The Edge of Freedom

Master’s Thesis | Bc. Jakub Nohejl | Faculty of Architecture BUT | 2023

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STRUCTURALISM FOR THE 21ST CENTURY

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AUTHOR
AUTOR PRÁCE
Bc. Jakub Nohejl

SUPERVISOR
VEDOUCÍ PRÁCE
mgr inż. arch Szymon Rozwałka

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Assignment Master's Thesis

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Title of Master's Thesis:

Structuralism for the 21st Century

Master's Thesis:

The topic of the thesis will be the analysis of structuralism and metabolism in 20th century architecture. An analysis of the reasons for the relatively rapid end of both these architectural movements, a search for their positive and negative aspects, and an attempt to create a contemporary version of an analogous system based on current technological developments (including digital technologies) and contemporary sociological and political discourse.

Graphics scope :

The aim of the work is to find a contemporary version of structuralism, here treated as a form of open structure, whose never–final form would be constantly open to change and modification, resulting both from the emergence of new technical conditions (paramaters) and from the interventions of users (individual and group) not foreseen at the design stage.

List of literature:

- Hertzberger, Herman: Přednášky pro studenty architektury, ISBN 10

8090506402

- Rem Koolhaas, Hans Ulrich Obrist, Project Japan: Metabolism Talks, ISBN: 978-3836525084

- Andrea Simitch and Val Warke: The language of architecture, ISBN 978-1-59253-858-4

- The Why Factory, Adrien Ravon, Winy Maas: Porocity: Opening up Solidity, ISBN: 9789462084599

- The Why Factory, Winy Maas, Javier Arpa Fernández, Adrien Ravon, Felix Madrazo: (w)Ego, Dream Homes in Density, ISBN 978-94-6208-530-5

- The Why Factory, Winy Maas, Alexander Sverdlov: Absolute Leisure - The World of Fun, ISBN: 978-90-5662-766-9

- The Why Factory, Winy Maas: The Vertical Village - Individual, Informal, Intense, ISBN:978-90-5662-844-4

- The Why Factory, Winy Maas, Ulf Hackauf, Adrien Ravon, Patrick Healy: Barba - Life in the Fully Adaptable Environment, ISBN:978-94-6208-253-3

- The Why Factory, Winy Maas, Felix Madrazo: Copy Paste - The Badass Architectural Copy Guide, ISBN: 978-94-6208-164-2

- The Why Factory, Winy Maas, Pirjo Haikola, Ulf Hackauf: Green Dream - How Future Cities Can Outsmart Nature, ISBN: 978-90-5662-862-8

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Master's Thesis is submitted in the scope determined by the project supervisor; in addition, one B1 exhibition panel and Master's Thesis in electronic form are submitted.

Bc. Jakub Nohejl student	mgr inż. arch Szymon Rozwałka project supervisor	B.Arch. Martin Kaftan, MSc, Ph.D. head of the institute
		Ing. arch. Radek Suchánek, Ph.D. Dean

In Brno dated 13.2.2023

Annotation

The thesis analyses the ideas of Dutch structuralism in the 1960s and 1970s, and the reasons for its early end.

Through an analysis of its historical development, it discovers the background of its origin in the humanities and its later application in the architectural environment.

By evaluating the current social situation and showing projects that build on the original ideas of structuralism, the thesis finds arguments supporting the possibilities of its further use.

The final proposal reflects the desire to create an open architectural system that can react to the constantly changing needs of users, while supporting the dialogue of individuals in creating one undefined whole.

The image of the final architectural work allows more freedom for users and their influence on the final form of the environment. Unlike conventional architecture, there are no attempts at unification or iconicity, but rather the promotion of diversity, including contradictions and conflicts that create a multitude of unique and not pre-defined situations.

Anotace

Diplomová práce analyzuje myšlenky holandského strukturalismu 60. a 70. let minulého století, a důvody jeho rychlého konce.

Prostřednictvím analýzy historického vývoje, odkrývá okolnosti jeho vzniku v humanitních vědách a následné aplikace v architektonickém prostředí.

Zhodnocením současné společenské situace a ukázkou projektů navazující na původní myšlenky strukturalismu diplomová práce nalézá argumenty podporující možnosti jeho dalšího využití.

Finální návrh v sobě odráží snahu o vytvoření otevřeného architektonického systému, který dokáže reagovat na neustále se vyvíjející potřeby uživatelů a současně podporovat dialog jednotlivců tvořící jeden předem nedefinovaný celek.

Obraz výsledného architektonického díla umožňuje větší svobodu uživatelů a jejich vlivu na finální podobu prostředí. Narozdíl od běžné architektury zde nejsou žádné snahy o sjednocení nebo dominanci, ale o podporu diverzity, včetně protikladů a konfliktů, vytvářející množství unikátních a předem nedefinovaných situací.

Declaration

By signing this, I declare that I created this project myself. All other resources people and who were part of this project are listed below the page or at the end of this book.

.....

Acknowledgements

I would like to thank very much my supervisor **Szymon Rozwałka**. Being part of his studio at the *Department of Experimental Design at BUT* has been the best time of my academy period. It was always a great place for pleasant discussions, meeting new talented people, many of whom became my friends, and working on topics that opened our minds. The projects we did in his studio helped me to clarify what I like most about architecture, and each of them has influenced the final image of this Master's thesis.

I would also like to thank architect **Winy Maas** for his time and important comments during the writing of this and the pre-diploma project. This project would not be what it is without a trip to the Netherlands, where we saw first hand the important projects of *MVRDV, Rem Koolhaas and Herman Hertzberger*.

I would also like to thank my best friends, colleagues and flatmates **Tereza Jeckelová** and **Martin Vojtíšek**. They have been by my side most of the time during the last 4 years and have shared with me all the efforts and sorrows, but also happiness and exciting moments, not only during the development of the school projects.

Last but not least, I would like to thank **my family** for supporting me in my life and my decisions. They have always been there when I needed them and tried to help me and make me feel better.

I would also like to thank **Markéta Maria Elbel** for her consultation and revision of the text.

Content

History 15

The Rise and Fall of Structuralism
Humanities
Structuralism in Architecture
Dutch “Forum architecture”
Metabolism
Slow End
Consequences and Post-structuralism

New Chance for Structuralism? 39

Current Society
Current Architecture
Between Homogeneity and Diversity
How We Perceive Change
Current Structuralists
Structuralism and Common Denominator
Computation Design

Comparison of Structures 55

Diagrams

Structuralism Without The Physical Structure? 79

Is Structuralism The Right Term?
The Edge of The Structuralism

System 89

Summary of The Existing
New Vision

Framework 97

Rules 103

Inside Your Space
Contact With Others
Different Strategies

Example of Infilling 117

In-Between Space 129

Final Image of The Fragment 139

Conclusion 178

History

Where, when, and why Structuralism began. What were its main goals and the story of the end of its golden age.

The Rise and Fall of Structuralism

Introduction

Structuralism in architecture, the most famous in Dutch scene during 1960's – 70's, was an example of a new way of thinking about concept of architecture and architects.

Beginning in Humanities

It all started at the turn of the 19th and 20th century in humanities as an opposite methodology from classic analytical method. Structural method tried to focus not only on separate elements and their properties, but also on relations between elements and rules which are based on these relations. If we knew the structure of the rules, we would be able to know all variations of elements even before we found them. The best example of these ideas can be seen from the difference between "language" and "speech" where language is defined as a structure with rules and speech is the final group of elements which we use to tell something.[1]

Architecture context

In the first half of the 20th century, society was influenced by the consequences of the industrial revolution as a mass society, poor health conditions in cities and the population explosion. The architects tried to find new revolutionary conceptions in avant-gardes which are mostly connected with new political movements. There was also a breaking point in traditional architecture movement with rising modernism, Le Corbusier and Bauhaus. The modernism seemed to be the answer for this period.

After World War II new members of CIAM started to criticize the unhuman aspect of modernism. In a devastated Europe, with the victory of democracy in the war and the need for urbanism to rebuild cities, they wanted to push classical modernism further.

[1] VALENA, Thomas. *Structuralism Reloaded: Rule-Based Design in Architecture and Urbanism.* ISBN 978-3-936681-47-5. Chapter: Structural Approaches and Rule-Based Design in Architecture and Urban Planing by Tomáš Valenta

[2] LÉVI-STRAUSS, Claude. *Strukturální antropologie.* ISBN 80-720-3713-7. Free translation

Humanities
Timeline

before WWI
First mentions of structuralism in phonology (Swiss linguist *Ferdinand de Saussre*). Structuralism is being developed as an opposite methodology from analytical method focused on isolated elements in linguistics.

interwar period
Still in humanities. The new methodology is developing by *Russian formalist* group and *Prague school* of linguistics.

after WWII
Move from linguistics to anthropology. *Claude Lévi-Strauss* is using structuralist method for the study of primitive cultures.

1950's
Boom in other humanities studies.

1960's
Officially established as an scientific method.

"language" and "speech" are two types of structure, primary and secondary, where the secondary individual elements are connected through a list of rules from primary structure [3]

"We would be able to understand some of the basic analogies between the manifestations of life in society, which seem very distant from each other, such as language, art, law and religion." [4]

...and at the same time, we might hope to overcome the opposition between culture as collective thought and the individuals who create it....[4]

by Claude Lévi-Strauss

[3] VALENA, Thomas. *Structuralism Reloaded: Rule-Based Design in Architecture and Urbanism.* ISBN 978-3-936681-47-5. Chapter: Structural Approaches and Rule-Based Design in Architecture and Urban Planing by Tomáš Valenta

4 LÉVI-STRAUSS, Claude. *Strukturální antropologie.* ISBN 80-720-3713-7. Free translation

Structuralism in Architecture

Timeline

before 1950

Le Corbusier mentions a primary and a secondary structure in his projects such as Domino house [1], Immeuble Villa or Hospital in Venice

1950's - 70's

Boom in Netherlands. *Team 10* is inspired by anthropology and starts implementing it into new architecture.

Aldo van Eyck is publishing in the Forum magazine where he presents new ideas about architecture and significant projects.

Forum magazine and *Team 10* influence also the metabolism movement.

Cause and consequence

1958

Yona Friedman is presenting his conceptual drawings of the Spacial City [3]

1959-74

Constant is developing his anti-capitalist city project New Babylon [4]

1962-64

Archigram presents their utopic project The Plugin City [2]

VALENA, Thomas. *Structuralism Reloaded: Rule-Based Design in Architecture and Urbanism.* ISBN 978-3-936681-47-5. Chapter: Structural Approaches and Rule-Based Design in Architecture and Urban Planing by Tomáš Valenta

By us, for us

Space in the image of man is place, and time in the image of man is occasion

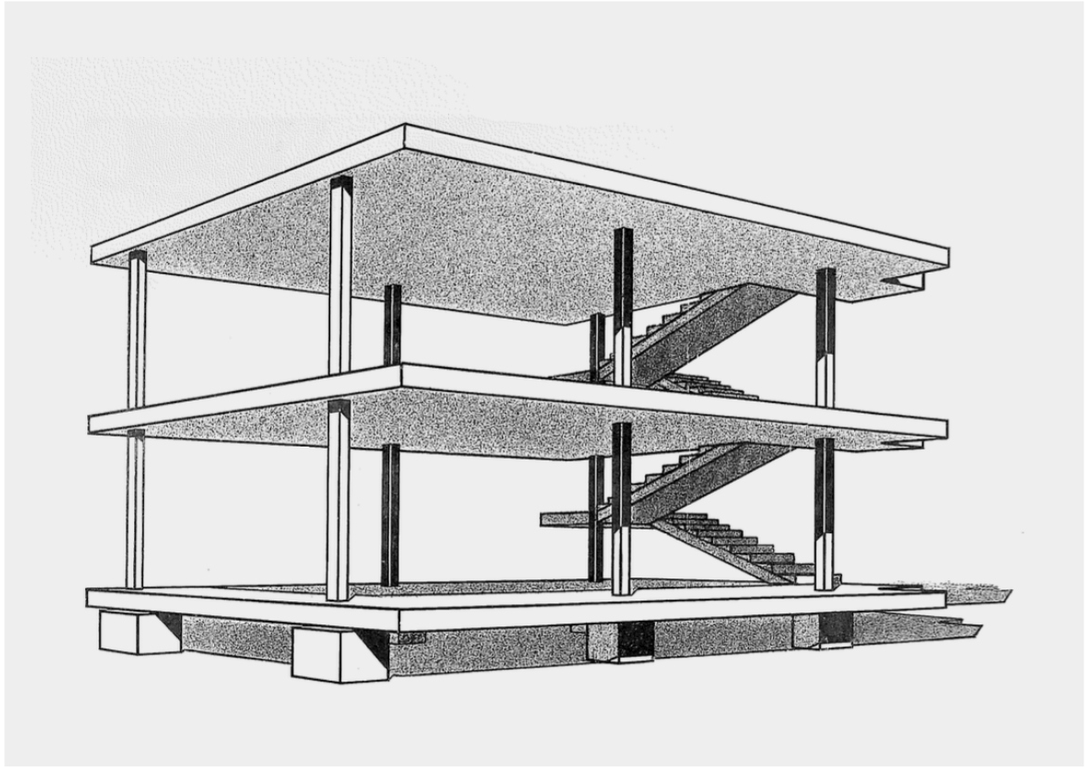
Architecture formed by daily rituals of life

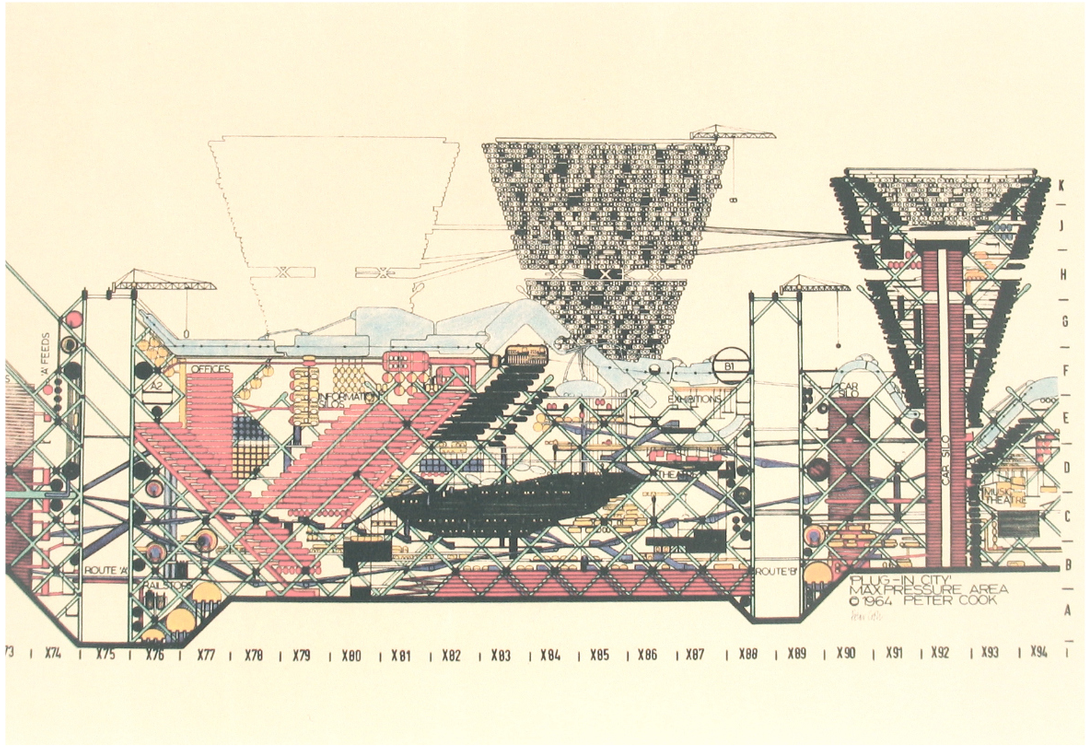
If society has no form, how can architects build the counter-form?

by Aldo van Eyck

quotes: MCCARTER, Robert a Aldo van EYCK. *Aldo van Eyck*. -. New Haven: Yale University Press, [2015]. ISBN 978-0-300-15396-5. and LIGTELIJN, Vincent, ed. *Aldo van Eyck: Works*. -. Basel: Birkhäuser, 1999. ISBN 3-7643-6012-7.

