# SYNERGISING ARCHITECTURE:

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

AR3CS100 | City of the Future Graduation Studio
Department of Architecture
Faculty of Architecture and the Built Environment
TU Delft
Final Presentation
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| 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.** Case study project implementation of key concepts for food system integration with urban areas. Source: Author.

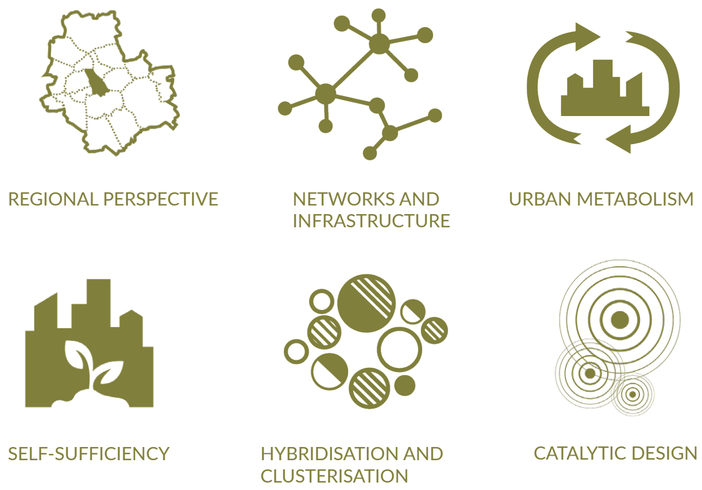



**Fig. 1.** Key concepts for integrating agriculture with urban areas. Source: Author.

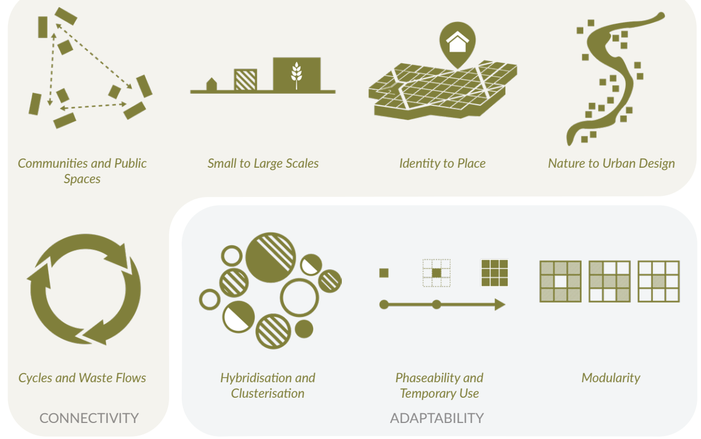



**Fig. 3**. Design Framework Objectives. Source: Author.

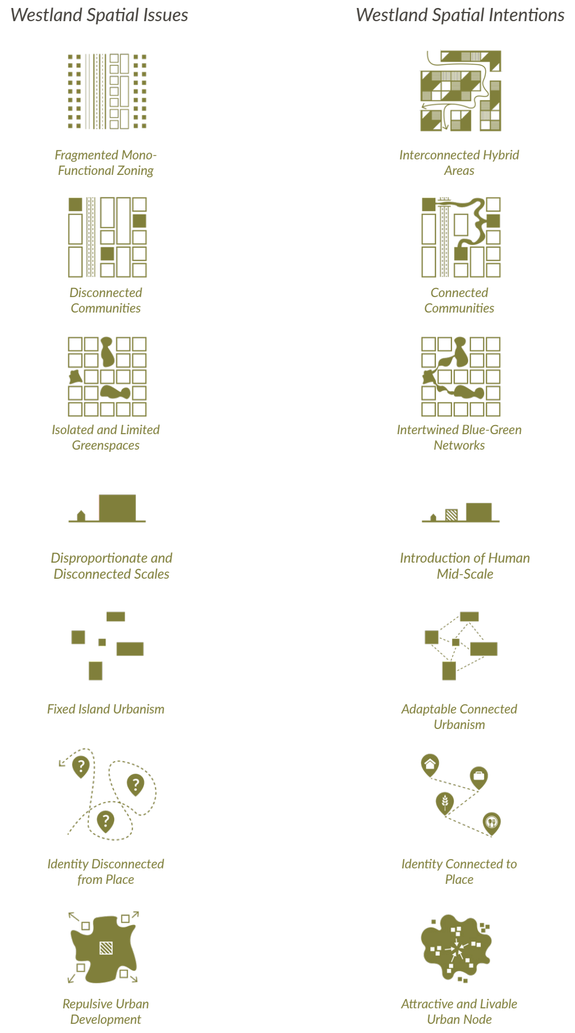



**Fig. 2**. Spatial design strategies to remedy spatial site issues. Source: Author.

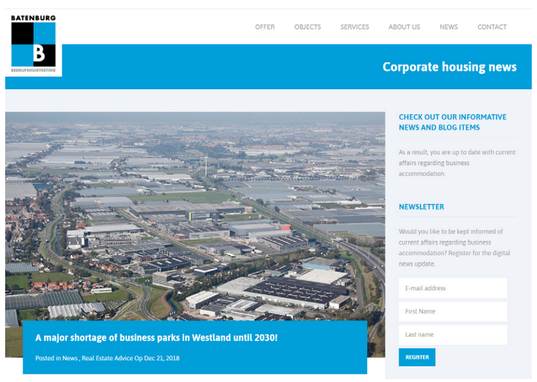



**Fig. 4**. Major shortage of business parks in Westland until 2030. Source: Batenburg.

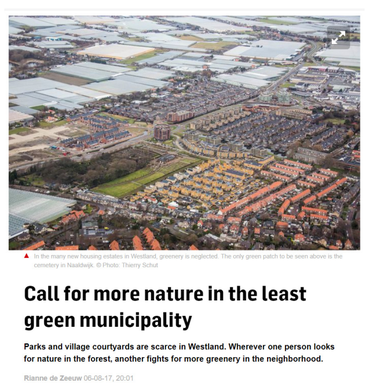



**Fig. 5**. Westland is the least green municipality in The Netherlands. Source: De Zeeuw.


**Fig. 6**. Increasing housing shortage. Source: Capital Value.

**Fig. 7**. Photos of Maasdijk in the 20th century showing a balance of livability despite having a dominant focus on food production. Source: Gementee Westland.

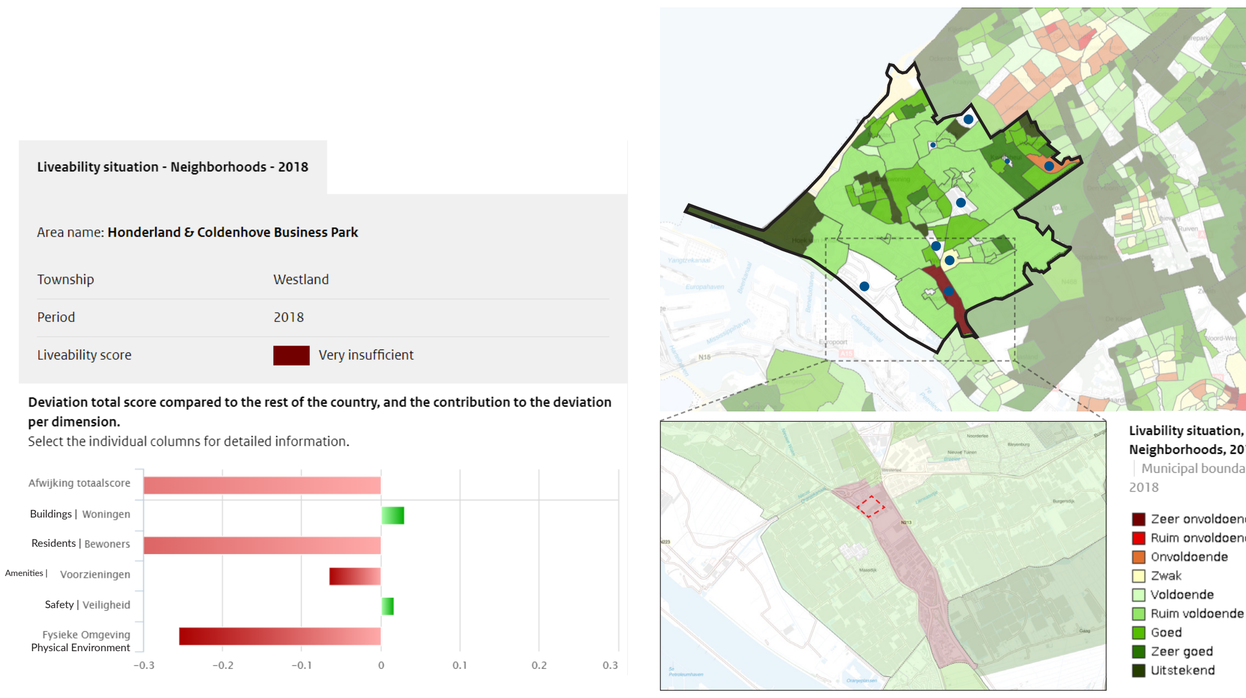



**Fig. 8**. Agri-food business parks (represented with dots) score far below the Westland's average liveability score. Source: Leefbarometer.nl

