AMERICAN UNIVERSITY OF BEIRUT

HOME IN THE AGE OF AMAZON

by
LAMA BASSEM BARHOUMI

An Undergraduate Architecture Design Thesis
submitted in partial fulfillment of the requirements
for the degree of Bachelor of Architecture
to the Department of Architecture and Design
of the Maroun Semaan Faculty of Engineering and Architecture
at the American University of Beirut

Beirut, Lebanon
May 2021

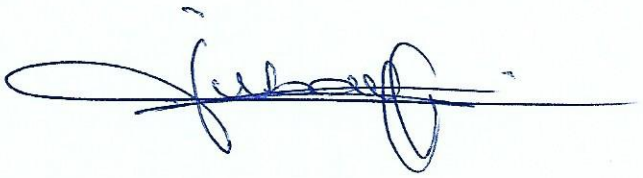
AMERICAN UNIVERSITY OF BEIRUT

HOME IN THE AGE OF AMAZON

by

LAMA BASSEM BARHOUMI

Approved by:



Rana Samara, Senior Lecturer — Thesis Advisor
Department of Architecture and Design

Date of project presentation: May 27, 2021

AMERICAN UNIVERSITY OF BEIRUT

PROJECT RELEASE FORM

Student Name: Barhoumi (Last) Lama (First) Bassem (Middle)

I authorize the American University of Beirut, to: (a) reproduce hard or electronic copies of my project; (b) include such copies in the archives and digital repositories of the University; and (c) make freely available such copies to third parties for research or educational purposes:

- ☒ As of the date of submission
- ☐ One year from the date of submission of my project.
- ☐ Two years from the date of submission of my project.
- ☐ Three years from the date of submission of my project.

Signature

May 27, 2021

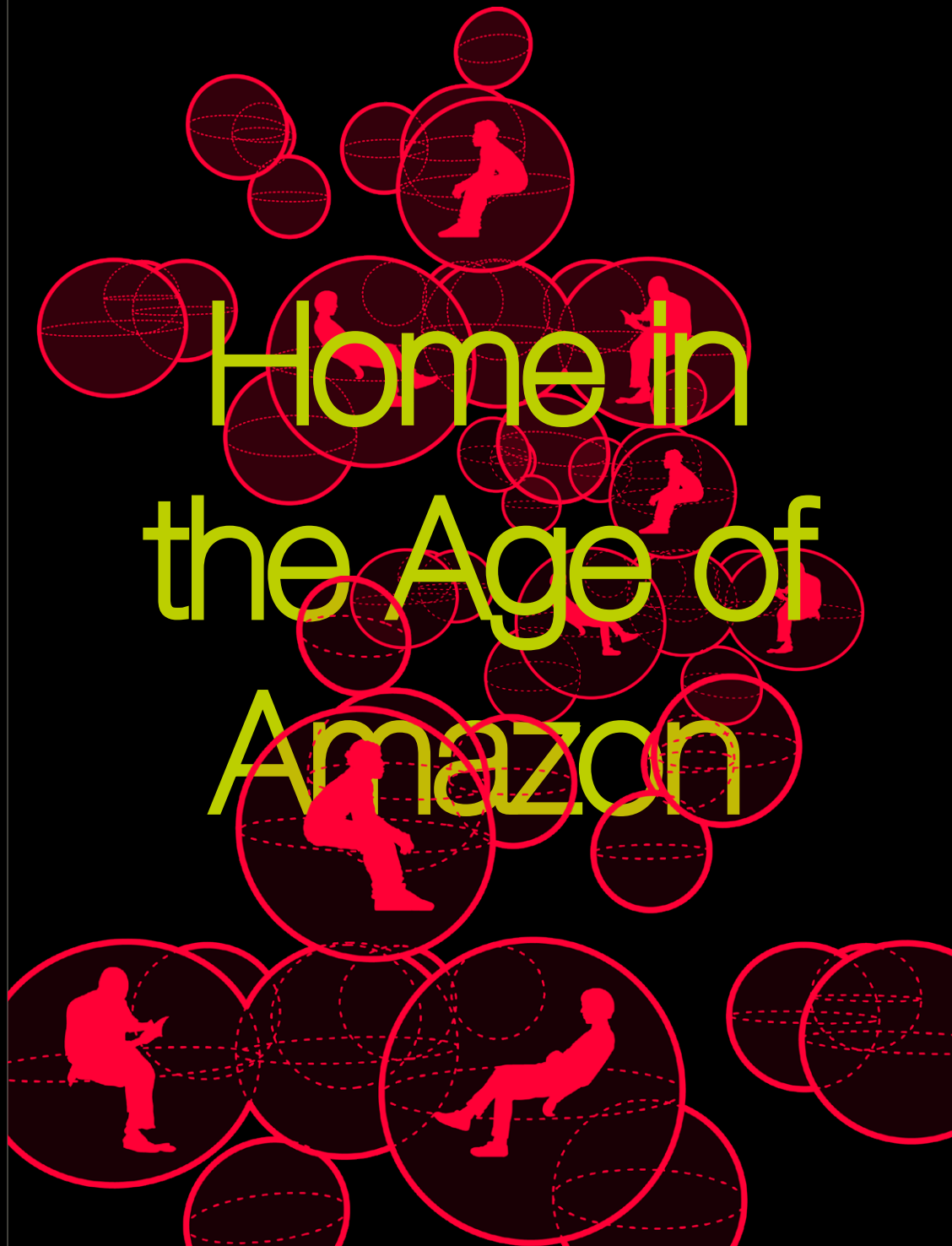
Date

ABSTRACT

Title: Home in the Age of Amazon

Home in the Age of Amazon explores living in an age where the home as we know it today is nothing but a single component in the larger network of spaces we have come to depend on in our daily lives. In an age dominated by digitization, speedy delivery infrastructure, and user-tailored solutions, we no longer are restricted to the walls of our living units to carry out our daily tasks. Instead, we resort to external spaces just as often as we do our bedrooms, bathrooms, or living rooms, in a manner that has become like second nature. This thesis concludes that a home today is not just a bed, bath, kitchen, etc. but belongs to a new typology: it is a network or cluster, made up of a large set of spaces and programs that include everything the inhabitant does in a day, be it a place to sleep, shop, work, so on. Designing this network requires an understanding of the program not only within a single user's life, but within the lives of those whose daily routines also intersect the program. The home cluster is thus a multi-owned project that must be flexible to suit a multitude of needs. A design methodology is proposed that allows for this complex intersection of programs and users to be broken down and understood, in attempt to automate the site selection, to facilitate design, and to make change and growth possible within this project. The result is an example of a home in the Mtein area of Lebanon, that caters to a group of entrepreneurs, consumers, and employees, by combining all their needed programs while also having the potential for expansion, shifting, and remote presence.

Home in the Age of Amazon



Thesis I
By Lama Barhoumi

Table of Contents

0. A Precedent From History 16
1. The Tycoon of Our Time 26
2. What Is the Home in the Age of Amazon? 34
   - 2.1. Behvaioral-Spatial Shift 36
   - 2.2. Behvaioral-Spatial Shift: The Amazon Way 52
   - 2.3. Conclusion: The Home is a Cluster 74
3. How Can We Design This Home? 80
   - 3.1. User-Centered-Design: The Oil in the Amazon Machine 82
   - 3.2. User-Centered-Design: From An Economic Standpoint 90
   - 3.3. User-Centered-Design: From A User Standpoint 96
   - 3.4. User-Centered-Design: From An Architecture Standpoint 104
4. MVRDV Expo 2000 112

5. Materializing the network home 118
5.1. User Group 122
5.2. Ownership Model 128
5.3. Spacial Configurations 140
5.4. Program 144
6. Site Selection Process 148
7. Auxiliary Sites 156
8. Base Site 164
8.1. Site Analysis 166
8.2. Kitchen Design + Sylvie and Dana Home 182
8.3. Workspace + Assistant Home 204
8.4. Retailer + Owner's Home 218
8.5. Phases: Section/Elevation 232

Table of Contents

0.

A Precedent From History

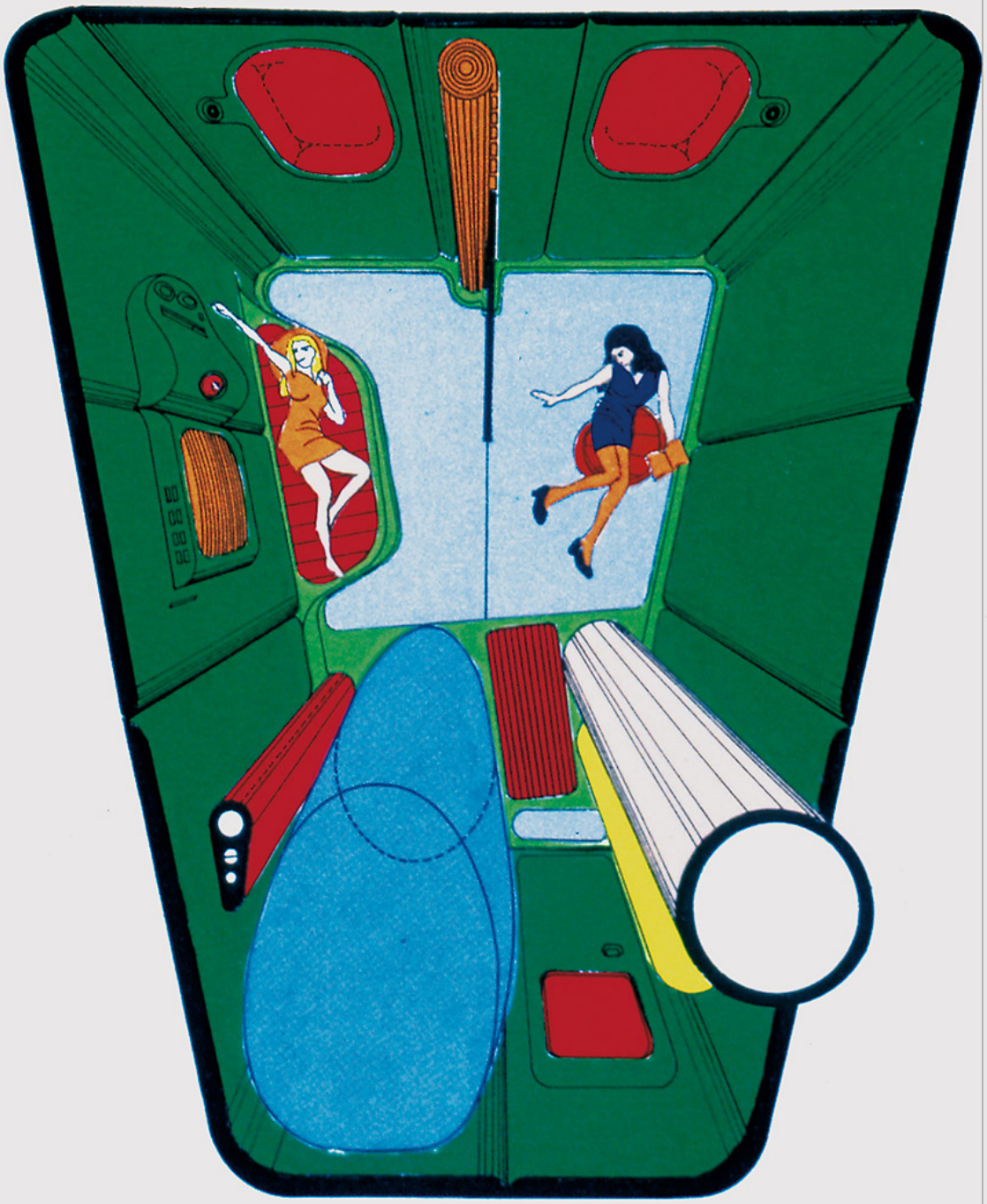
Ford Motor Company emerged amidst the industrial revolution and left an imprint on the build of our societies, the advancement of our technologies, and our most intimate spaces: our homes. The Modernist and Fordist home came as an amalgam of the drastic changes in lifestyle and the groundbreaking discoveries of science: the emergence of the working man/woman, the emergence of the 9 to 5 job, and the fast-paced lifestyle meant that people were less and less present in the home, a shift that was bound to be reflected in home design. Ford and the industry propagated the idea that being economic was a priority and set a new standard for building and production with the introduction of the assembly line. The architect and builder adopted this new design thinking: the systematic, economical, machine-like approach to building; the result was the Fordist home which became a mass-produced, ready-made unit fit for the working individual.

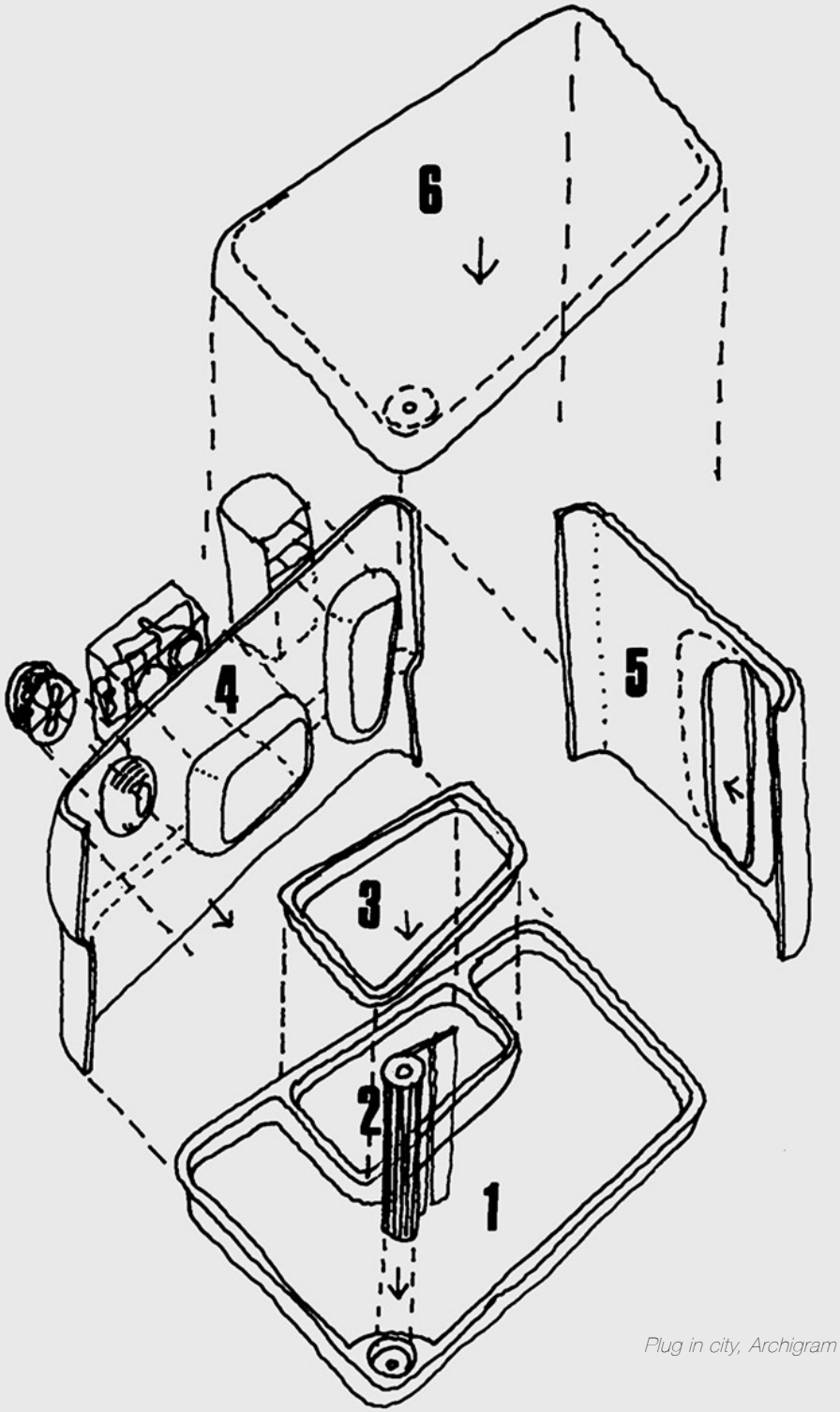
1903

c. 1900's, the working man

Ford Assembly Line, c. 1900's

From Housing in US Fordism, Florida and Feldman





Plug in city, Archigram

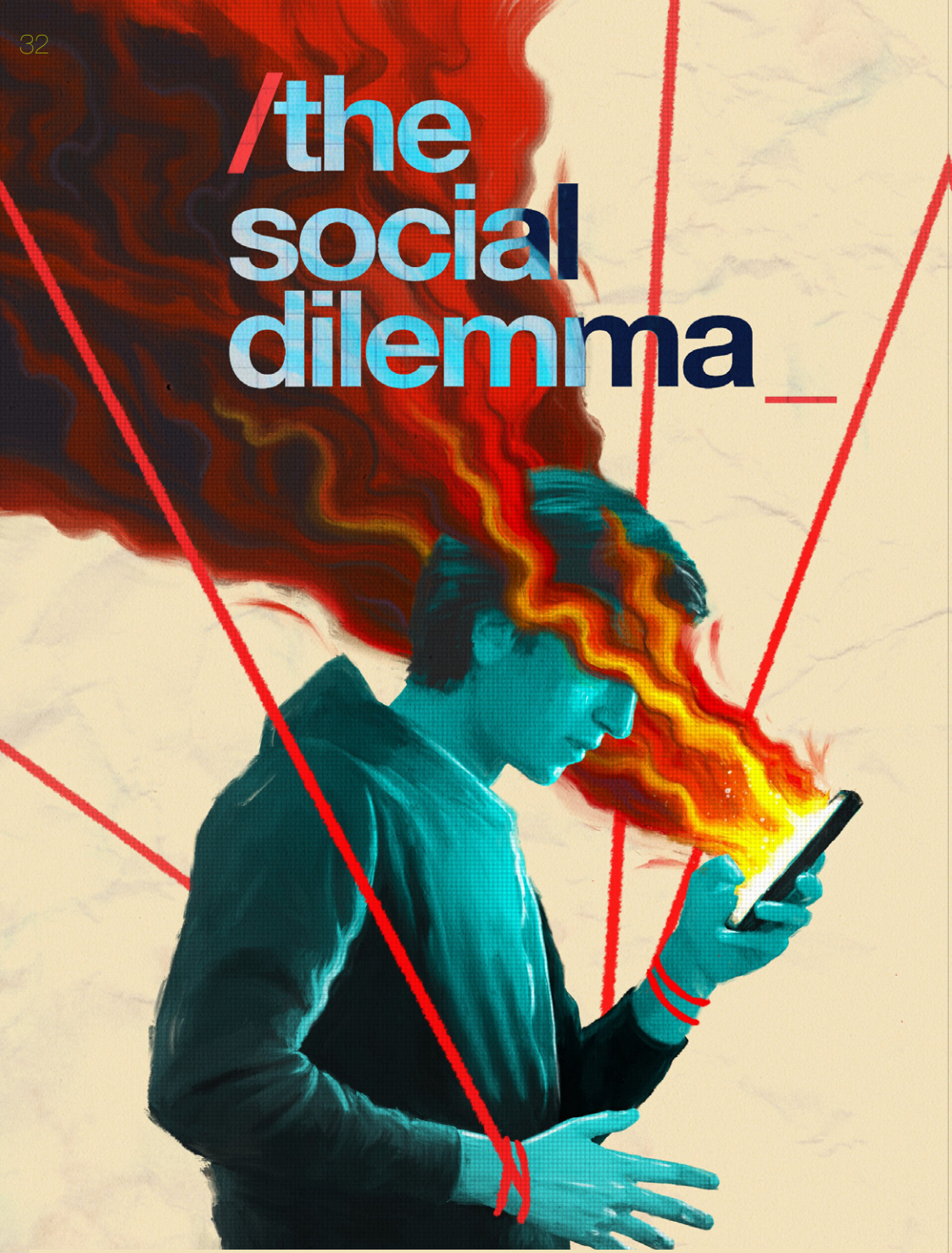
1.

The Tycoon of our Time

In the 21st century, amazon is an economic force to be reckoned with. It is an agent that is contributing to and causing a big shift in our lifestyle, but its immense growth and power also suggest a foundational way of thinking that got it this far. If Ford Motor Co. and the industrial age could send ripples through the home-design world by influencing society and science, then a plausible prediction would be that Amazon and the digital age might also spew some new child of the home. To discover whether this new home exists and what it is, it is important to explore both the lifestyle changes and technological advancements propagated by Amazon.

2020

/the social dilemma_



Among other things, this documentary accurately introduces some of the sociological ways we have changed as humans in our physical environment. How can our new lifestyle inform the design of our home?

/the social dilemma_

What can we adopt from Amazon's design approach?

2.

What Is the Home in the Age of Amazon?

2.1
Behavioral-spatial Shift

An initial look at our behavioral shift can tell a lot about how we interact with our living spaces today. This section explores our lifestyle changes that come as a result of the era we live in that is dominated by digital platforms and the e-world. The section that follows will elaborate on the particular role Amazon had to play in this lifestyle change.

New spatial boundaries

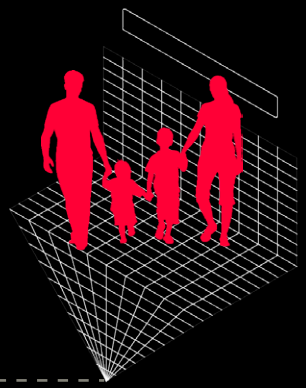
According to Gibbs and Arnold in their piece "Material Ecologies of Domestic ICT's" our technology has a role in creating new spatial boundaries within our homes. Devices are not merely physical objects in the home, they are more like portals that allow us to transport to a digital other-world. Although these other-worlds are physically intangible, Arnold and Gibbs argue that the way we perceive them is similar to how we experience physical space: some use technology as a portal to split between life domains, like splitting between work life and family time, others use it to create introverted nesting spaces for the self, others to create platforms of connecting and socializing.

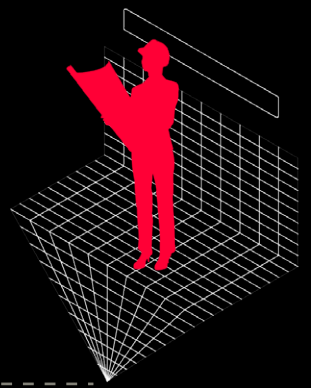
“The notion that technologies are usefully understood as forming an 'environment' (rather than being objects that occupy an environment) is a profound one.”

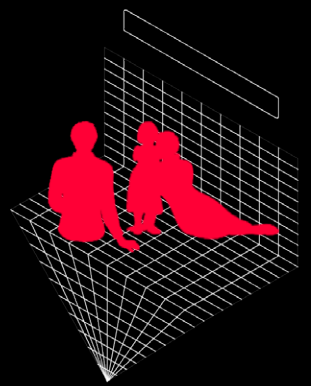
Source: Material Ecologies of Domestic ICT's, Arnold and Gibbs 2007

“We have identified five logics to ICT-home-spatialities: those that define boundaries between life's domains, those that facilitate surveillance of communications, those that dedicate space to media, those that use technologies to define 'nesting spaces' for self, and those undifferentiated spaces in which communications media are ambient.”

Source: Material Ecologies of Domestic ICT's, Arnold and Gibbs 2007







Technology as a portal to digital space

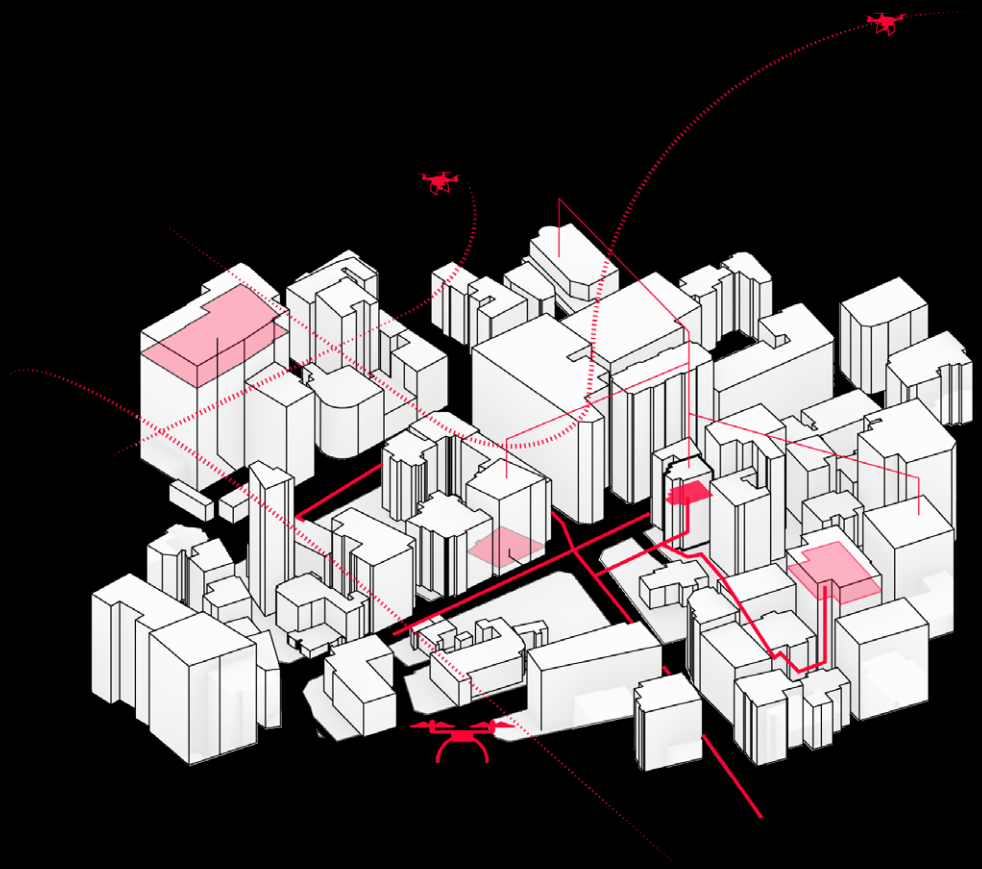
Digital space as a new type of boundary

Home as an Ecology

Arnold and Gibbs also draw to attention the importance of looking at the home as an ecology. The home is not merely the physical unit we inhabit, but it also encompasses the set of e-spaces related to this physical unit. Having established that technology and digital devices act as portals to digital other-worlds, and that many homes today host both humans and their technological devices alike, the home becomes a whole environment of physical and digital spaces.

> “The ‘thingness’ of the things that mediate communications is absent, except in so much as they mediate symbolic formats and communicative acts. In this… we explore the physical and spatial aspects of environments of technologies in the ecology of the home.”

Source: Material Ecologies of Domestic ICT's, Arnold and Gibbs 2007



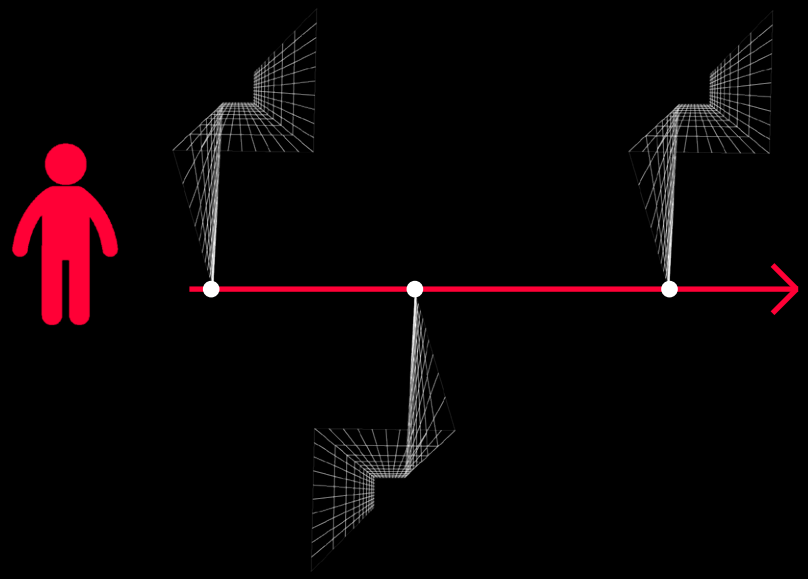
The home ecology

How individual actions/behavior correlate to space

If technologies are portals to digital spaces, and the home is an ecology of these digital and physical spaces, then the ecology is determined by the inhabitant's interaction with his/her technological devices. Every time an inhabitant or a user of the home uses a device, he/she is actively engaging in creating the home, or in visiting parts of it. Arnold and Gibbs sum this up by saying that the ecology becomes a set of "temporal or sequential arrangements with information technology".