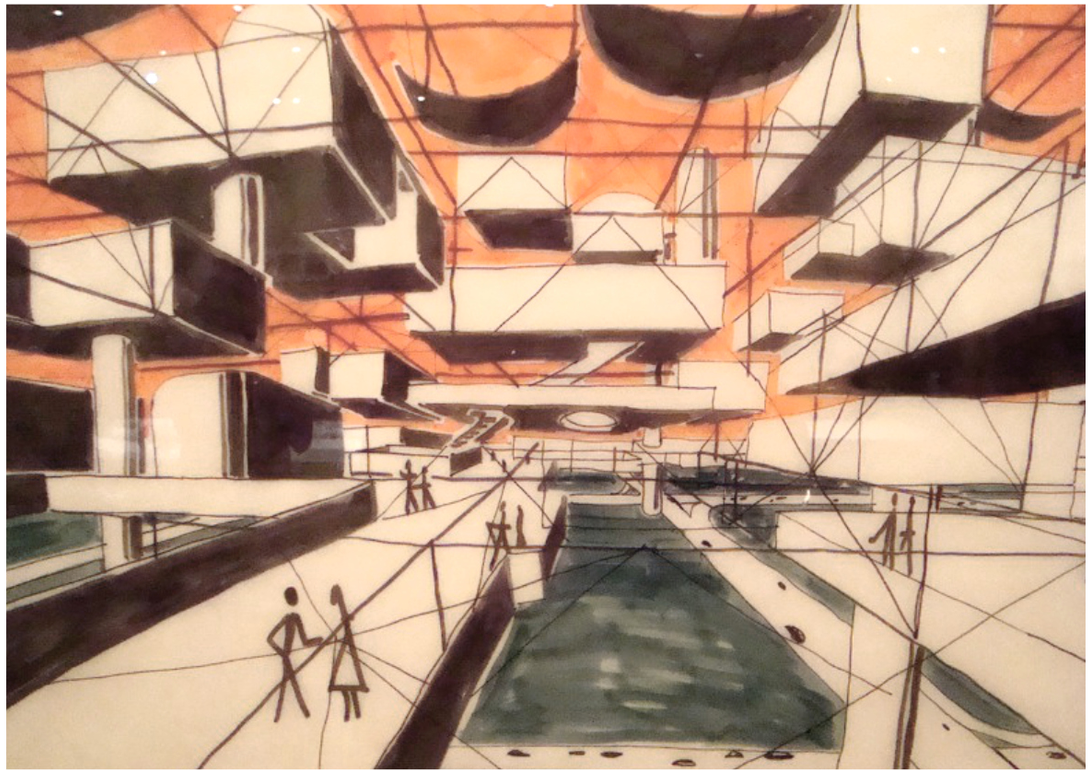
Le Corbusier’s Domino House, 1914 [1]

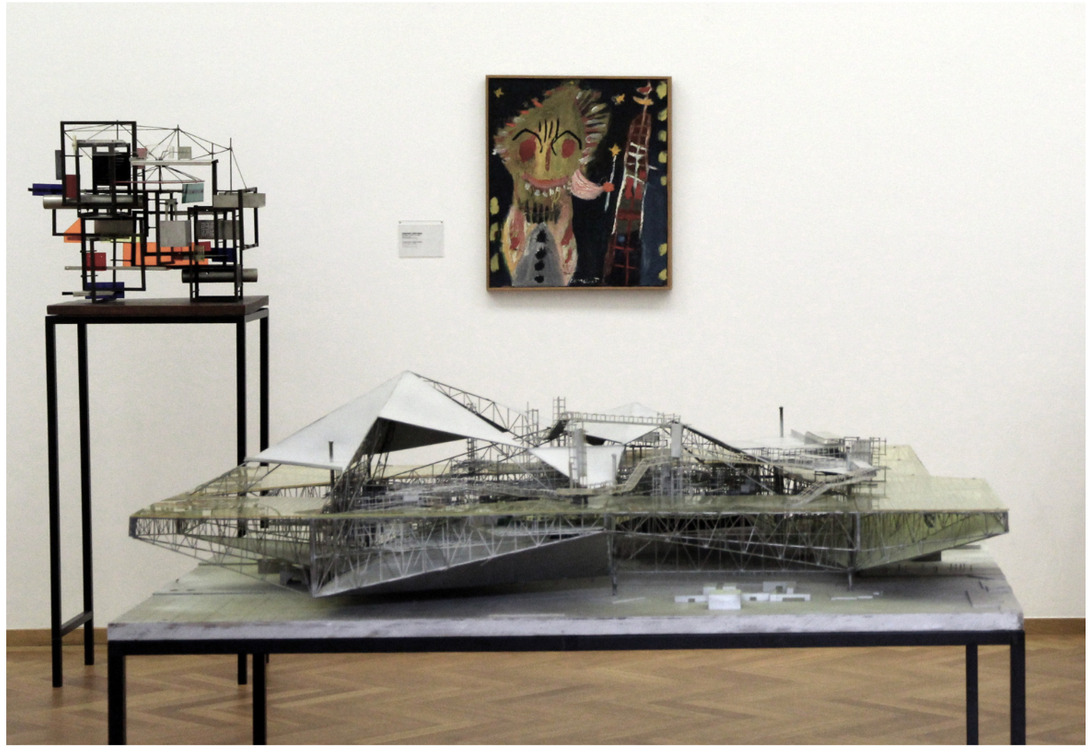




Archigram’s Plig-in City, 1962-1964 [2]

Yona Friedman’s Spacial City, 1958-59 [3]





Constant’s New Babylon, 1959-74 [4]

The Dutch architecture scene was the main one inspired by these new methods in anthropology. Through Aldo van Eyck's texts in Forum magazine and his travels into Africa and South/Central America he, along with other architects from Team 10, tried to move the current Le Corbusier's modernism into a more human version.

Dutch "Forum architecture"

Aldo van Eyck

We can speculate why? Perhaps because of the density and high level of urbanization, or the sensitivity to social connections. But the Netherlands was the main scene of structuralist ideas. We could say that it began with the architect Aldo van Eyck and his first job as an urban designer of playgrounds for kids. After that he was inspired by new anthropology methods and travels to primitive cultures. As a result, he started to manifest his dissatisfaction with unhuman and non-contextual modernism at the CIAM conferences and through the Forum magazine. He was also a founding member of *Team 10*, a group of architects from different countries with similar ideas, which was the signpost for new movements in the future such as metabolism.[5]

Team 10

Members of this group designed the most impressive projects starting with Eyck's Orphanage in Amsterdam [5]. The open concept of small units connected to each other which can potentially grow to the end of the site. And as *Aldo van Eyck* used to happily said, there is no difference between a building and a city. With his words "by us, for us" he put the role of a user into the centre of architecture and buildings. The influence from anthropology was clear.

These ideas project also into other architects such as *Piet Blom* with his Noah's Ark project presenting 3D labyrinth concept [6], *Sharach Woods* and *George Candilis's* project of Free University in Berlin [10] and *Herman Hertzberger* who is the author of Montessori school in Delft and Centraal Beheer headquarters [7], the masterpiece of structuralism. They share their interests and incorporate the new ideas into their projects independently.

We can use Hertzberger's Centraal Beheer as an example that easily tells a story about the term structure in architecture and difference between a structure and an infill. The structure isn't only the final construction consisting of basic elements, it is a principle that defines the foundation for further use. Because we don't know what will happen in the future, what will be the user's needs, and how quickly they will change. The rest of the building inside the structure is the infill which can be rebuildable, reorganized.[6]

Reach

Projects and texts presented by *Team 10* during the 1950's – 70's inspired or became a foundation for other not only architectural groups such as *Archigram* and their project The Plug-in City [2], *Yona Friedman* and his Spacial City project [3] or painter *Constant Nieuwenhuys* and his New Babylon [4]. All of these projects aimed to design a future global city. The last one having probably the most radical concept with developing ideas such as a new society order, "homoludens", nomads and having maximal freedom while abiding minimum rules. In competition for Haupt-stadt in Berlin in 1958 *Alison and Peter Smithson* based their concept on Constant's ideas, however without success. The New Babylon project ended in 1974 and has never been realised.[7]

[5] Robert a Aldo van EYCK. Aldo van Eyck. -. New Haven: Yale University Press, [2015]. ISBN 978-0-300-15396-5. and LIGTELIJN, Vincent, ed. Aldo van Eyck: Works. -. Basel: Birkhäuser, 1999. ISBN 3-7643-6012-7.

[6] HERTZBERGER, Herman. *Přednášky pro studenty architektury.* Dolní Kounice: MOX NOX, 2012. ISBN 978-80-905064-0-4.

[7] Constant Nieuwenhuys. In: *Wikipedia: the free encyclopedia* [online]. San Francisco (CA): Wikimedia Foundation, 2023 [cit. 2023-03-09]. Dostupné z: https://en.wikipedia.org/wiki/Constant_Nieuwenhuys

Dutch “Forum architecture”
Timeline

1951
Aldo van Eyck is traveling to central Africa to study primitive cultures

1953
Team 10 - critics of classic modernism in CIAM, pressure for more human design

1958
Competition for Haupt-stadt in Berlin - *Alison and Peter Smitson* present their urban concept influenced by Constant’s ideas. Unfortunately without success.

1959
CIAM congress in Otterlo - organized by *Team 10*, attended also by *Louis Kahn* and *Kenzo Tange* who was one of Metabolism starting members

1960
Aldo van Eyck completes the Orphange project in Amsterdam. Others later call it the entry project of structuralism ideas in architecture.

In the same year *Kenzo Tange* presents his vision of Tokio Bay plan.

1962
Piet Blom influenced by Eyck presents his Noach’s Arch student project. An inspiring concept of an endless multilevel labyrinth.

1963
Competition for the Free University of Berlin - a real project inspired by Blom’s Noah’s Ark, that was finished in 1970. Unfortunately it appears to disappoint it’s initial values with the polyvalent space becoming a regular corridor.

VALENA, Thomas. *Structuralism Reloaded: Rule-Based Design in Architecture and Urbanism.* Stuttgart: Edition A. Menges, 2011. ISBN 978-3-936681-47-5. Chapter: Structuralism in Architecture and Urban Planning. Developments in the Netherlands. Introduction of Term by Arnulf Lüchinger.

1967
Herman Hertzberger fails with his project in Amsterdame City Hall competition.

1969
Arnaud Beerends uses the term Structuralism for the first time in architecture literature when describing Amsterdam City Hall competition. Doing so he is influenced by Eyck’s text “Aesthetic of number” and the ongoing construction of the Centraal Beheer.

1970
Udo Kultermann sets the term Structurism in Japan architecture.

1972
Centraal Beheer cinstruction is finished.

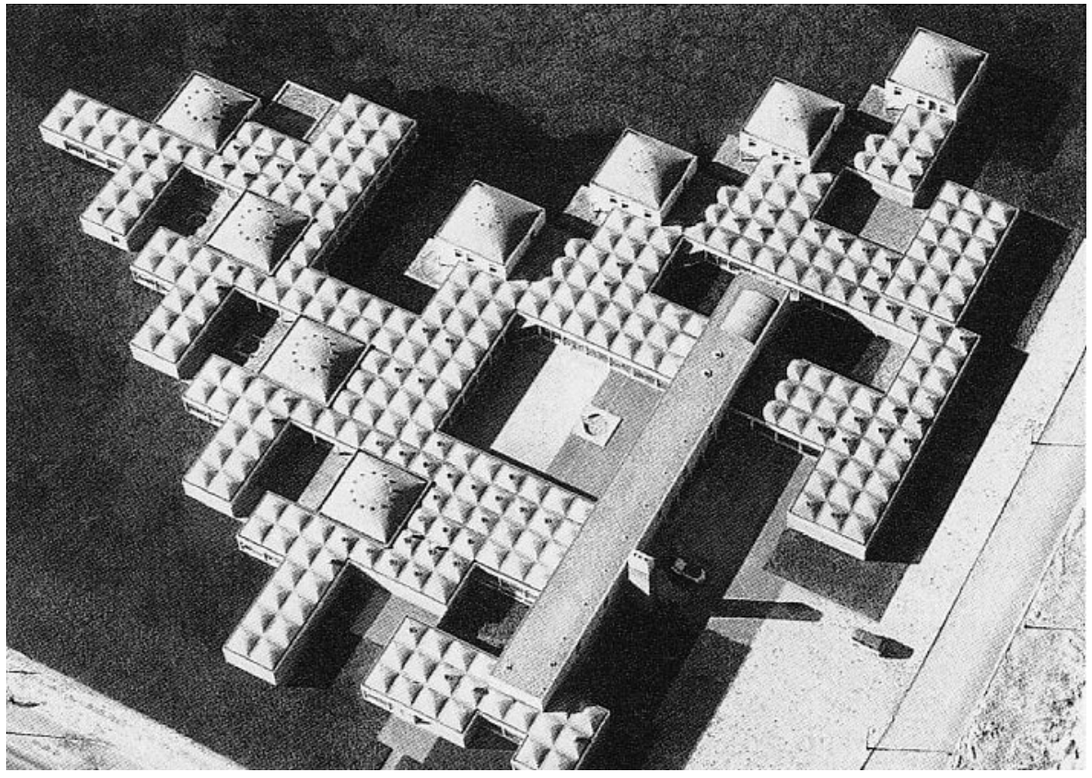
1973
Dutch universities - professors such as *Aldo van Eyck* and *H. Hertzberger* are afraid to officially use the term Structuralism because of a big chance of misunderstanding. At TU Delft Structuralism competes with Rationalism.