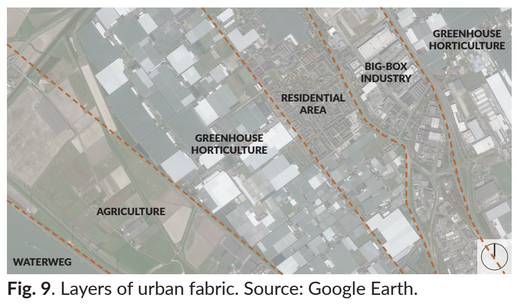



**Fig. 9**. Layers of urban fabric. Source: Google Earth.

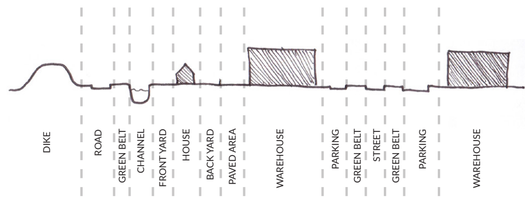
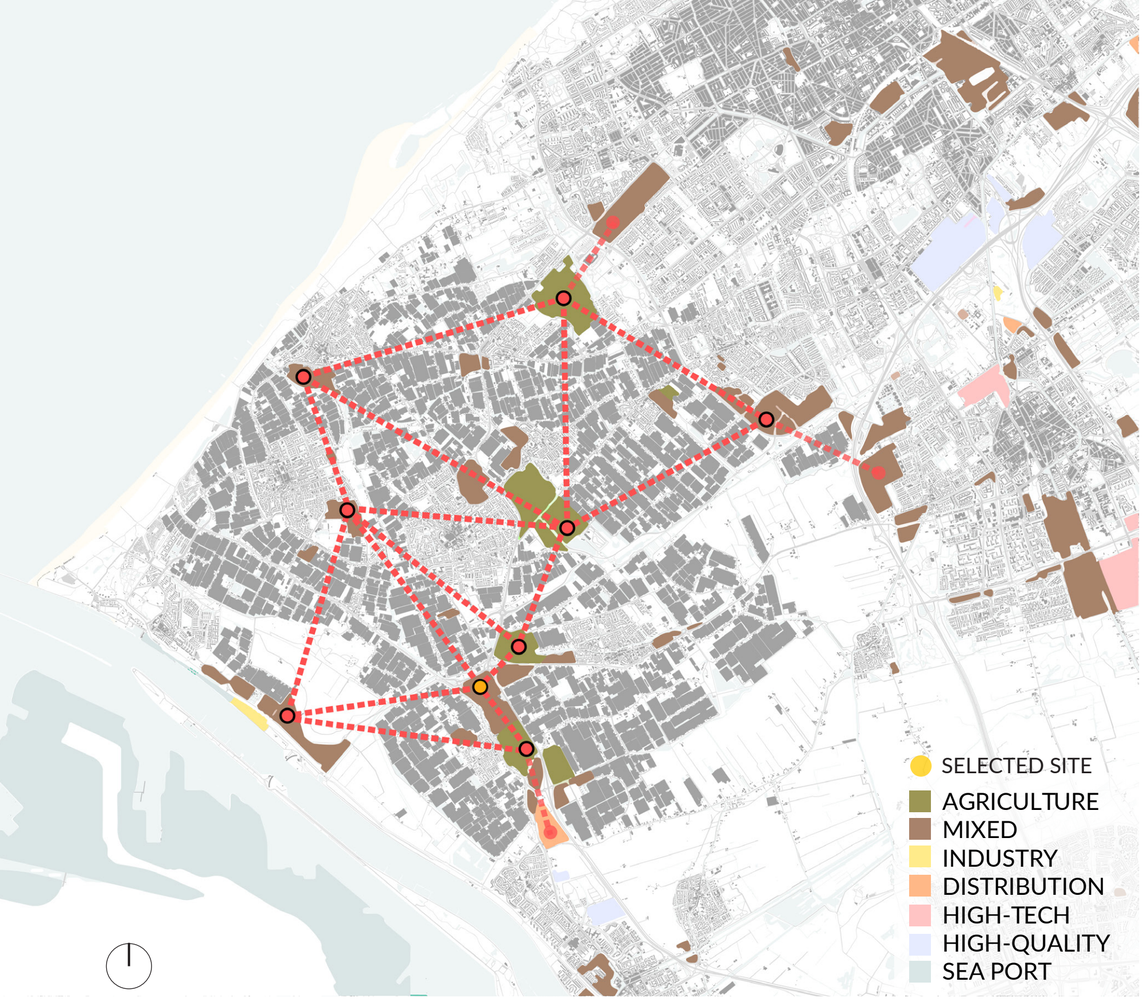
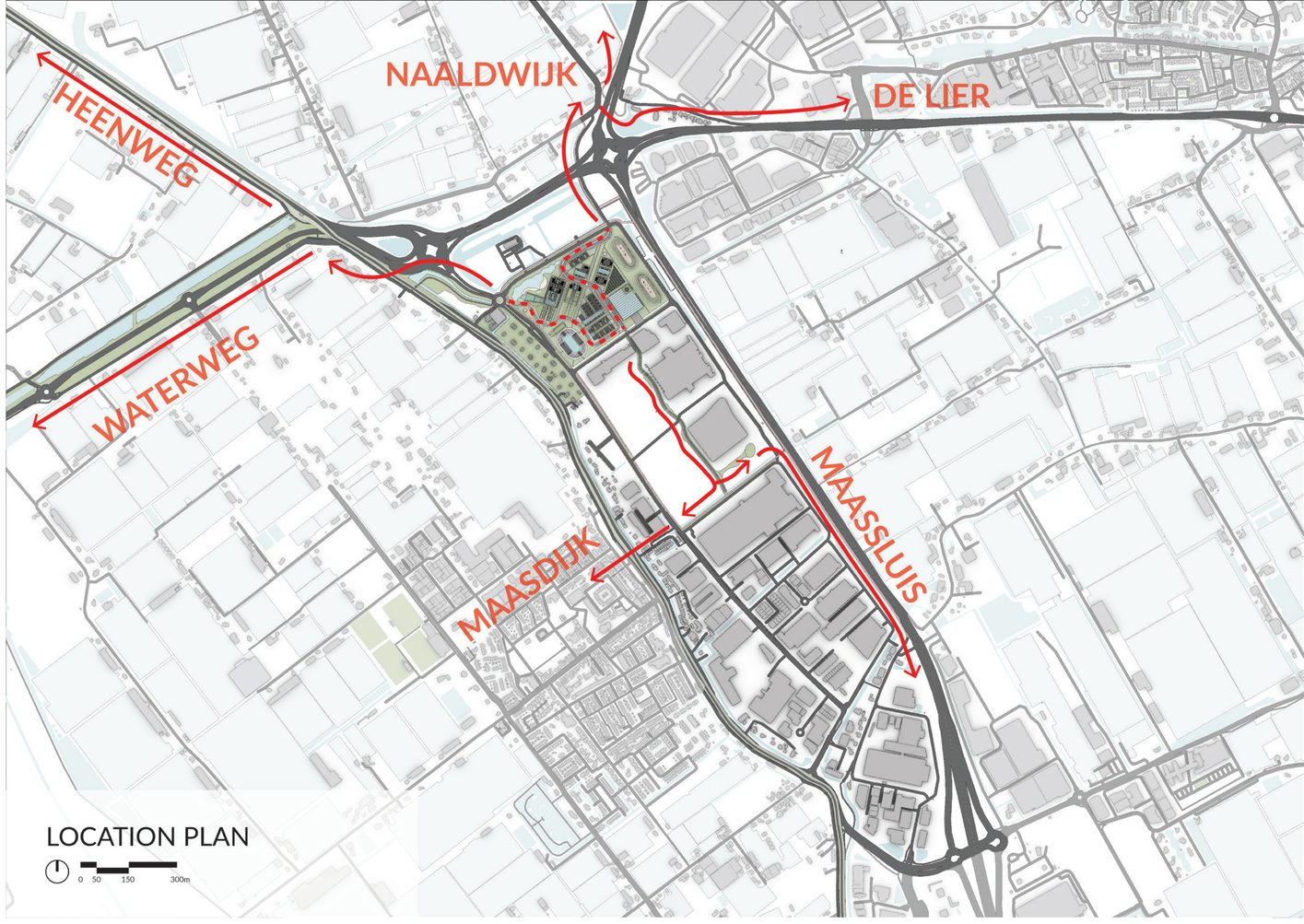