> “Spatial arrangements, which are usually implied by the concept of ecology, increasingly are replaced by temporal or sequential arrangements with information technology.”

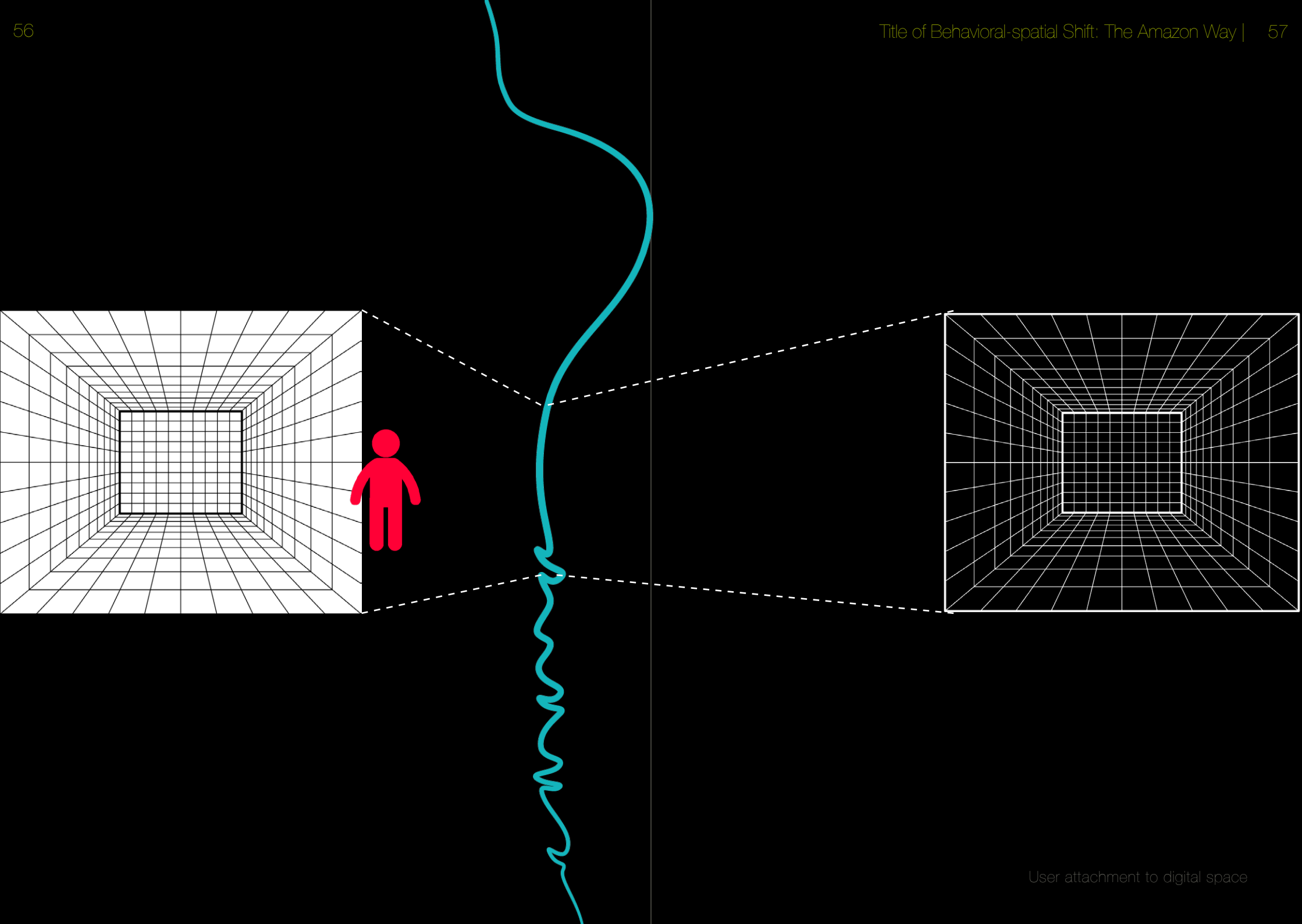
Source: Material Ecologies of Domestic ICT's, Arnold and Gibbs 2007



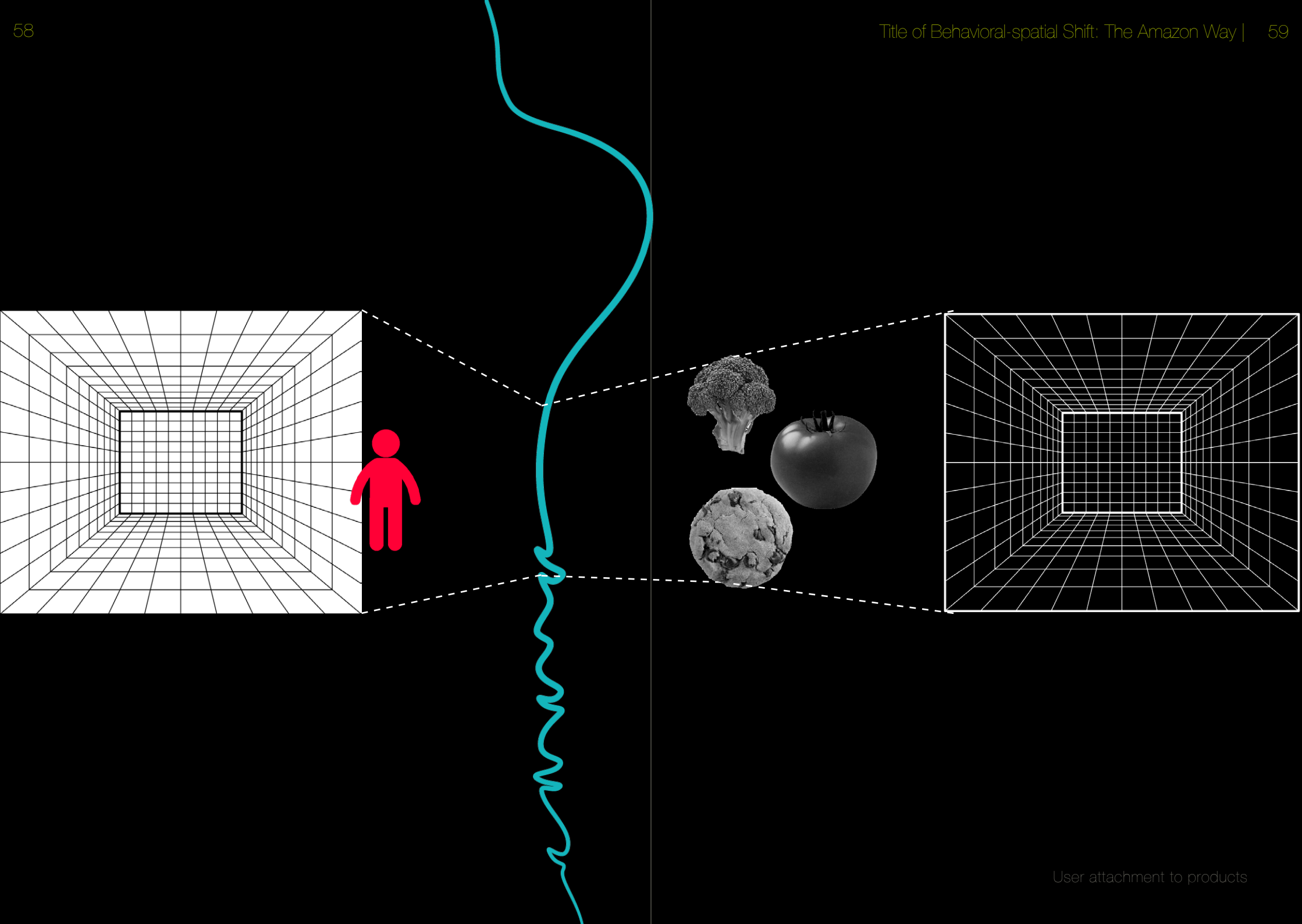
The inhabitant, or user, participates in creating digital other-worlds that become part of the home ecology

2.2
Behavioral-spatial Shift
The Amazon way

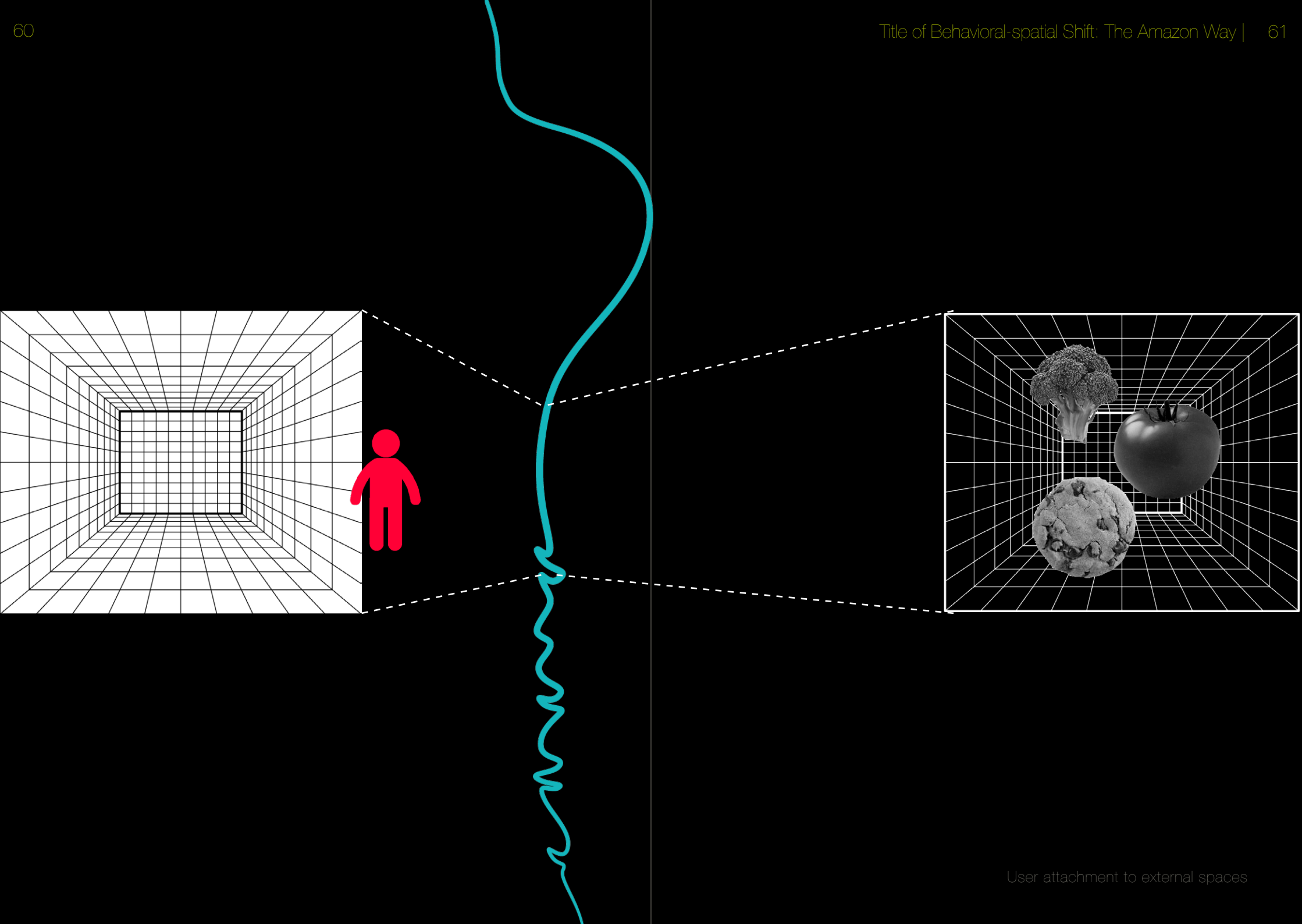
Amazon has become notorious for its speedy delivery, hyper-efficient processes, and globality. By virtue of being a delivery services company at heart, Amazon adds a layer of physicality to this ecology of a home. Where digital platforms like Instagram, Facebook, or Whatsapp, attach users to a space, product, or image that is merely digital, Amazon attaches its users to real, physical products. Amazon has created such a powerful, efficient system and experience that it has allowed for delivery and consumption to become an integral part of a 21st-century citizen's life. This citizen, or user, is no longer merely attached to a product or space that is digital, but rather he/she become dependent on these physical spaces external to their home that hold all the products they see and order online. Just as digital other-worlds become a part of the home's ecology in their integrality to everyday life, so do these externalized fragments of the home, and just as digital ecologies of the home are created by the user's habits and interactions with technology, so is this fragmented home.



User attachment to digital space



User attachment to products



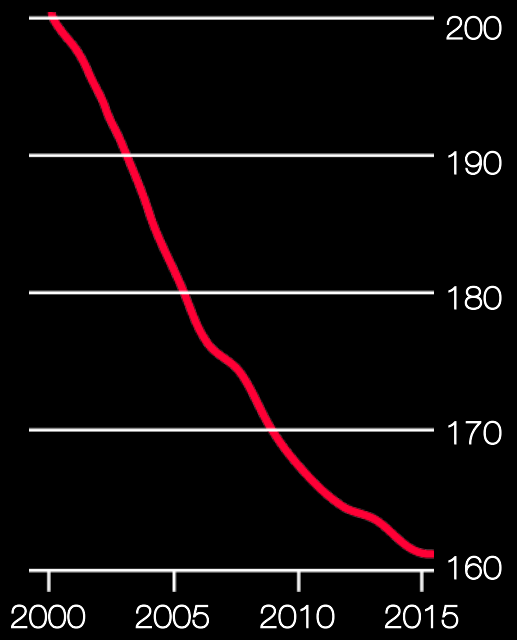
User attachment to external spaces

User dependence on online grocery shopping

User dependence on retail stores

In a study conducted by the Financial Times, the number of times a garment is worn before it is thrown out or disregarded is exponentially decreasing. Among younger shoppers, it is not uncommon for a clothing item to be worn just once before it is thrown away. In other words, younger shoppers are less likely to wear an item that has already been worn once as they would an item that is brand new. If the brand-new clothes that exist at a retail store outside a user's home are just as likely to be worn as the older garments that exist in a user's closet, then the retail store can be adopted as part of this ecology of a home. Similarly, when it comes to grocery shopping, the percentage of people who depend on online grocery shopping has increased by 200% this year. Prior to that, approximately half of the population of millennials and younger generations depended on online grocery stores. If these grocery stores are also integral to the everyday lives of these young users, they too can be part of the home ecology.

Average number of times a garment is worn before it ceases to be used



“Increasingly, younger generation shoppers are likely to throw out garments after wearing them only once.”

Source: Financial Times

203%

increase in online grocery shopping in 2020

“Tech-savvy generations like Millennials and Gen Z constitute important target markets for e-grocery retailers. Specifically, 45 percent of Millennials and 44 percent of Gen Z shoppers in the United States reported only or primarily shopping for groceries online in 2019.”

Source: Statista yearly reports

If distance or time was a factor that ruled out whether a space belonged to the home or not, it is not so much the case with these two examples and with Amazon's existing delivery infrastructure. When Amazon masters the ability to deliver to a user's doorstep in minutes, these external spaces, like the grocery store or the retail store, become as virtually quick and accessible as any other digital space or physical space in the home.

Prime Air

Warehouse blimp

Prime Air Drones

Prime Van

Amazon Flex

Amazon digital and delivery services

2.3 Conclusion: The Home Is a Network

To design the home of a user is to design the whole cluster of spaces entangled in the ecology of the home. The home is therefore a network/ cluster, but this network does not start and end with one single individual. The grocery store and the retail store are not only visited by a single user and therefore they are not only integrated in the home-ecology of one user. Rather, they are part of all the other user homes who also depend on these stores in their everyday life. The network is thus a set of ecologies that belong to all the users who share complimentary and mutual lifestyles, routines, or preferences.

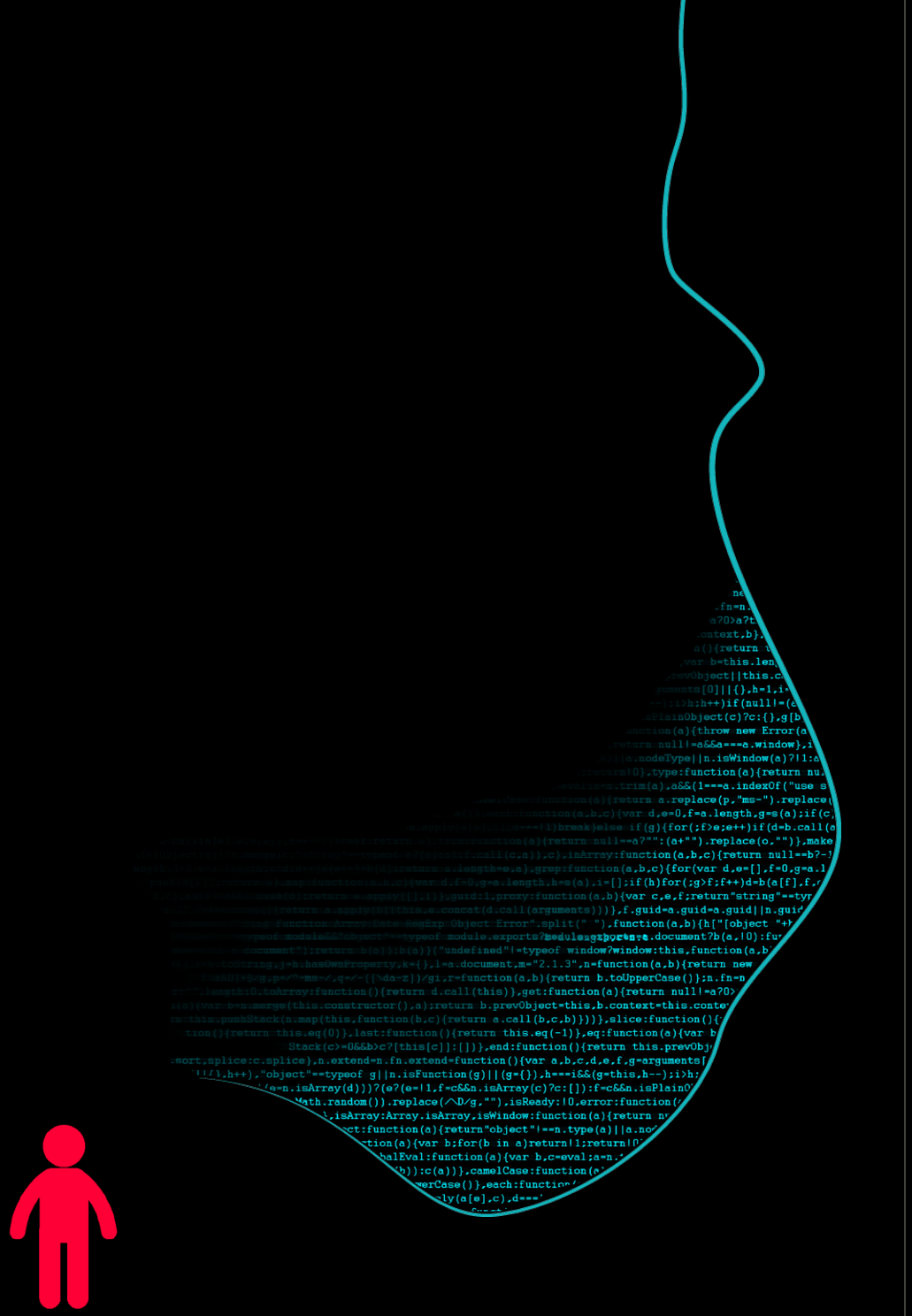
Home as a network

3.

How Can We Design This Home?

3.1 User-centered Design

Amazon's design strategy, user-centered design, is at the core of all its success. This is the very design tool that managed to penetrate our lives and create such a mass dependency on third parties like Amazon, but it doesn't necessarily have to stay that way. Designing the home as a cluster is, by definition, designing a set of spaces that allows users to carry out their daily needs within the environment of their home. User-centered design can tailor this place so that everyone is satisfied, in a mutual give-and-take environment where user lifestyles fit like puzzle pieces together in the bigger picture.



Preferences
Routine
Predictability
Behavior in space
Needs/wants

“Customer obsession… We have a pretty good database, that's all that we need.”

-Gutam Kumar

Source: Personal interview

“Data town is based only upon data. It is a city that wants to be described by information: a city that knows no given topography, no prescribed ideology, no representation, no context, only huge, pure data.”

Source: MVRDV Datatown

3.2 Economic Standpoint

User-centered design has allowed Amazon to reap maximal benefits from an economic standpoint. User-centered design, or UCD for short, helps determine exactly what users demand, which in turn is an advantageous tool in deciding the allocation of resources and investing money into new projects. Amazon has a relatively low inventory, high turn-over, high efficiency, and focused resource allocation thanks to the deep understanding of users and the market. If this methodology could be used when designing the cluster, then this new home typology can be born of a smart-allocation of resources too, based on an exact study of what is needed.

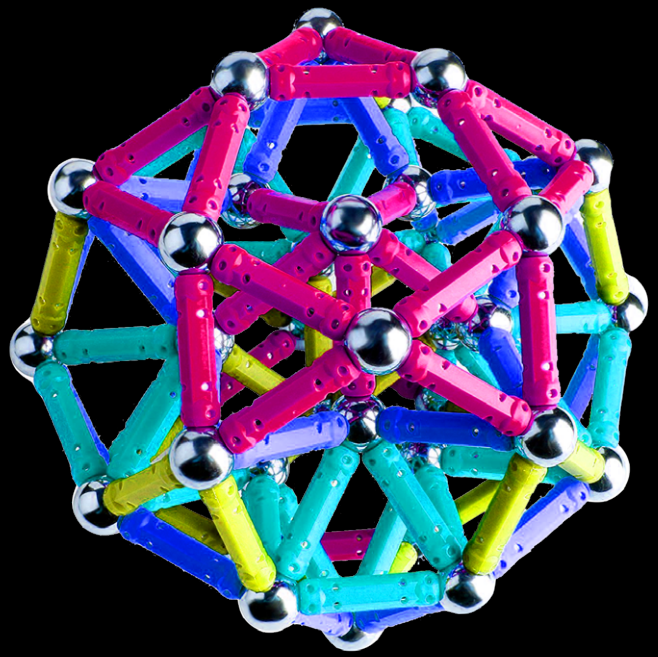
efficiency
allocation of resources
low inventory
profitable

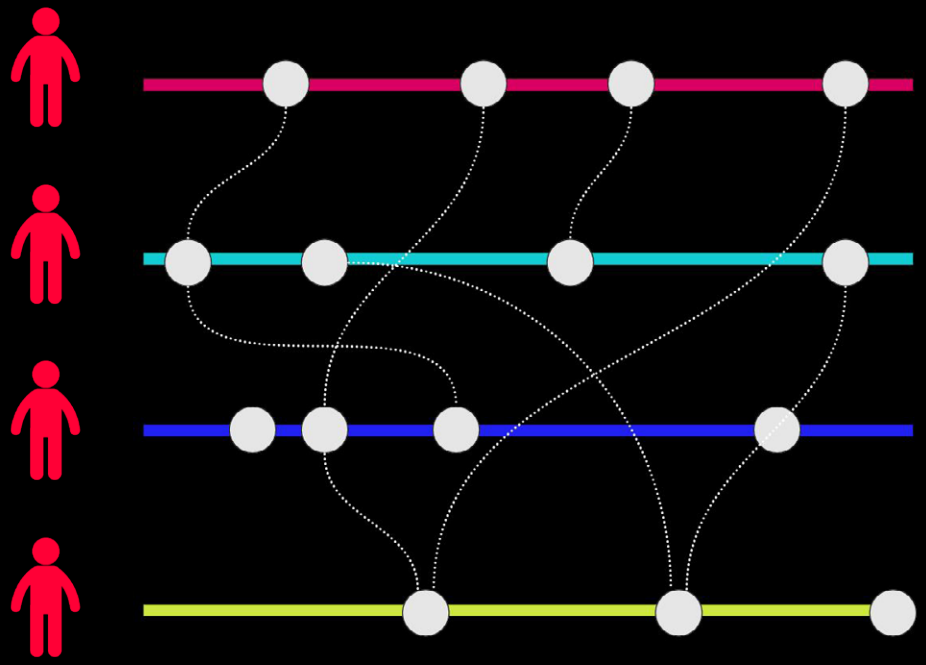
3.3 User Standpoint

UCD gives insight on user patterns, preferences, and predictions on future behavior. As such, a cluster designed by UCD can appropriately match users based on their common spaces, preferences, as well as their complimentary behaviors and spaces. For example, creating a cluster for entrepreneurs who want to produce would also mean that the cluster must have a market ready to consume what they are producing. Matching this group of entrepreneurs with a group of consumers who are looking for their products would give both parties what they want. Using this logic to design the cluster as a set of user preferences, routes, or relationships, will give way to having a cluster that is highly personalized, beneficial to all users, responsive to needs, with high proximity.

> “And the occupation of space is now reimagined on individual scales where were each tuned to our own personal architectural channel.”

Source: City Everywhere, Liam Young

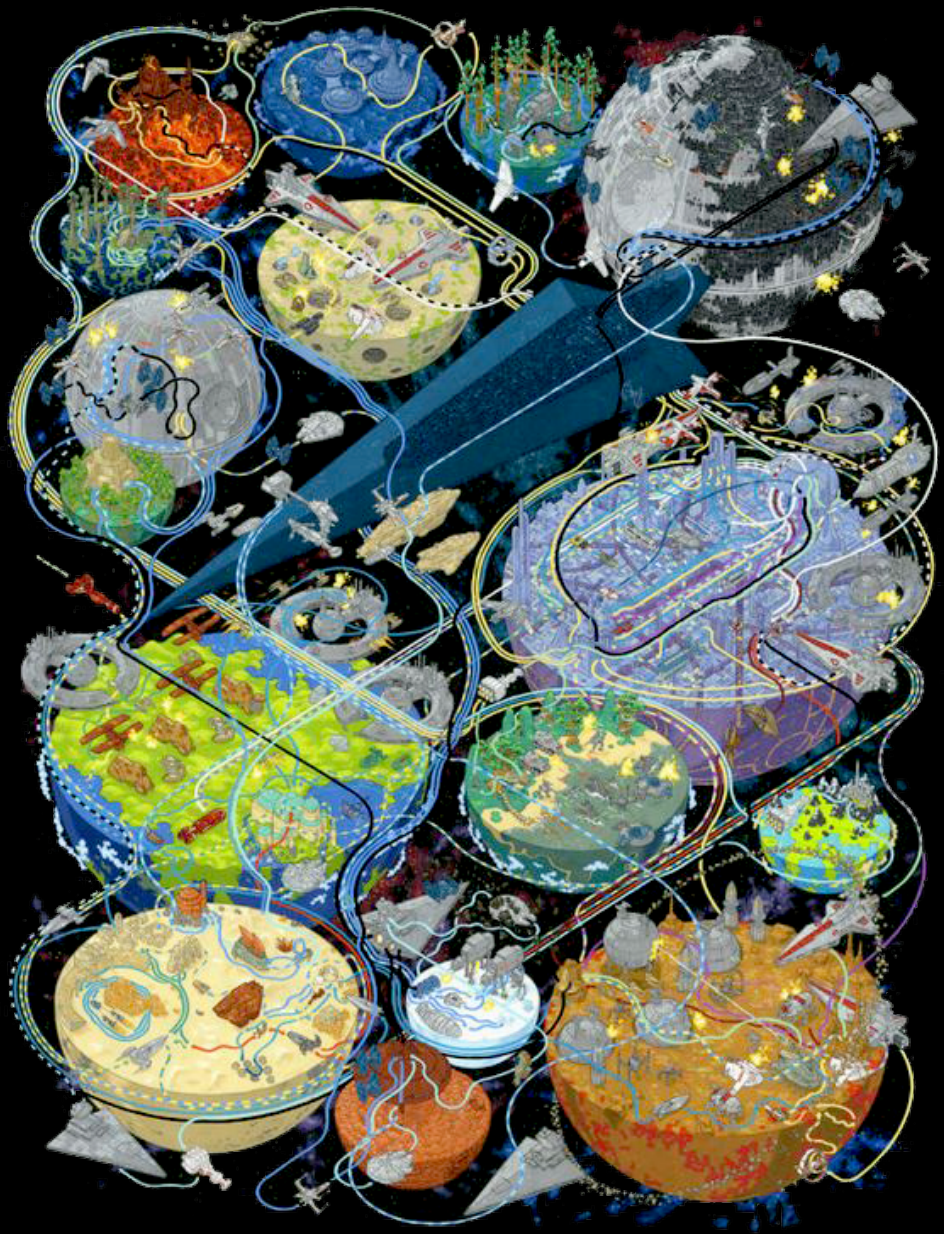




User routes and preferences: where they intersect *(right)*
and how that is translated in space *(left)*

3.4 Architecture Standpoint

In their book titles Collage Cities, Rowe and Koetter write about the importance of having smaller bundles or utopias within a city, rather than one large, imposed plan-to-fit-all. Creating the home as a cluster allows for this specificity in design that is not attempting to provide solutions on a mass scale. In a writing on rule-based design, authors Pisano, Luca, and Dastgerdi also argue the power of rules and design codes over topography, blueprints, and geometry when it comes to designing spaces. The cluster lets user behavior and preferences become a parameter of design before anything else: designing by looking at space as a dataset of user preferences then attempting to materialize it.



