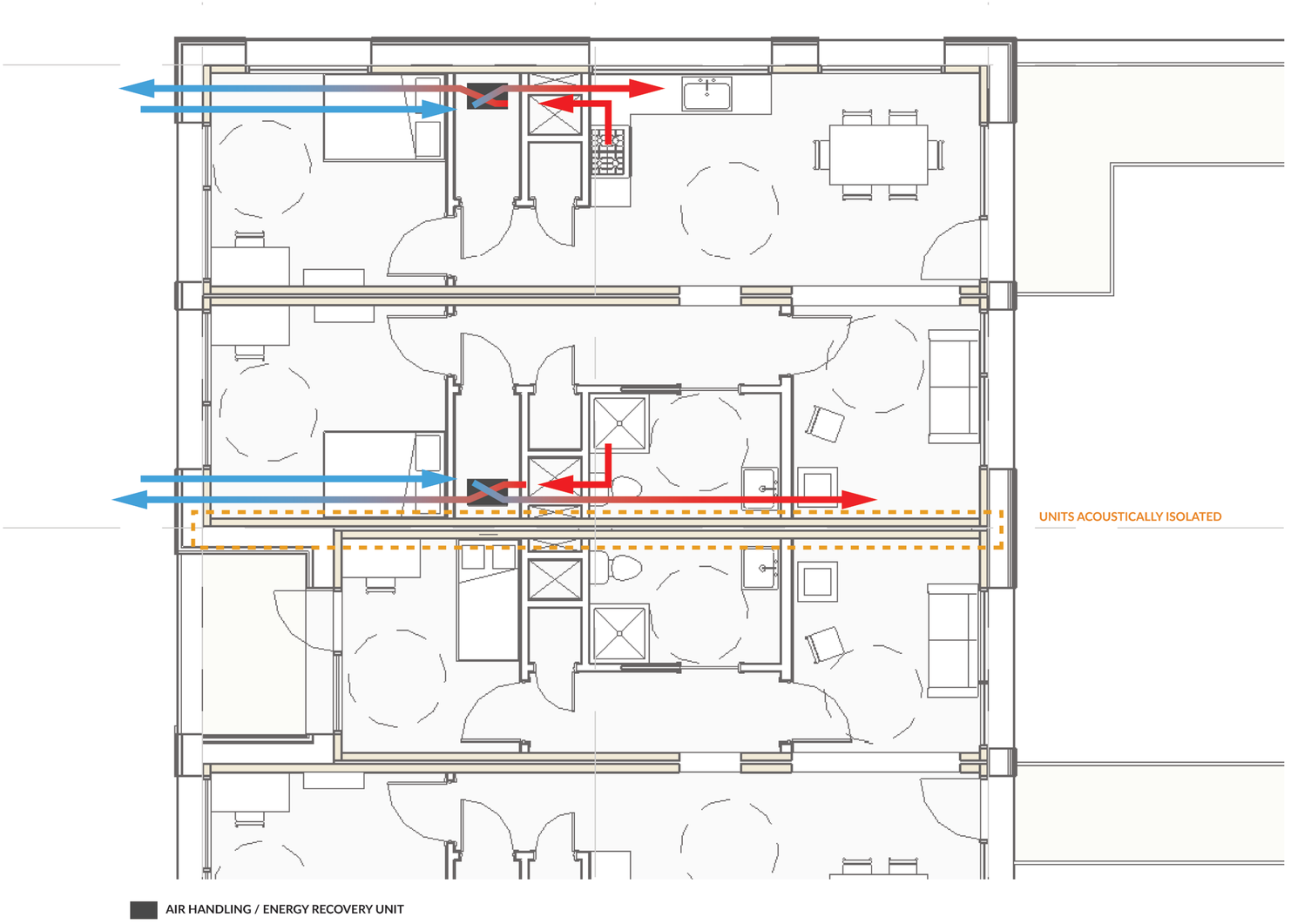
LONGITUDINAL SECTION

LAB VENTILATION

ARCHITECTURAL CONNECTIVITY: (5) Cycles and Waste Flows



ARCHITECTURAL CONNECTIVITY: (5) Cycles and Waste Flows

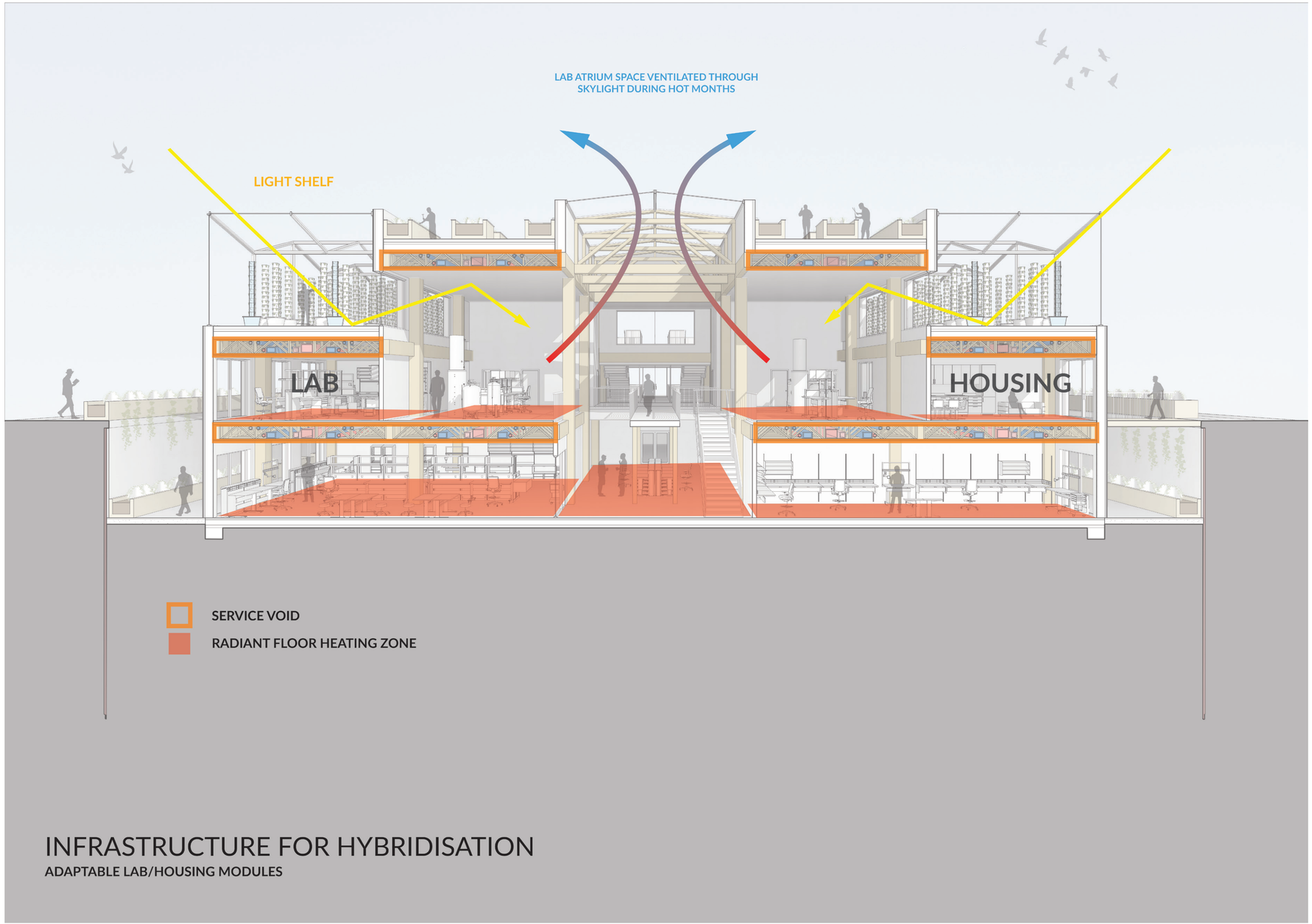


ENLARGED UNIT PLAN

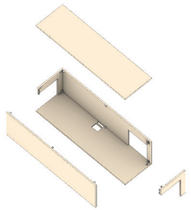
INDEPENDENT UNIT VENTILATION

0 1 2 4m

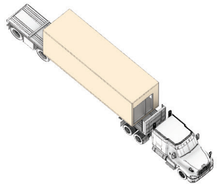
ARCHITECTURAL ADAPTABILITY: (6) Hybridisation and Clusterisation



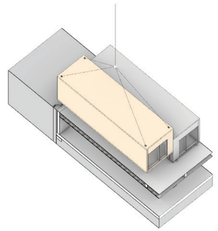