**Fig. 10**. Typical urban section of Honderdland business park. Source: Author.

**Fig. 11**. Drone shot, Honderdland looking South. Source: Author.

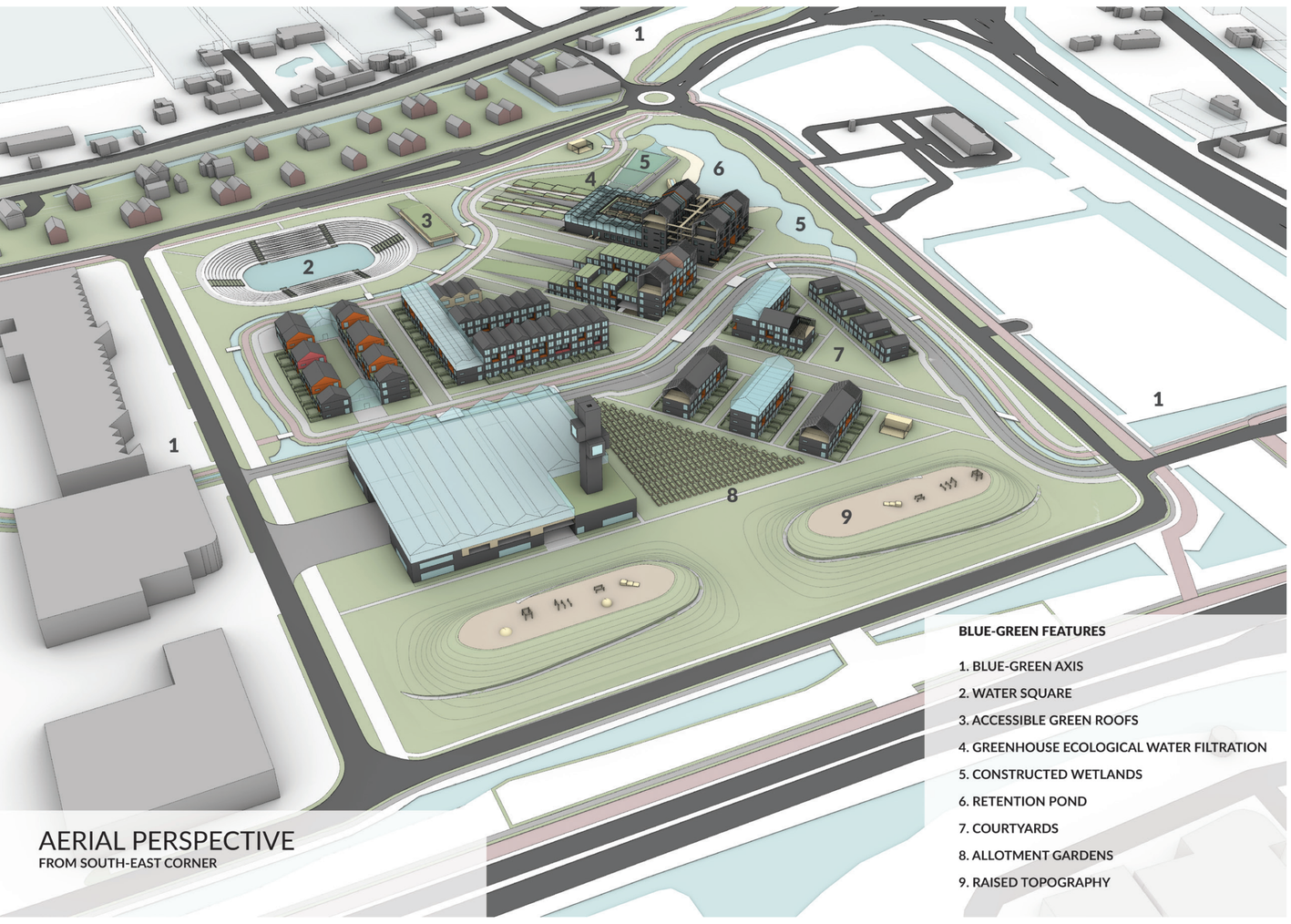
**Fig. 12**. Warehouses and distribution centres dwarf small homes and pedestrians. Source: Author.




LOCATION PLAN

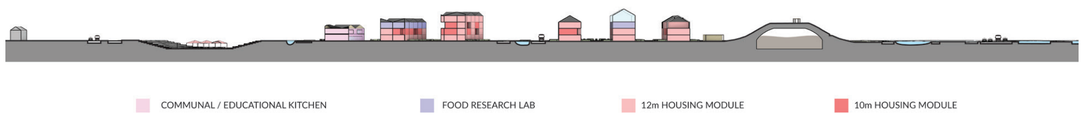
0 50 150 300m

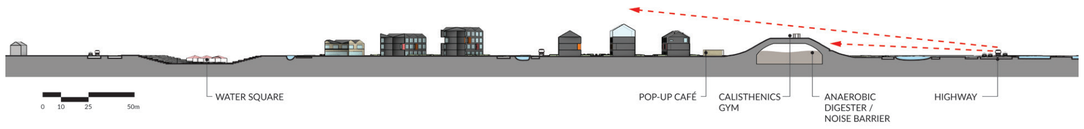



**BLUE-GREEN FEATURES**

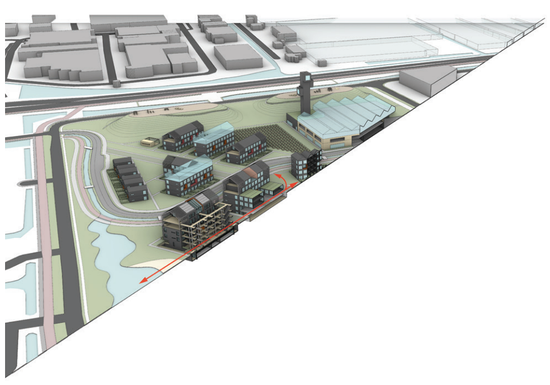
1. BLUE-GREEN AXIS
2. WATER SQUARE
3. ACCESSIBLE GREEN ROOFS
4. GREENHOUSE ECOLOGICAL WATER FILTRATION
5. CONSTRUCTED WETLANDS
6. RETENTION POND
7. COURTYARDS
8. ALLOTMENT GARDENS
9. RAISED TOPOGRAPHY