A visualization of the clusters
Source: Lucasfilm *art show called Art Awakens at Gallery 1988 West in Los Angeles CA*

> The form of the Collage City can accommodate fragments of utopias without having to accept a singular utopia as a governing model.

Source: Collage Cities, by Collin Rowe and Fred Koetter

“In the last decades, the ideology of managing the city form and performance through pre-determined plans has gradually lost its validity. Some contemporary urban planning theories suggest the application of smart design techniques for managing urban complexity… the rule-based design as a smart design technique for a shift from pre-determined urban plans to design rules.”

“Several new forms of hybrid and flexible urban approaches have emerged, often grounded over ‘soft’ relations [15,16] and interactive governance between actors and instruments.

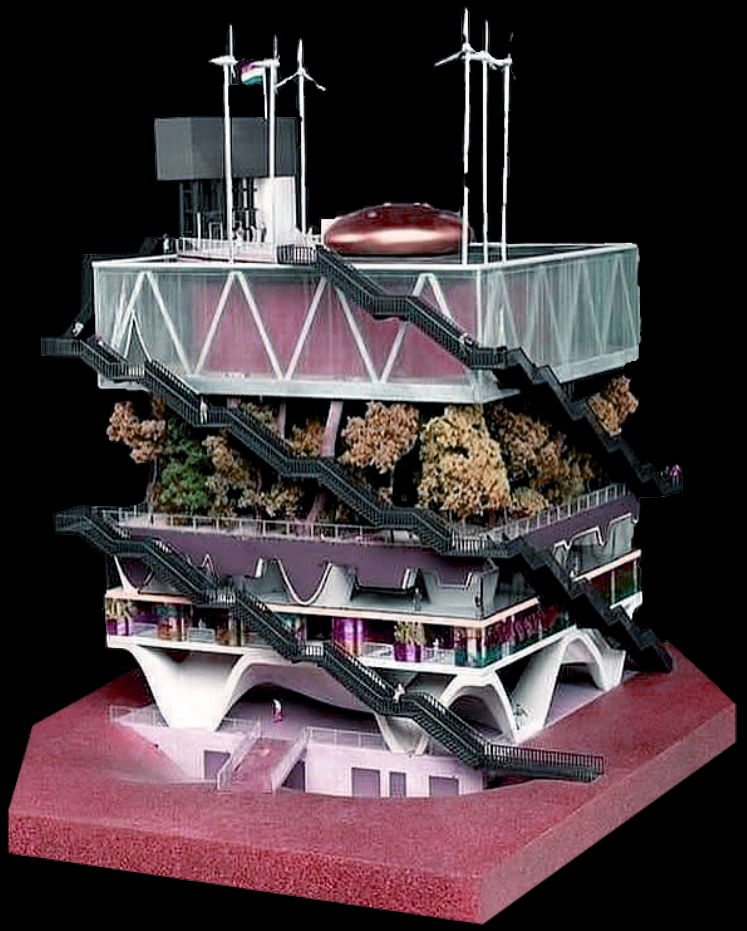
This trend goes hand-in-hand with the emerging ideology of planning without a plan, which eventually points out a generative approach to urbanism [13]. The developing idea of urban complexity, therefore, shifted the mainstream interest in the literature [6,17,18] from the plan to rules.”

Smart Techniques in Urban Planning: An Insight to Ruled-Based Design by Pisano, Luca, and Dastgerdi

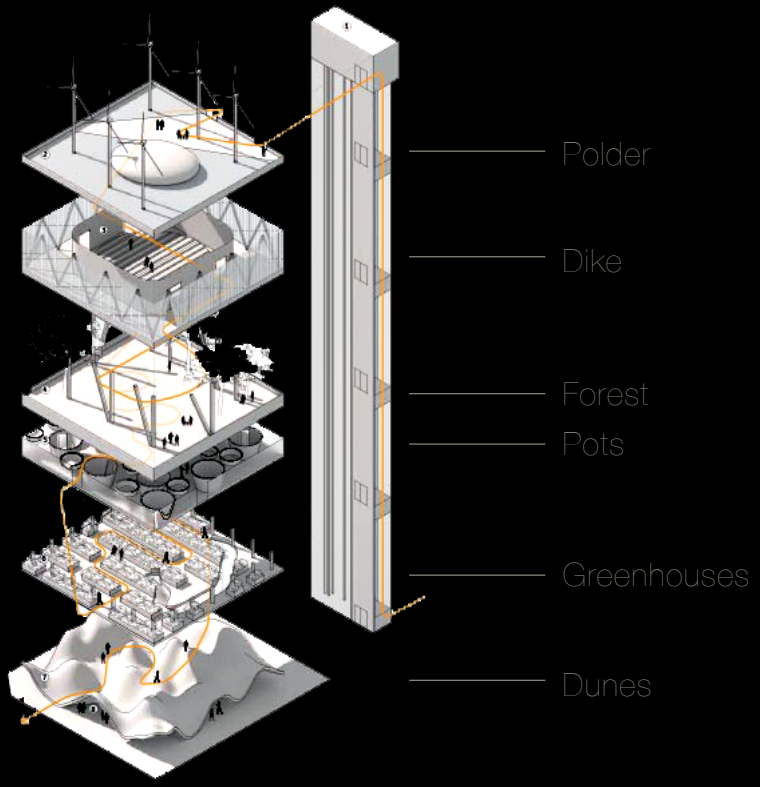
4.

MVRDV Expo 2000

This pavilion designed by MVRDV is one way to visualize the home-cluster proposed. The pavilion stacks 6 different biomes on top of each other, concentrating a wide variety of climates in one building. In the same way, the cluster-home will concentrate all the needs of its users in one environment.



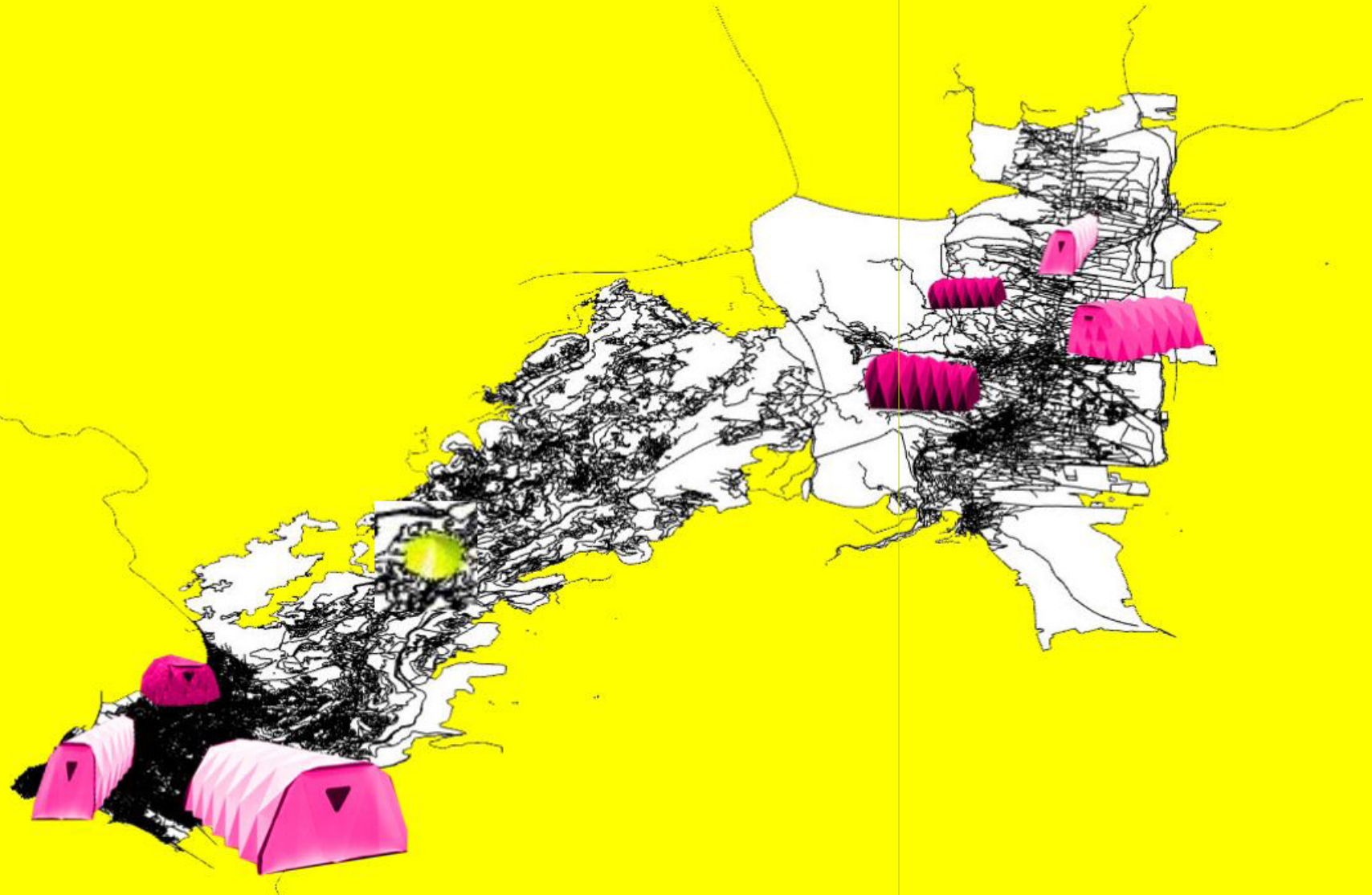
Source: MVRDV Expo 2000



Source: MVRDV Expo 2000

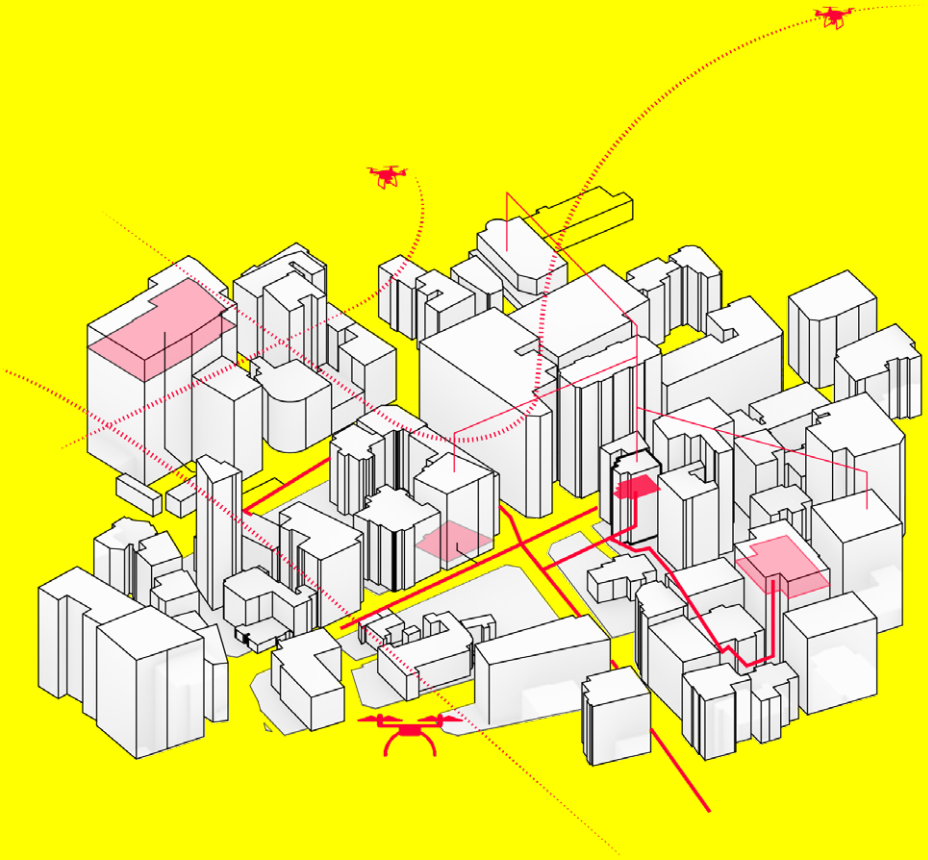
5.

Materializing the network home



5.1 User group

Since the network home is strongly dependant on the routine of the users who inhabit it, the first step is to select the user group whose living patterns overlap. This allows for the isolation of a network, despite the fact that there will always be more overlaps beyond.



Dana

Dana family

Assistant

Marketing officer

Sylvie

On-call worker

PR officer

Farmer

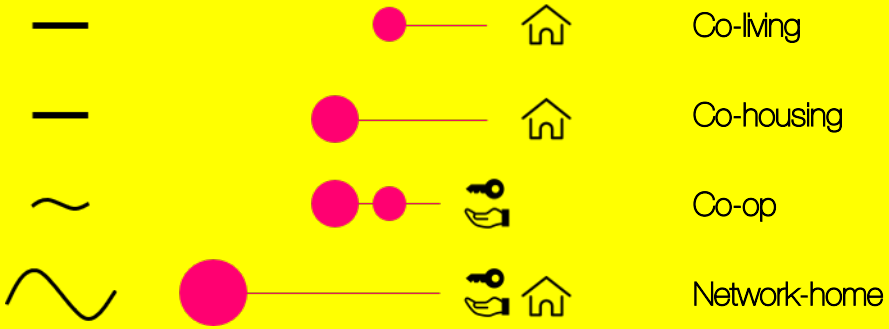
Retailer

Dana:
> Young entrepreneur
> Owns a local organic produce company
> Struggles include commuting to and from Bekaa
> Struggles keeping up with essential workers from afar

Sylvie:
> Retired lady
> Looking for company/community life
> Baking is her hobby
> Looking for ways to earn a living

Dana's entourage:
> People Dana needs with her at all times
> Can be family members or business essential services
> Type of people Dana would stay up late with

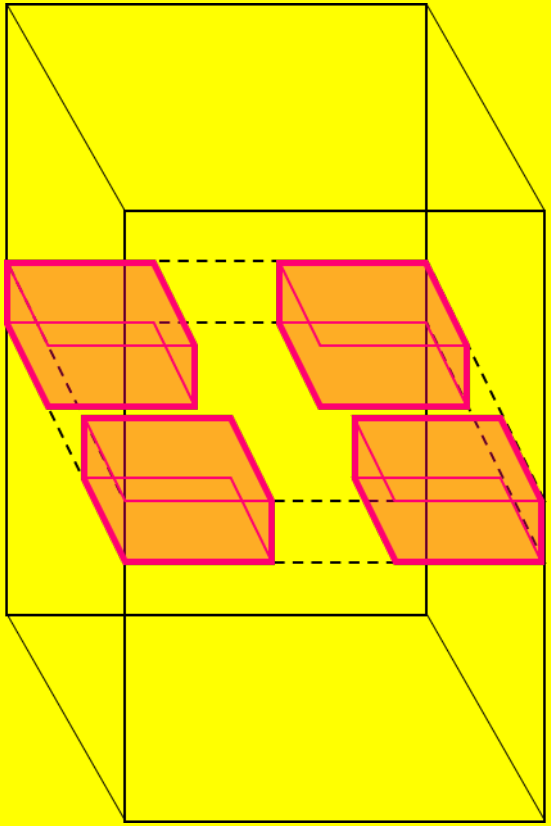
5.2 Ownership Model



The network home is place for users with overlapping interests and mutual benefits. It belongs to them all, so its ownership will reflect this logic.

Co-living

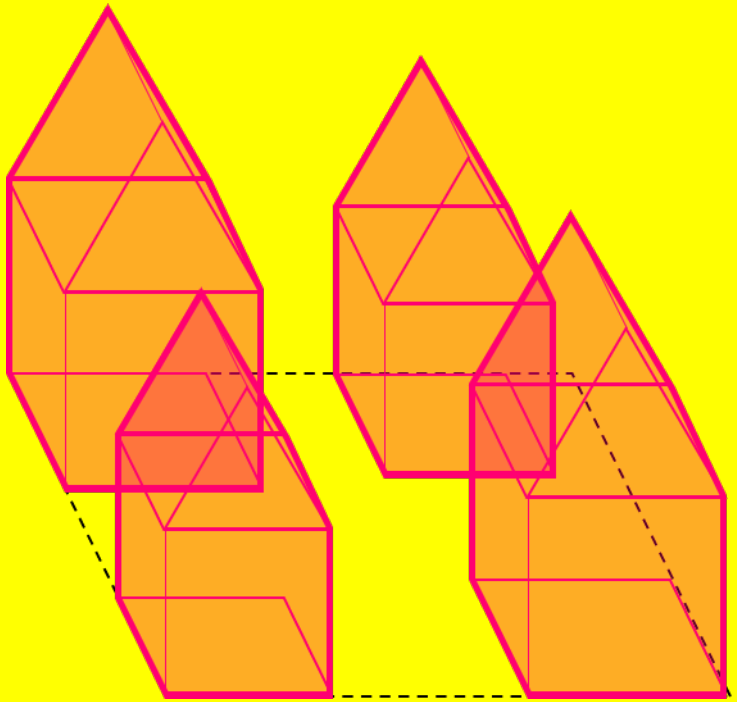
One building or appartment
Individual private units within (rooms)
Shared rooms (living space, etc.)



Co-housing

Multiple buildings/ apartments

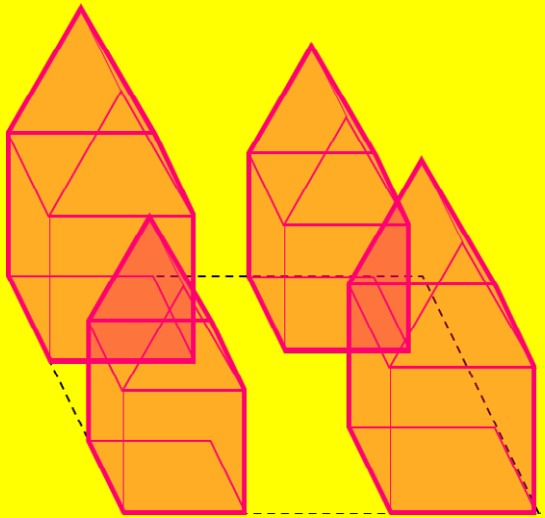
Shared community spaces, mainly outdoor or outside the living unit (gym, garden, etc.)

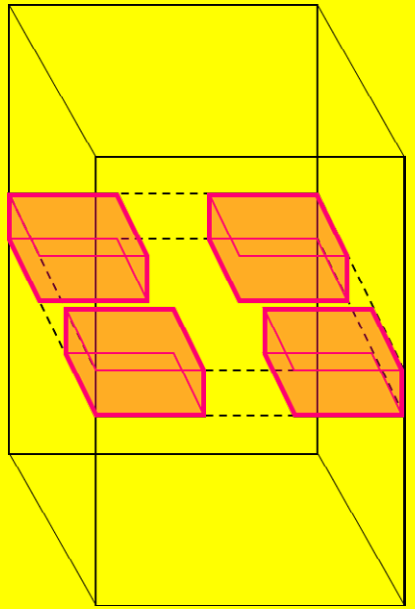


Co-op

Any type of ownership unit

Not a housing typology, but an ownership typology. Once built it is more or less permanent.





The Home-Network

Similar to a co-op, but has room for growth, change, admitting new users or letting go of old ones.

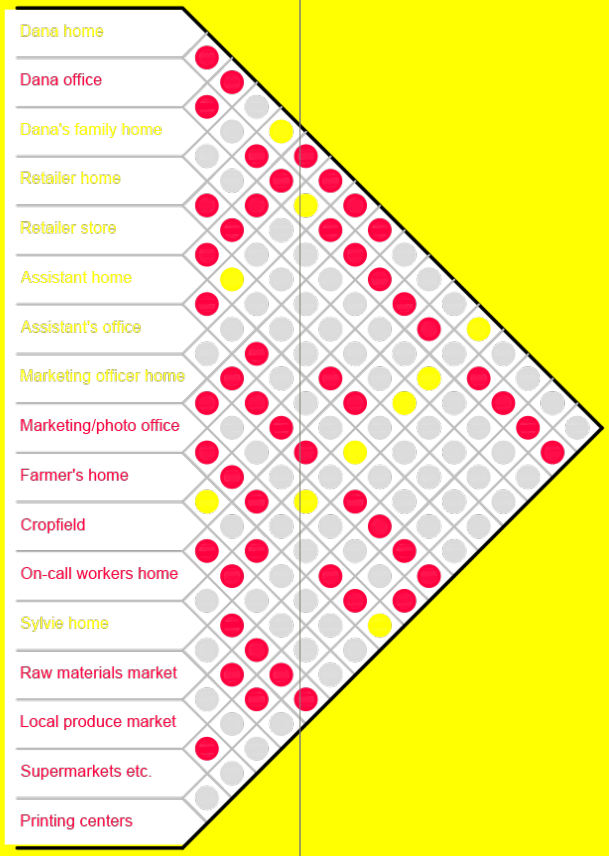
5.3 Spacial Configurations

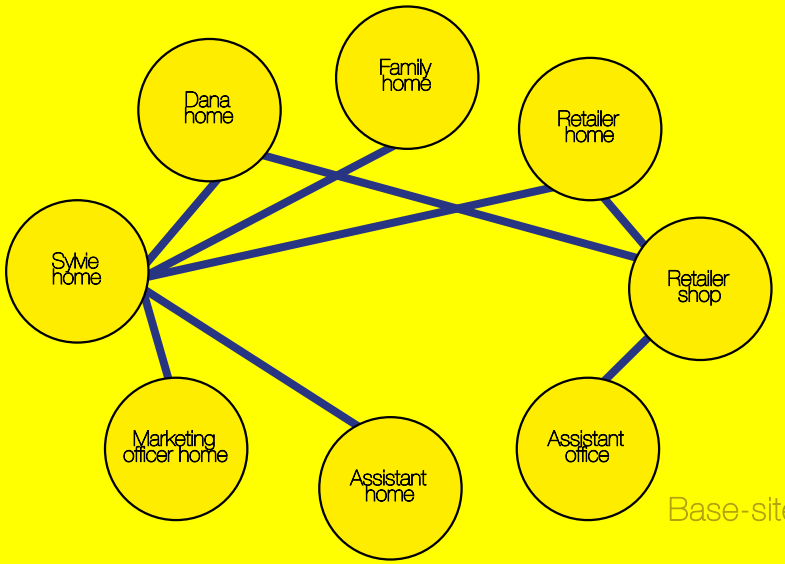
Configuration 1: Concentrated on a base site

Configuration 2: Hybrid

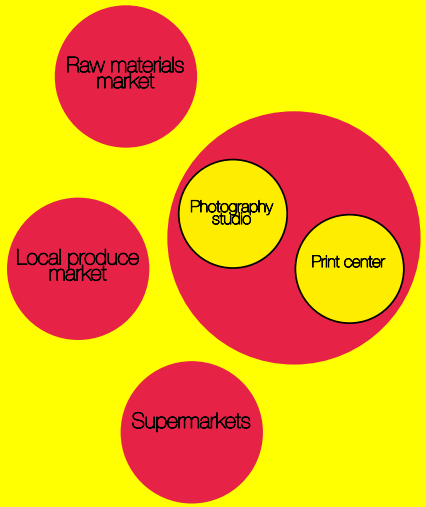
Configuration 3: Dispersed on multiple smaller-scale sites

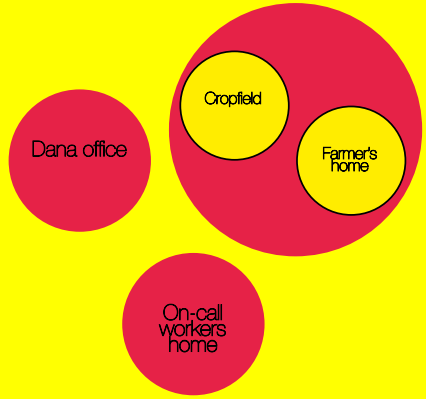
5.4
Dana, Sylvie, Workers Program





Base-site program





Auxiliary site program

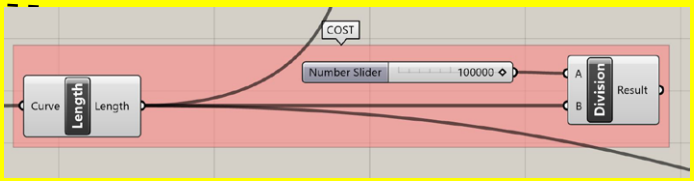
6.