ARCHITECTURAL ADAPTABILITY: (7) Building Phaseability



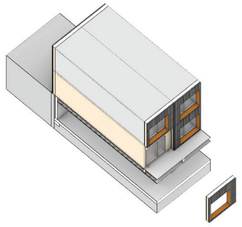
FACTORY ASSEMBLY



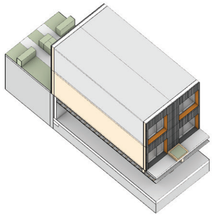
TRANSPORTATION



MODULE MOUNTING



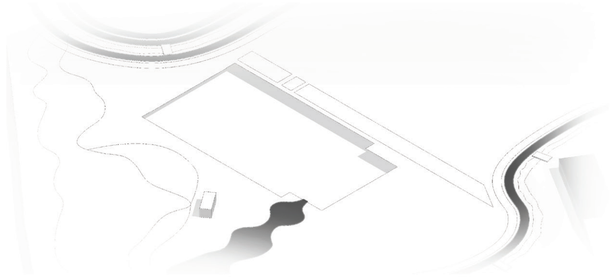
PRE-FABRICATED FACADE INSTALLATION



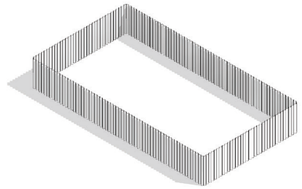
COMPLETION

CLT MODULE CONSTRUCTION

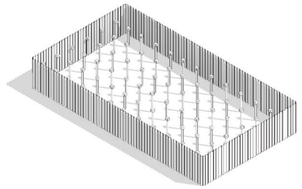
ARCHITECTURAL ADAPTABILITY: (7) Building Phaseability