AERIAL PERSPECTIVE
FROM SOUTH-EAST CORNER

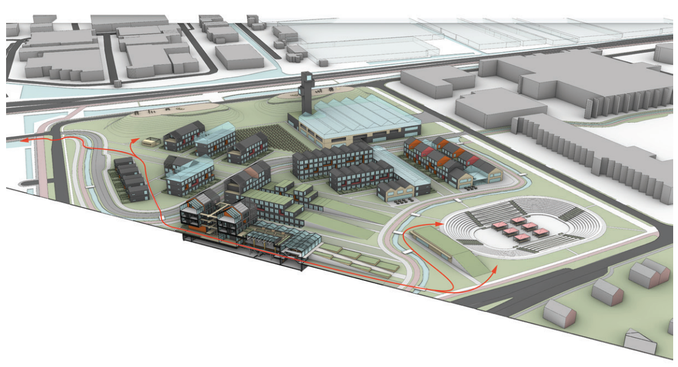


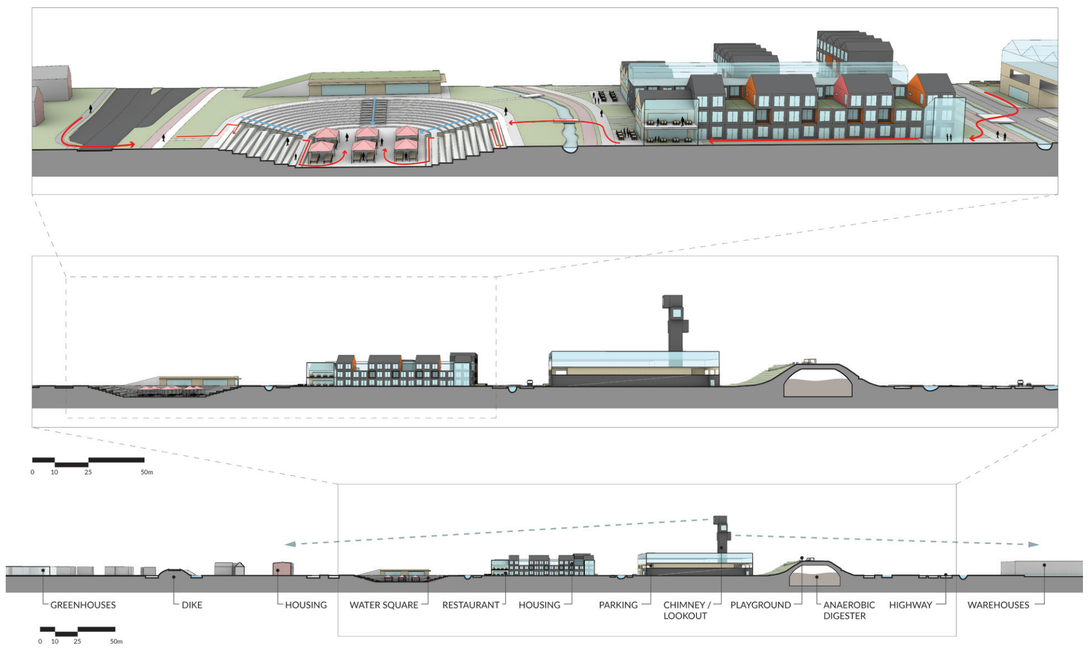

SITE SECTION A
EAST-WEST LOOKING NORTH



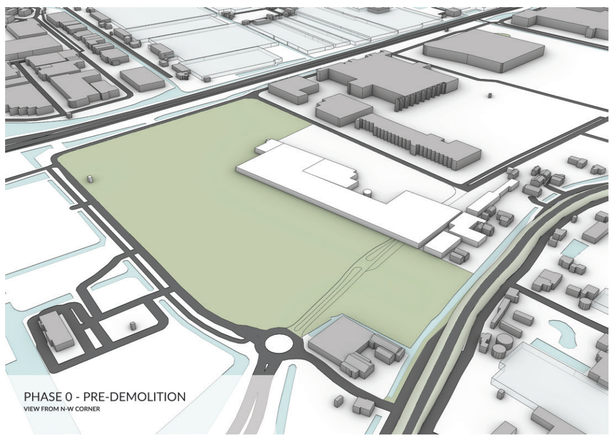
TRANSVERSAL SECTION PERSPECTIVE
OF ARCHITECTURAL INTERVENTION FROM NORTH-WEST CORNER



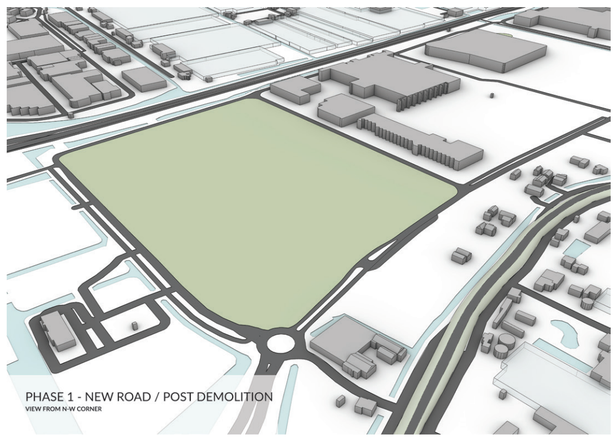
LONGITUDINAL SECTION PERSPECTIVE
OF ARCHITECTURAL INTERVENTION FROM NORTH-WEST CORNER



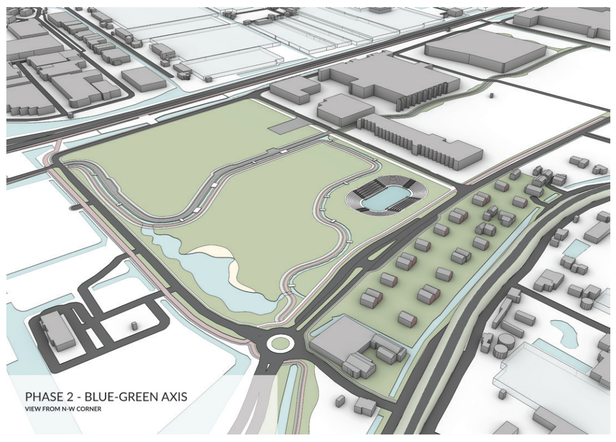

SITE SECTION B
EAST-WEST LOOKING NORTH



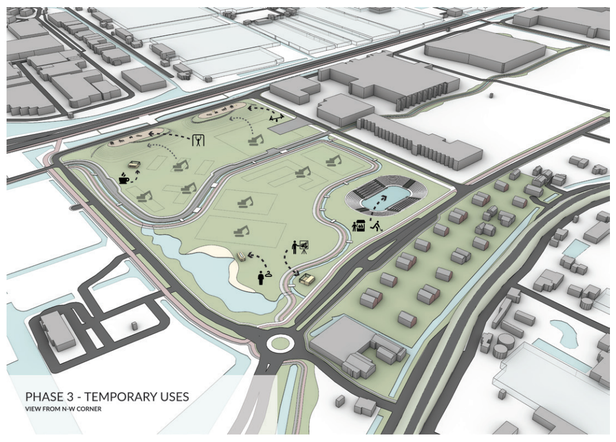
PHASE 0 - PRE-DEMOLITION
VIEW FROM N-W CORNER



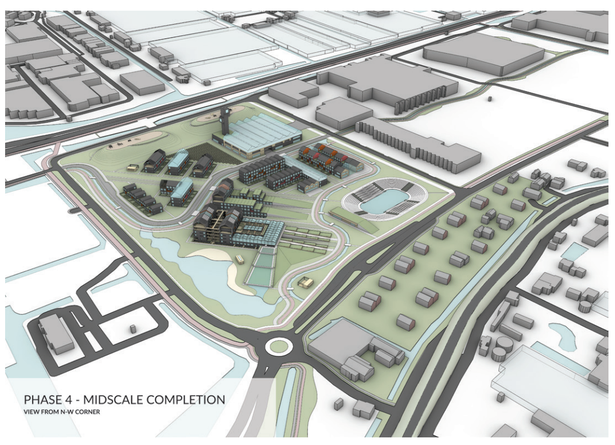
PHASE 1 - NEW ROAD / POST DEMOLITION
VIEW FROM N-W CORNER



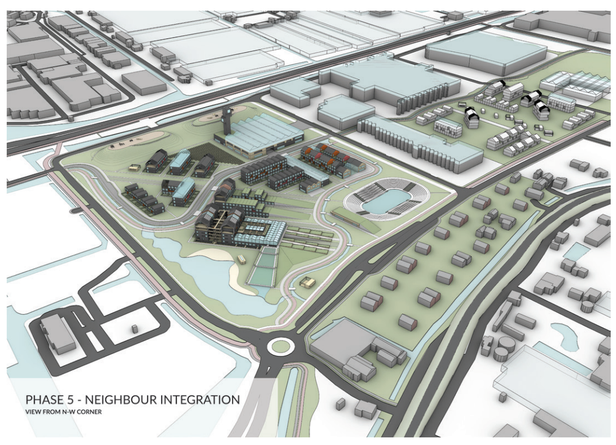
PHASE 2 - BLUE-GREEN AXIS
VIEW FROM N-W CORNER