1974
At TU Delft they call “Forum architecture” instead of “Structuralism” because it is more open and not so manifesting.

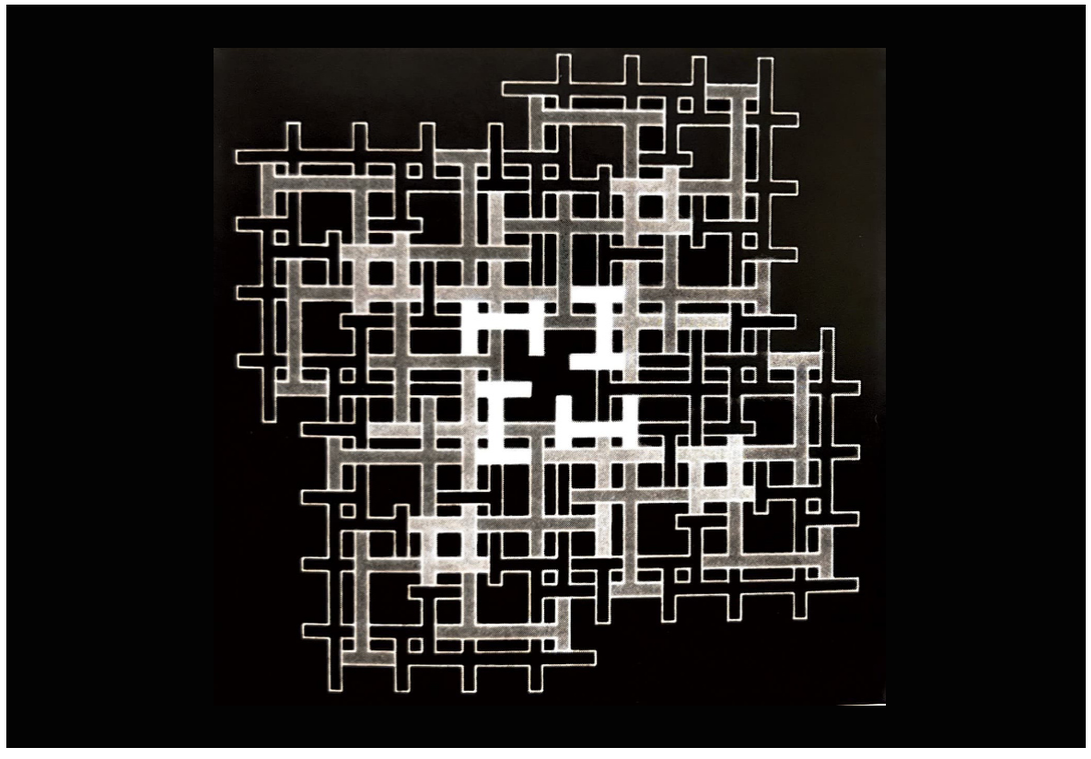
1976
Conflict at TU Delft - a marxist’s group (influenced by events of 1968) critics 5 professors (including *H. Hertzberger* and *A. van Eyck*). Professors are dismissed for one year from the school.

1981
Team 10 is dissolved.

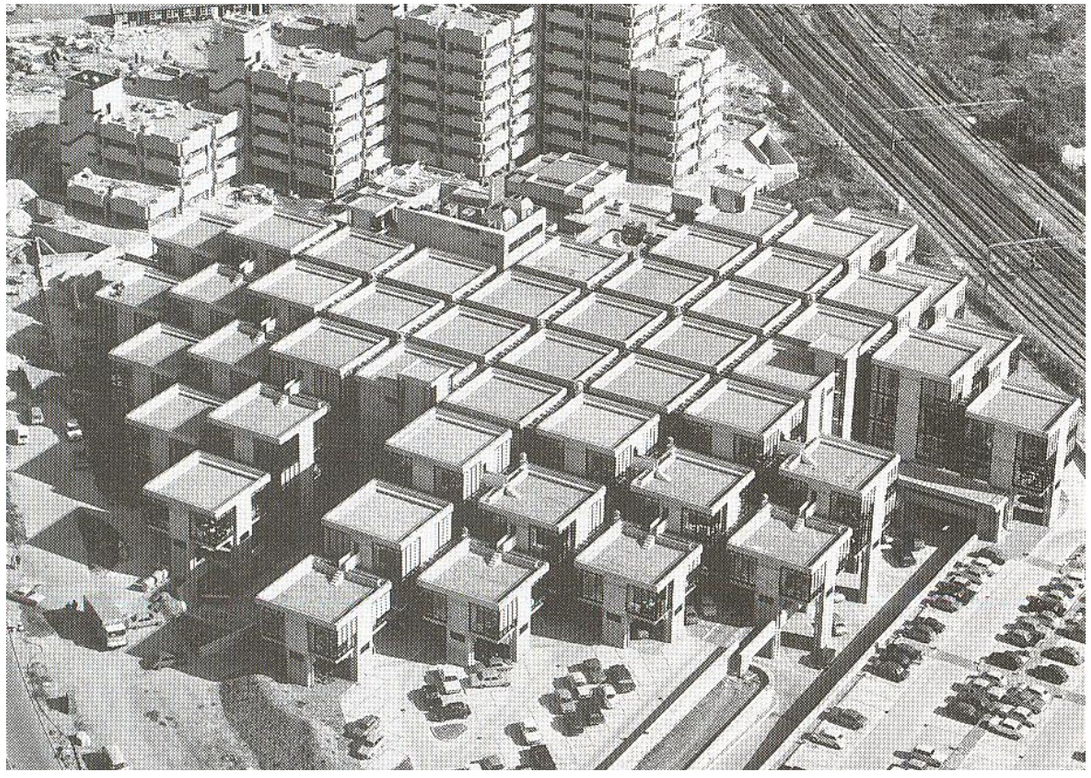
Aldo van Eyck's Orphanage, 1960 [5]



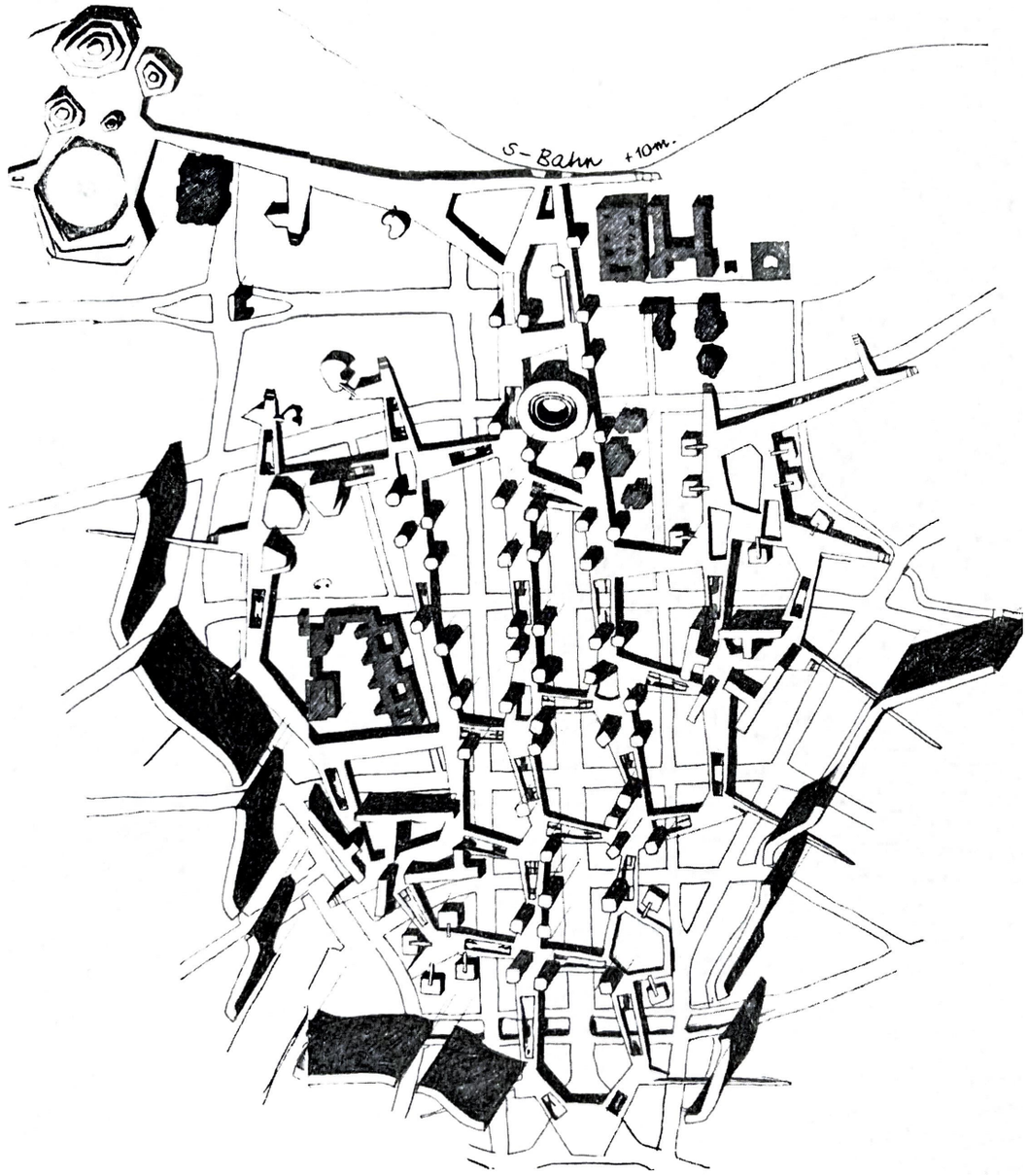
Piet Blom's Noach's Arch, 1962 [6]



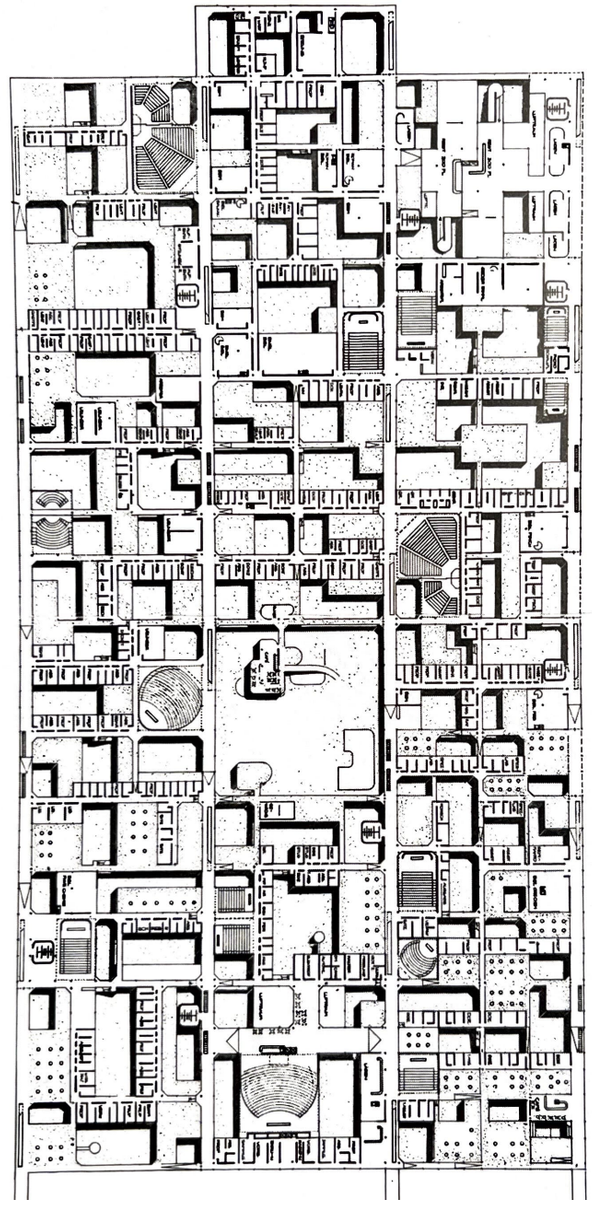
Herman Hertzberger's Centraal Beheer, 1972 [7]



Kenzo Tange's Tokio Bay, 1960 [8]



Alison and Peter Smitson with R. Sigmond - Competition project Hauptstadt Berlin, 1958 [9]



Candilis-Josic-Woods with Manfread Schiedhelm - Free University Berlin, 1963 [10]

Peter Blom's Cube House, 1977 [11]

Piet Blom's "De Kasbah", 1973 [12]

Moshe Safdie's HABITAT 67, 1967 [13]

Kisho Kurokawa's Nakagin Capsule Tower, 1972 [14]

Metabolism

Probably one of the strongest movements, which was highly manifested, was Japan's *Metabolism*. We can't say that Metabolism is a child of Structuralism. They started around the same time and developed on the opposite sides of the world. *Team 10* and Metabolists first met at CIAM conference in 1959, where *Kenzo Tange* presented his Skyhouse and Marine City [8]. A year later a number of Team 10 architects attended the Japan World Design Confarreation in Tokyo.