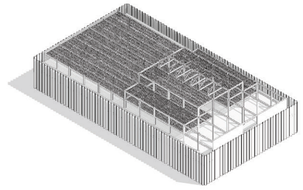
1. EXCAVATION



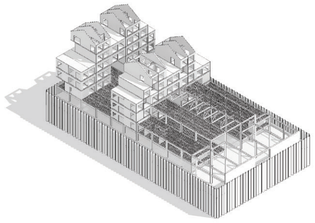
2. SHEET PILE FOUNDATION



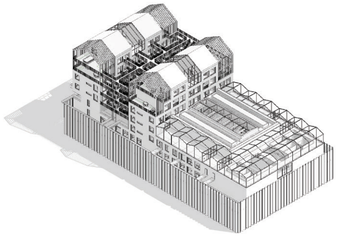
3. CONCRETE PILES



4. PREFABRICATED CONCRETE ELEMENTS AND TIMBER STRUCTURE



5. MOUNTING OF CLT MODULES



6. FACADE INSTALLATION AND FINISHES

CONSTRUCTION CONCEPT

ABILITY TO BE DISASSEMBLED

ARCHITECTURAL ADAPTABILITY: (8) Adaptable Modularity

1. HOUSING MODULES
   - 1 BEDROOM
   - 1 BEDROOM - TYPE 2
   - 2 BEDROOM
   - 2 BEDROOM - BALCONY
   - 3 BEDROOM - BALCONY
2. SHARED TERRACE

THIRD FLOOR PLAN

ARCHITECTURAL ADAPTABILITY: (8) Adaptable Modularity

1:20 NORTH FACADE WALL SECTION

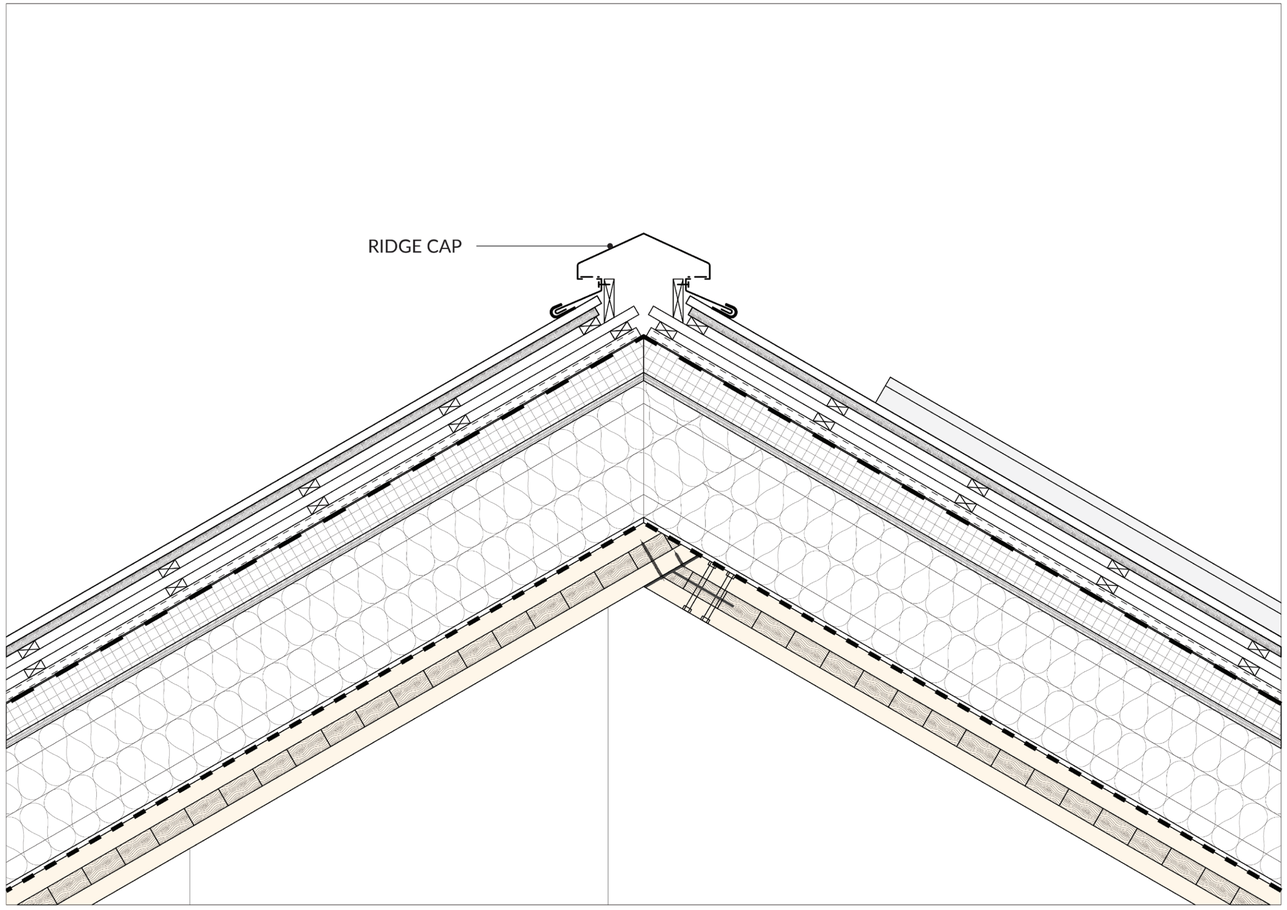
ARCHITECTURAL ADAPTABILITY: (8) Adaptable Modularity

ROOF ASSEMBLY

EXT.