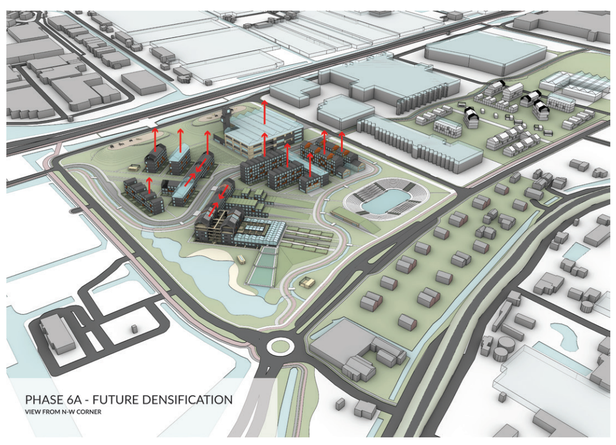
PHASE 3 - TEMPORARY USES
VIEW FROM N-W CORNER



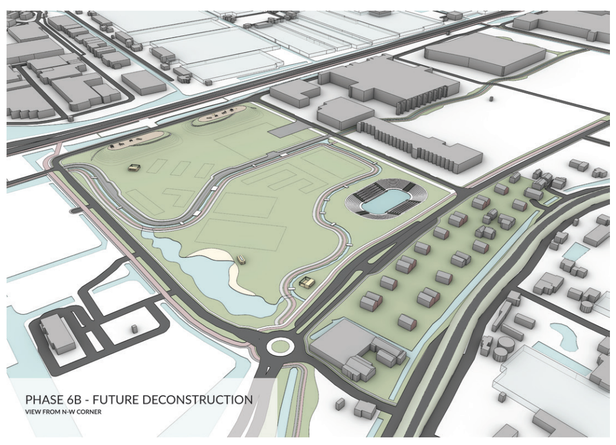
PHASE 4 - MIDSCALE COMPLETION
VIEW FROM N-W CORNER



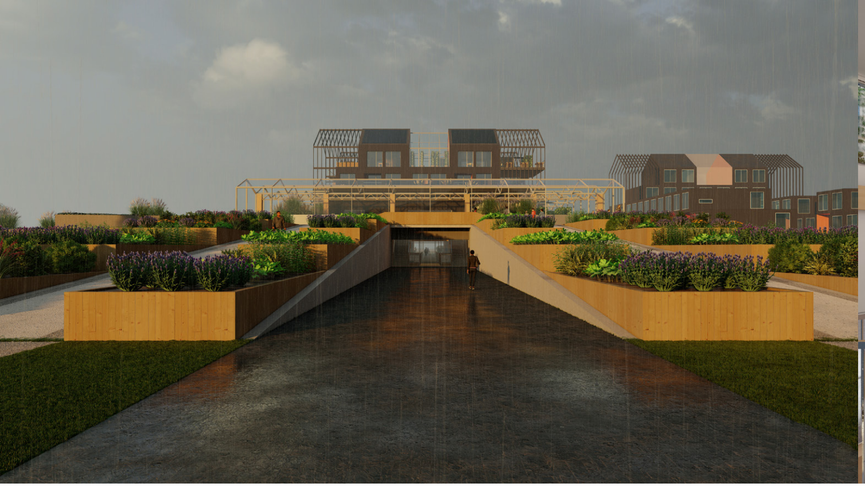
PHASE 5 - NEIGHBOUR INTEGRATION
VIEW FROM N-W CORNER

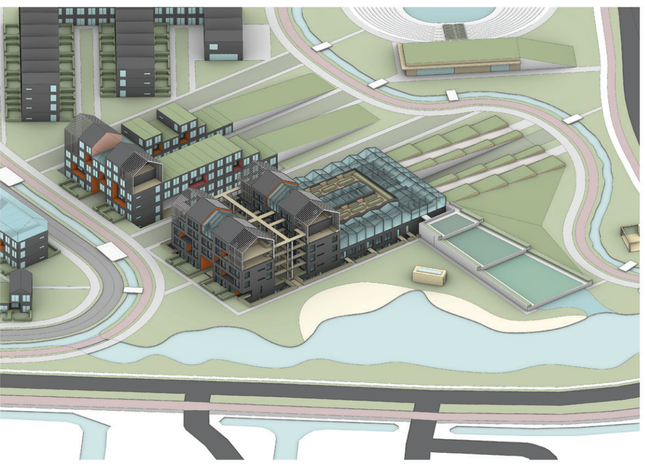


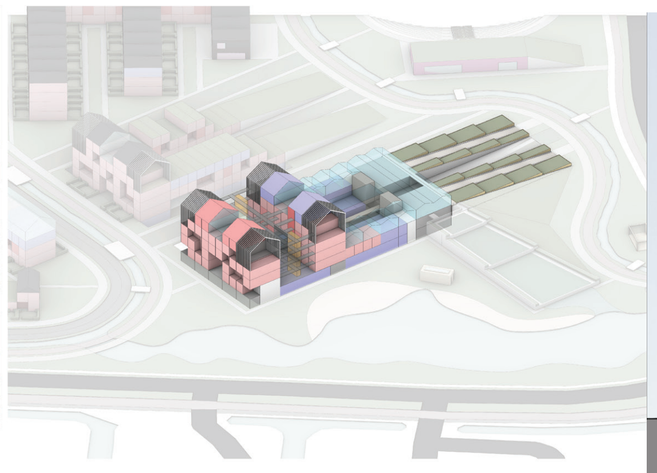
PHASE 6A - FUTURE DENSIFICATION
VIEW FROM N-W CORNER