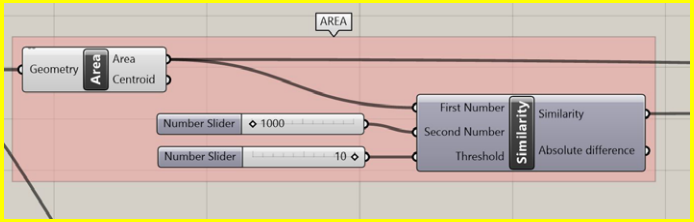
Site Selection Process

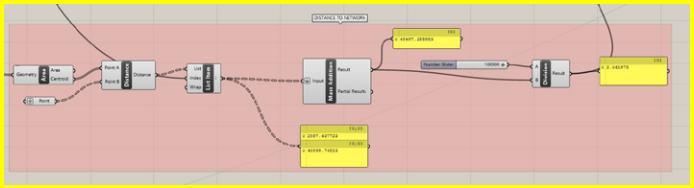
Area breakdown

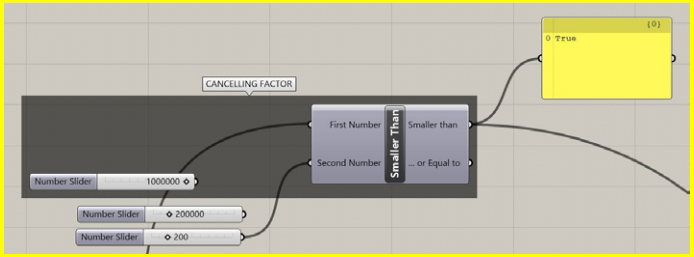
Dana home 70 sqm
Family home 150 sqm
Sylvie home 200 sqm
Retailer home 70 sqm
Marketing home 70 sqm
Retailer store 150 sqm
Cropfield // sqm
Marketing office
Photography studio
Assistant office 20 sqm

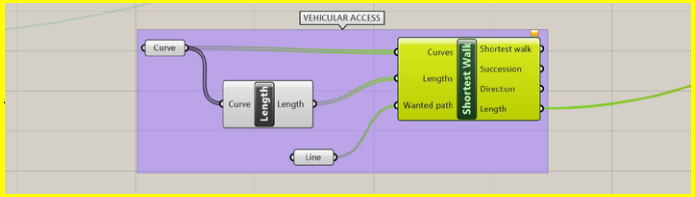
Site Selection Criteria (table)	Weight
Area	5
Price	5
Distance shortest to nearby nodes	3
Accessible to vehicular delivery	4
Rural Vs. Urban	1
Potential for site growth (nearby empty lands)	1
Potential for market growth (nearby market/audience)	4



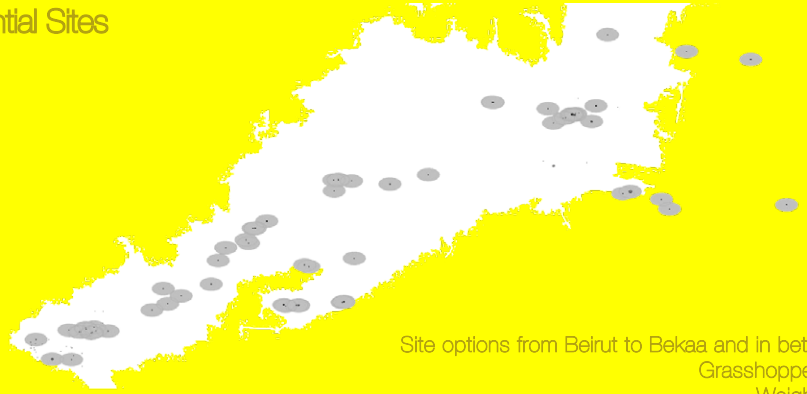






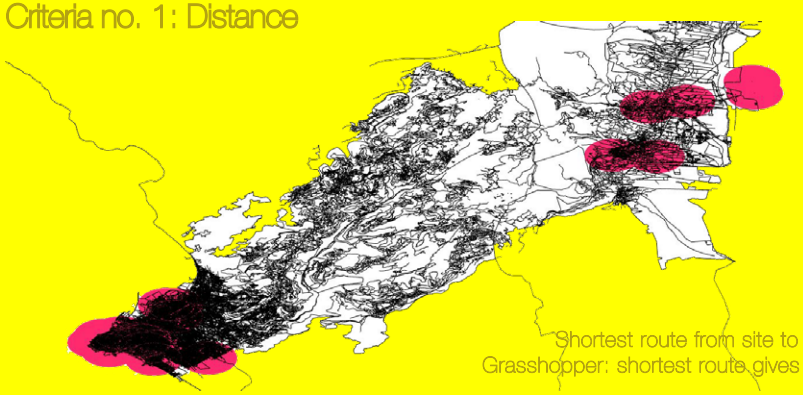


Potential Sites



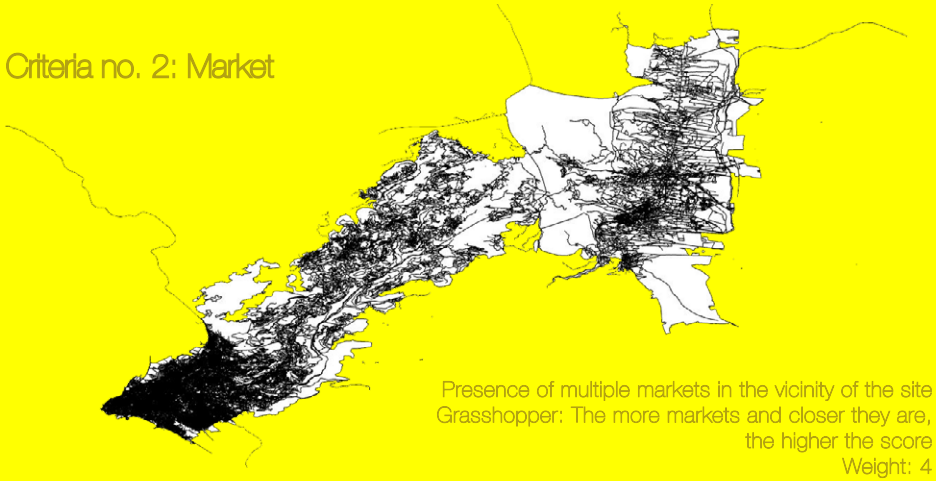
Site options from Beirut to Bekaa and in between
Grasshopper: ---
Weight: ---

Criteria no. 1: Distance



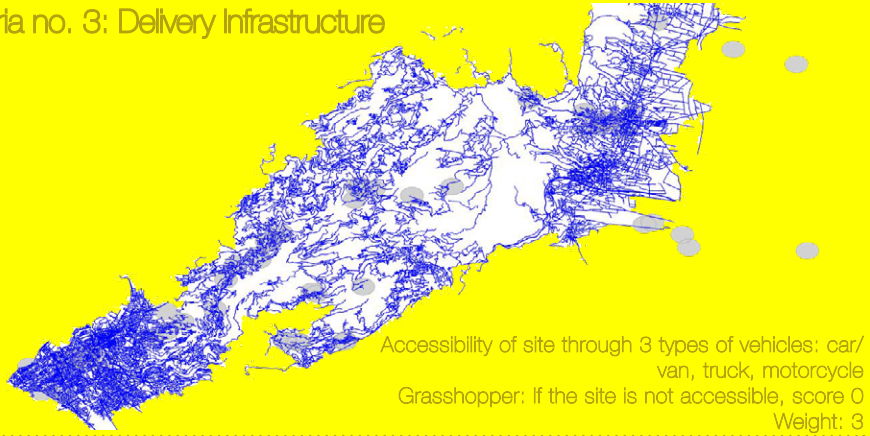
Shortest route from site to nearby nodes
Grasshopper: shortest route gives highest score
Weight: 3

Criteria no. 2: Market



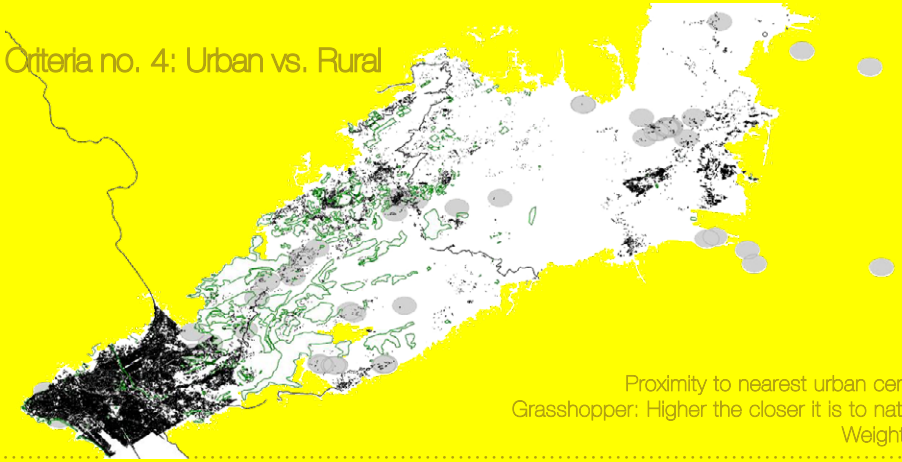
Presence of multiple markets in the vicinity of the site
Grasshopper: The more markets and closer they are, the higher the score
Weight: 4

Criteria no. 3: Delivery Infrastructure



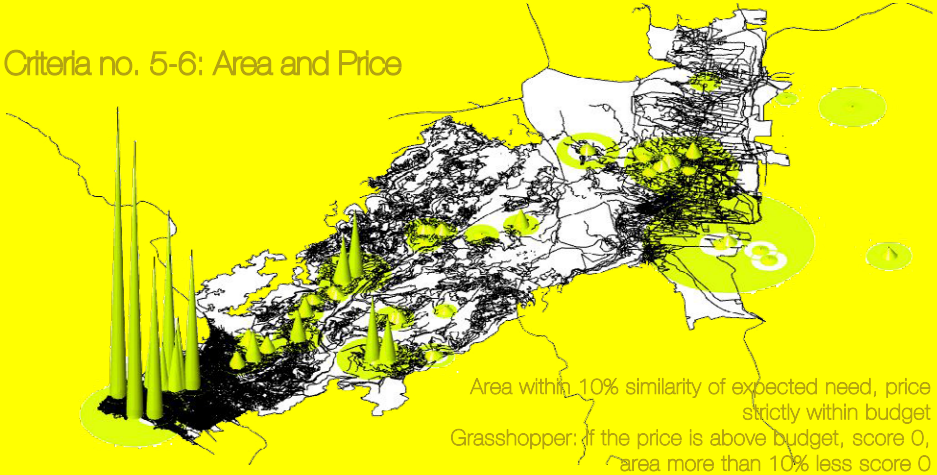
Accessibility of site through 3 types of vehicles: car/van, truck, motorcycle
Grasshopper: If the site is not accessible, score 0
Weight: 3

Criteria no. 4: Urban vs. Rural

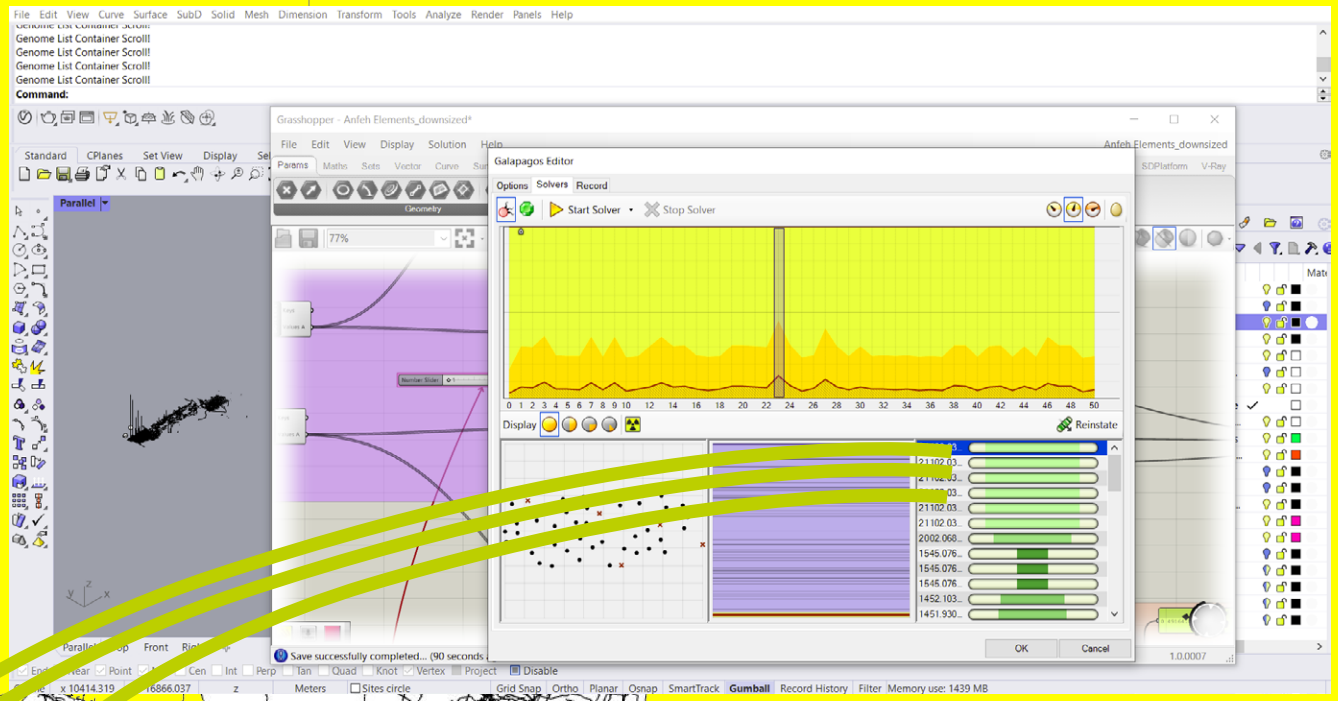


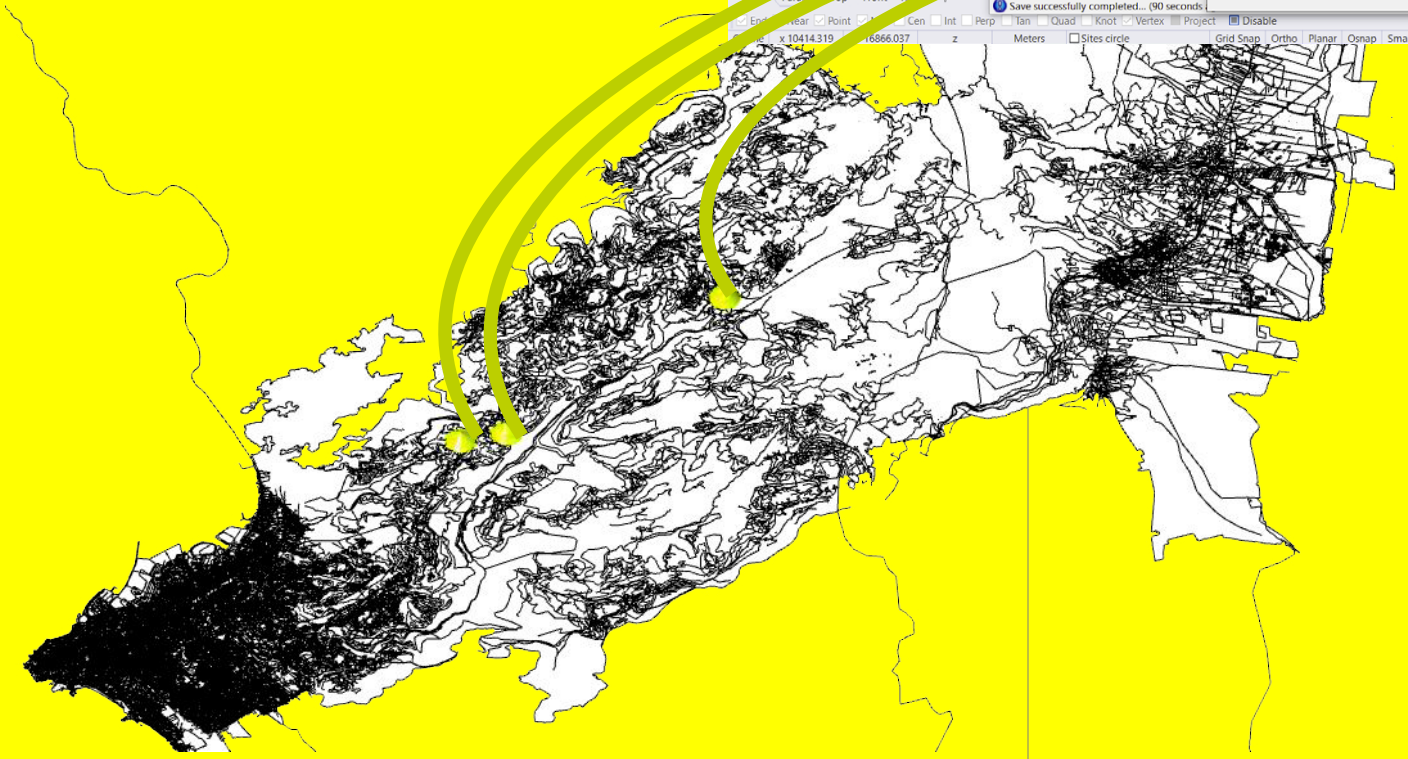
Proximity to nearest urban center
Grasshopper: Higher the closer it is to nature
Weight: 1

Criteria no. 5-6: Area and Price



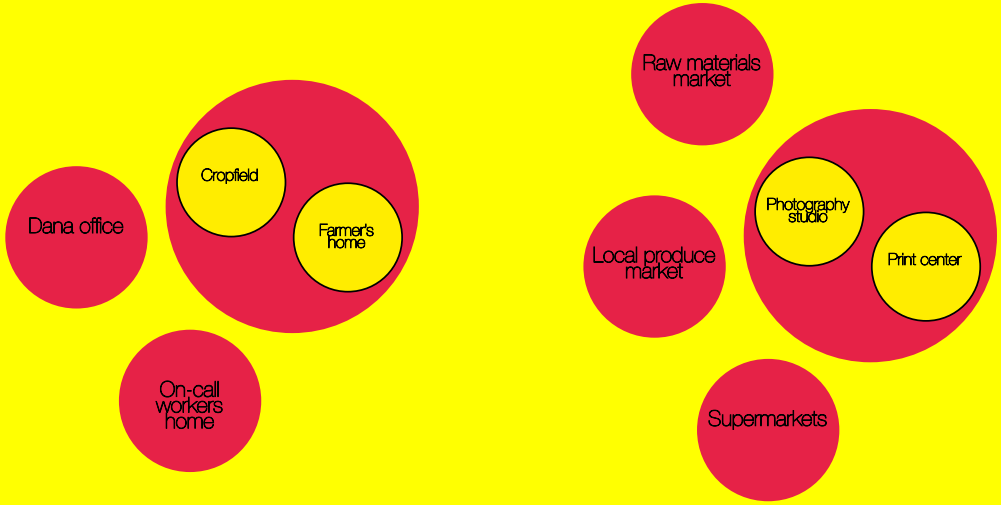
Area within 10% similarity of expected need, price strictly within budget
Grasshopper: if the price is above budget, score 0, area more than 10% less score 0
Weight: 5 price, 2 area





Results:
Arsoun, Broummana, Mtein

7.



Auxiliary Sites

Aux. site #1:

Doculand, Bliss
Basement, sheltered

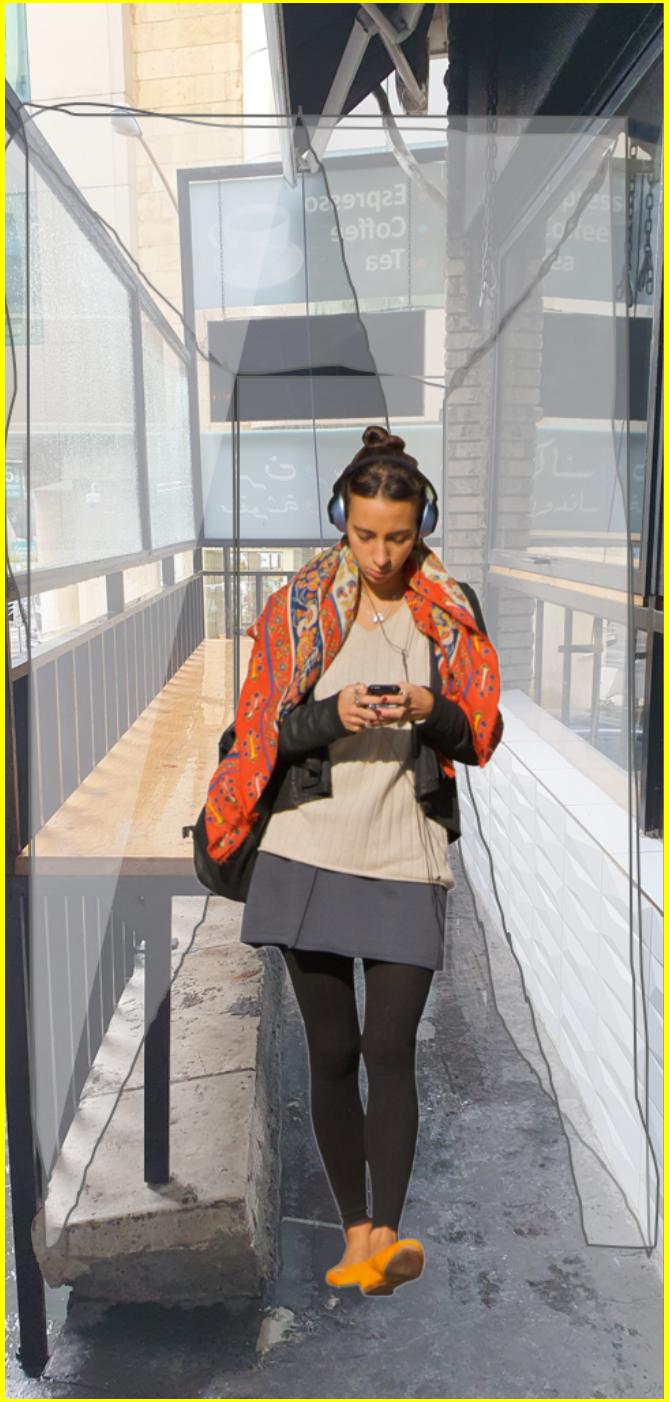
This, and the options that follow, are potential sites for the photographer's impromptu photography studio, next to some of the print shops Dana relies on for her business.

Aux. site #2:

Horriah Copy Center, Tarik el Jdide
GF, indoors

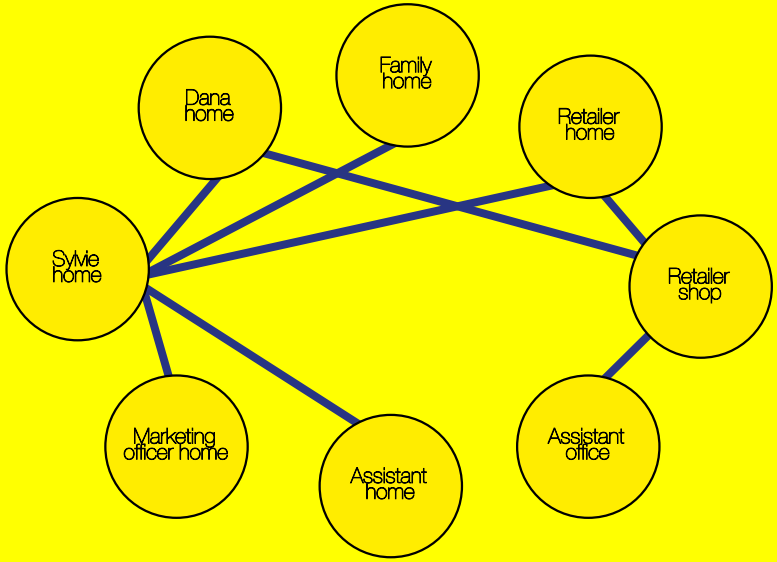
Aux. site #3:

Printshop, Makhoul
Outdoor, GF

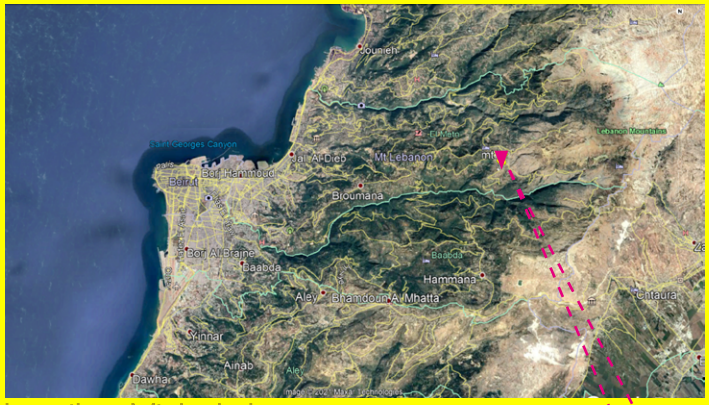


8.

Base Site

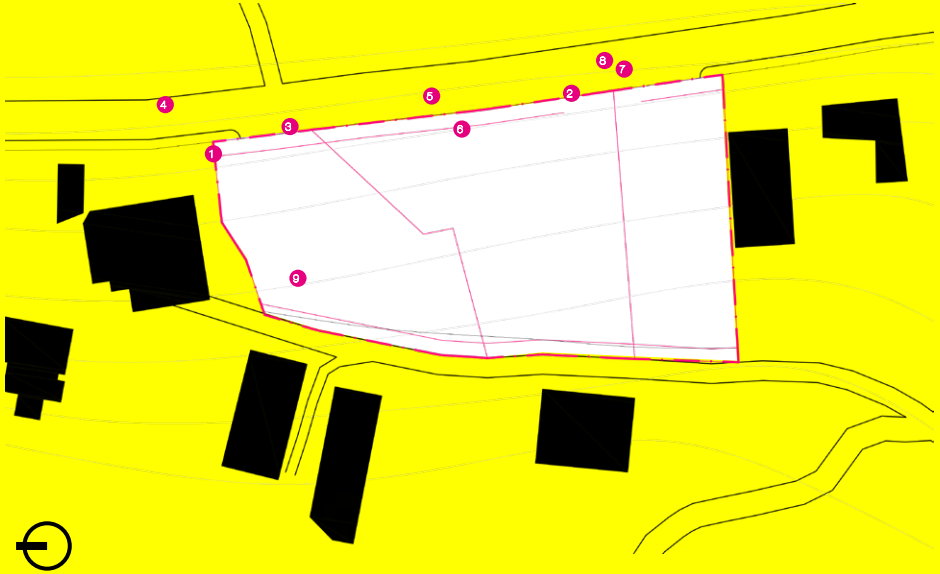

Dana home
Family home
Retailer home
Sylvie home
Retailer shop
Marketing officer home
Assistant home
Assistant office