22mm CHARRED WOOD
22mm CHARRED WOOD
25mm HOR. FURRING STRIP
25mm CORRUGATED METAL ROOF
25mm HOR. FURRING STRIP
25mm VER. FURRING STRIP
3mm WATERPROOF MEMBRANE
80mm RIGID MINERAL WOOL
18mm ORIENTED STRAND BOARD
300mm DENSE CELLULOSE BOARDS BETWEEN
TIMBER I-JOISTS
12mm VAPOUR BARRIER BOARD
140mm EXPOSED CLT

INT.



1:5 ROOF RIDGE DETAIL

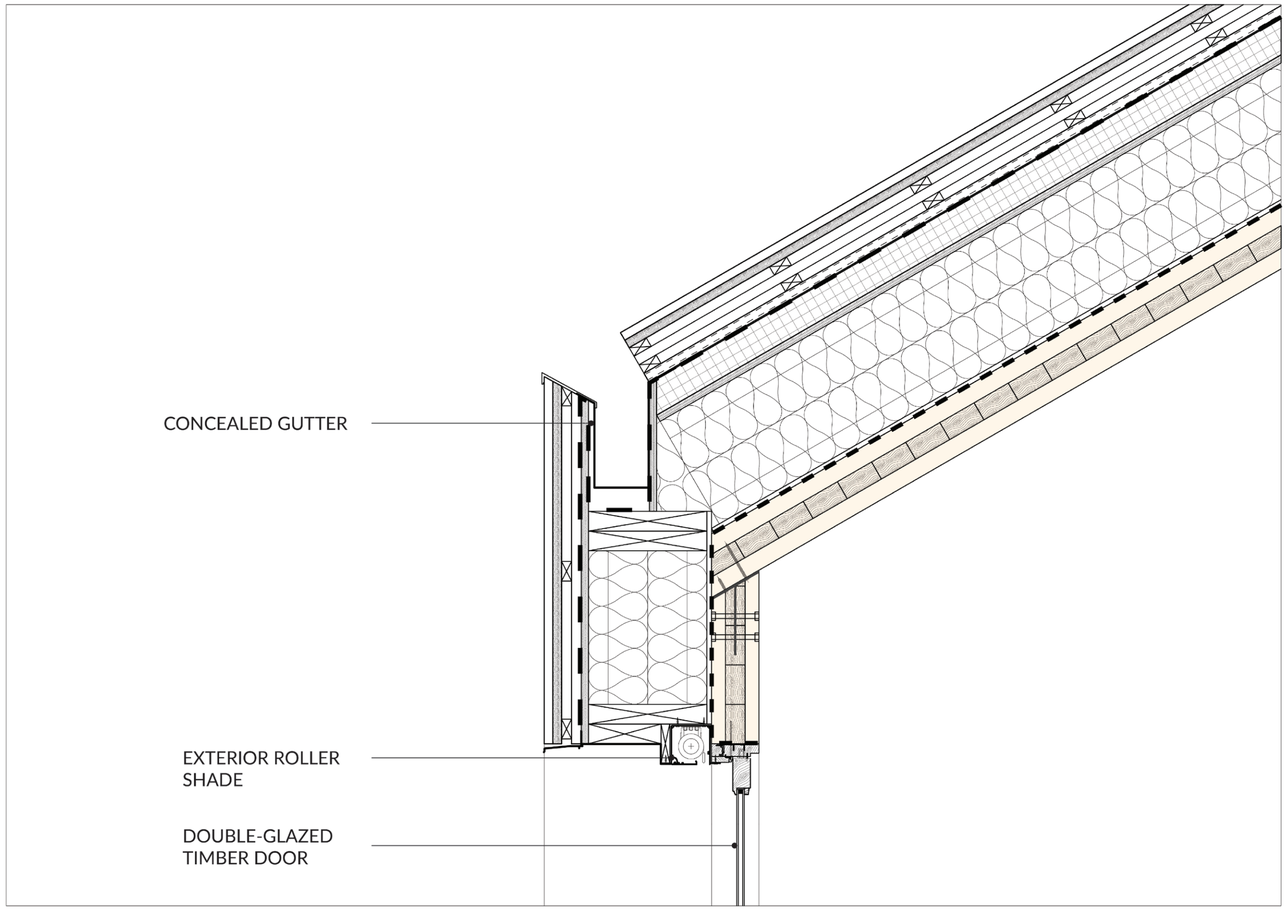
ARCHITECTURAL ADAPTABILITY: (8) Adaptable Modularity

WALL ASSEMBLY

EXT.

22mm CHARRED WOOD
22mm CHARRED WOOD
25mm HOR. FURRING STRIP
25mm VER. FURRING STRIP
18mm ORIENTED STRAND BOARD
300mm DENSE CELLULOSE INSULATION BOARD
BETWEEN TIMBER I-JOISTS
12mm VAPOUR BARRIER BOARD
120mm EXPOSED CLT PANEL

INT.