PHASE 6B - FUTURE DECONSTRUCTION
VIEW FROM N-W CORNER

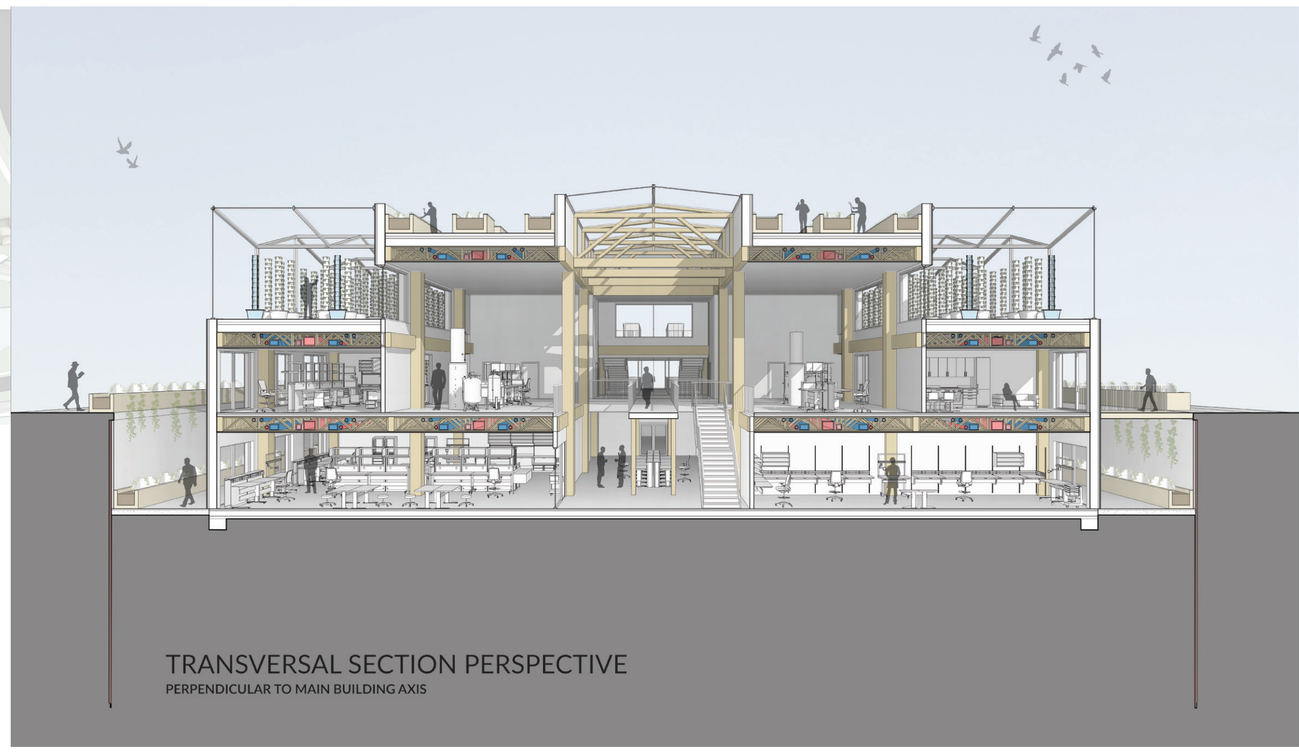




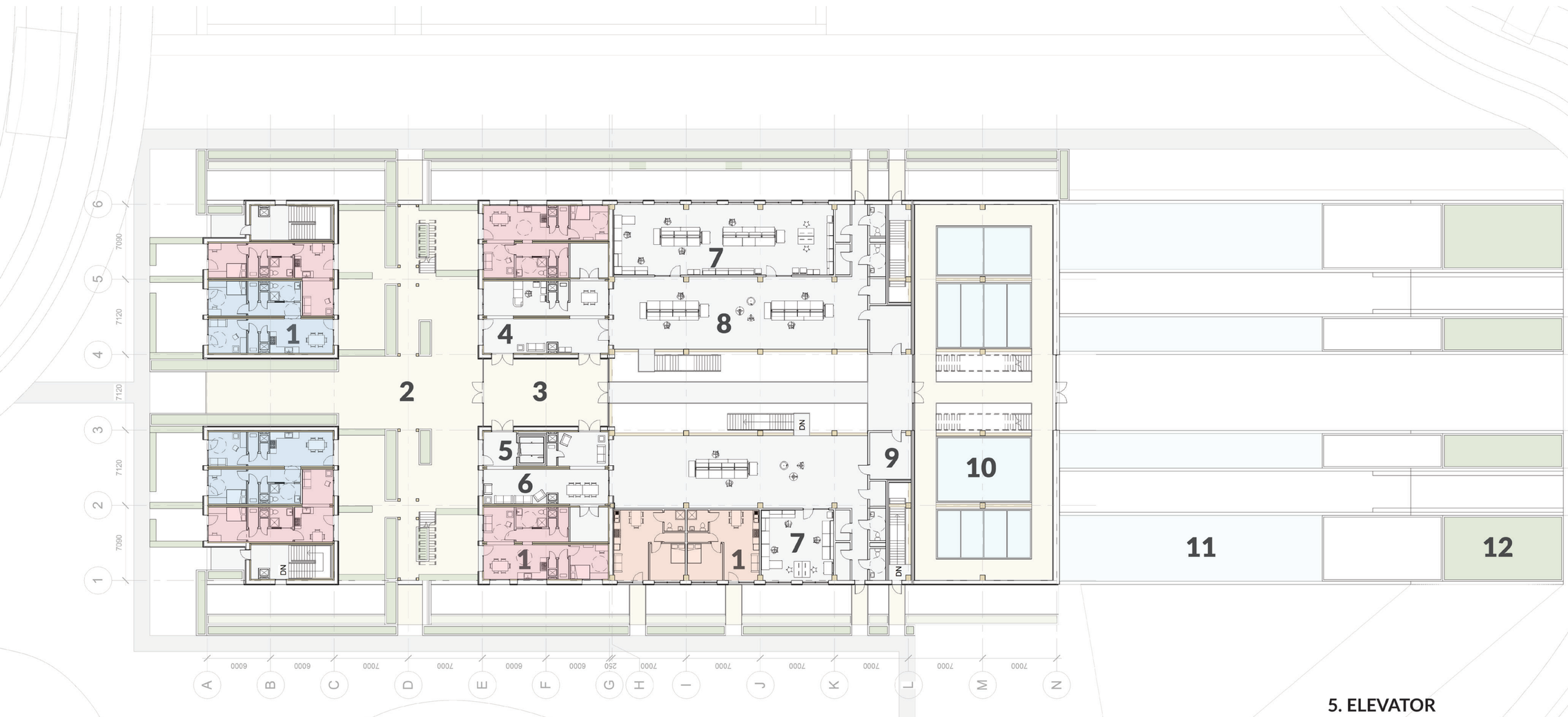


FOOD RESEARCH LAB
HOUSING
COMMON AREA
GREENHOUSE
MECHANICAL ROOM
STAIR
ELEVATOR
GREEN ROOF

## BUILDING PROGRAMME
VIEW FROM N-W CORNER



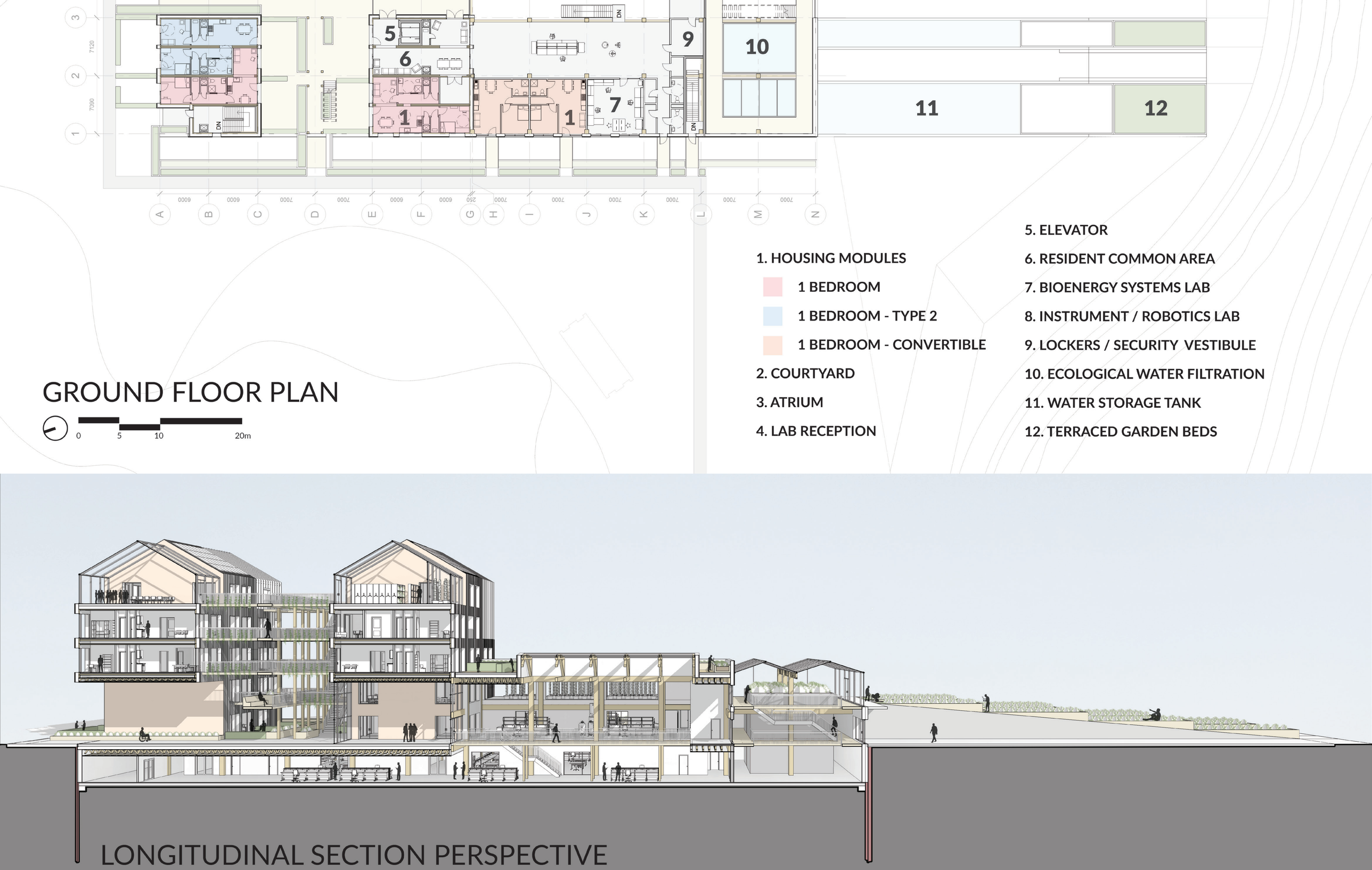
## TRANSVERSAL SECTION PERSPECTIVE
PERPENDICULAR TO MAIN BUILDING AXIS



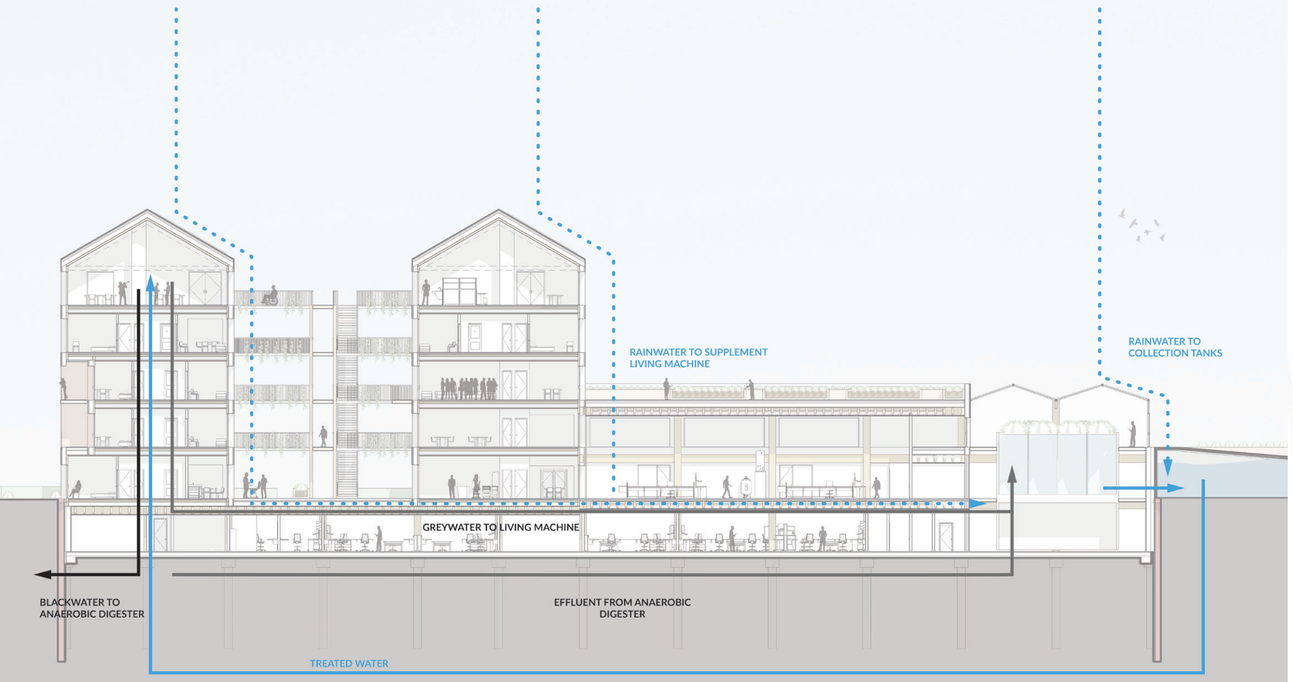

## GROUND FLOOR PLAN

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

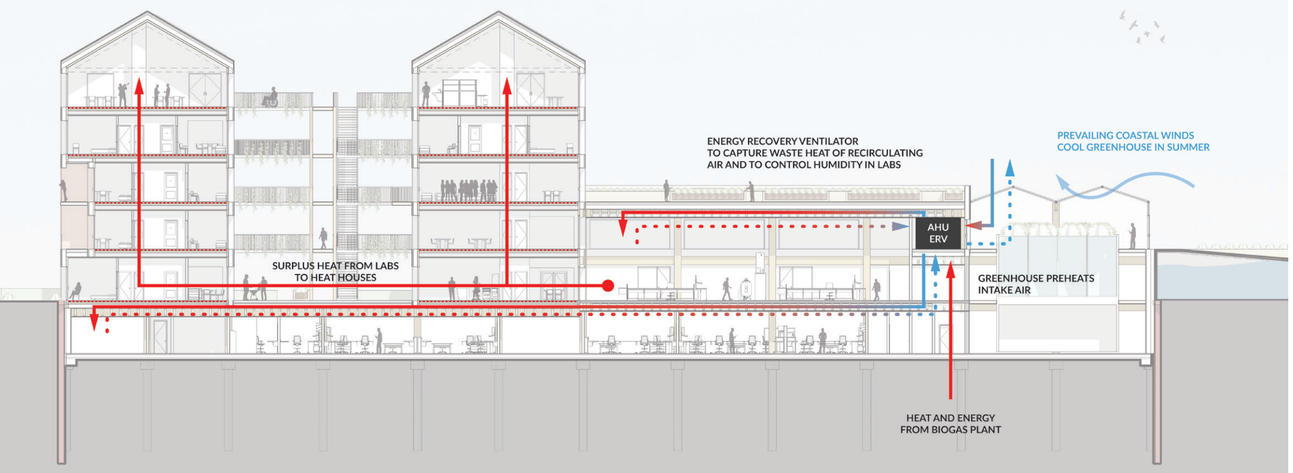


## LONGITUDINAL SECTION PERSPECTIVE
THROUGH MAIN BUILDING AXIS




## LONGITUDINAL SECTION

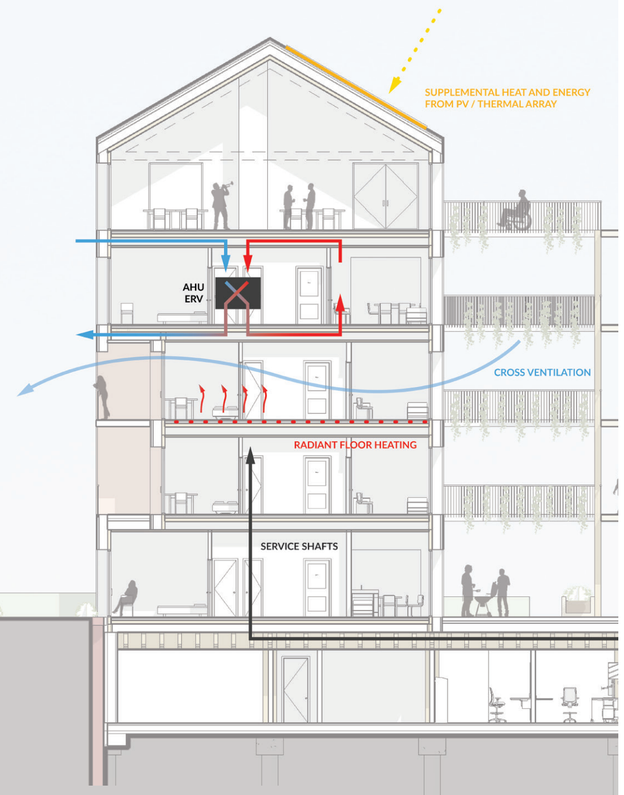