8.1 Site Analysis



Location: Mtein, Lebanon

Area: 4000 sqm



North elevation

South-east elevation

Neighboring building

Neighboring building

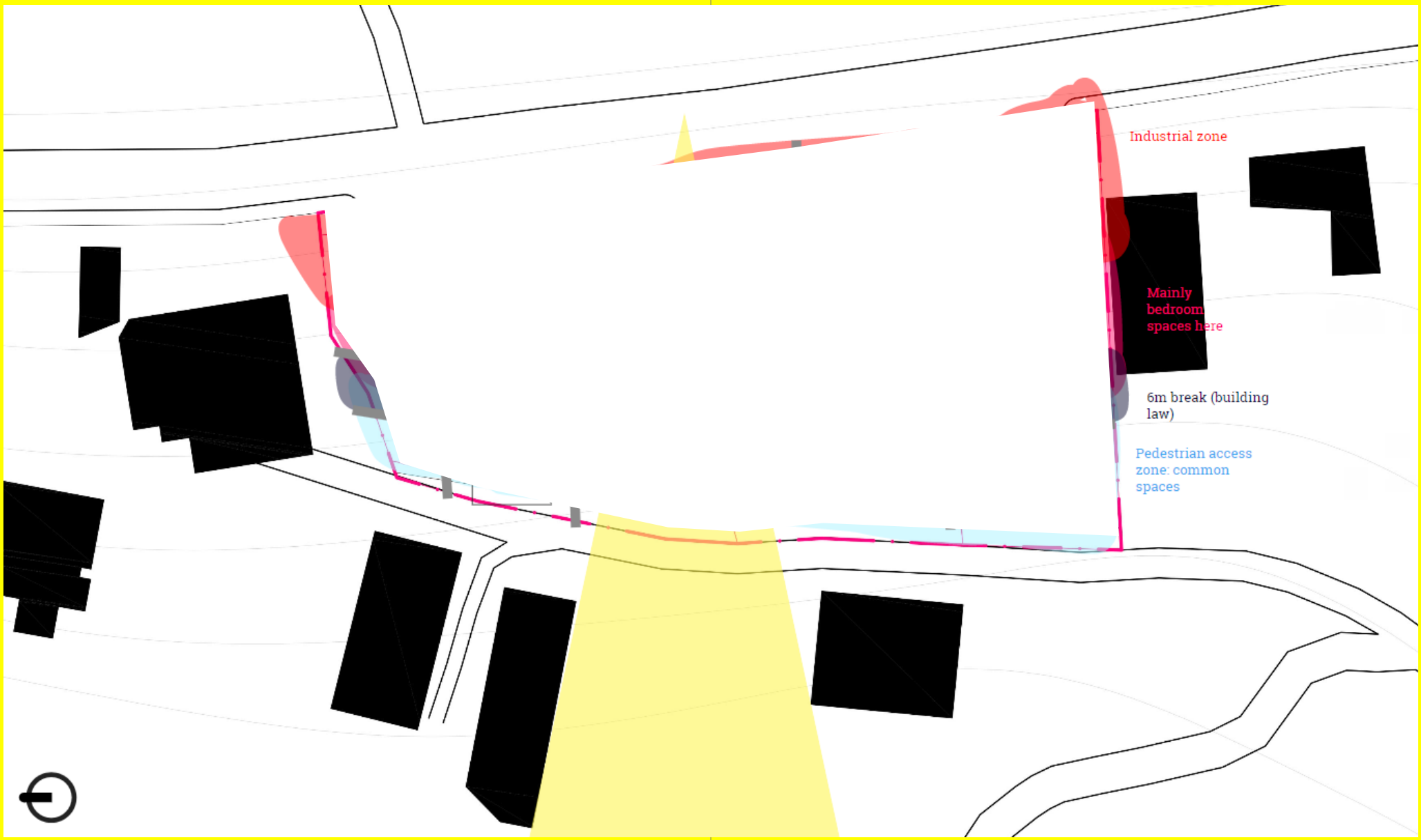
East elevation

Neighboring building

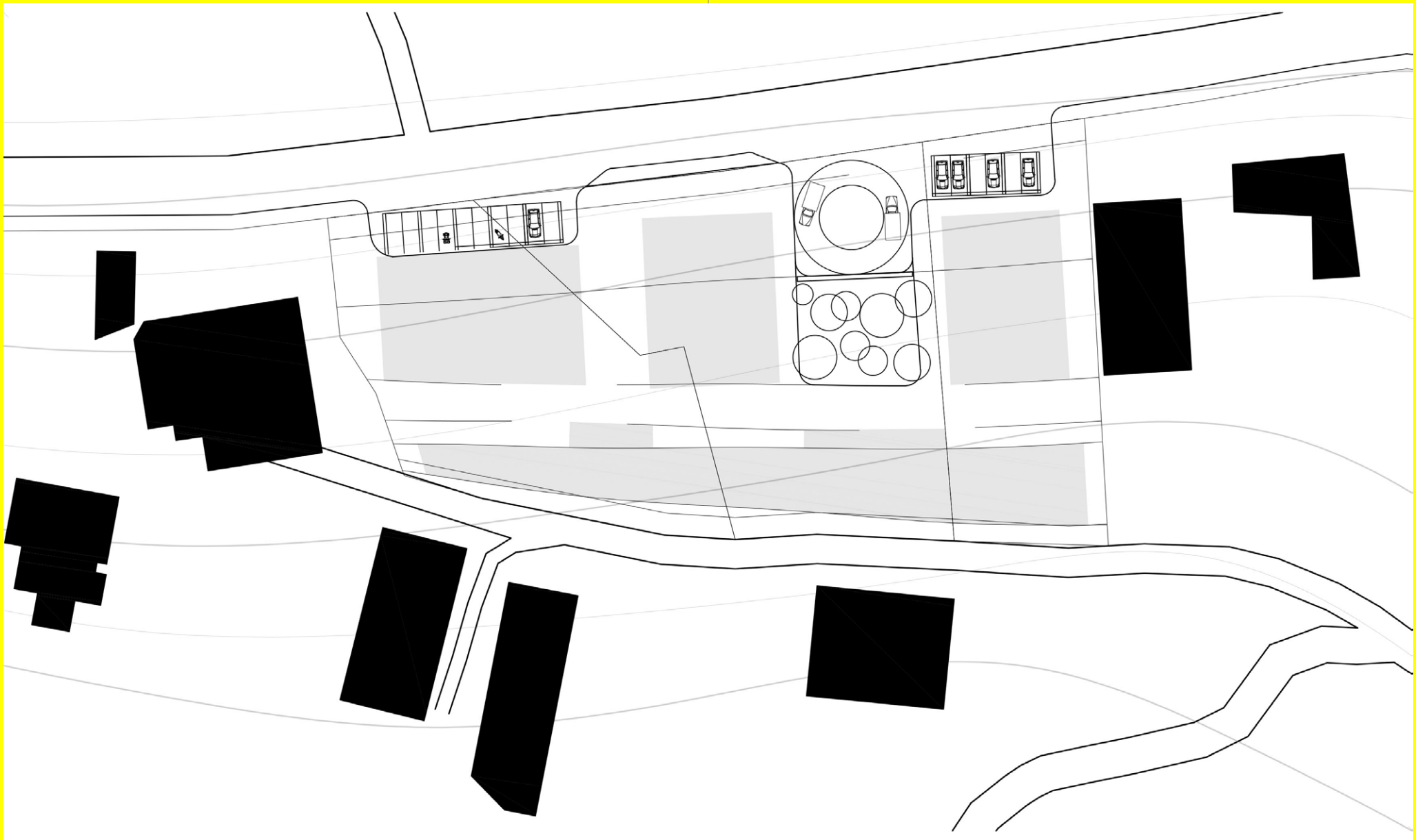
Highway - east border

Highway - east border

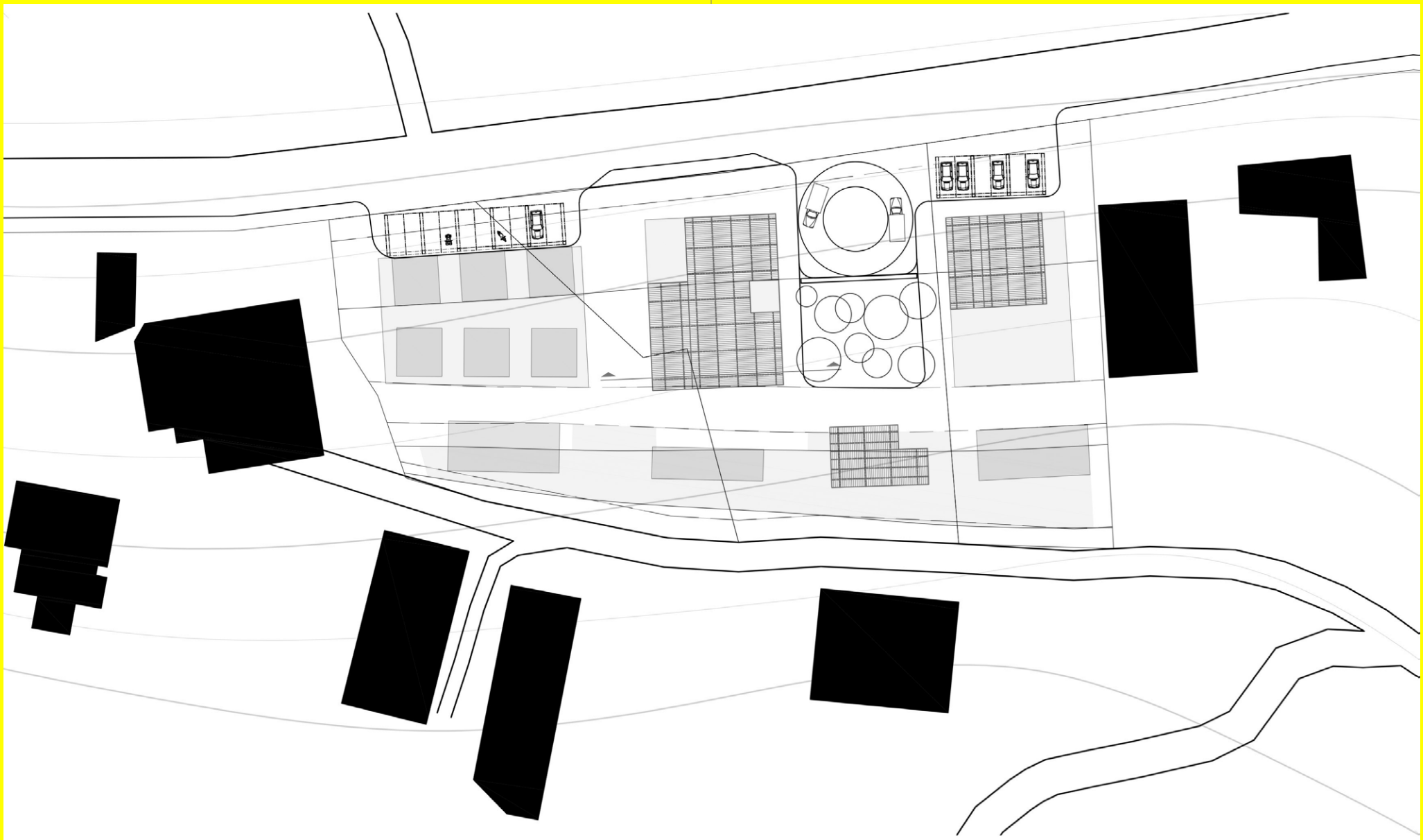
Neighboring building



Site zoning: Based on adjacent roads, buildings, and user preferences

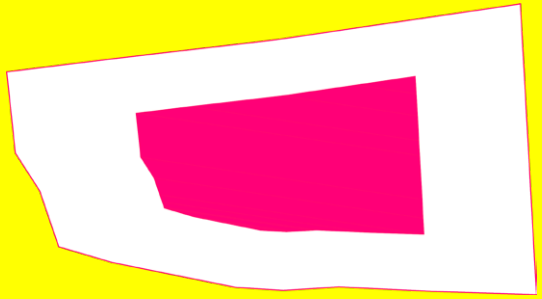


Site zoning: Grey areas = slab on grade, this indicated the possible zoning strategy on which buildings can erect, but cannot fully occupy the whole slab which is larger than allowable

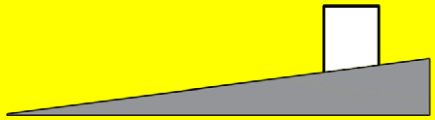


Possible option for building growth along the provided slab base

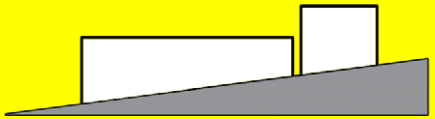
Building Restrictions



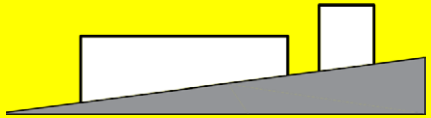
30% exploitable area



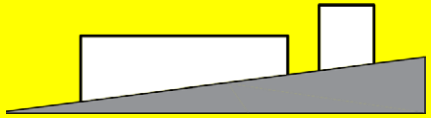
11m maximum height



Total building height on site <=11m

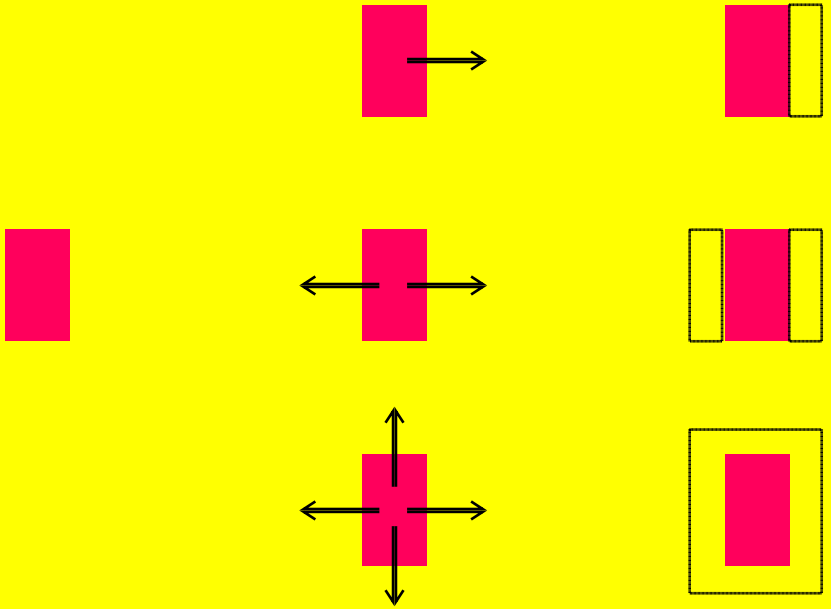


6m distance between buildings if total height >11m

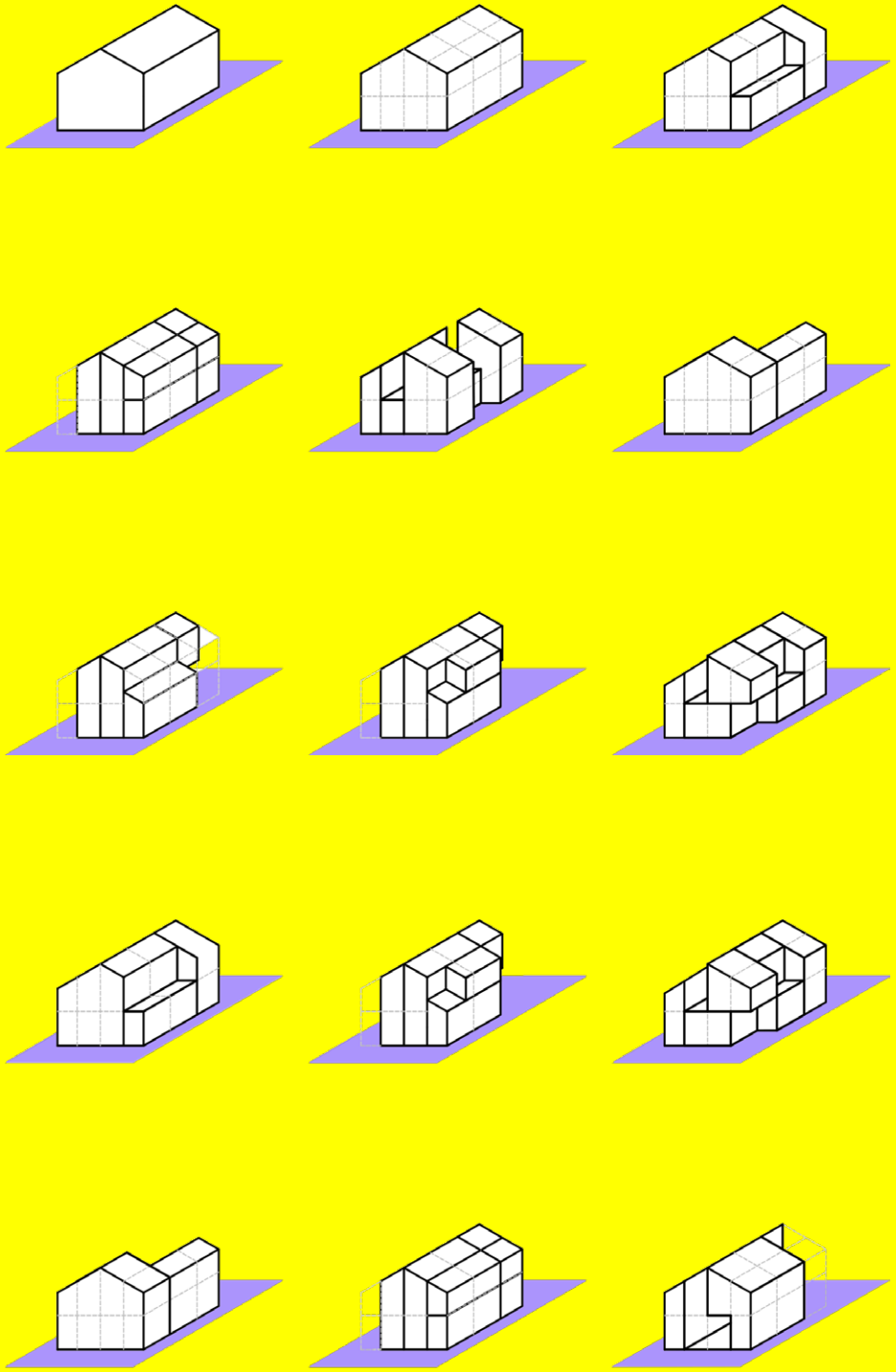


6m distance between buildings if total height >11m

Modes of Growth



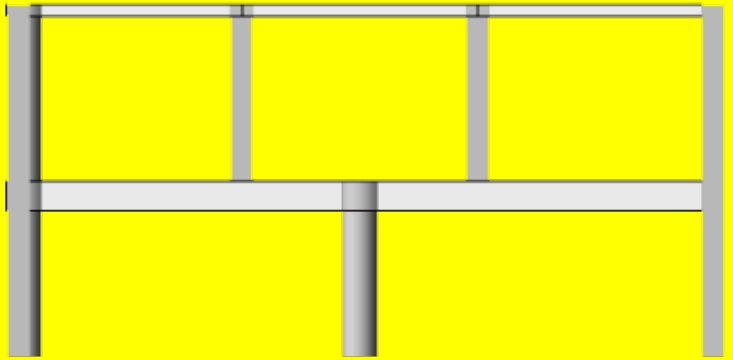
Starting with existing architecture practices in Mtein, the network home is comprise of a deconstructed lebanese home that can be built, unit by unit, until the envelopei s completed.



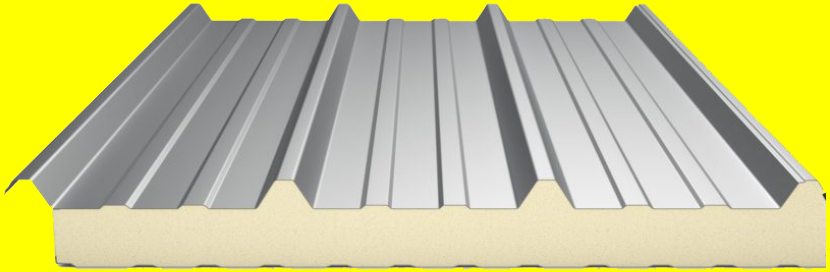
The network home is made of simple, cheap, and easily installable materials. Its main structure is a concrete skeleton of columns and slabs, leaving a flexible and open floor plan for future alterations.

Its walls are made of sandwich panels that can be removed and re-installed as necessary.

Its roof is a corrugated sheet used to facilitate vertical expansion as it is lightweight and can be re-installed easily. All materials, once no longer in use, go towards the construction of the auxiliary site units.