1:5 WALL TO ROOF CONNECTION DETAIL

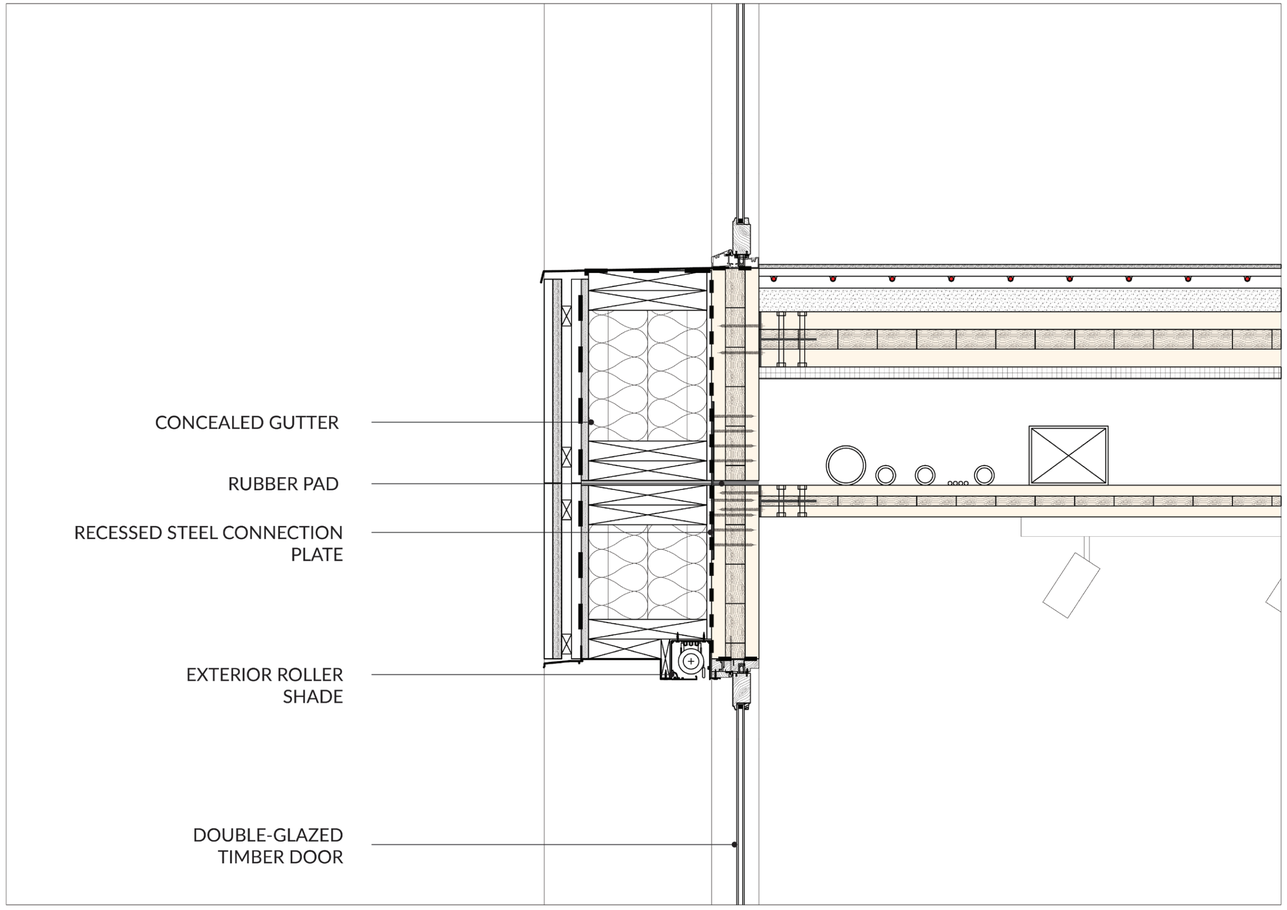
ARCHITECTURAL ADAPTABILITY: (8) Adaptable Modularity

FLOOR ASSEMBLY

TOP

10mm ENGINEERED WOOD FLOOR
20mm FERMACELL GYPSUM FIBREBOARD
30mm IDEAL ECO HYDRONIC WOOD
FIBRE BOARD
60mm SAND-FILLED CARDBOARD HONEYCOMB
1mm TRICKLING PROTECTION LAYER
140mm CLT PANEL
30mm SOUND INSULATION
270mm SERVICE VOID
80mm EXPOSED CLT CEILING