If we said earlier that Dutch Structuralism was influenced by anthropology, Japan Metabolism came from traditional Japanese culture and was inspired by nature.

In Metabolism they use a parallel of a "tree" as a permanent structure and "leaves" as temporary elements. The "tree" can grow, die, or regrow and the "leaves" can follow needs.

There are some other differences as well. Both groups agreed with the criticism of CIAM. Dutch structuralists wanted to improve modernism and metabolists were more focused on the new way of understanding and designing the environment in opposition to the functionalism and its mechanical methods. Where the structuralists understand the society in the terms of identity, belonging and neighborhoods, the metabolists think about the revolution of the mobility where the neighborhoods start to be meaningless.

Both groups felt that there were differences between them, mainly in terms of culture, geography and political context. *Team 10* was impressed by the work of the metabolists. They mentioned that the megastructures could be an answer to a mass society. However, there is a need for a more human scale.[8]

Slow End

At the beginning of the 70's, when the Centraal Beheer was completed, everything seemed very optimistic. However, in the academic context, where mainly *Aldo van Eyck* and *Herman Hertzberger* taught structuralism, it was still very difficult to talk about the subject. They were

afraid of establishing the term structuralism officially

because of the danger of misunderstanding the meaning of the term. On other hand, there was the rationalist movement (around *William of Tijen*) at the TU Delft, which wanted to retain the leading role at the faculty.

At the TU Delft they used the name "Forum architecture" instead of structuralism for the architecture around *Team 10* and *Forum* magazine. In 1976 the conflict with the Marxist group (based on the events of 1968) and 5 professors (including *A. van Eyck* and *H. Hertzberger*) ended with them being dismissed from their jobs for more than a year.[9]

After this and with the

rise of postmodernism

with *Robert Venturi* and *Aldo Rossi* (manifested in 1966), all their efforts to improve classical modernism seemed to be in vain. *Aldo van Eyck* summed it up in his sentence:

...being attentive to the "constant and constantly changing" did not mean establishing the change only: "I have heard it said that an architect "cannot be a prisoner of tradition in a time of change." It seems to me that he cannot be a prisoner of any kind. And at no time can he be a prisoner of change." [10]

Conclusion of the gold age of structuralism

From today's perspective, we could say that *Aldo van Eyck* was ahead of his time with his Orphanage. It was he who opened up the subject and fought for a more humane modernism. However, he never identified himself as a structuralist. After building the orphanage, he continued to publish and teach history at the university, but he never developed his projects in a structuralist way.[11]

Although the other members of *Team 10* followed in Eyck's footsteps and designed important projects, there were also major disappointments in the competitions (Hauptstadt in Berlin, City Hall in Amsterdam, etc.). *Team 10,* which never defined itself as a movement wasn't, strong enough to offer a new architectural concept that could meet with the needs of society. The rise of the postmodernism, with its loud rejection of the modernism as boring thing, started from scratch and returned back to history, context, and individuality.

There were probably also the practical issues within structuralism, such as:

hard orientation within the system

not enough individuality

the physical structure seems to be too dominant and determined

non-iconic visuality

lack of complexity[12]

However, some of the original members still tried to apply this theoretical concept. *Herman Hertzberger* influenced future generations of architects through his famous book Lessons for Students in Architecture.

Consequences and Post-structuralism

Breakthrough studies

The last quarter of the century has seen the emergence of new studies, most of which are not directly related to the original structuralism but which had helped to develop it for the future. We can mention *Christopher Alexander* and his studies around the topology and patterns[13], Chaos Theory, *Frei Otto's* form-finding experiments in an urban context[14] or post-structuralist philosophers *Gilles Deleuze* and *Félix Guattari,* especially with their texts on Rhizome[15]. These new theories and the rise of a computer age were attractive ideas that helped architects move forward.

[8] VALENA, Thomas F., Tom AVERMAETE a Georg VRACHLIOTIS. *Structuralism Reloaded: Rule-Based Design in Architecture and Urbanism*. Stuttgart: Edition A. Menges, 2011. ISBN 978-3-936681-47-5. Chapter: Structuralism and Metabolism by Ersi Ioannidou

[9] VALENA, Thomas F., Tom AVERMAETE a Georg VRACHLIOTIS. *Structuralism Reloaded: Rule-Based Design in Architecture and Urbanism*. Stuttgart: Edition A. Menges, 2011. ISBN 978-3-936681-47-5. Chapter: Structuralism in Architecture and Urban Planning. Developments in the Netherlands. Introduction of Term by Arnulf Lüchinger.

[10, 11] MCCARTER, Robert a Aldo van EYCK. *Aldo van Eyck*. -. New Haven: Yale University Press, [2015]. ISBN 978-0-300-15396-5. Final chapter

[12] VALENA, Thomas F., Tom AVERMAETE a Georg VRACHLIOTIS. *Structuralism Reloaded: Rule-Based Design in Architecture and Urbanism. Stuttgart*: Edition A. Menges, 2011. ISBN 978-3-936681-47-5. Chapter: Structural Approaches and Rule-Based Design in Architecture and Urban Planing by Tomáš Valenta

[13] for example, the books: *A Pattern Language* (1968) and *A City is Not a Tree* (1965)

[14] LOPES, João V., Alexandra C. PAIO a José P. SOUSA. Parametric Urban Models Based on Frei Otto's Generative Form-Finding Processes. ResearchGate [online]. *ResearchGate*, © 2008-2023, 2014, 595-604 [cit. 2023-03-10]. Linked from: doi:10.52842/conf.caadria.2014.595

[15] Published in their book *A Thousand Plateaus: Capitalism and Schizophrenia* in 1980

Rule-based and computer design

Probably the most famous is the voice of parametric design, which later gave us the term Parametricism, first defined by *Patrik Schumacher* in 2008.[16] If we go to the beginning of the story, between the linguistics and the anthropology, we know that the structure was defined as a set of internal rules between elements. We can see the parallel with this parametric design where we use rules (independent or combined into an equation) and entry parameters. We can call it also as rule-based design.[17]

It is necessary to be careful because not all projects that use the parametric way of design need to be fully rule-based. It can be divided into the iconic design which uses the parametric after the classical architectural composing as a tool for complex construction and design such as *Frank Gehry.* On the other hand, we can also find examples of mathematically based design where the parameters and rules are used from the beginning, for example in the *Greg Lynn's* approach.

We can say that this principle uses the rules to build the final image of the building and through different conditions or parameters, which can be unique, we get more complex design. The same rules can be used many times in different contexts.

However, from the original side of the structuralism in Dutch architecture, there is much less discussion about the primary and secondary structure and the role of the users and how the result can be absorbed and adapted to their needs over time. After establishing the equation and parameters, we "bake" the process and construct the building. We can compare this with *Herman Hertzberger's* sentence:

"Authentic structuralism, as derived from the cultural anthropology of Claude Lévi-Strauss, provides insight into the reciprocal dependencies that exist between the individuals and the community." [18]

Specific direction of FA BUT

Not far from us, the word structure is also used in our alma mater. Professor *Jaroslav Drápal* has it in his theory of architecture as the source of his term "structurality". Even though he follows the same examples of *Aldo van Eyck,* such as *Paul Klee's* drawing "Medieval Town" (1924), he wasn't influenced by anthropologic structuralism. His interpretation of structure as a relations between elements are more based on principles such as crystals and the chemical crystal lattice. In architecture, he promotes

"structural thinking"

which helps to define the main parts and a unit, the primary and the secondary.

„In the concept of an architectural work, the issue is the structuring and hierarchization of a complex issue"

He describes the word "structure" in architecture as a final realized project consisting of special, constructional and form relations. Even though his definitions lack the social context, which was used in Dutch scene, his work has a similar basis to the linguistic theory and it's a nice example of independent local direction.[19]

[16] SCHUMACHER, Patrik. Patrik Schumacher on parametricism – 'Let the style wars begin'. *The Architects' Journal* [online]. UK: Metropolis Group, © 2023, 6 MAY 2010 [cit. 2023-03-10]. Dostupné z: https://www.architectsjournal.co.uk/practice/culture/patrik-schumacher-on-parametricism-let-the-style-wars-begin

[17] VALENA, Thomas F., Tom AVERMAETE a Georg VRACHLIOTIS. *Structuralism Reloaded: Rule-Based Design in Architecture and Urbanism*. Stuttgart: Edition A. Menges, 2011. ISBN 978-3-936681-47-5.

[18] VALENA, Thomas F., Tom AVERMAETE a Georg VRACHLIOTIS. *Structuralism Reloaded: Rule-Based Design in Architecture and Urbanism*. Stuttgart: Edition A. Menges, 2011. ISBN 978-3-936681-47-5. Page 168

[19] DRÁPAL, Jaroslav. *Architektonické struktury*. Brno: VUTIUM, 2022. ISBN 978-80-214-5858-1.

New Chance for Structuralism?

**What is the position of structuralism today.
Architects following its original mission.**

Current Society

Before we start thinking about applying structuralism in the present, we should briefly analyze the current society. The last few decades show us new challenges like an increasing pace of life, internet and social media revolution, revolution in access to information, entertainment and consumerism, etc.

Zikmund Bauman, in his book The Liquid Modernity nicely describes the shift from classical modernism, the period of mass society gathered together in one place with the strong position of a family, community and place. It was the long-term status quo that was important for survival. Being strong and solid was better and useful for life. However, after the World War II, we can observe the unexpectedly increasing speed of change. The strong and solid concept starts to be limited and unadaptable in the fast-changing world. There appeared to be a place for the new concept which he named “the liquid”.

Instead of being strong and solid, it’s much better to be flexible and adaptable.

Those who remain solid lose their chance of success. As a result, he sees the shift from community to individualism. Strong and solid relationships, such as a family, community, or a life spent in one place are losing their value. As a result, we are now pushed to be quicker, more flexible and less limited in all aspects of life.[20]

It's no longer difficult to change where we live, what field we study, our work or our friends and families. In society that has for the last few decades been surrounded by this combination of endless possibilities, we can observe a

new fever for change.

Consumerism (not only material oriented but also in entertainment) has also left its mark.

Another important fact that we

can't forget is The Climate Crisis.

It isn’t just a speculation. We know from research that it is a fact, and we should do something about it. It’s a legacy of the industrial revolution and the habits from that period. The scenarios don’t look promising. Rising temperature, higher see levels or more extreme weather would be only the start of other crises. Governments and international institutions have already declared that they will find solutions in terms of sustainability. The question is, will it be fast enough? Or is our capitalist global system too much of an obstacle?

Current Architecture

Looking at the current state of our architectural environment, on one hand we have a huge demand for housing (influenced by changing lifestyle and still growing population) and on the other hand a clash with regulations which make the process more expensive and time-consuming. Issues of identity are also part of this, and are holding us back.

We got stuck somewhere between urban sprawl and housing estates.

Sprawl is the fulfillment of an individualist dream.

You can do anything you want on your plot. And because most of us don't have much, you'll probably design your own house or pick something out of a catalogue. The final result may not be pretty, but the important thing is that you have a roof over your head and a long way from anything or anyone but yourself. Dream of an individual freedom.

But from a global perspective, it's unsustainable - materially, spatially and morally. With the rising cost of buildings, it will also be far less available in the coming years. Even though it contributes to the disappearance of the gradient between public and private, in this space

we lose density and our sense of understanding others, sharing, and mutual development.

The public begins to be just an utility for the transfer from one private space to another. We use it, but it doesn’t feel like we are part of it.

The housing estates stand on the opposite side. It's effective in the use of space, energy and money. It creates more available housing and a denser urban area. On the opposite side of sprawl, we have a small area of private space and a huge area of public space.

A uniformed space for mass community.

However, the space between buildings is usually not full of life. The inhabitants can use it, but they do not change it themselves. It all looks like one project made by some nameless architect. As a result, there is

no space for individuality, creativity, interventions and changes,

which could absorb new social wishes. As in the first example, the private and the public are strictly separated. However, the private part isn’t visible and it’s only within the same buildings.

After the period of modernism, communist brutalism and postmodernism in our country, whose projects were perceived as an image of the architectural ego, we are now witnessing a new style.

Being contextual and neutral is the easiest way

to lose the sign of arrogant architectural ego. The results aren't that special, but no one will hate it. Better for marketing and sales.

It all seems like a magic circle where we jump from the uniform housing estates to the crazy houses in the urban sprawl and back again. As a result, we still have control over the final design on the architect's side, and we hide it behind neutrality.

trust the users and find a compromise between our control and their?

A win-win compromise?

Between Homogeneity and Diversity

In the context of the previous chapter, I would like to continue in a more theoretical way. The question of homogeneity and diversity, uniformity and vast differences sounds similar. It’s a complex issue, and we can look at it from many points of view. However, as architects we work with these terms in a very ordinary way and our sense of them has a huge influence on our urban environment.

Most of us perceive the high level of uniformity as a negative aspect, as well as the huge differences.

Uniformity is too boring and huge differences are too radical.

We normally design a new project to keep our environments nice, starting with a building and ending up with a public space.

If we look back at the two examples from the golden age of Dutch Structuralism: Constant’s New Babylon and Hertzberger’s Centraal Beheer, and interpret them we will see that New Babylon works with different types of construction that are plugged together. The primary and secondary elements change their form in relation to needs of the final program. The result looks like a beautiful chaos with a diverse space full of unexpected situations and contradictions. It’s an open system that offers infinite types of space and can absorb change without disrupting the whole.

[20] BAUMAN, Zygmunt. *Tekutá modernita*. Druhé. Praha: Portál, 2020. ISBN 978-80-262-1602-5.

[21] SMITH, Sean. The world needs to build 2 billion new homes over the next 80 years. *The World Economic Forum* [online]. Geneva, Switzerland: The Forum, © 2023, Mar 2, 2018 [cit. 2023-03-12]. Dostupné z: https://www.weforum.org/agenda/2018/03/the-world-needs-to-build-more-than-two-billion-new-homes-over-the-next-80-years/

If we look at the Centraal Beheer, the first frame, the construction, which represents the primary structure, is strict with a clear order. Inside you can fill it however you like. The structure offers enough stability to provide the user with basic needs such as space, corridors, orientation, ventilation, light, heating, etc. and possibilities to easily change the purpose of the space. The order tells us that we are all on the same level, equal and able to express our individuality.