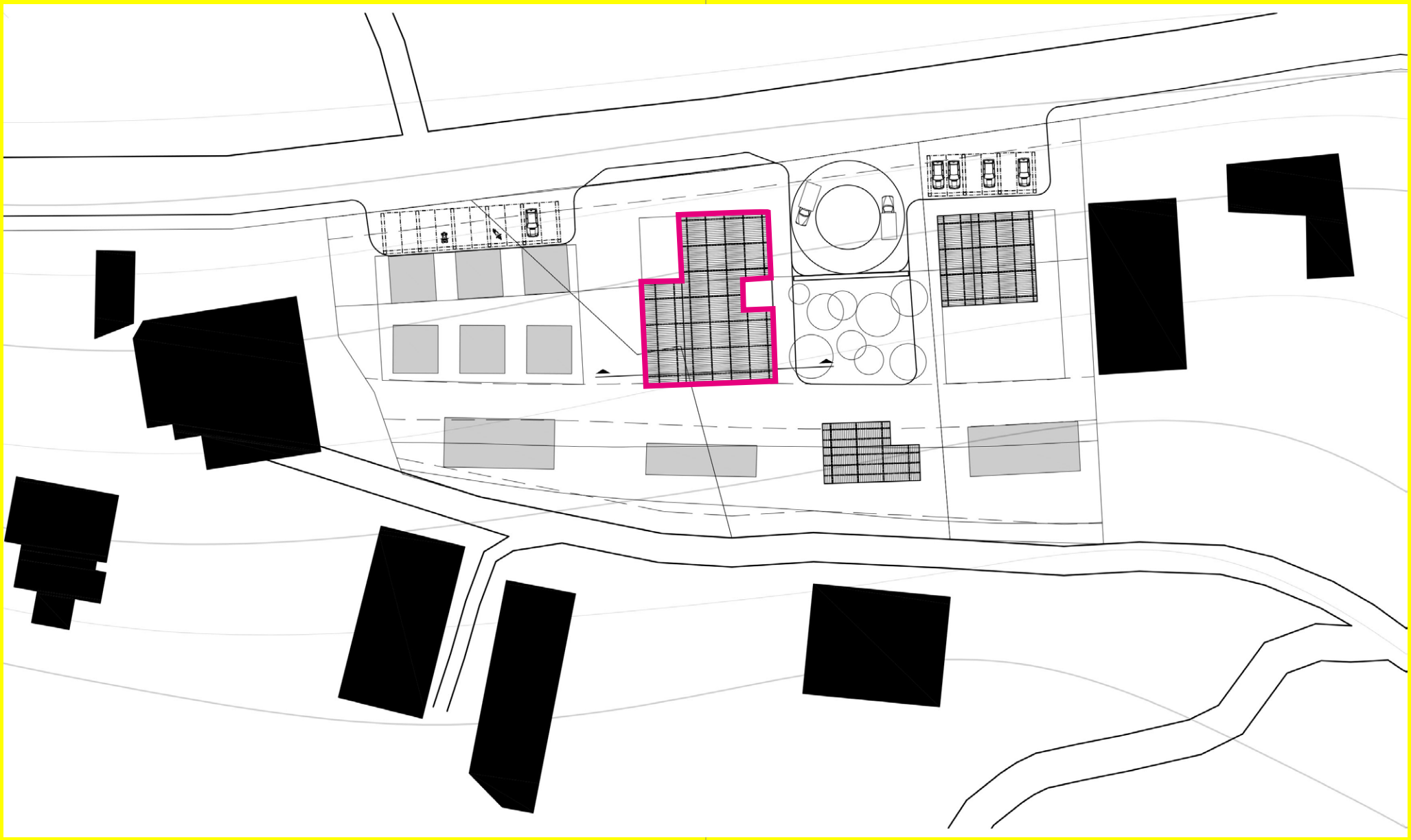
Concrete skeleton



Sandwich panels

Corrugated roof

8.2 Kitchen + Sylvie and Dana home

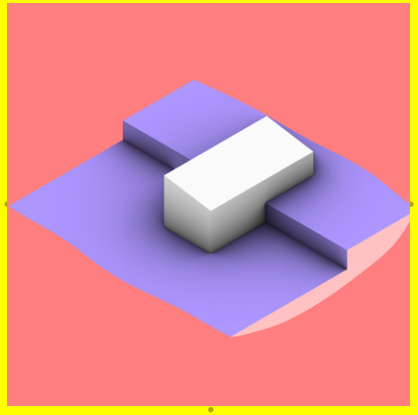


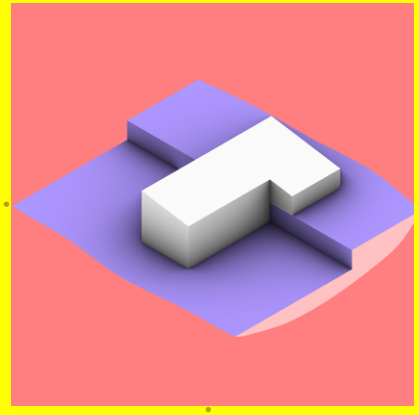
Phase I

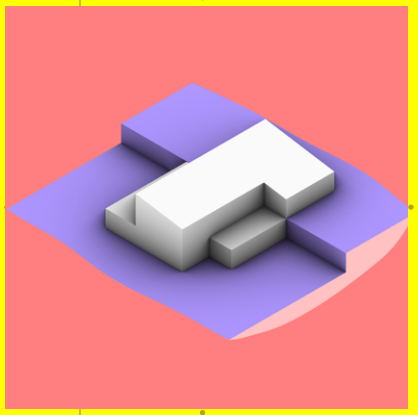
Phase II

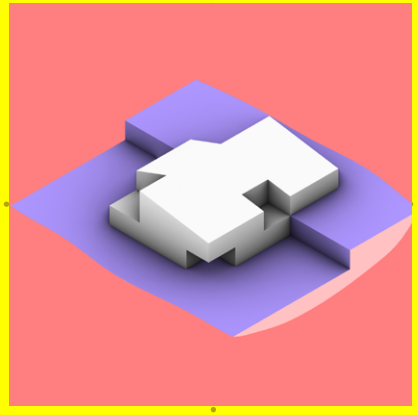
Phase III

Phase IV

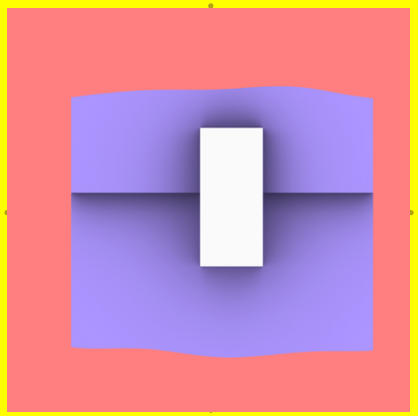


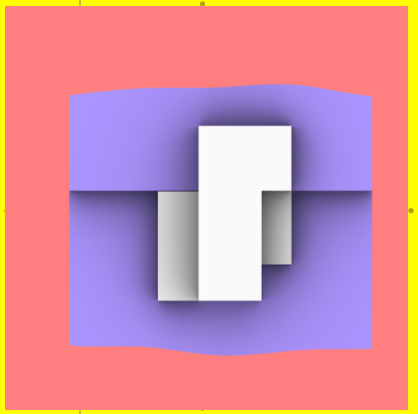




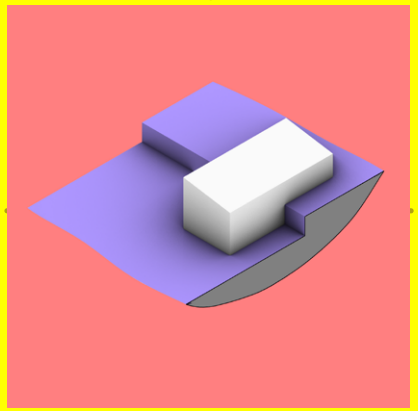


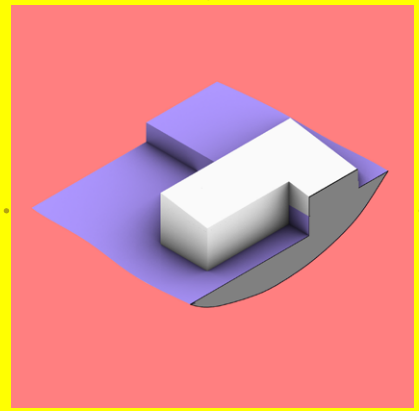
Massing

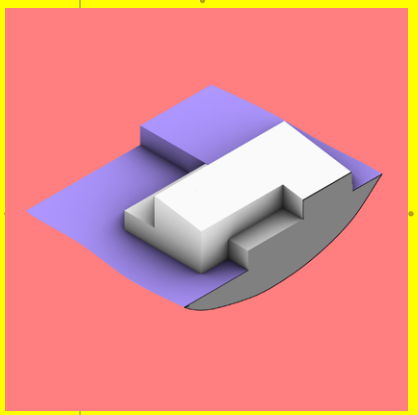


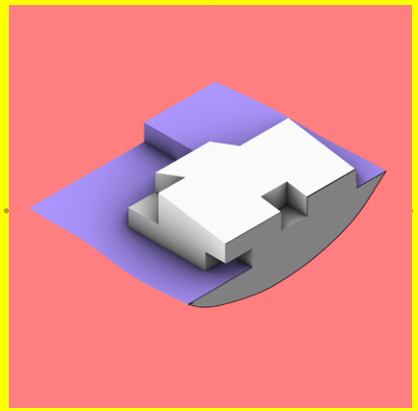


Plan

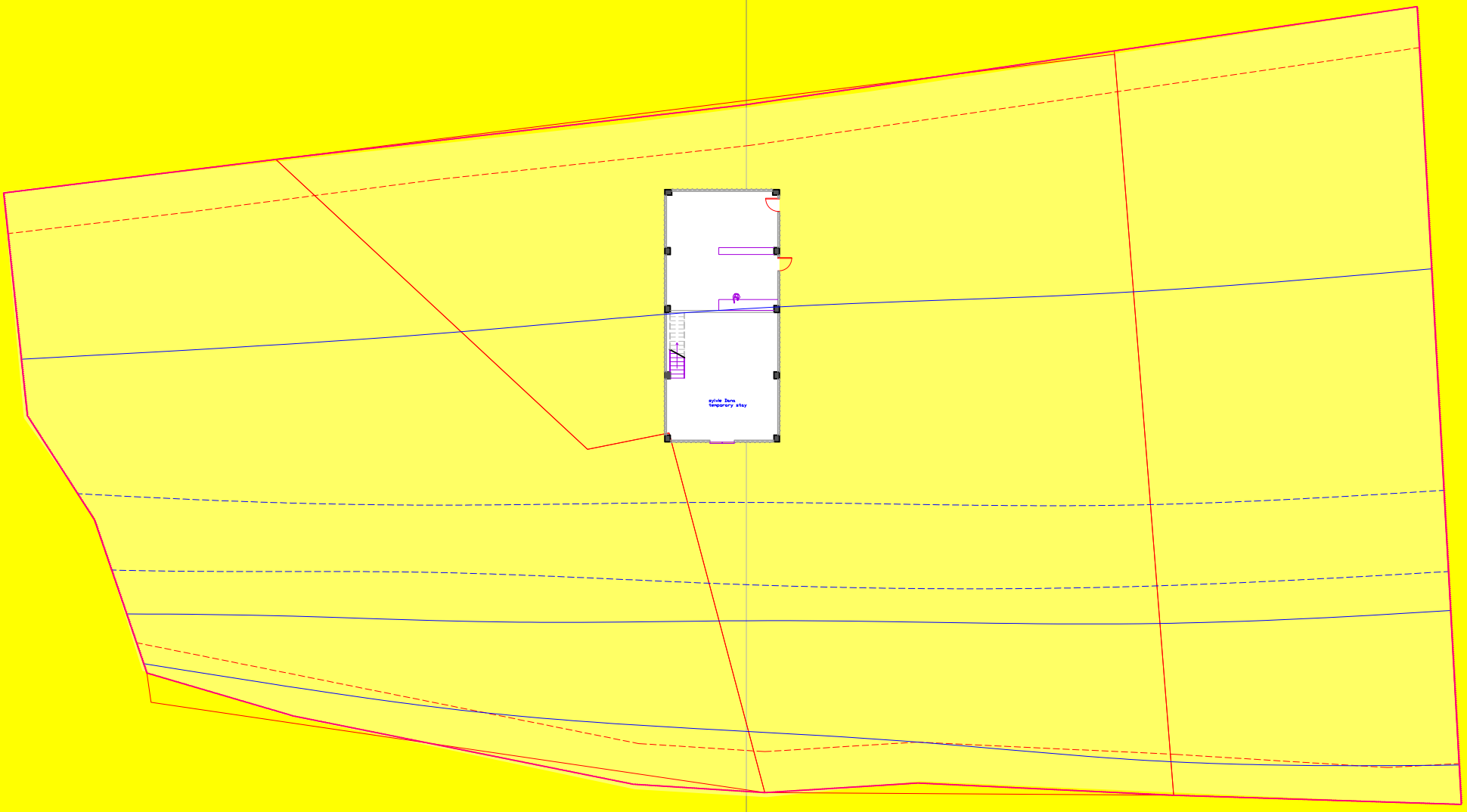




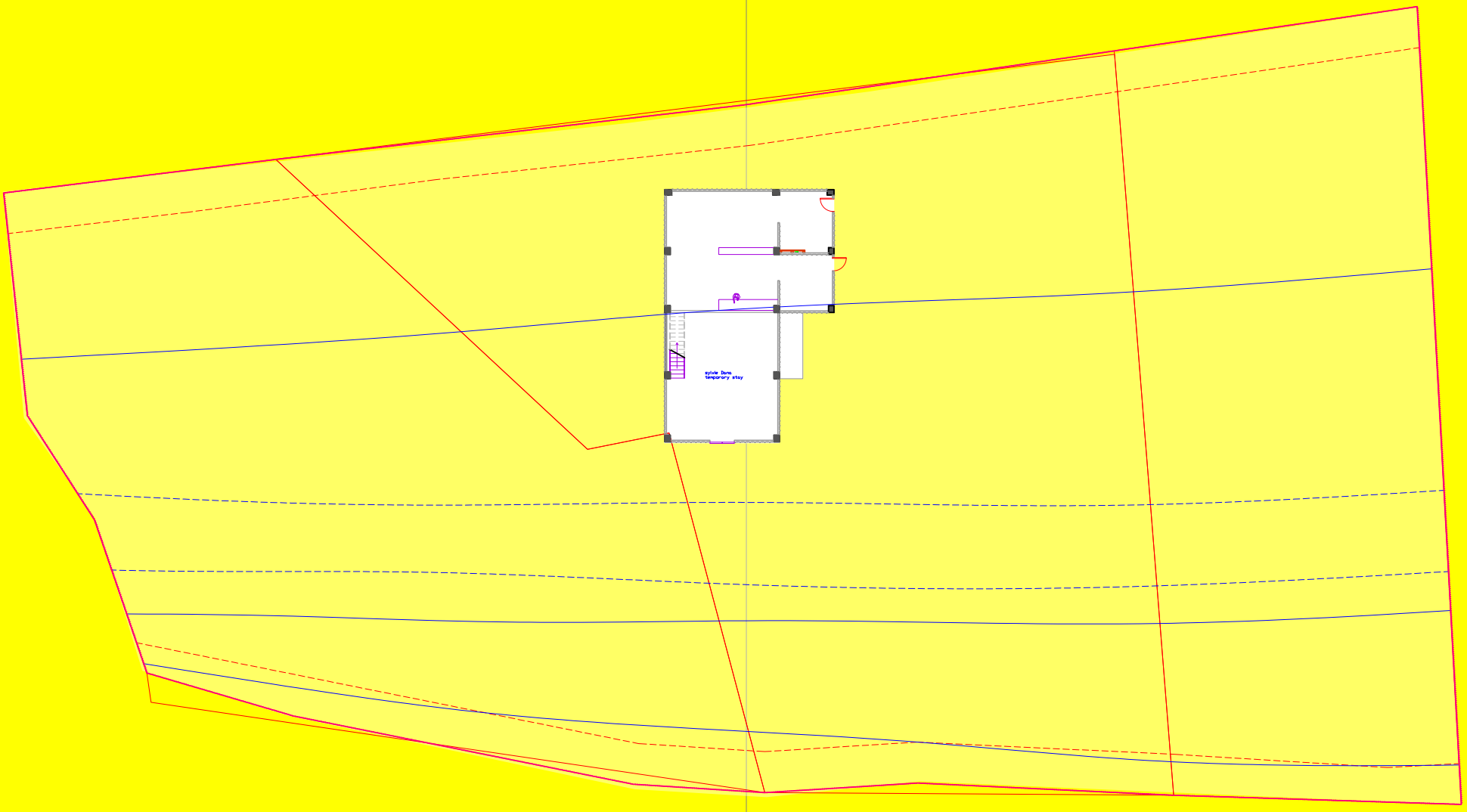




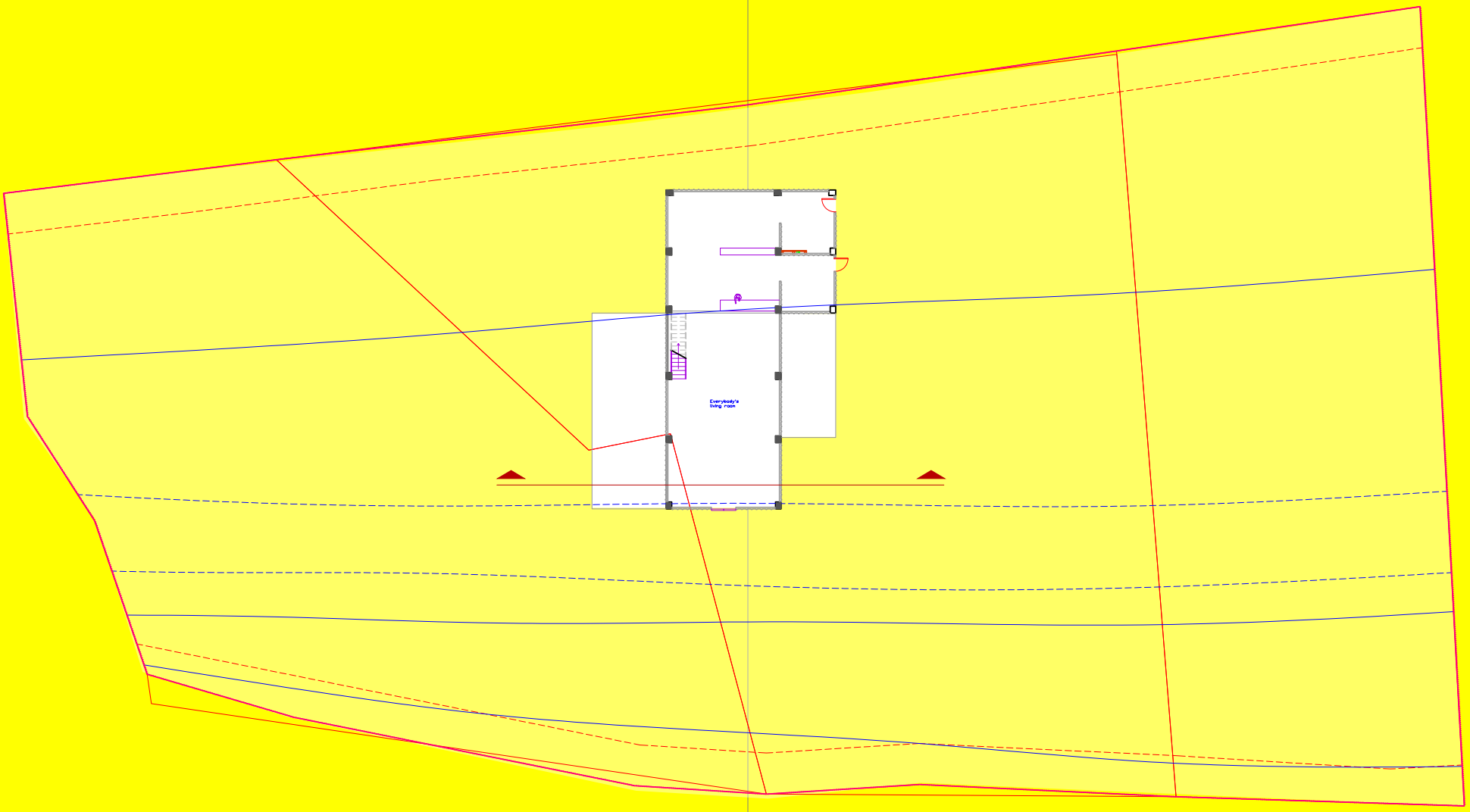