BOTTOM



1:5 TYPICAL FLOOR DETAIL

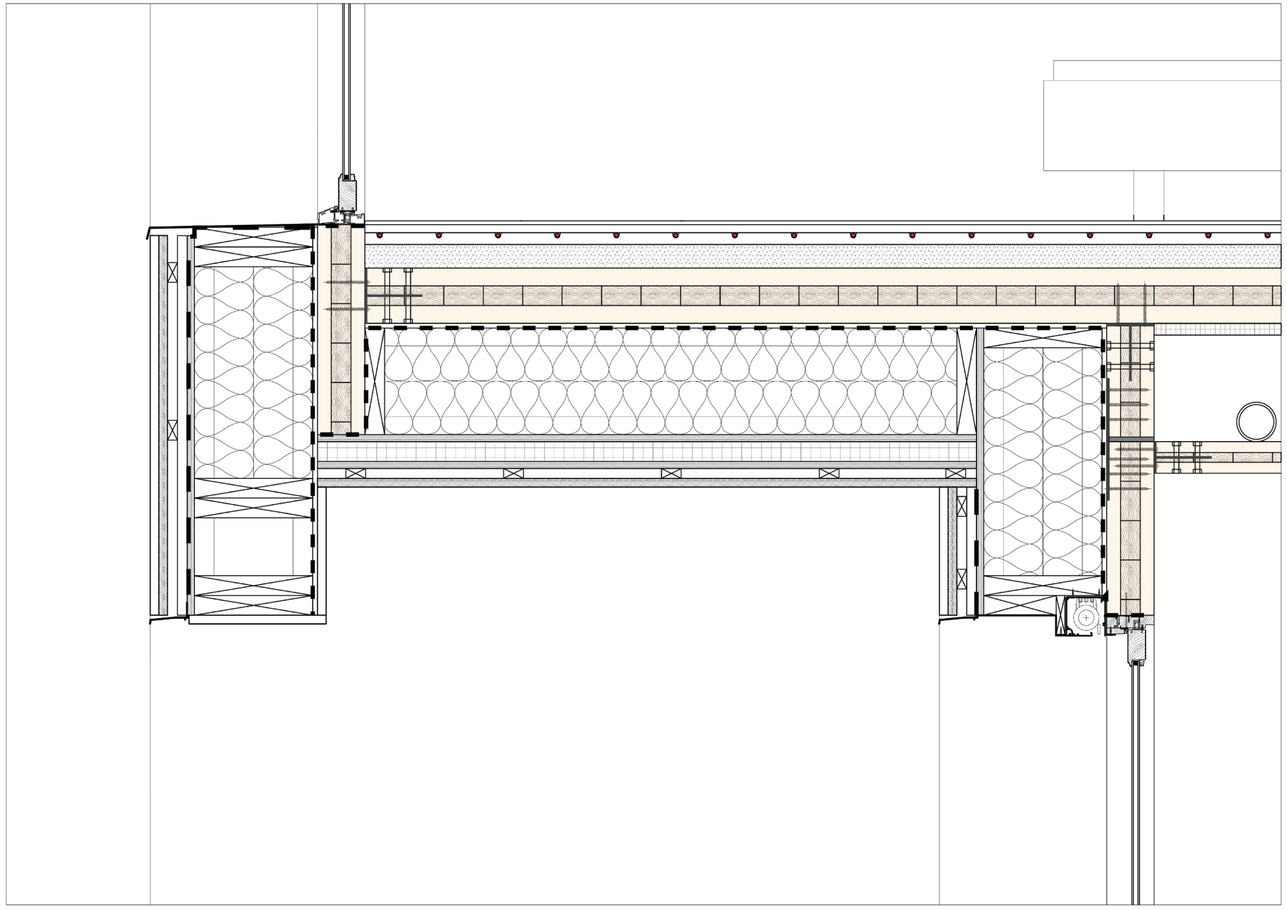
ARCHITECTURAL ADAPTABILITY: (8) Adaptable Modularity

FLOOR ASSEMBLY

TOP

10mm ENGINEERED WOOD FLOOR
20mm FERMACELL GYPSUM FIBREBOARD
30mm IDEAL ECO HYDRONIC WOOD
FIBRE BOARD
60mm SAND-FILLED CARDBOARD HONEYCOMB
1mm TRICKLING PROTECTION LAYER
140mm CLT PANEL
30mm SOUND INSULATION
270mm SERVICE VOID
80mm EXPOSED CLT CEILING