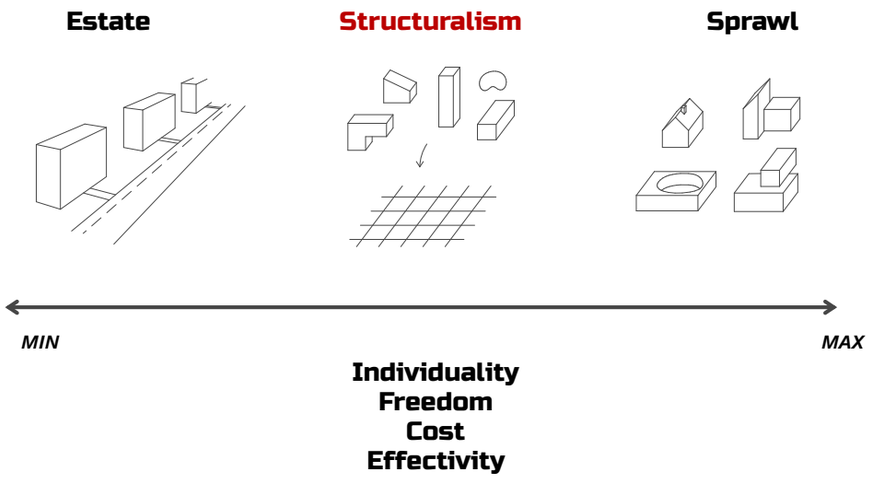
Both examples offer users flexibility and adaptability. However, New Babylon, which is more open and divided than Centraal Beheer, is too chaotic and complicated. It is also easy to imagine that the Centraal Beheer, on a larger scale, could be too homogeneous and limited by its structural order.

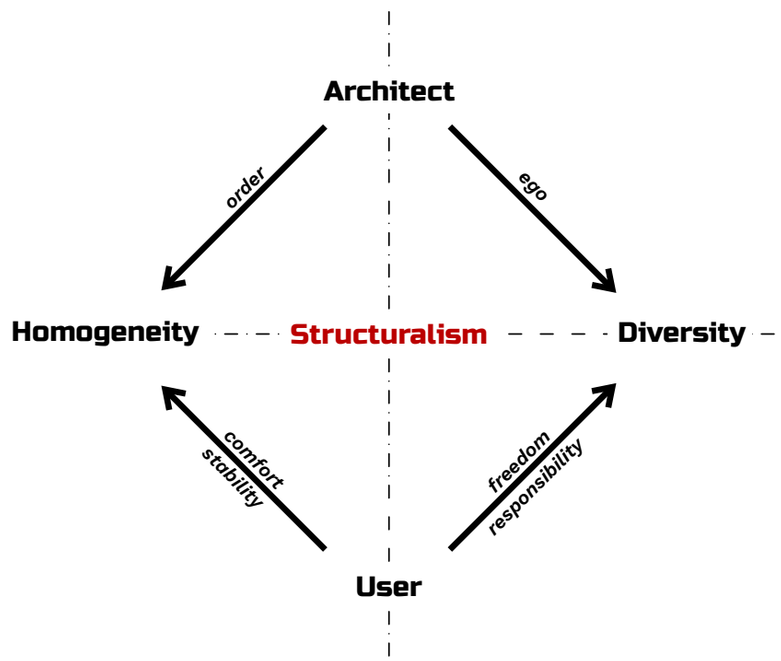
It's the

position of the role of the architect and user in architecture

that was supposed to help structuralism push the classical modernism in more a human, individual and diverse way.

We could say that an architect creates homogeneity through some kind of order (cultural, economic, etc.) and diversity through his ego. The user, on the other hand, can choose between stability and comfort, which tends to lead to homogeneity, or freedom and insecurity, which tends to lead to diversity.





How We Perceive Change

If we look at the user side, there is a question about change perception. Structuralism works with the terms such as changeability, flexibility, adaptability, and absorption. The goal is to be more effective and open to actual needs.

However, we can look at the small practical situation of how users use the options and flexibility of a space. Imagine a lecture room in your school where you go several times a week. There are many variations of where students can sit. However, even though there is no seating plan, the students will probably sit on the same chair in the room. Based on this, we could say that even though we have many options, after a few tries we find our safe and comfortable position and start to be lazy to think about different position. It's naturally comfortable for as and it save our energy which we must use when we deciding between something.

What we should take away from this example as architects is that a situation with many options doesn't necessarily mean more useful flexibility. Especially when there are no indications to help us decide which solution is better for us.

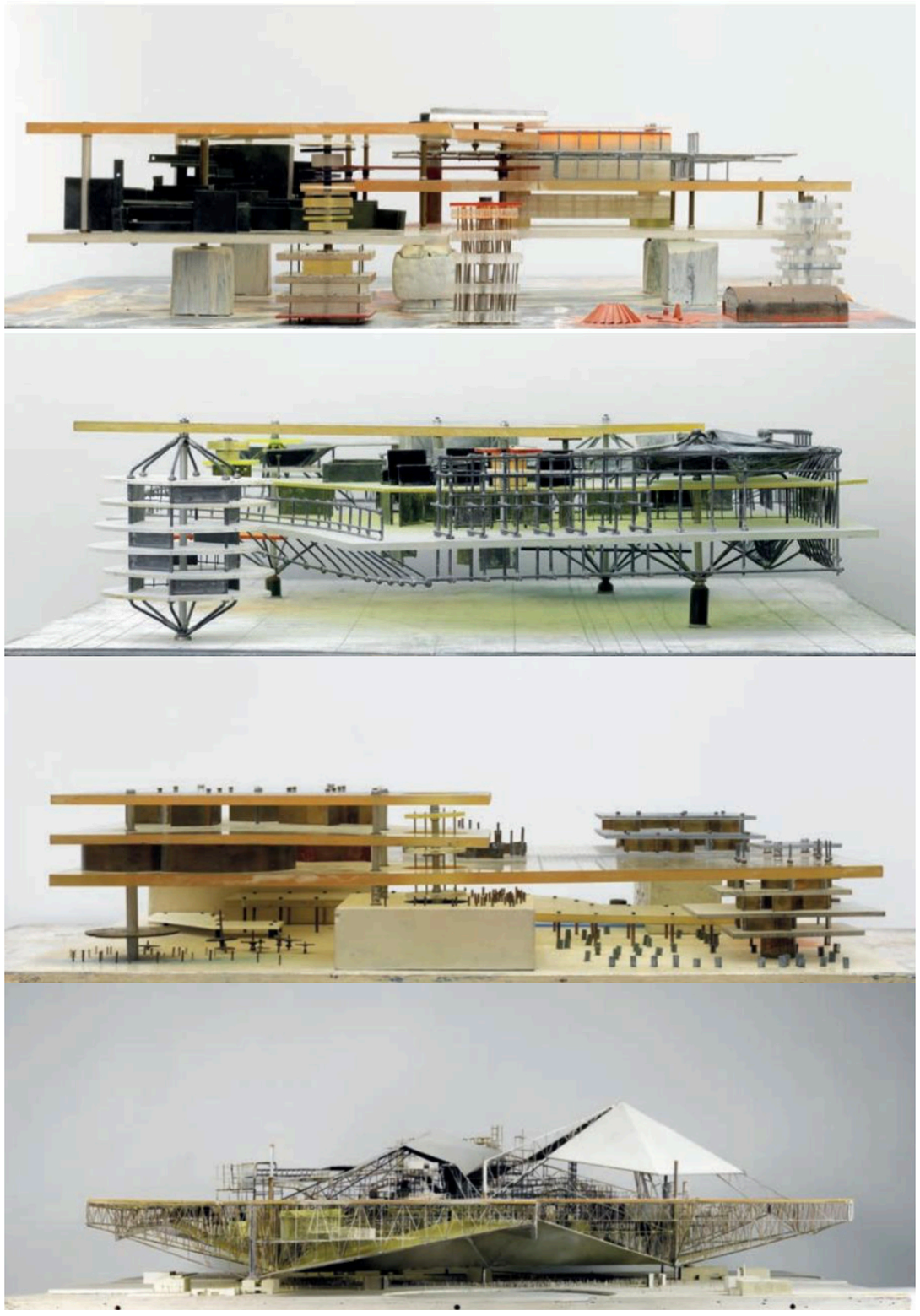
We can say that it's still better to give users more options on how they can use or change the space, but it's also much better to show them some final variations as an inspiration for easier decision-making.

We can go deeper into the various projects that touch on the theme of polyvalent space as defined by *Aldo van Eyck* and *Herman Hertzberger*. In Constant's New Babylon, he thought of the users as "homo-ludens" (creative people who don't have to earn and own stuff) and nomads who will travel through his construction. This means that there is less need for a stable non-changing space. The nomads find the

right place depending on its conditions

and use it for a short time for their purpose. The spaces in the construction are diverse, with different conditions and with options to

finalized or change it by a current user.



The New Babylon - Sector Models [15]

How We Perceive Change

The second project I would like to mention is the Hostel from the book (w)Ego made by *The Why Factory*. The Hostel works with the concept of a movable construction (walls, floors, ceilings) based on the actually space used. Because most of the spaces aren't used 24 hours a day

the volume of the space is constantly changing

and it's bigger where we actually use the space and smaller where we leave the space alone. The goal is to create a building with much more effective use of space and to offer the maximum specific with minimum of the volume.

We can see that the first project works with the idea of changing the space in the hand of the user, who has all control over the change. In contrast, the second project

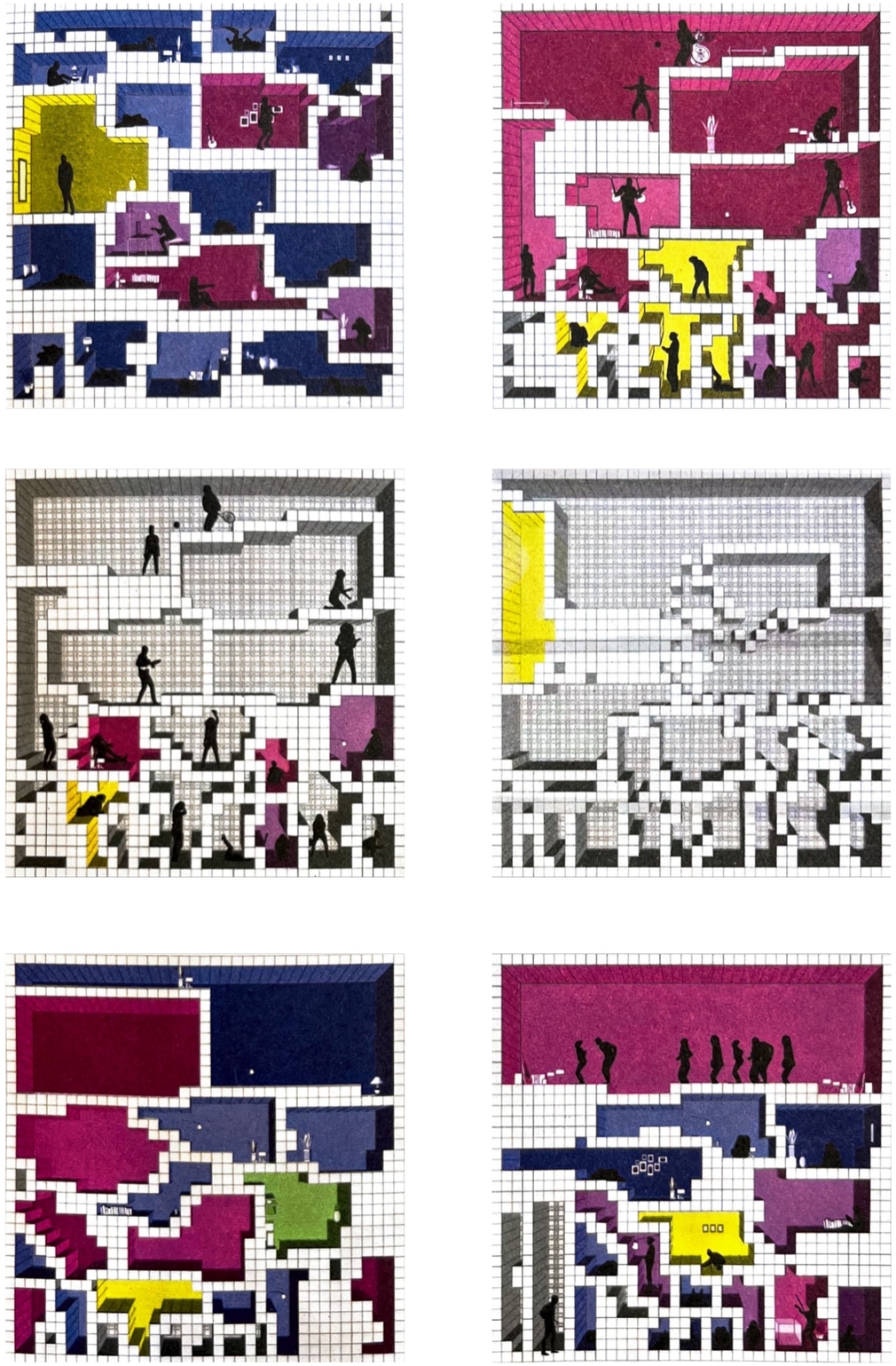
uses some kind of system which is optimized and sets the boundaries of what is able or not.

The system provides a comfortable solution where the user doesn't have to decide about everything (which spaces will be smaller and which bigger, how the construction pieces will move etc.) It's effective, but also

could it make a change without your consent?

The same goes for orientation. If you imagine that you come back to your room and it has a different shape than when you left it, it starts to get confusing. Perhaps there is also a need for a new society vision.

In the end, we can say that the changeability, flexibility, and adaptability, can help the user to save his/her resources and offer a solution that is more resistant to ageing. The change can be in the hands of the user, which is more liberal but requires more effort, or in hands of the system, which can be more effective and requires less effort.



The Why Factory - wEgo Hostel [16]

Current Structuralists

Nowadays we can observe new examples that touch topic such as a default structure, undefined space, system, changeability and playing with the role of an architect and a user.

The work of the Chilean architect *Alejandro Aravena* and his

“half-houses”

is a nice example of using the potential of user’s creations and undefined space as an answer for population growth and lack of housing. The result is often quicker, cheaper, and more available housing, which can absorb individual specifics but also be easily produce in a large scale.