Section



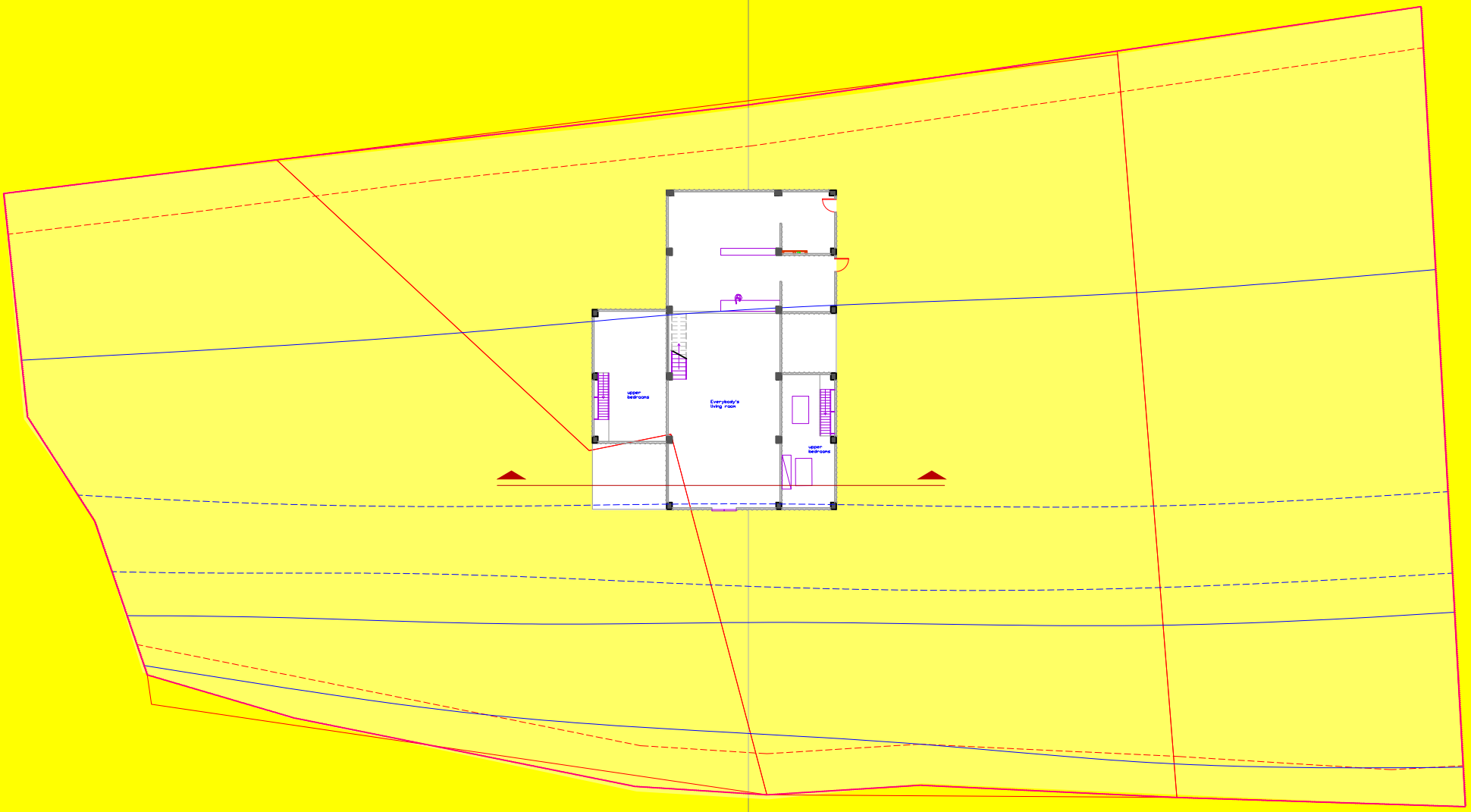
Phase I
Level 1



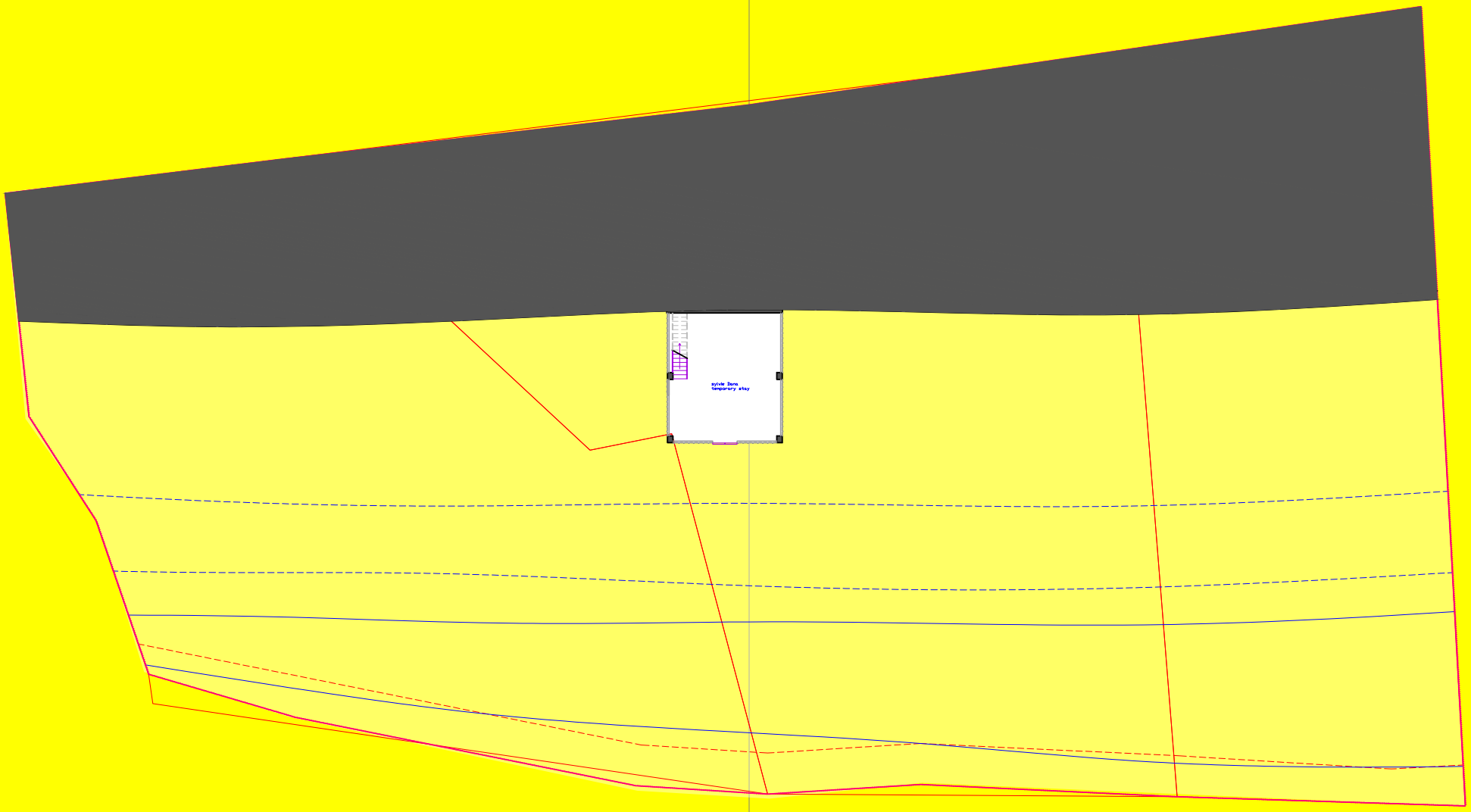
Phase II
Level 1



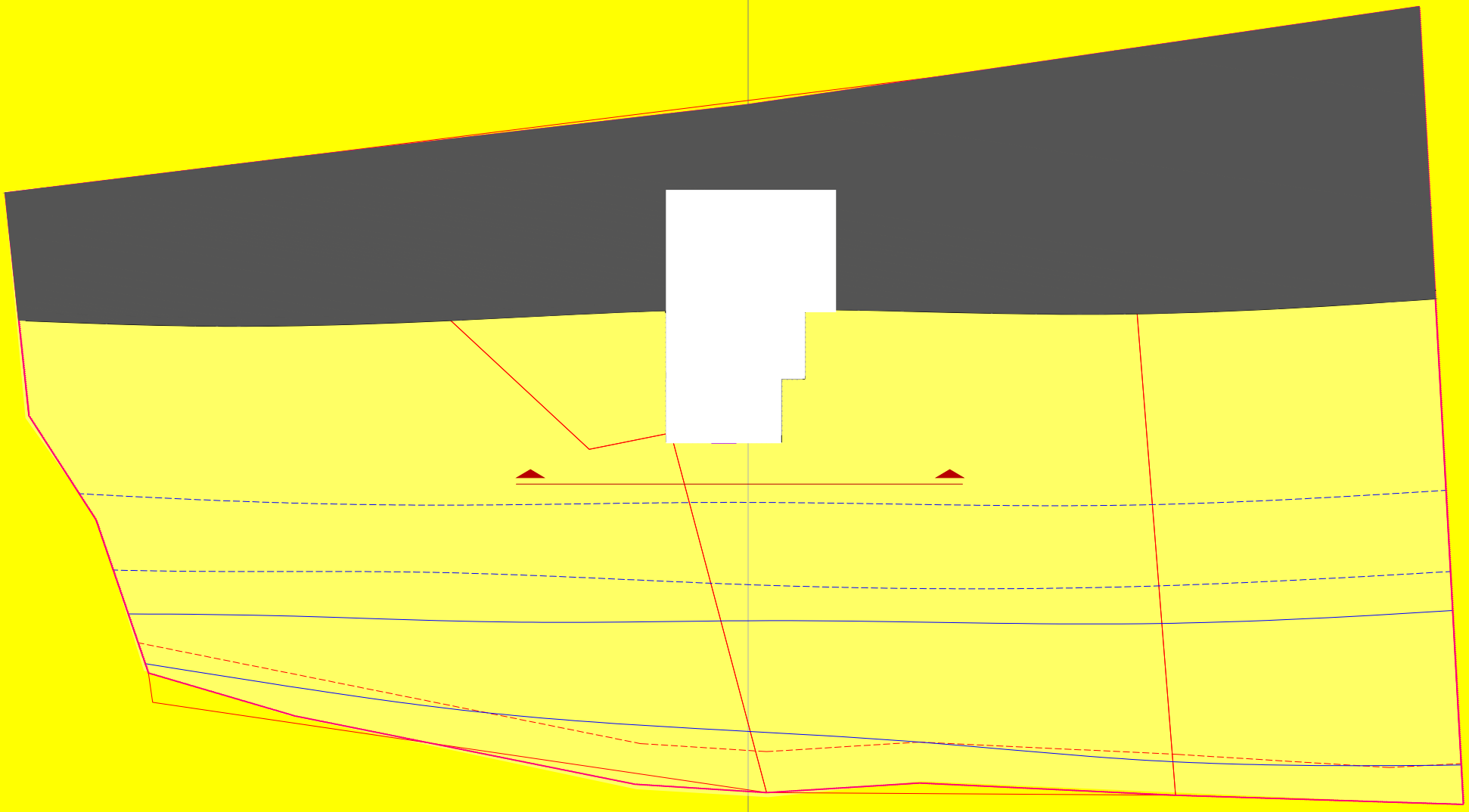
Phase III
Level 1



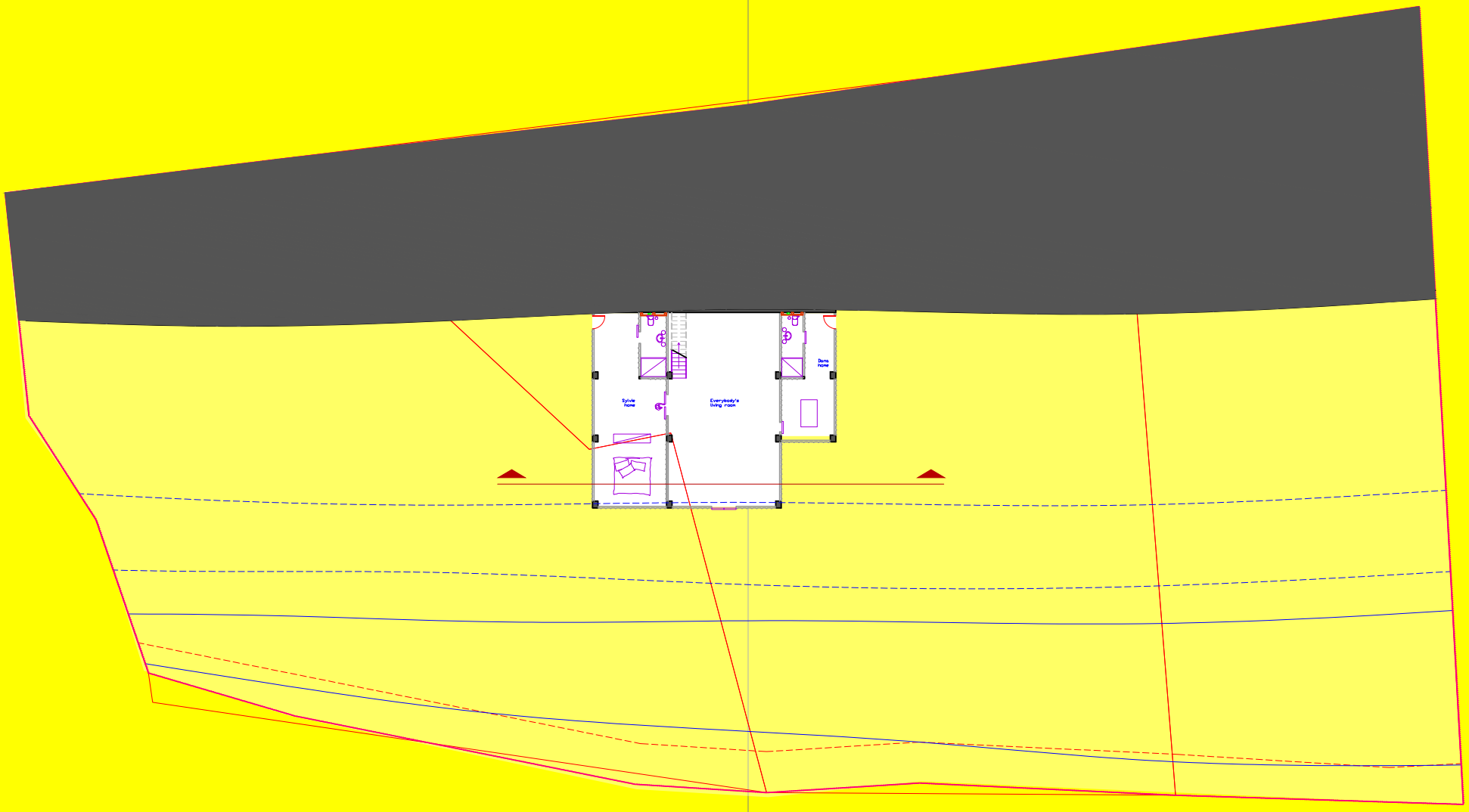
Phase IV
Level 1



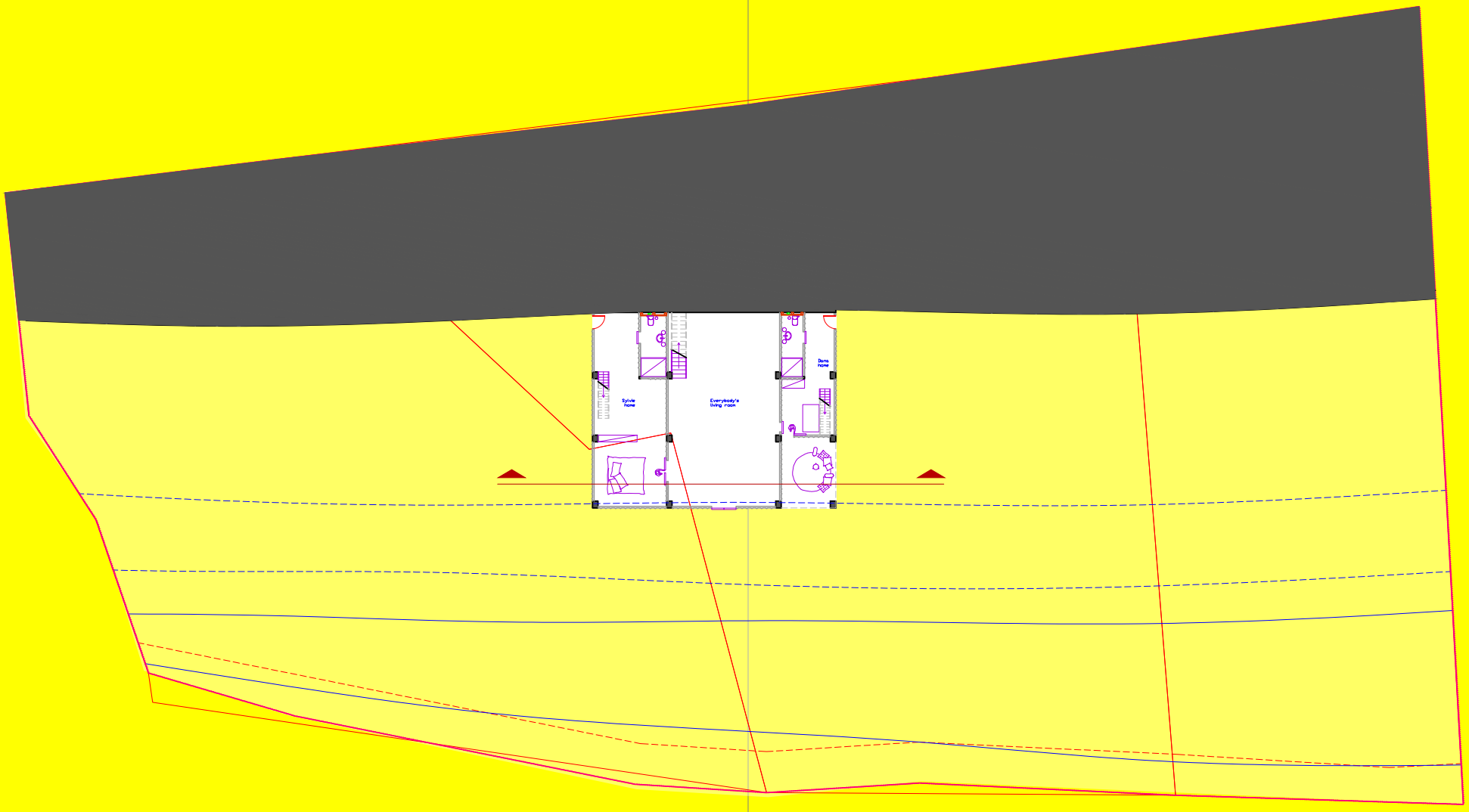
Phase I
Level 0



Phase II
Level 0

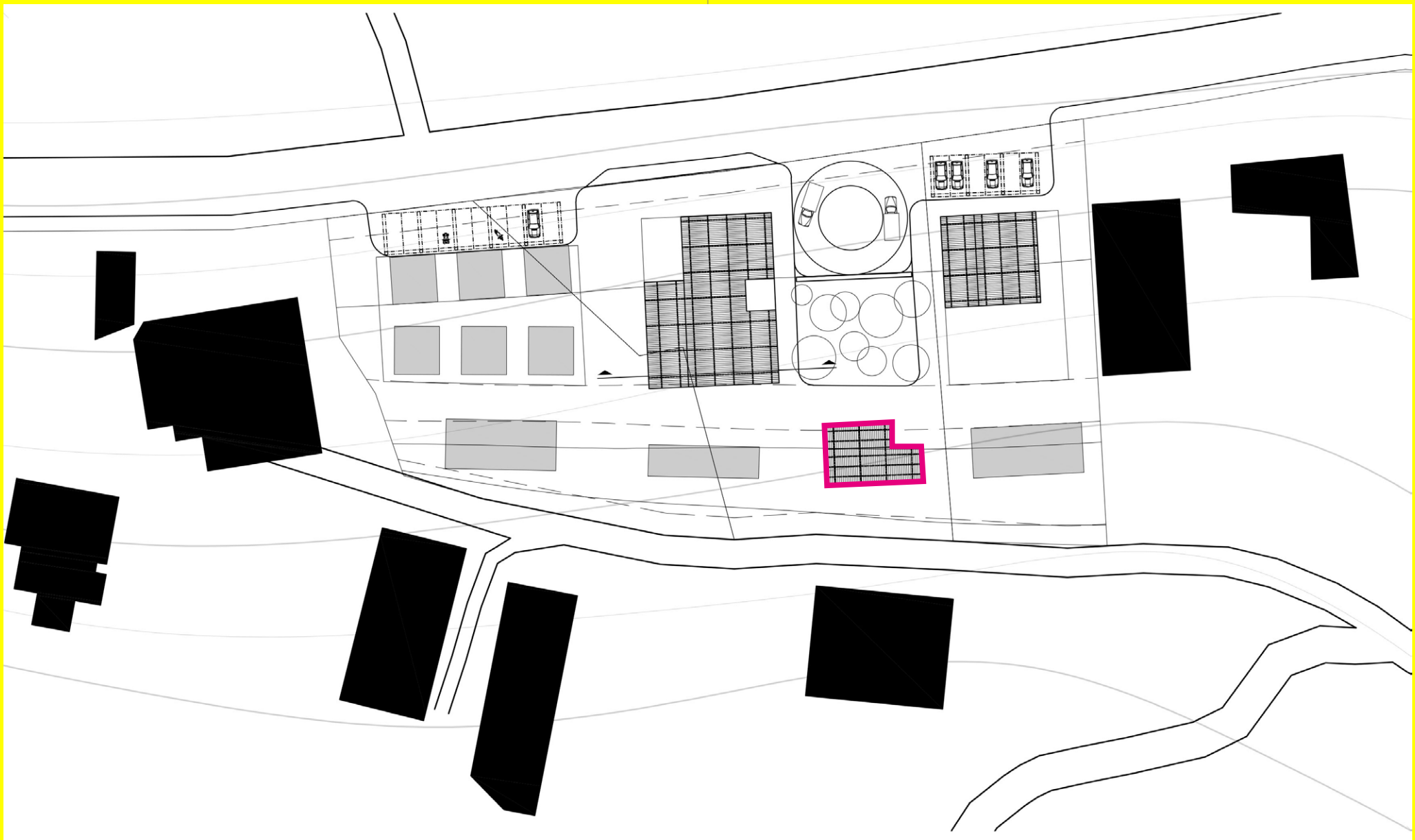


Phase III
Level 0



Phase IV
Level 0

8.3 Workspace + Assistant Home

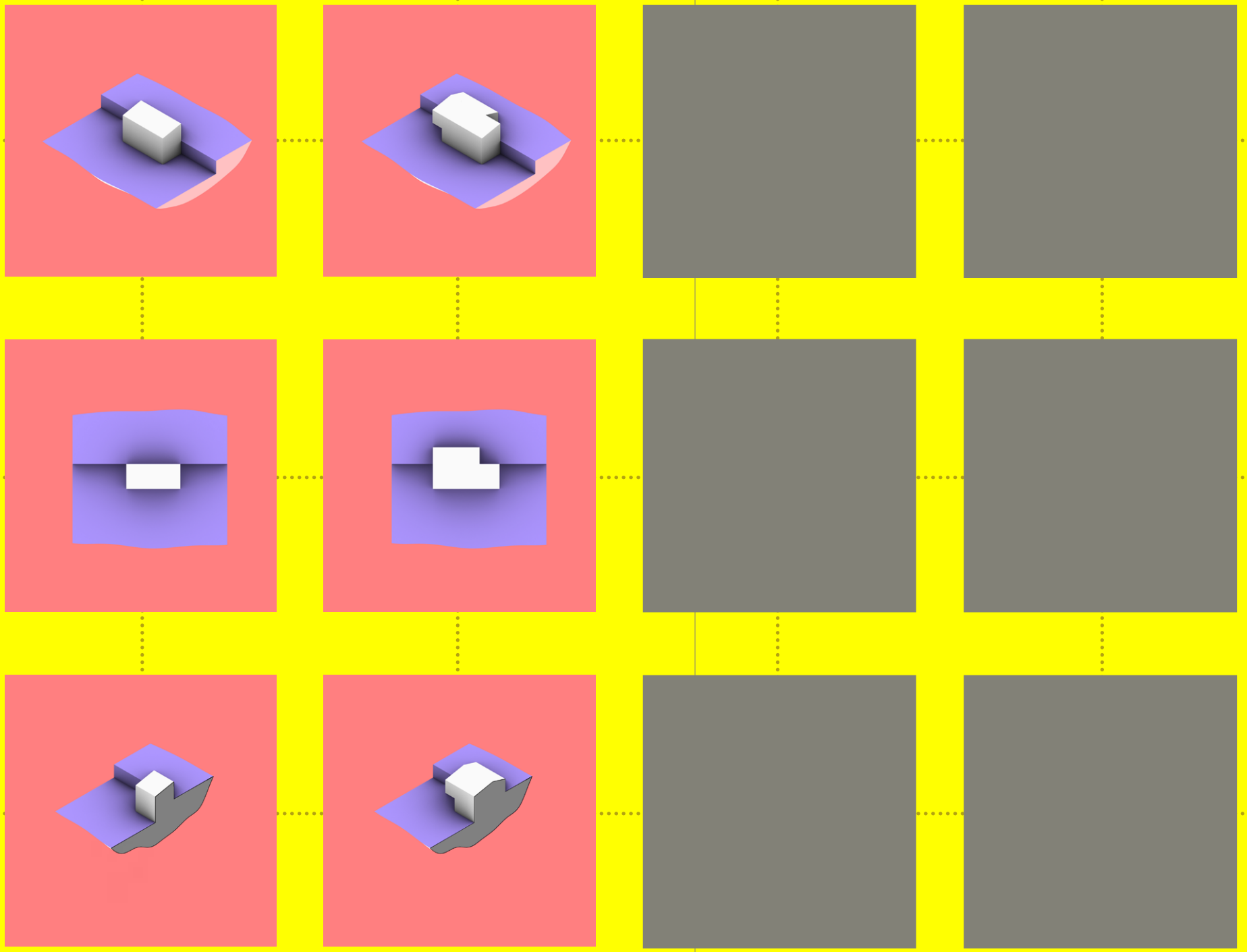


Phase I

Phase II

Phase III

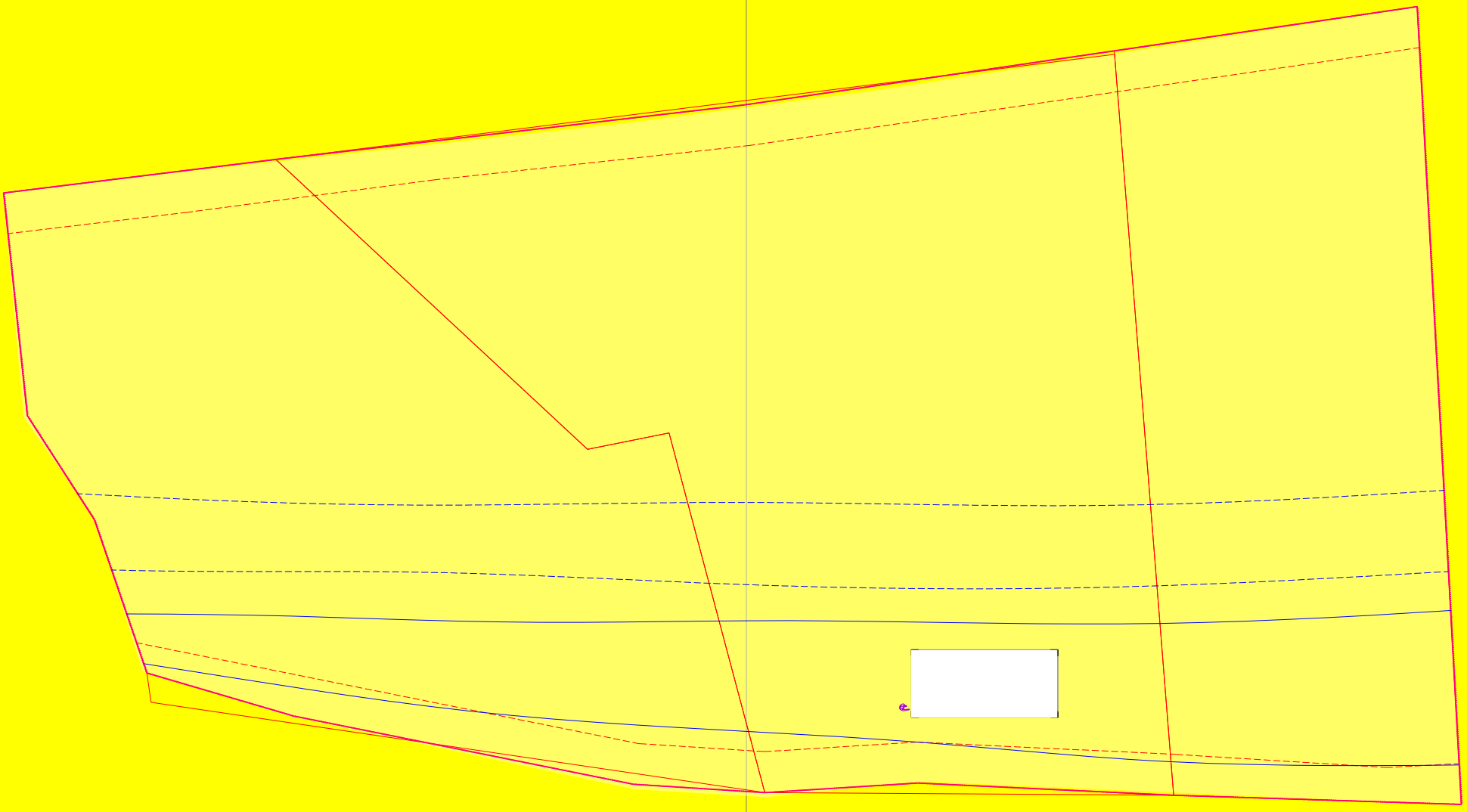
Phase IV



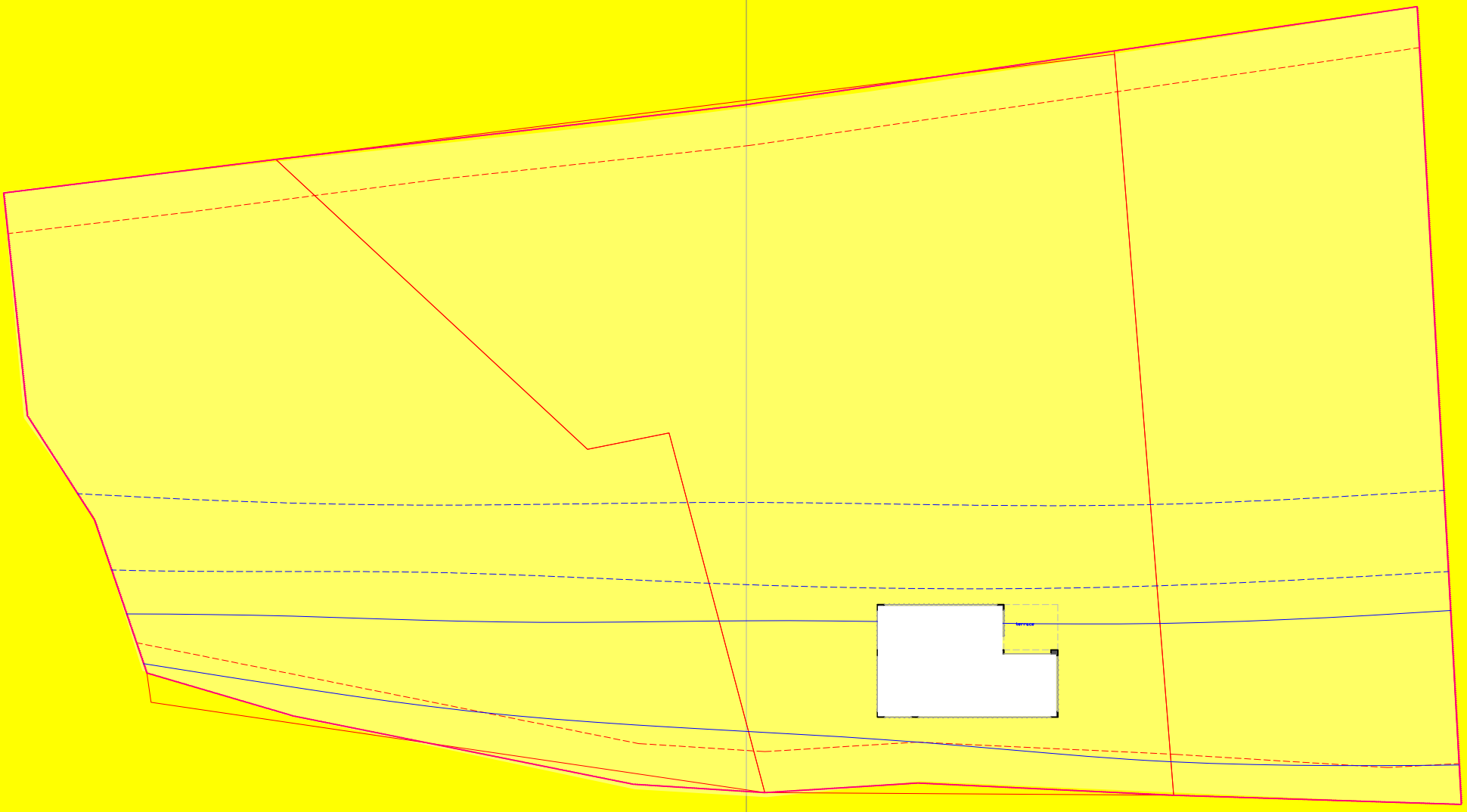
Massing

Plan

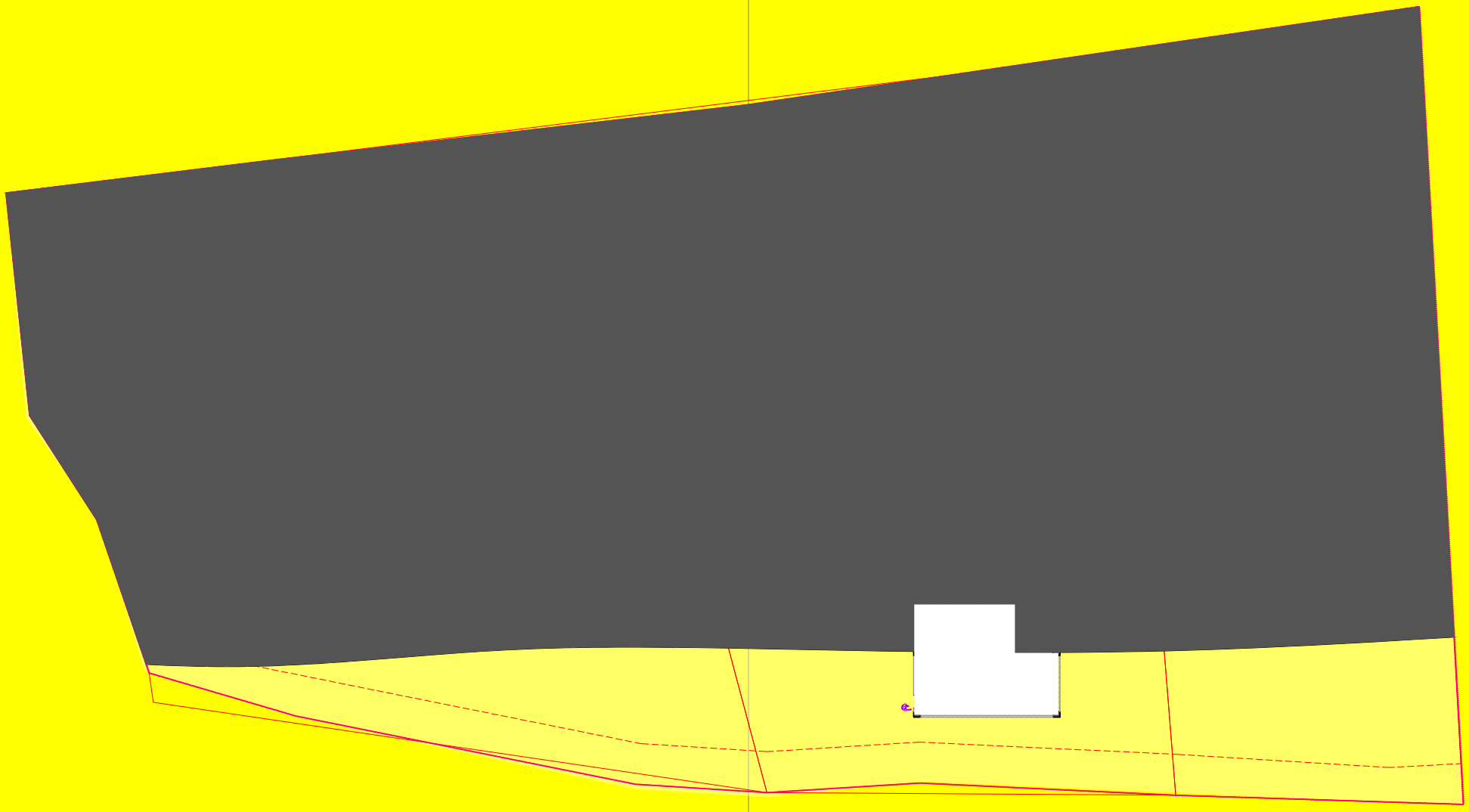
Section



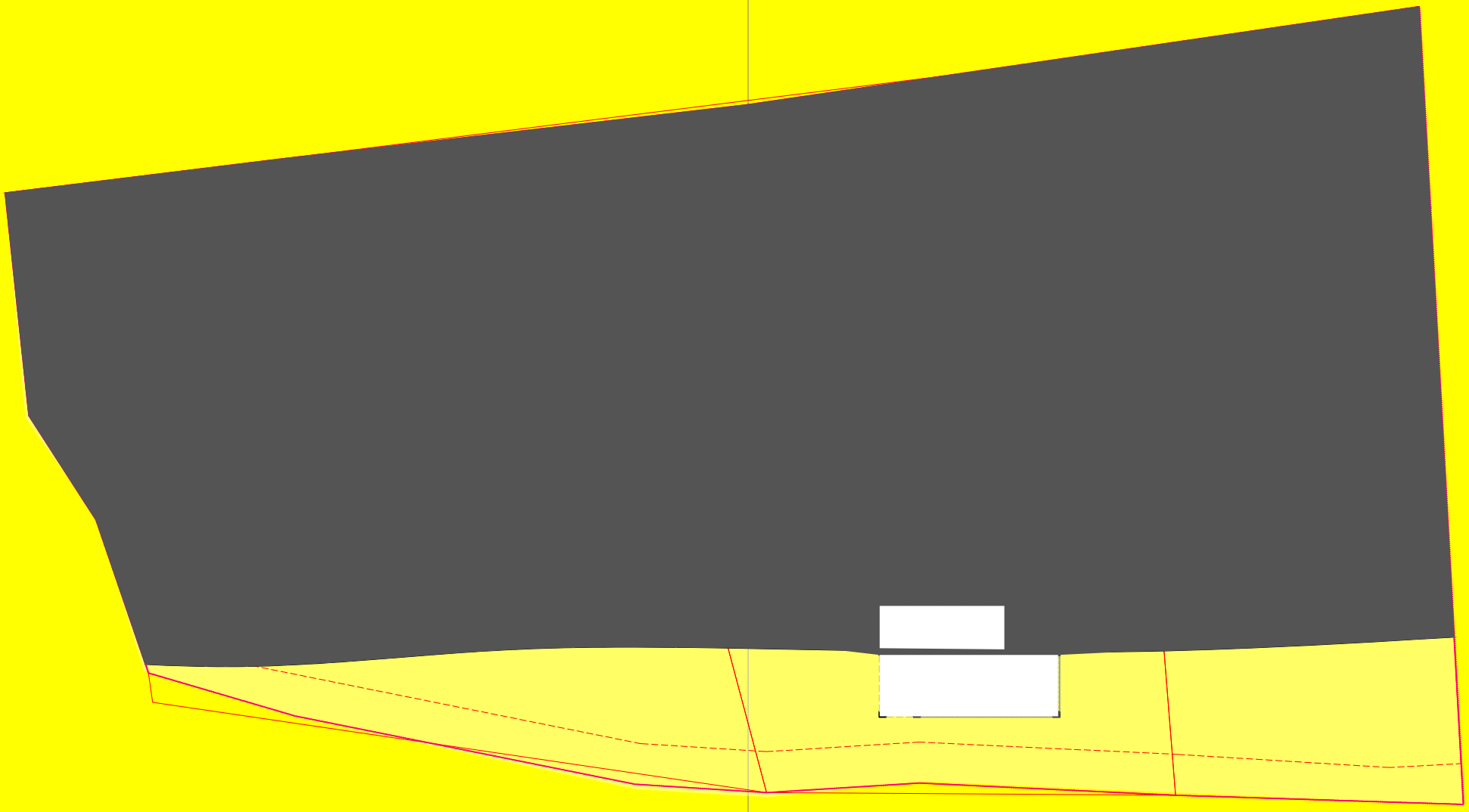