BOTTOM



1:5 RECESSED BALCONY CEILING DETAIL

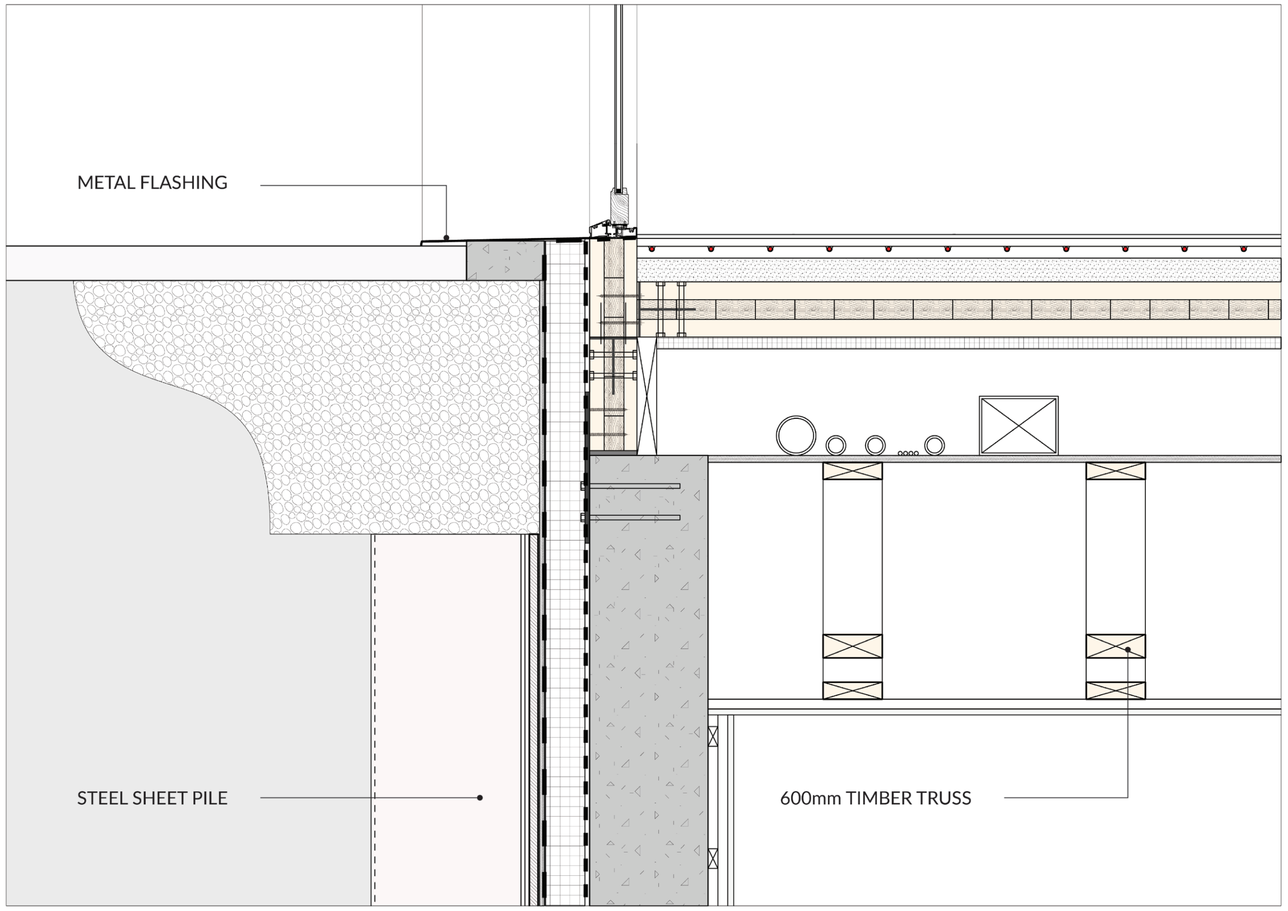
ARCHITECTURAL ADAPTABILITY: (8) Adaptable Modularity

WALL ASSEMBLY

EXT.

AZ26 PROFILE SHEET PILE
12mm ORIENTED STRAND BOARD
3mm BENTONITE WATERPROOFING MEMBRANE
100mm RIGID MINERAL WOOL INSULATION
12mm VAPOUR BARRIER BOARD
300mm PRECAST CONCRETE PANEL
50mm SERVICE VOID
15mm GYPSUM WALL BOARD

INT.



1:5 SHEET PILE INTERFACE DETAIL

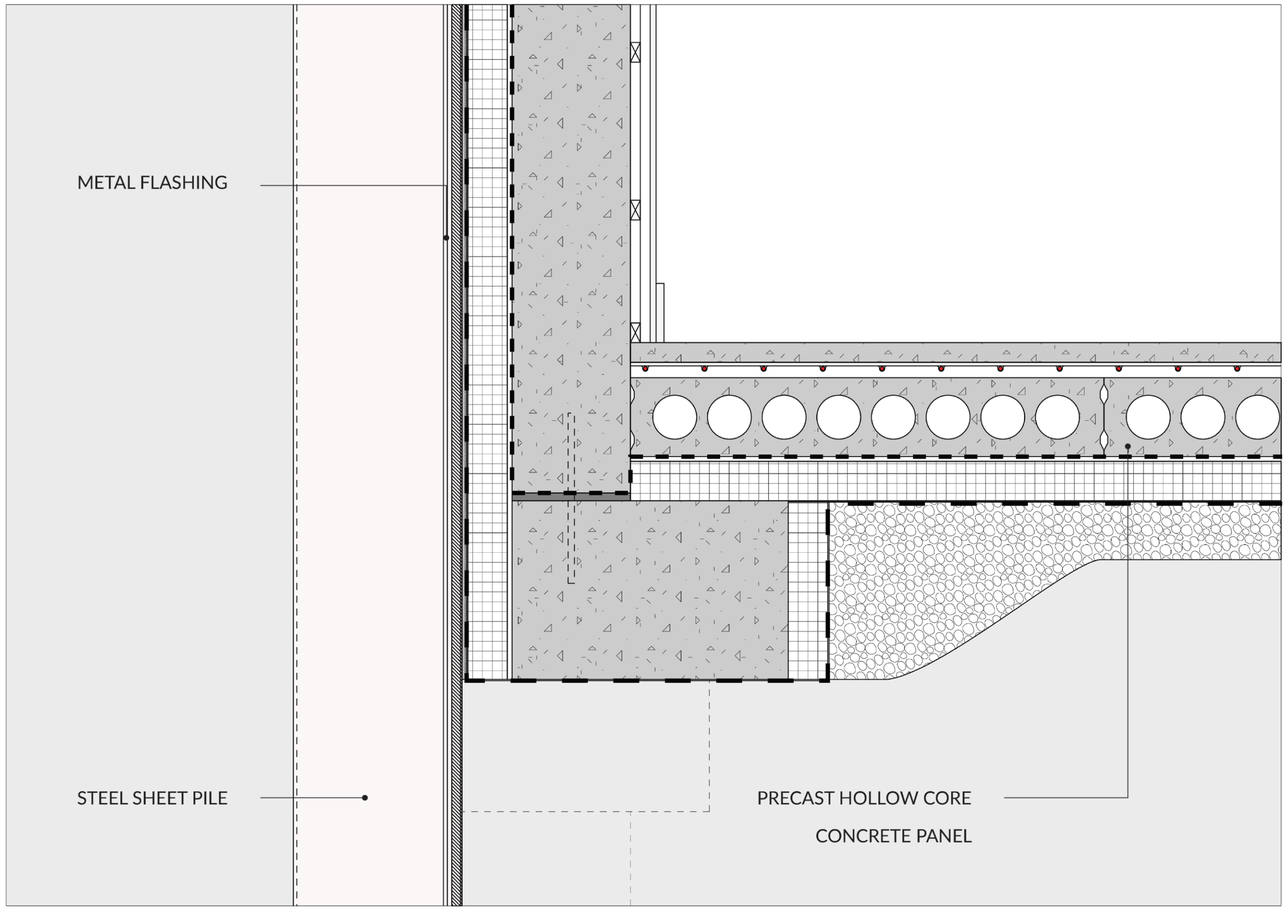
ARCHITECTURAL ADAPTABILITY: (8) Adaptable Modularity