A Dutch architect *Winy Maas* and his office *MVRDV* partially follow the local tradition. Through research and work with data they push the way of designing to a more complex direction. Unlike the parametric design described in previous chapters which is focused more on shape, there is a pressure to cover the social aspects such as diversity, individuality and collectiveness, global change, etc. Through data they design

new systems and complex organizations.

The main feature of their systems is

a pixel or a voxel

which we can understand as a common denominator.

If we talk about system and systematism which can offer effectivity but also changeability, we can also mention a Belgian architect *Gilles Retsin* and his

“discrete architecture”

Retsin combines new technologies, automation, digital theory, AI and robotics, to find a new way of constructing. Unlike MVRDV, he doesn't use the pixel or voxel method for designs that cover more aspects, but as a construction revolution where there is no difference between a celling, a wall, a column, etc. The building is discretized and consists of the same prefab elements.

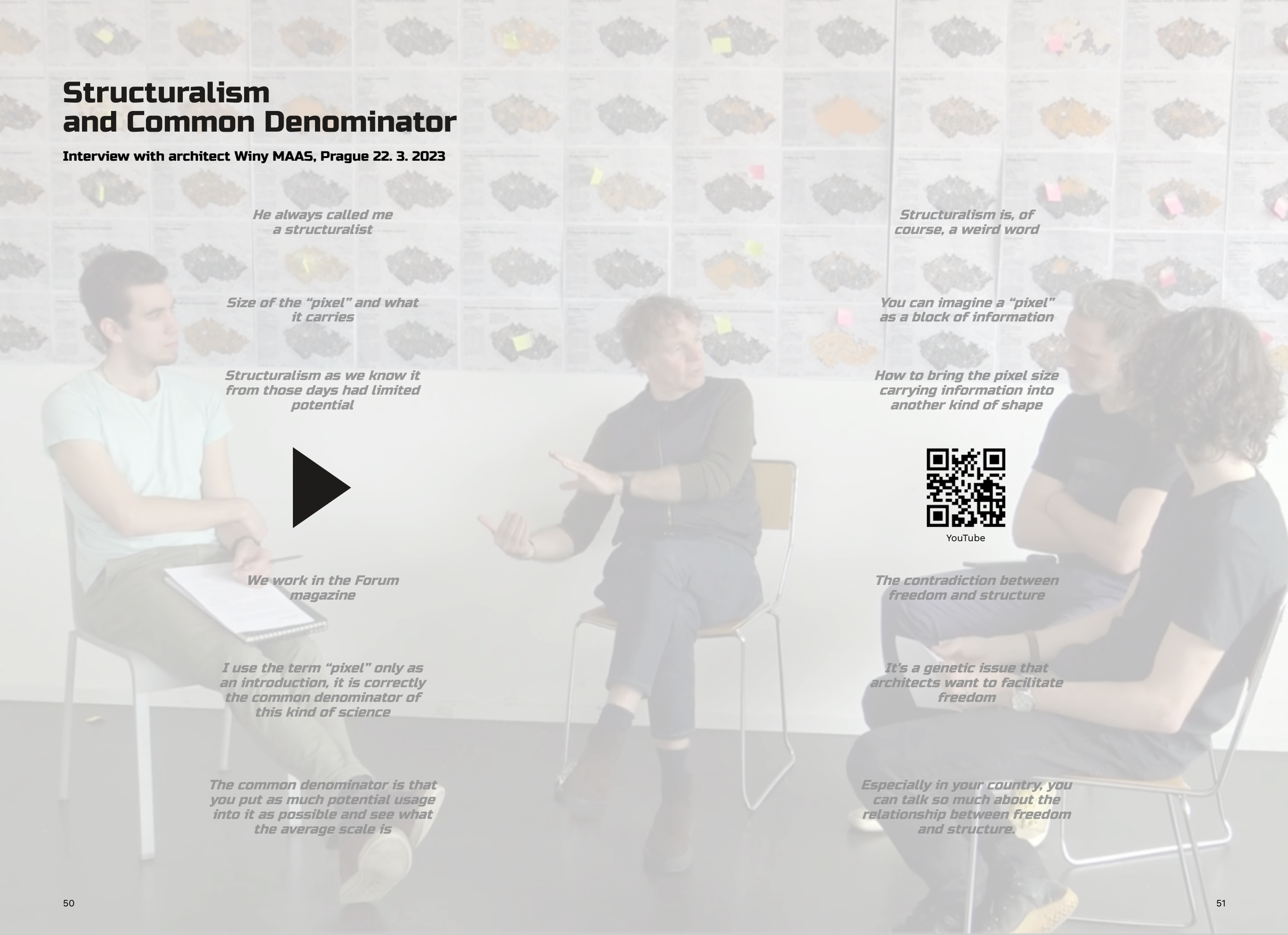
Aravena - Half-houses [17]

MVRDV - Pixels [18]

Gilles Retsin - Discrete architecture [19]

Structuralism and Common Denominator

Interview with architect Winy MAAS, Prague 22. 3. 2023



He always called me a structuralist

Size of the “pixel” and what it carries

Structuralism as we know it from those days had limited potential

We work in the Forum magazine

I use the term “pixel” only as an introduction, it is correctly the common denominator of this kind of science

The common denominator is that you put as much potential usage into it as possible and see what the average scale is

Structuralism is, of course, a weird word

You can imagine a “pixel” as a block of information

How to bring the pixel size carrying information into another kind of shape

YouTube

The contradiction between freedom and structure

It's a genetic issue that architects want to facilitate freedom

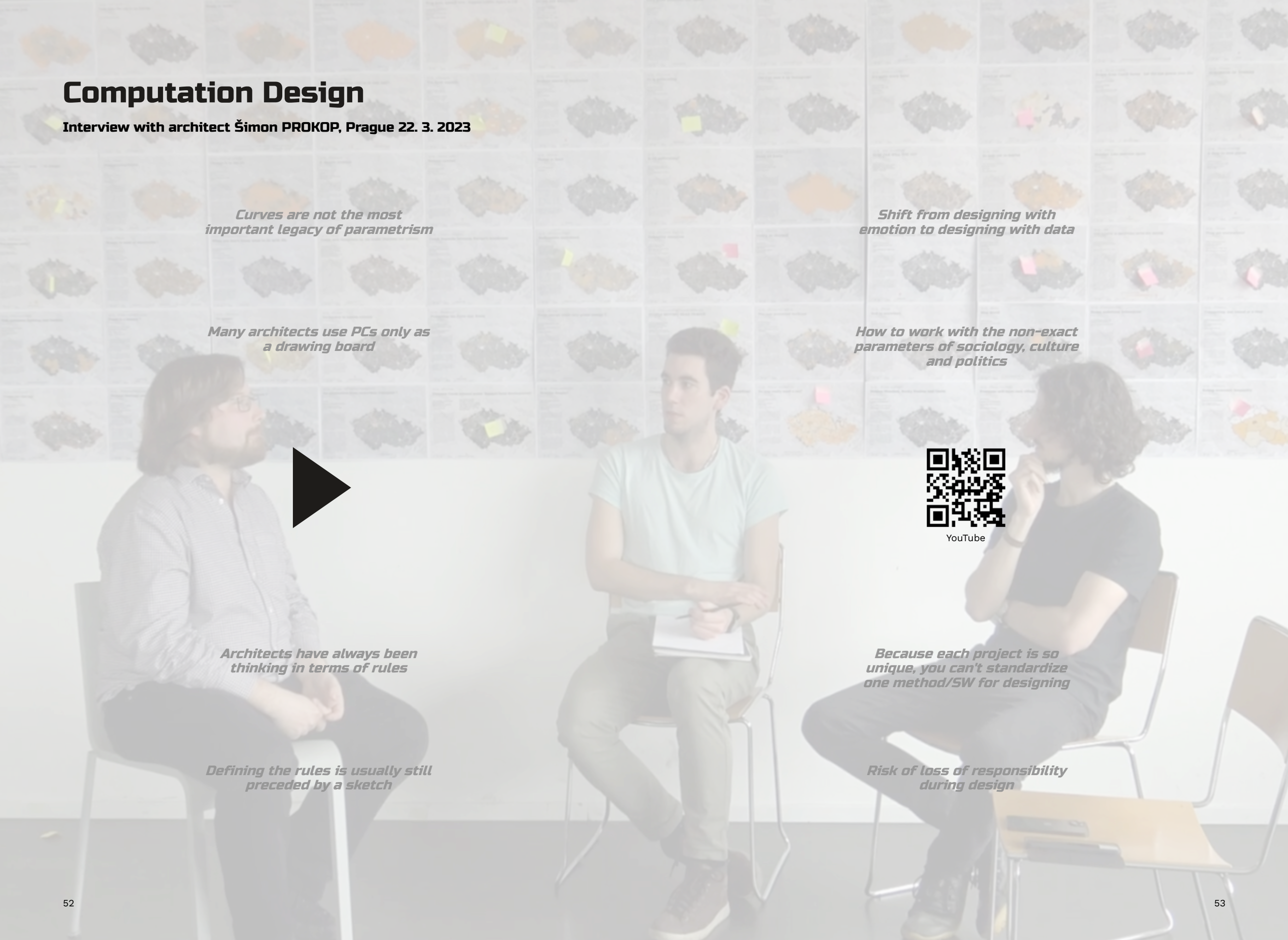
Especially in your country, you can talk so much about the relationship between freedom and structure.

Computation Design

Interview with architect Šimon PROKOP, Prague 22. 3. 2023

Curves are not the most important legacy of parametrism

Many architects use PCs only as a drawing board



Architects have always been thinking in terms of rules

Defining the rules is usually still preceded by a sketch

Shift from designing with emotion to designing with data

How to work with the non-exact parameters of sociology, culture and politics

YouTube

Because each project is so unique, you can't standardize one method/SW for designing

Risk of loss of responsibility during design

Comparison of Structures

Examples and comparison of contemporary and past structuralist projects. How they work with the module and what is their relationship between architect and user.

Centraal Beheer
Herman Hertzberger

The project was designed as an office headquarters for the company of the same name. It consists of units replicated in horizontal and vertical way. The units are empty spaces consisting of slabs, columns, beams, railings and voids that wait for future infill. The infill in this project means different functions (office for individual or open space, meeting room, kitchen, archive and also utilities such as toilets, etc.) that can change during the time.

There is also a strong pressure for a sense of community. Through the voids and the fact that there are no closed corridors and walls, users keep contact on many levels.

Module:
unit

Module size:
9x9 (12x12 with void)

Structure components:
physical element - columns, beams, slabs, voids, bridges

Undefined:
content of the unit, interior, layout

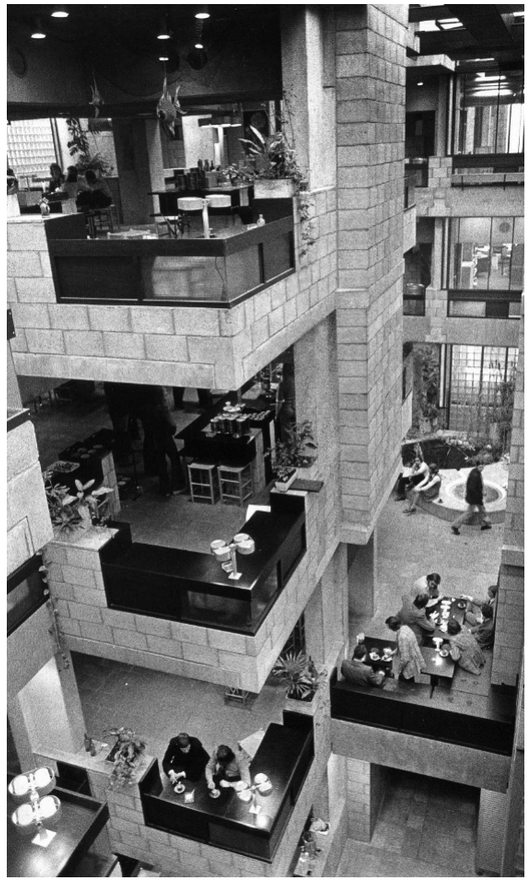
Limits:
homogeneity, daylight, orthogonality, privacy, orientation

Control of the final image?
architect > user

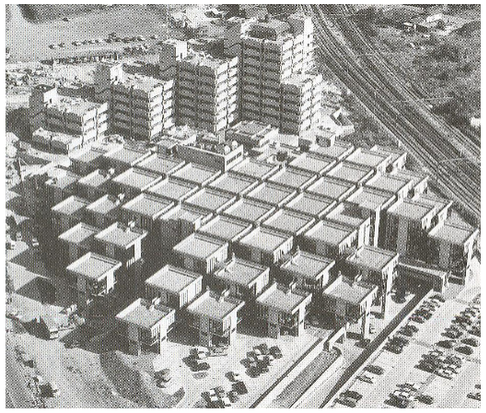
Flexible/movable elements:
no

Advantages:
equality, a sense of community

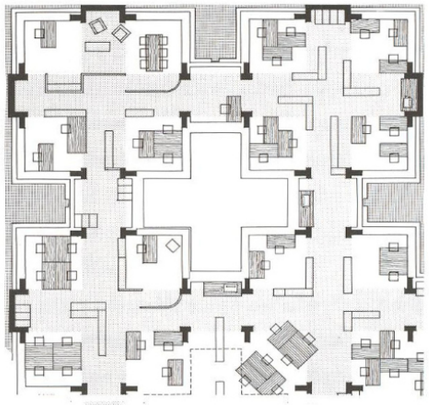
Disadvantages:
too strict, too much order, no contradiction, predictable



Interior [20]



Central view [7]



Infilling system [21]

Centraal Beheer
pre-diploma project

Our team designed a new version of the original system. The new system was determined by daylight, access and privacy.

In contrast to the original version, we allow users to place their "block" in the original units. The requirements was to keep the access points and allow for a corridor through the block. It doesn't matter how the users did it.

The block can be designed for different functions, for one or more original units and with its own construction, material and shape.