Phase I
Level 1



Phase II
Level 1

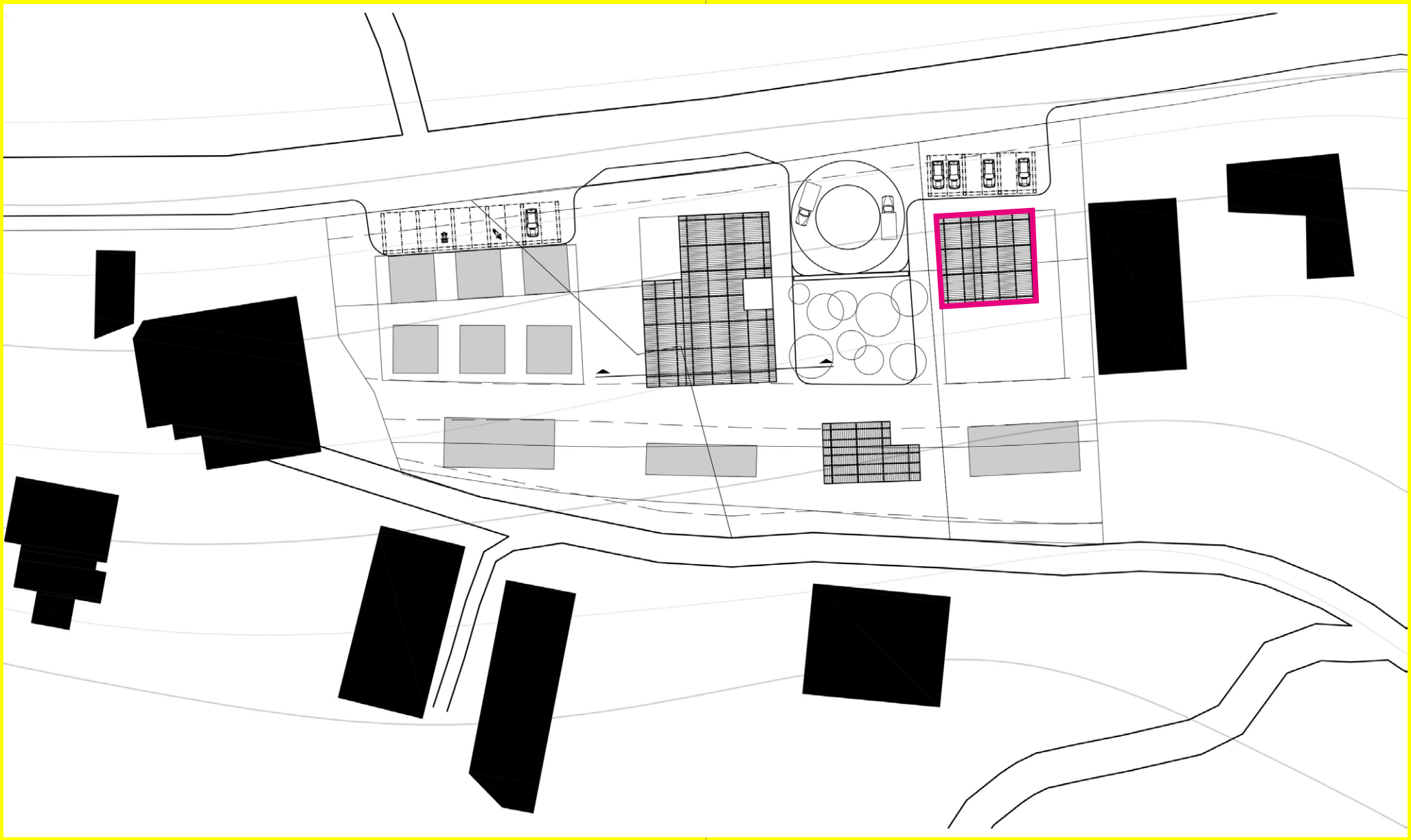


Phase I
Level 0



Phase II
Level 0

8.4 Retailer + Owner's Home

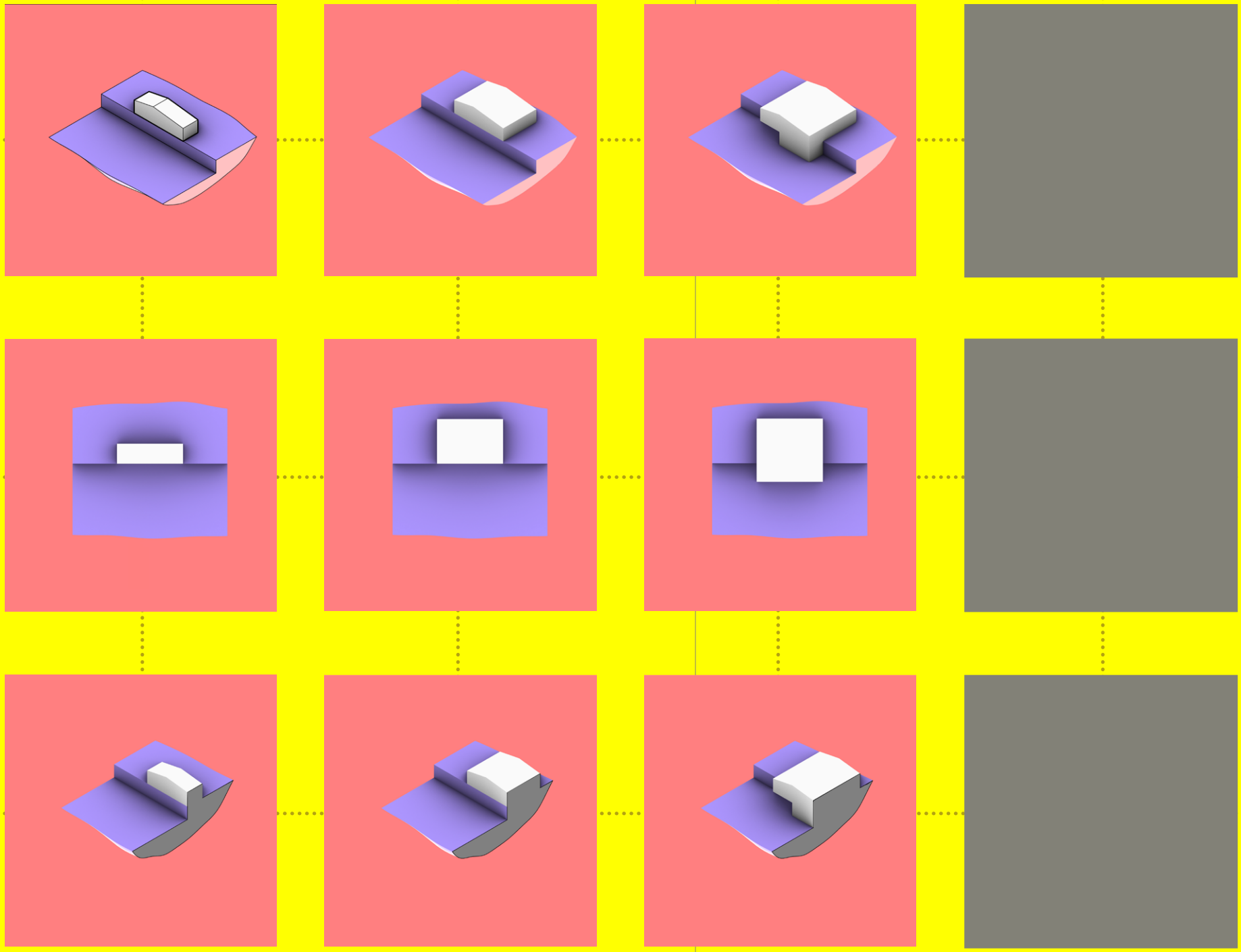


Phase I

Phase II

Phase III

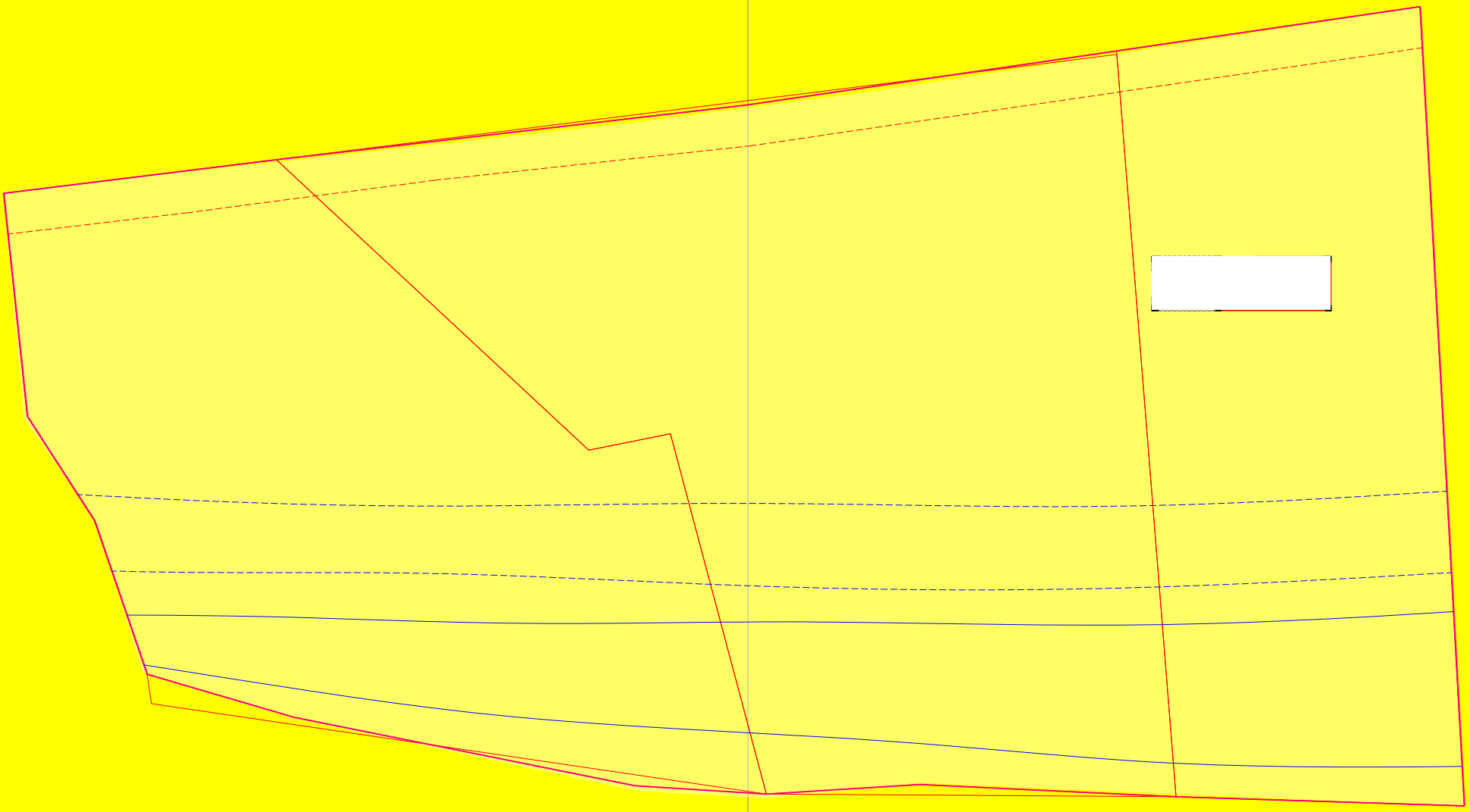
Phase IV



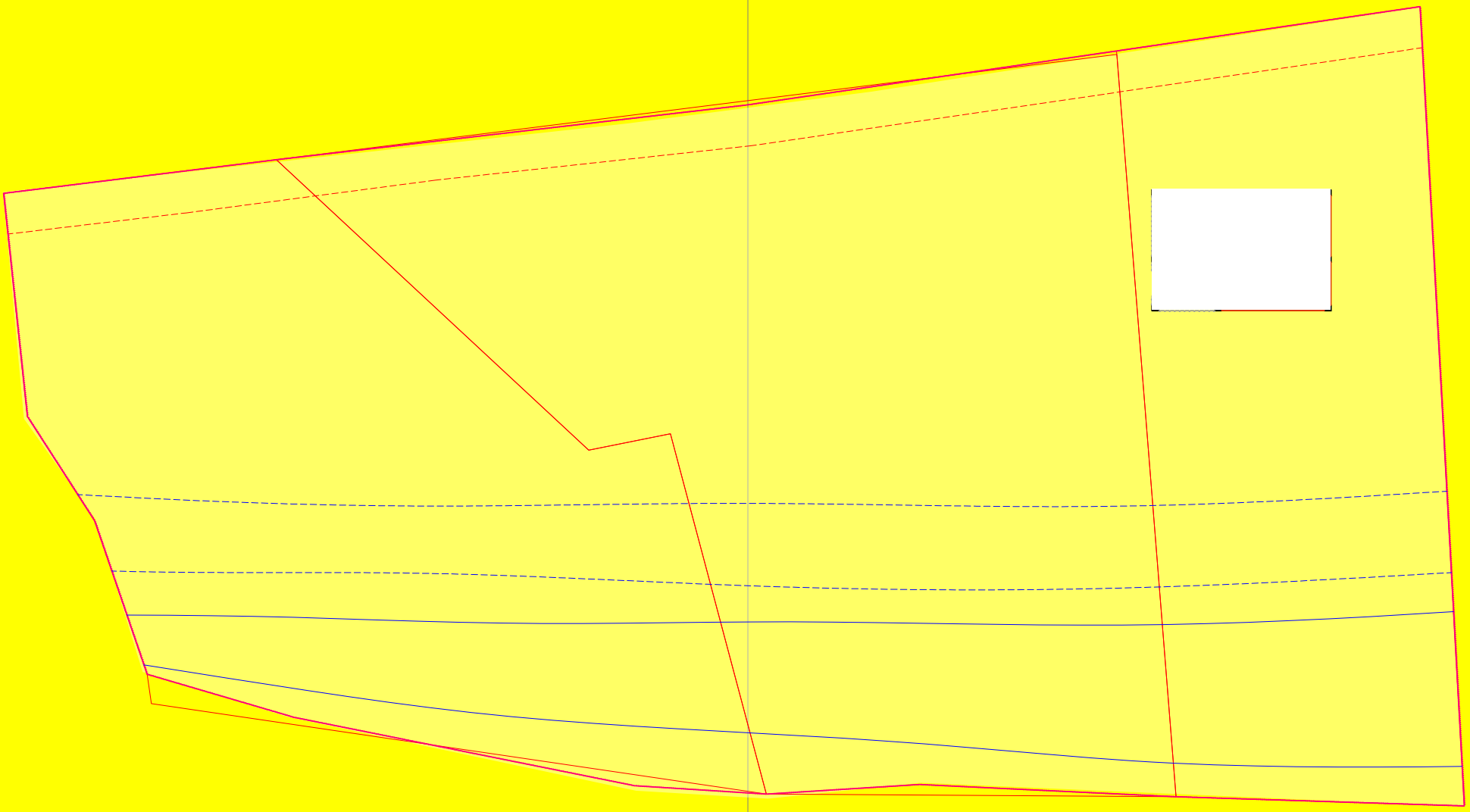
Massing

Plan

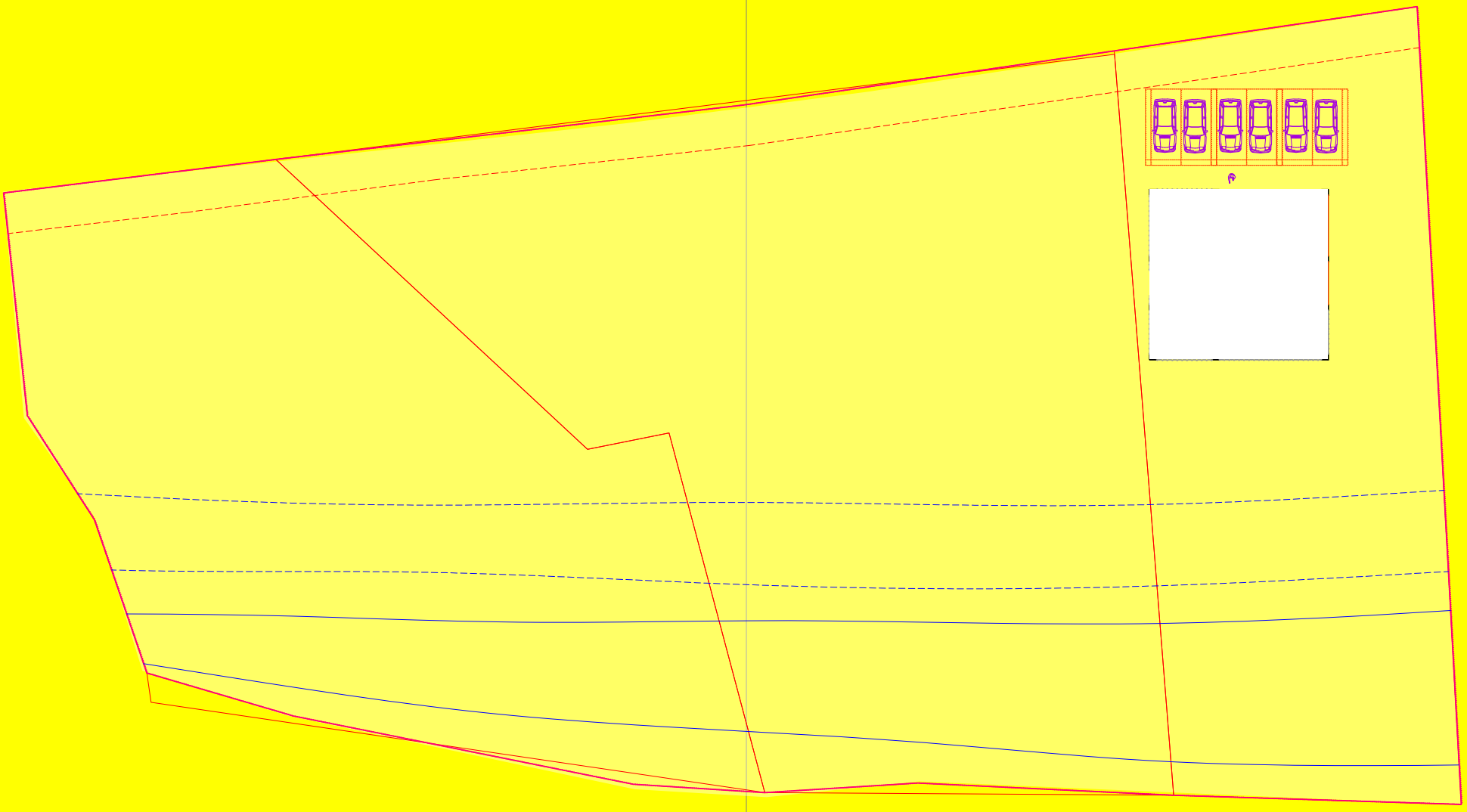
Section



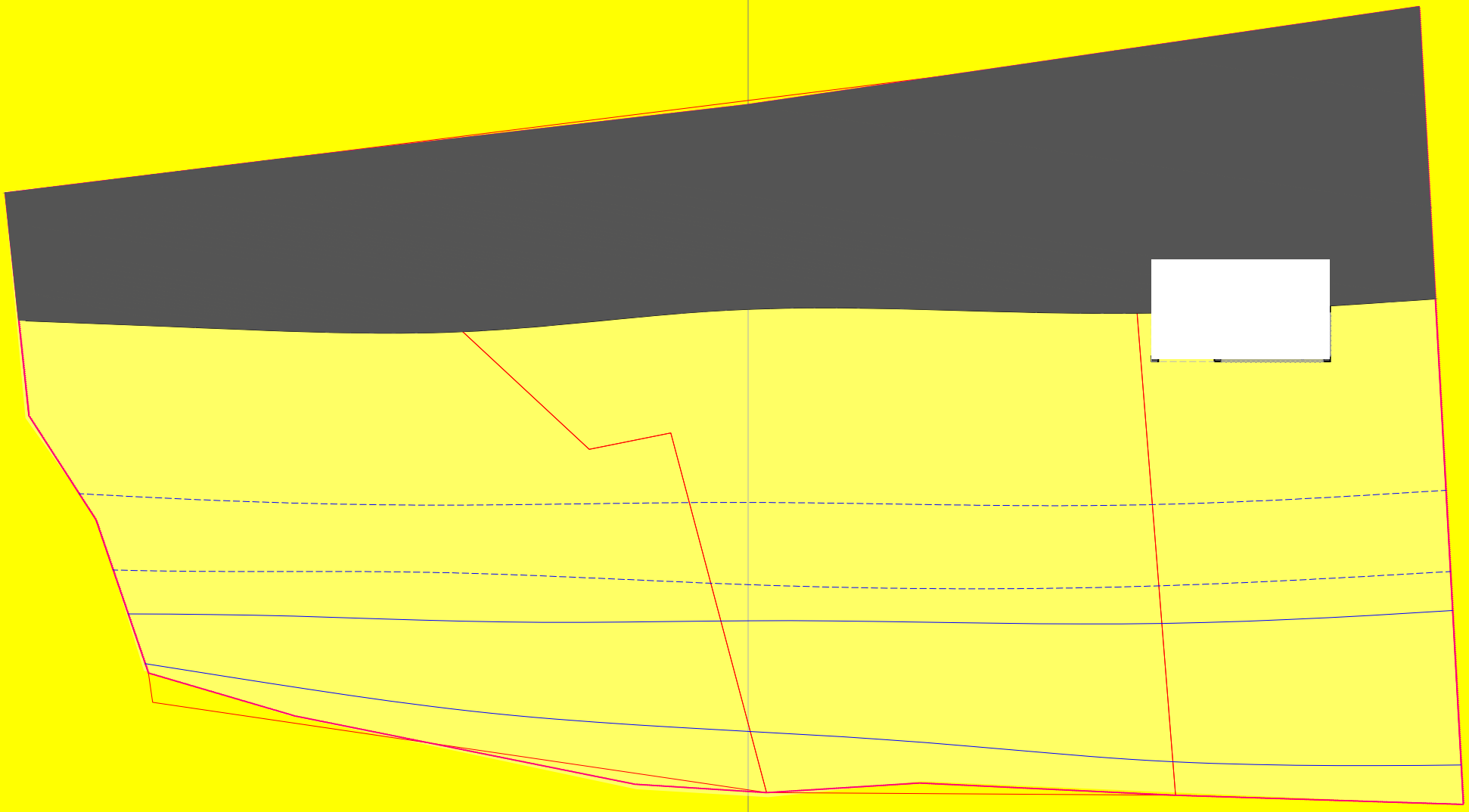
Phase I
Level 1



Phase II
Level 1

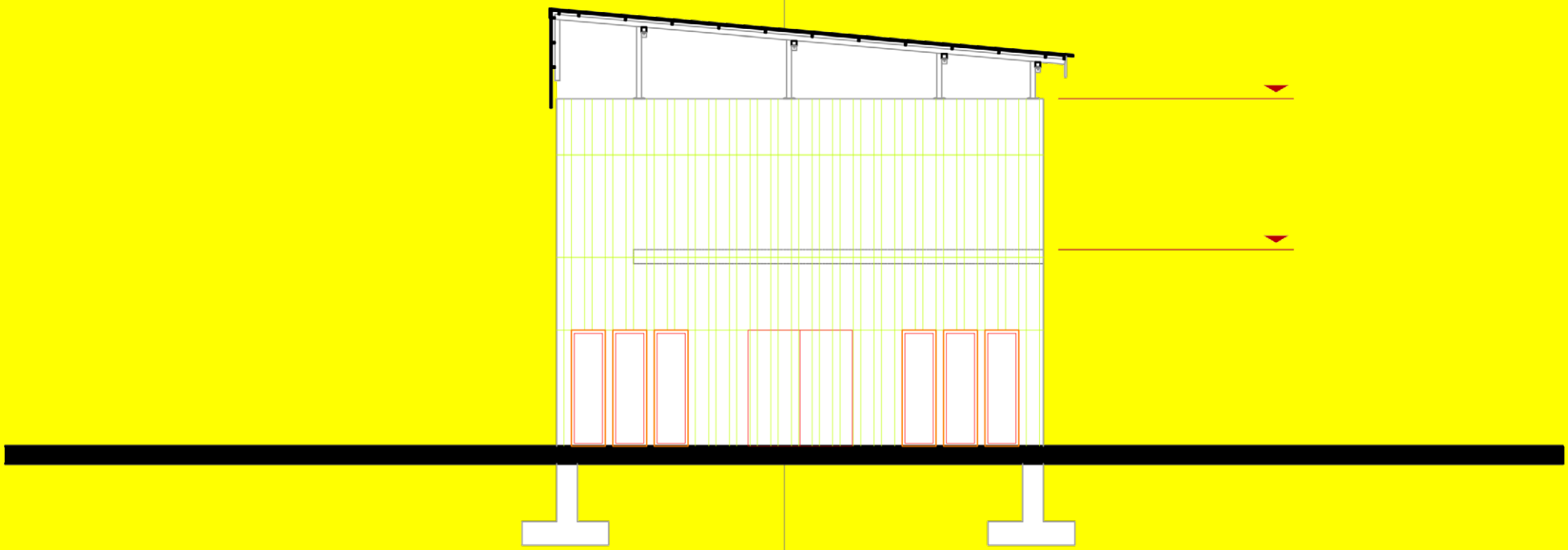
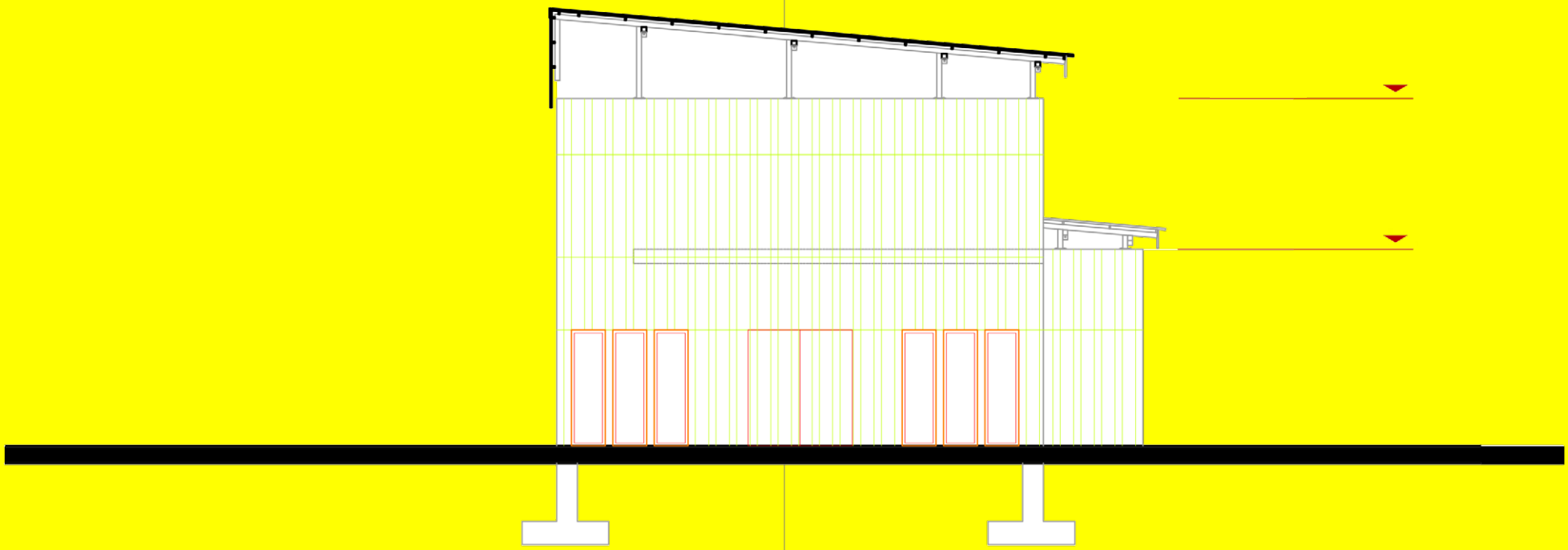
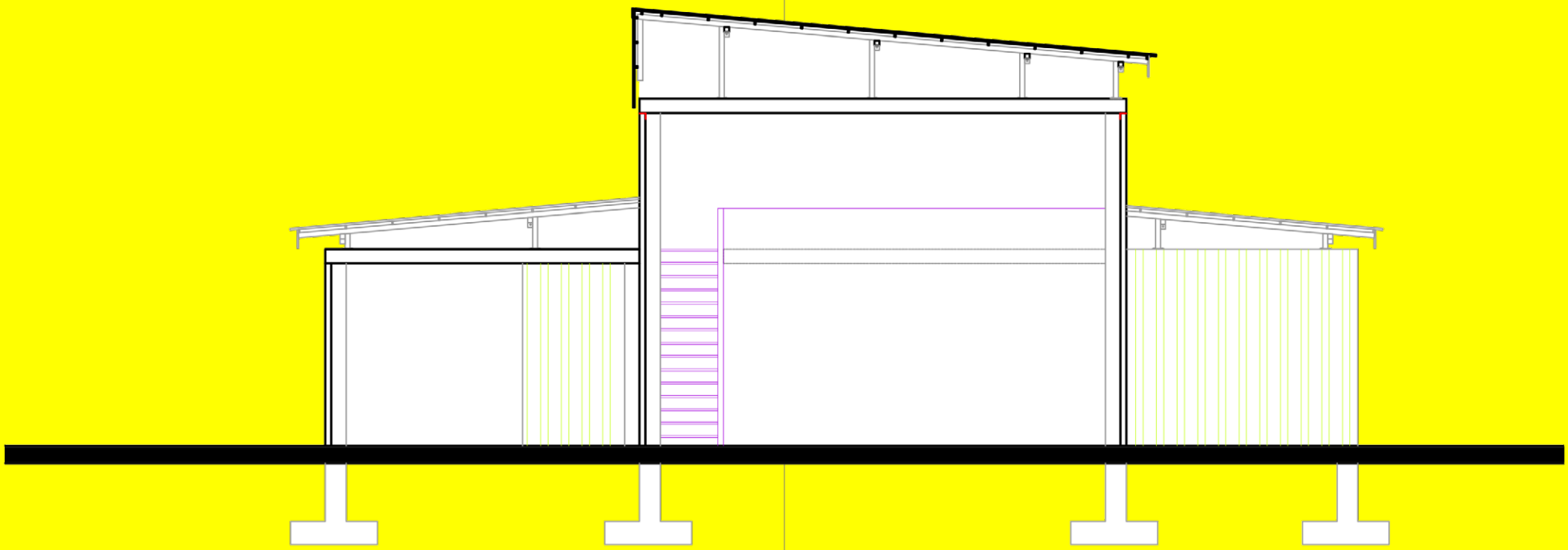
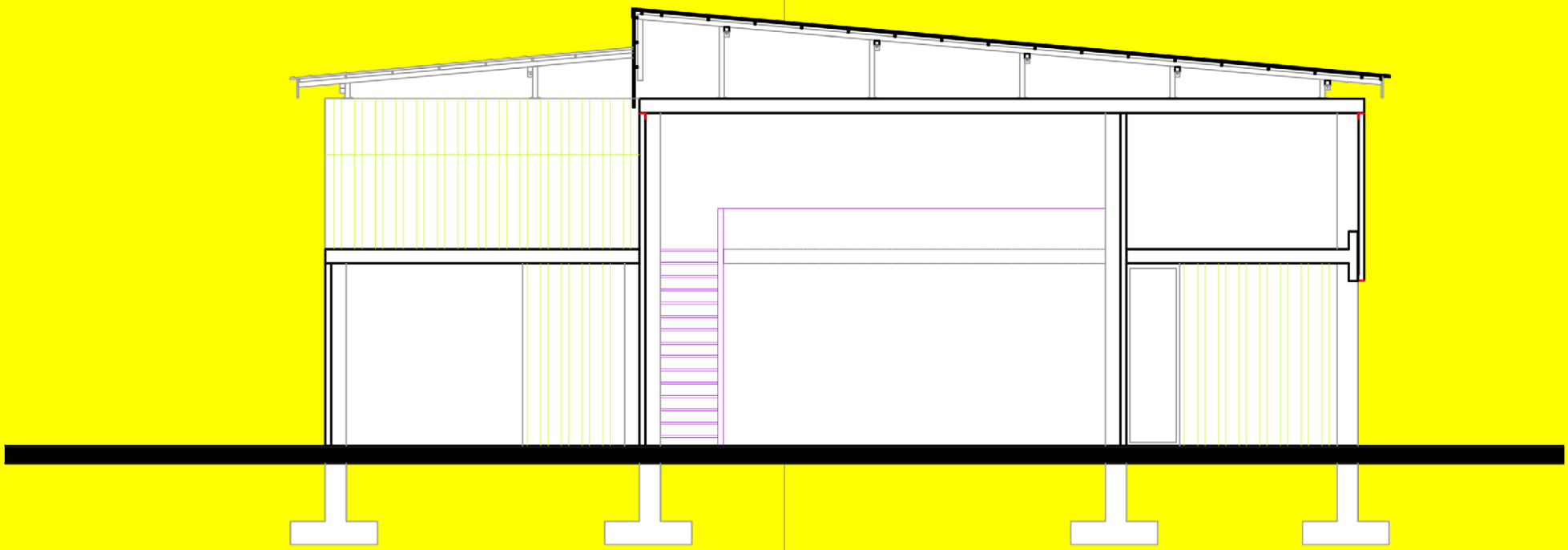


Phase III
Level 1



Phase III
Level 0

8.5 Phases: Section/Elevation



West elevation