FLOOR ASSEMBLY

TOP

50mm CONCRETE TOPPING
9mm ORIENTED STRAND BOARD
30mm IDEAL ECO HYDRONIC WOOD FIBRE BOARD
200mm PRECAST HOLLOW CORE CONCRETE PANEL
12mm VAPOUR BARRIER BOARD
100mm RIGID MINERAL WOOL INSULATION
3mm BENTONITE WATERPROOFING MEMBRANE

BOTTOM



1:5 WALL TO FOUNDATION CONNECTION DETAIL

CONCLUSION

MAIN RESEARCH QUESTION

HOW CAN THE **SYNERGISTIC INTEGRATION** OF **FOOD SYSTEM PROCESSES** WITH **URBAN FUNCTIONS** THROUGH **ARCHITECTURE** CREATE A MORE **LIVEABLE** AND **SUSTAINABLE** DEVELOPMENT OF **AGRI-FOOD BUSINESS PARKS** IN THE **WESTLAND** REGION?

- First understand relationship between the food system and an existing place
- Create solutions that address multiple issues simultaneously
- Focus on connection and adaptability

CONCLUSION

SUBSIDIARY RESEARCH QUESTIONS

1. WHAT ARE THE **KEY STRATEGIES** FOR **INTEGRATING FOOD SYSTEM** PROCESSES WITH **URBAN AREAS**?

- Regional Perspective
- Network Thinking
- Urban Metabolism
- Self-Sufficiency
- Hybridisation
- Catalytic Design

CONCLUSION

SUBSIDIARY RESEARCH QUESTIONS

2. WHAT ARE THE **MATTERS** THAT **ARCHITECTS CAN** HAVE AN **IMPACT** ON IN THE **FOOD SYSTEM**?

- Explore and depict alternative futures
- Reimagine the future of food systems
- Initiate discussions by visualising these futures

CONCLUSION

SUBSIDIARY RESEARCH QUESTIONS

3. WHAT **SPATIAL QUALITIES** HAS THE **FOOD SYSTEM SHAPED** IN **WESTLAND**?

- Fragmented Mono-Functional Zoning
- Isolated and Disconnected Communities
- Fragmented greenspace
- Disproportionate jump in scales
- Rigid island urbanism
- Lack of sense of place
- Repulsive Urban Development

CONCLUSION

SUBSIDIARY RESEARCH QUESTIONS

4. WHAT **SPATIAL QUALITIES ARE MISSING** OR NEED TO BE RESTORED **TO IMPROVE LIVEABILITY** AROUND **AGRI-FOOD BUSINESS PARKS** IN WESTLAND?

- Interconnected hybrid areas
- Connected communities with public spaces and amenities
- Intertwined blue-green networks
- Introduction of mid-scale
- Adaptable and phaseable urbanism
- Connection of identity to place
- Creation of attractive urban node

CONCLUSION

SUBSIDIARY RESEARCH QUESTIONS

5. HOW CAN AN **ARCHITECTURAL PROPOSAL** SERVE AS A **CATALYST** TO **DISRUPT** THE CURRENT **URBAN DEVELOPMENT** TRENDS AND CONTRIBUTE **TOWARDS** A MORE **LIVEABLE AND SUSTAINABLE** DEVELOPMENT OF **WESTLAND**?

- Transferable design framework of urban and building scale objectives
- Set of spatial design tools to achieve connectivity and adaptability
- Ability for others to reinterpret tools in future developments