Module:
unit

Module size:
9x9 (12x12 with void)

Structure components:
physical element - columns, beams, slabs, voids, bridges

Undefined:
unit, corridor layout, materials, surfaces, functions

Limits:
size of the original unit and its beams, columns, slabs

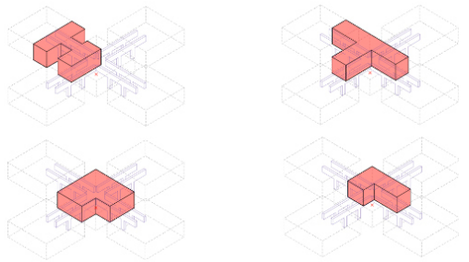
Control of the final image?
architect = user

Flexible/movable elements:
no

Advantages:
3D space for individual expression

Disadvantages:
orthogonality, limited ground clearance (beams), same size of the units

Central view [22]



Infilling system [22]

Scheme of the infilled structure [22]

Half Houses
ELEMENTAL – Alejandro Aravena

The participatory architecture of a Chilean architect Alejandro Aravena tries to solve the problem of rising population, slowness of administration and costs.

His Half-houses represent the idea that it is better for the user to get a half of a quality house than an inferior whole. The second half will be designed and built by the user in the future. This also means that users can optimize the second half to suit their needs.

Module:
house

Module size:
6,3 x 6,9 m

Structure components:
load bearing structure, roof, half of the infill

Undefined:
half of the infill

Limits:
homogeneity of the final shape

Control of the final image?
architect = user

Flexible/movable elements:
no

Advantages:
user's freedom of visual expression

Disadvantages:
each undefined space is the same (size, shape)

Half-infilled [17]

Full-infilled [17]

New Babylon
Constant Nieuwenhuys

This hypothetical project by the Dutch artist focuses on the new social context in which there is no need to earn money and fight for survival. The future belongs to the "homo-ludens", people whose purpose in life is to be creative, explore and wander the world.

The construction that represents the new layer of the environment is made up of huge elements such as columns, slabs, steel constructions and different kinds of fillings.

The structure is moved up the ground, forming an endless network across the world.

Module:
no

Module size:
-

Structure components:
different type of load bearing structure, frames, splitting systems

Undefined:
infill, grow

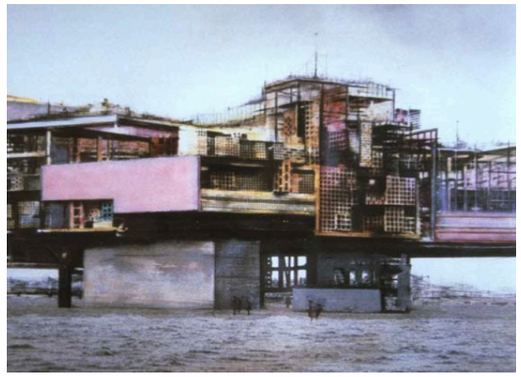
Limits:
minimum order, chaos, uncertainty, a lack of organization

Control of the final image?
architect < user

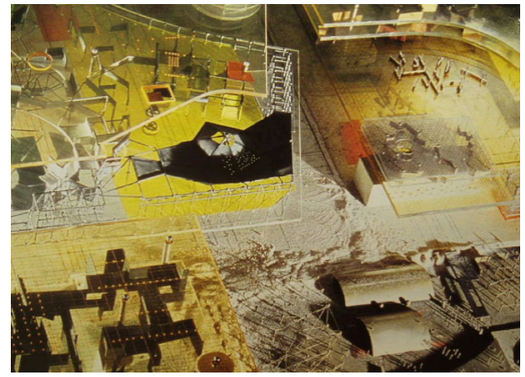
Flexible/movable elements:
no

Advantages:
user's freedom of visual expression, each piece and space is unique, endless possibilities

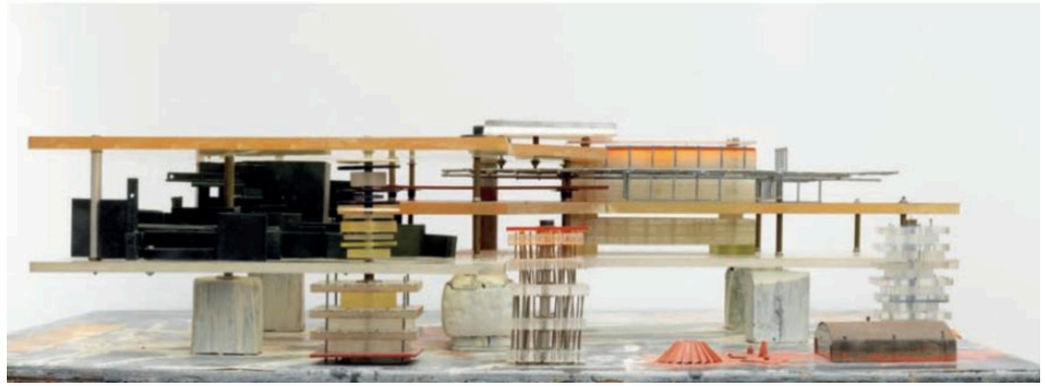
Disadvantages:
no rules



Hypotetic view [23]



Infilled detail [23]

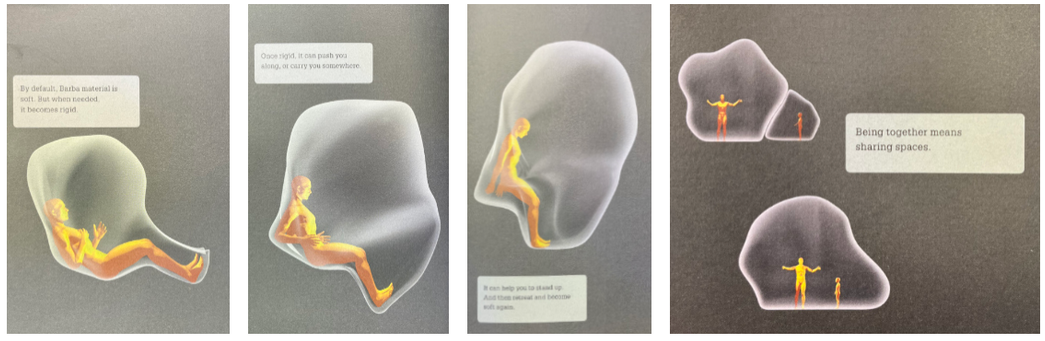


Sector model [15]

Barba
The Why Factory

The aim of this theoretical project is to reduce the volume of unused space and to design a new type of space that is flexible and corresponds with real needs of the user.

The space and the form are called Barba.
A hypothetical material that can shrink and stretch, merge and split, or transform into any shape.



System of a change [24]

Section [24]

Module:
individual space

Module size:
relative

Structure components:
abstract flexible fabric

Undefined:
shape, purpose

Limits:
technologies, user’s needs, freedom

Control of the final image?
architect < user

Flexible/movable elements:
yes

Advantages:
effectivity, changeability

Disadvantages:
the language of form is homogeneous, a loose fixed point in the lived environment

(w)Ego
The Why Factory

In relation to the Barba concept, the (w)Ego project pushes the idea of the fully used space into the more realistic boundaries.

The key element of this project is a game, where a group of people upload images of their favorite spaces. After that, AI generates the first instance of the form and the future residents have to negotiate through the game process.

As a result, we get completely new housing typologies based on real dreams and negotiations of the residents.

Module:
flat

Module size:
relative

Structure components:
abstract rules/game

Undefined:
shape of space, how they will be divided

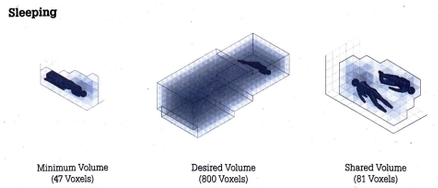
Limits:
organizations

Control of the final image?
architect > user

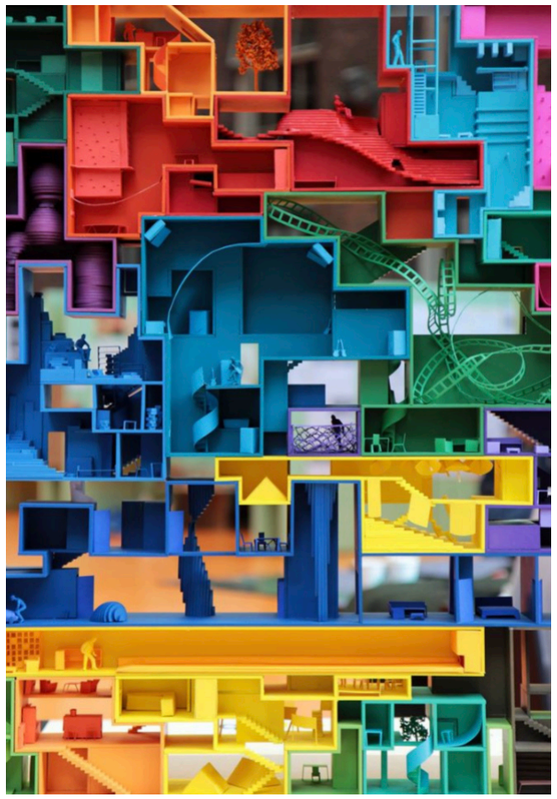
Flexible/movable elements:
no

Advantages:
diversity based on the users preferences, system can compromise

Disadvantages:
orthogonality, everything is created simultaneously.



Voxel Cloud [25]



The (w)Ego Game [26]

A Zero Star Hostel
The Why Factory

Following the (w)Ego project, A Zero Star Hostel does not only work with the given group of people. The concept can be described as a discretized Barba. Instead of a fabric we now have movable beams.

The shape of a room depends only on the actual needs of the users and can be changed at any time. If there are some spaces that aren't used, the system rebuilds the whole composition and other spaces can use these unused spaces as an advantage.

Module:
room space

Module size:
relative

Structure components:
mechanical beams (1,2 x 0,2 x 0,4 m), framework, change controlled by the system

Undefined:
space division and shape, specific function

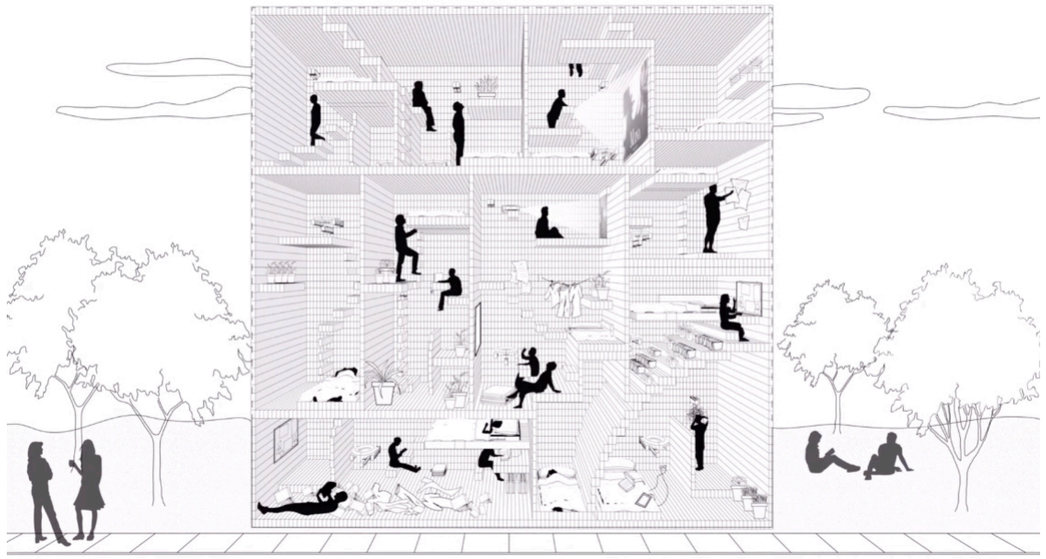
Limits:
organizations, always the same beam

Control of the final image?
architect < user

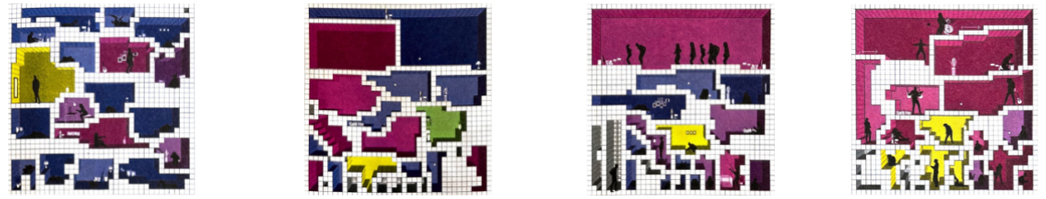
Flexible/movable elements:
yes

Advantages:
the idea of using the space when it's needed

Disadvantages:
not the user, but the system changes the shape, disorientation



Hostel section [27]



Rebuilding iterations [16]

Freeland

MVRDV & The Why Factory

Freeland is an alternative way of designing a new neighborhood that is self-organized and user-driven.

The project works with empty landscape areas. Then they set rules for the plot and a ratio of functions. How? In what way? That is up to the user.

Users can also collaborate and fulfill the rules together. This means that each individual plot doesn't have the same percentage of functions.