WATER TREATMENT




AHU - AIR HANDLING UNIT
ERV - ENERGY RECOVERY VENTILATOR

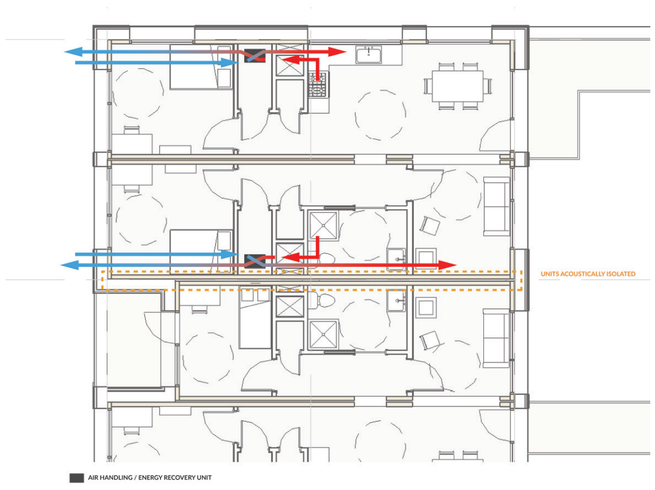
## LONGITUDINAL SECTION

LAB VENTILATION




## LONGITUDINAL SECTION

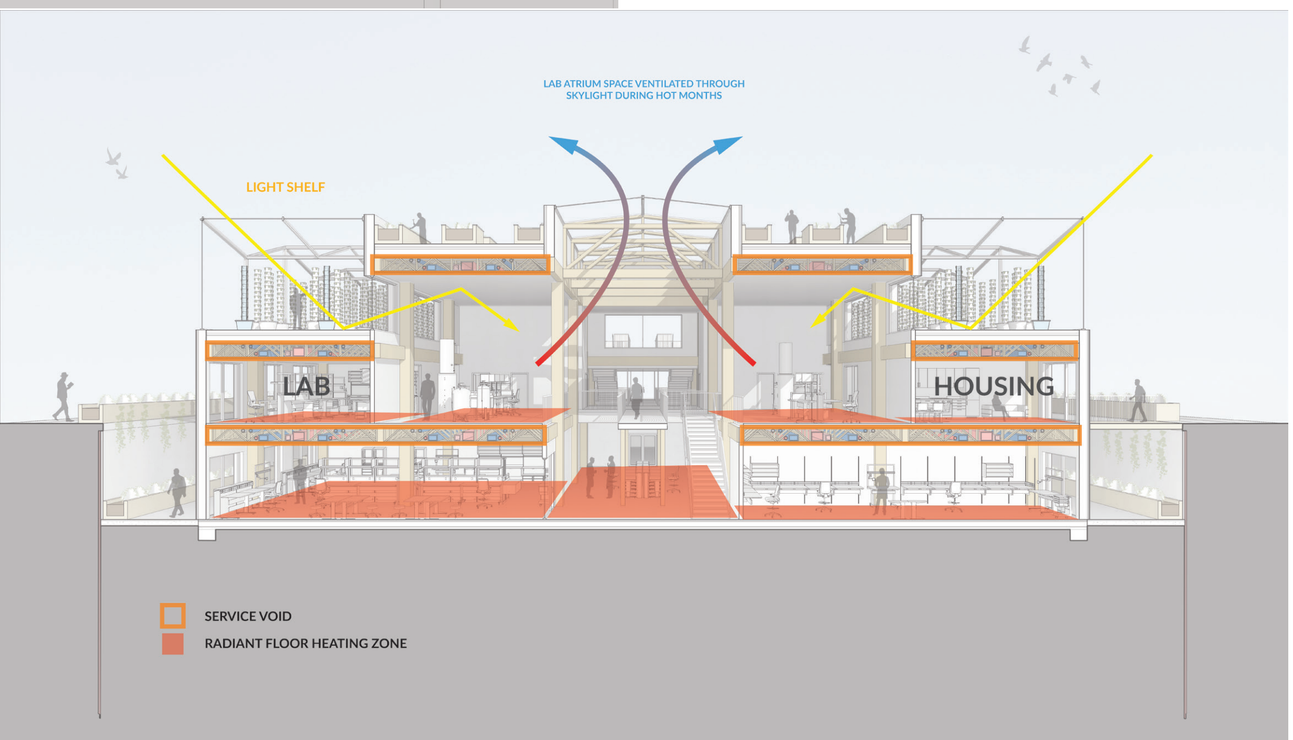
INDEPENDENT UNIT VENTILATION




## ENLARGED UNIT PLAN

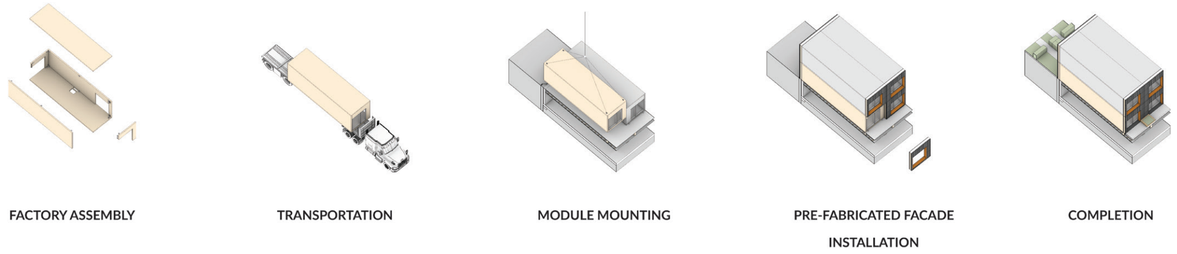
INDEPENDENT UNIT VENTILATION

0 1 2 4m



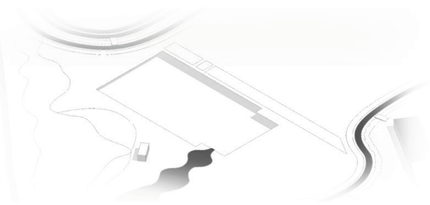

## INFRASTRUCTURE FOR HYBRIDISATION

ADAPTABLE LAB/HOUSING MODULES

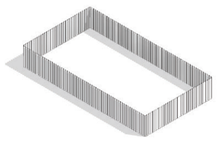


FACTORY ASSEMBLY | TRANSPORTATION | MODULE MOUNTING | PRE-FABRICATED FACADE INSTALLATION | COMPLETION

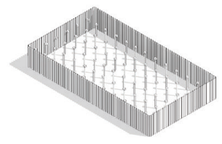
## CLT MODULE CONSTRUCTION



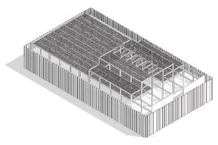
1. EXCAVATION



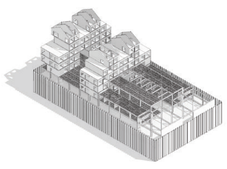
2. SHEET PILE FOUNDATION



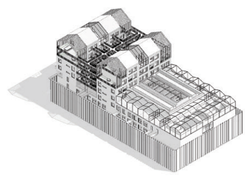
3. CONCRETE PILES



4. PREFABRICATED CONCRETE ELEMENTS AND TIMBER STRUCTURE



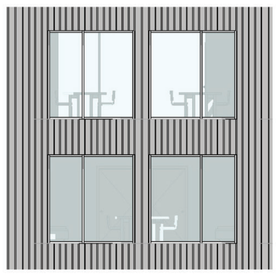
5. MOUNTING OF CLT MODULES

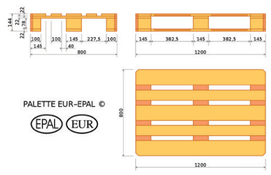


6. FACADE INSTALLATION AND FINISHES

## CONSTRUCTION CONCEPT

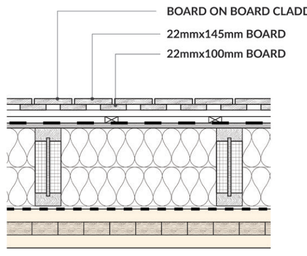
ABILITY TO BE DISASSEMBLED






STANDARD PALLET DIMENSIONS
SOURCE: EPAL.NL.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