Module:
residence

Module size:
relative

Structure components:
percentage of function area

Undefined:
shape

Limits:
shape between the plots

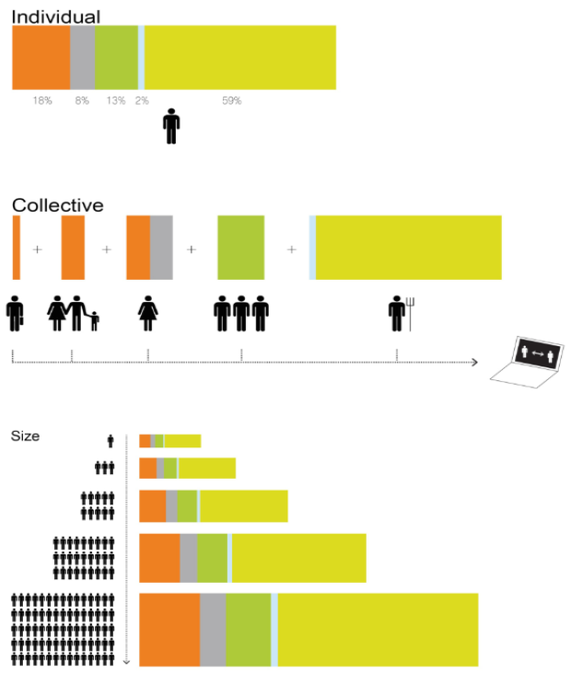
Control of the final image?
architect < user

Flexible/movable elements:
yes

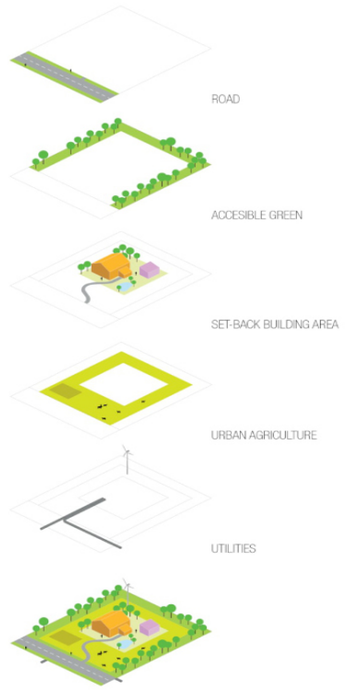
Advantages:
user's freedom of visual expression, each piece and space is unique, land registry alternative

Disadvantages:
only 2D system

Top view [28]



Ratio of programs area used in relation to area [28]



Rules for a plot [28]

Discrete Architecture

Gilles Retsin

This concept focuses on how we can answer many individual problems in a shorter and more effective time. The answers are discretized into a universal system that can be used anywhere.

As a result of this methodology, he designed a new element that discretizes all other construction parts. It's easy to create, connect, transform and rebuild. It's universal and can be used anywhere.

Instead of this project also referencing universal, replicable architectural ideas such as Aldo van Eyck and his Orphanage, we can say that the result isn't as oriented towards users, functions and social context as the previous project.

Module:
beam

Module size:
1,2 ~ 10 m

Structure components:
wooden beams, used as a brick for vertical and horizontal construction

Undefined:
-

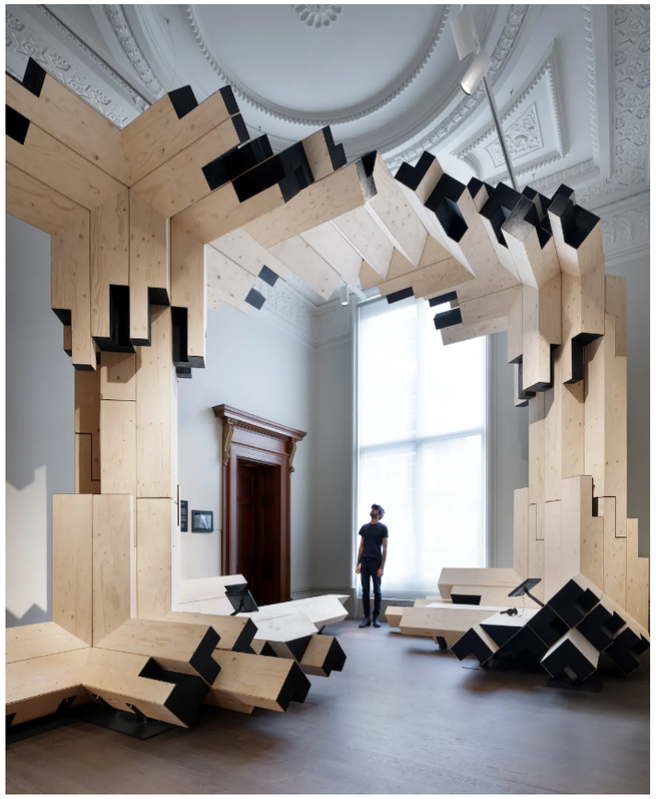
Limits:
statics

Control of the final image?
architect > user

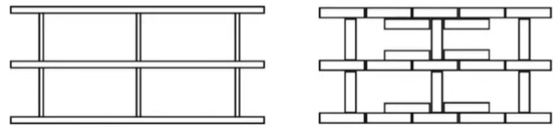
Flexible/movable elements:
-

Advantages:
price, robotization, same system for every shape

Disadvantages:
homogeneity, it’s not about the user and program, only construction system



Installation at the London Royal Academy [19]



Transfer from Domino into Discrete [19]

Diagrams

Followed diagrams focus on the final physicalized representation of the previous structures. It tries to describe the relationship between the structure order and a way of infilling and ability of a system to transform itself.

Addition used in the *Freeland* project is based on the abstract rules and enable infilling during the long time period without any shape definition.

Fulfilling used in the strict physicalized structure is core of the *Centraal Beheer* project. It uses the same repetitive modules format of the structure which are fulfilled in the same shape.

Overlap develops in the *pre-diploma* project allow infill the strict structure not only by fitting elements.

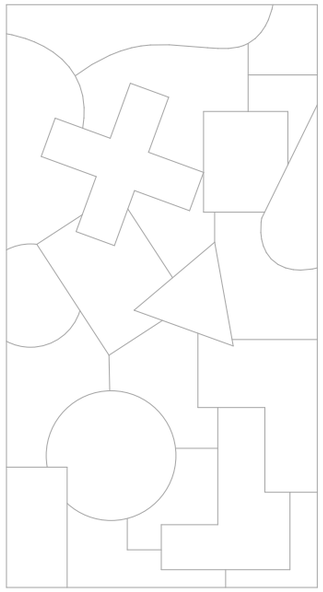
Subtraction used in *MVRDV* competition project in Prague disrupt homogeneity of the system. The result enable exception that helps the system works in bigger scale.

Shrinkage is a result of the high-level flexibility of the space. The *Barba* project use it as a way that fulfilling the actual users need in short time period.

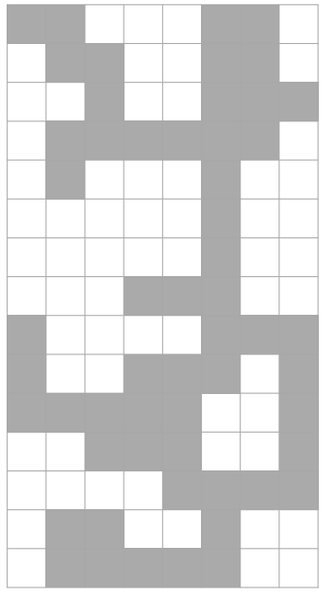
Discretization cut the predefined result into a small discrete piece that allow quick and cheap reorganization in future.

Layers are a tool how to provide new space for user but with the relation to the previous. Each layer is based on the previous and at the same time the previous layers are influenced by the new one.

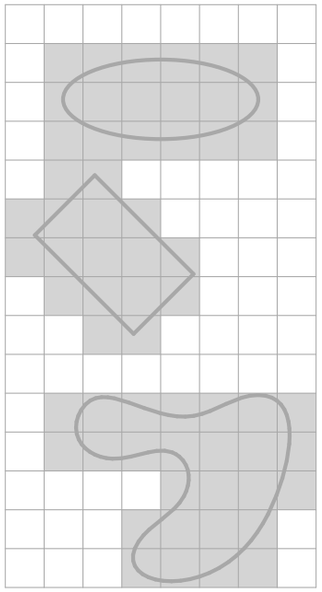
Split/Merge system allow transform the same structure into different scales. However, it is still a multiplication of the based module.



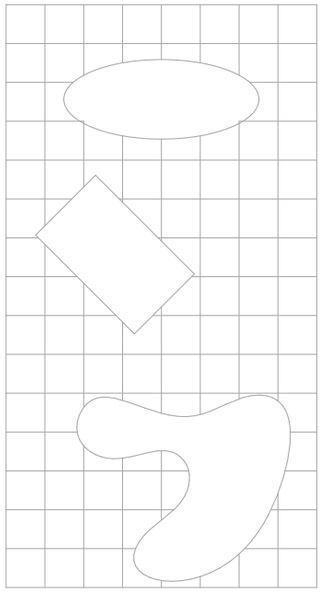
Addition
Freeland



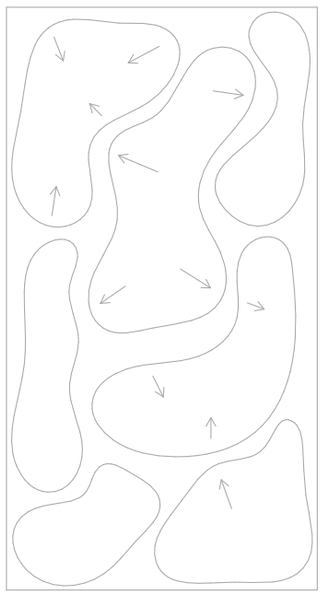
Fulfilling
current Centraal Beheer,
Half-Houses



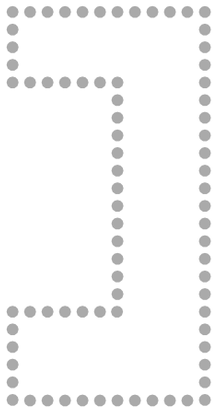
Overlap
pre-diploma Centraal Beheer



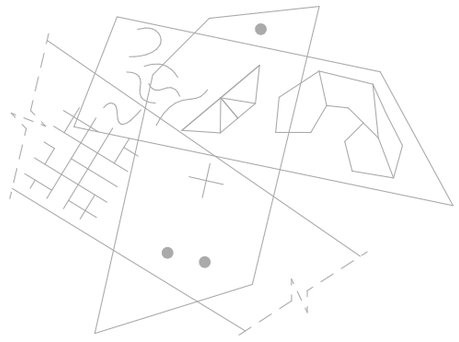
Subtraction
MVRDV, Bubny Prague



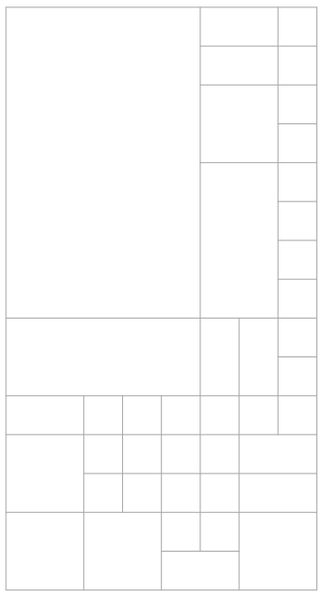
Shrinkage
Barba



Discretization
Gilles Retsin



Layers
Constant



Split/Merge
current Centraal Beheer

Structuralism Without The Physical Structure?

Conclusion of the theory and discussion of the abstract rules.

Is Structuralism the right term?

If we go back to the 1970s and remember how architects were afraid to use the official term structuralism because of its possible misinterpretation, the question is whether structure is really the right term.

In the following directions that continued the ideas of structuralism, we saw the tendency towards rule-based design and systems that control architecture. Using these shortcuts, we can say that the

structure is something that provides the basic principle / basic system.

It doesn't matter whether the structure is materialized or abstract.

It's a kind of system that the architect has set up, like a playground for future use.

The goal is to offer enough stability to facilitate use and enough freedom to provide a space for flexibility, individual needs and expression.

Structuralism without the physical structure?

It's also possible to say that physical representation or repetitiveness is not necessary.

The structure that provides the basic framework could also be abstract.

For example in MVRDV's urban project Freeland. There the structure is just a simple list of rules that define the main relationships between users with a sense of sustainability. From this point, however, we are now at a level where we can ask ourselves: is there any difference between this and current urban systems?

Can we mark the current urban systems with the master plans and laws that set all the regulations as structuralism?

Both only set the basic framework. Both calculate with a freedom of the user.

If we look back to the time of the original structuralism, we could say that there should always be a sense of dependency between the individual and the community. That is, the system should provide an environment for both the individual and the community, and help people feel a sense of belonging to the place.

The Edge of The Structuralism

Interview with architect Szymon ROZWAŁKA, Brno 9. 2. 2023

JN – What do you think about creating structure only through written rules? Is it still the structuralism way of designing, or do you think that it's only an alternative way to an already existing and commonly used system? For example, building regulations, which define how we can design and place buildings in the landscape, are also essentially a set of written rules within which we can do whatever we want.

SR – The difference is small but significant.

How public space looks and acts is usually decided by someone anonymous. The mother of my wife, for example, lives in a housing estate where people have taken a shortcut from the car park to the house. Then someone put a fence along the pavement and now they have to walk around it. Someone decided to do that and the real users of the space don't even know why. Some public space administrator made that decision without any communication with the people who live there. It's the main reason the residents feel almost no personal connection to their neighborhood.

It is often said that the problem with housing estates is the relationship between the built-up and the unbuilt-up. I tend to think that the fundamental problem is the impersonal nature of that relationship. The person who lives on the estate and uses the space does not feel that it is his/her space. He/she cannot even stamp out the mentioned path.

And now to your question.

If the new structure I'd be looking for was a city, you could walk through a sort of patchwork of individualities,

where the individual person only decides on a fragment of public space.

That fragment could meet the individual's requirements, but there would no longer be any ambition to make decisions on behalf of the public about the city as a whole, which is very often used as a method of manipulating the public.

Too often our freedom ends at the door of our house. You can do what you want inside, but not outside. Regulations often infringe on my privacy beyond what is acceptable to me, for example, the color of my house or the height of the building, the functional use or the materials used.

In that regulatory process, someone has decided, in the name of "us", that "I" am no longer the one who decides but "I" am the one who must submit to "us". For me this is the crucial difference, however small it may seem. I believe that classical "structuralism" was concerned with these issues. Questions that have disappeared from architectural discourse for quite a long time.

JN – So isn't it more a problem of misnaming what structure is and what it isn't? Because from what you're saying it still seems to be the same in principle, and we're moving towards the idea that structure can actually be anything.

SR – I have to say that I personally don't like the word structure at all, because it's too misleading. Perhaps it would be more appropriate to use another word. System? The logic of the structure? The logic of the territory?

Structure for me has always been associated with construction. Then I see structure as something stable because structure is stable. You can remove a window, a door, a partition, but not a load-bearing wall.

JN - And isn't it the same with written rules that just aren't visible?

SR – There are different types of rules.

We have state legislation and standards. They are not tied to a specific location. And then there are local rules in the form of Master and Regulation Plans - those are written specifically for a particular location. Personally, I don't have a problem with standards and legislation at the State level. In fact, they are constantly changing as society evolves.

The problem for me is the form of local legislation (Master Plans etc). Here behind the concept of "common good" architects and urban planners create their personal visions of the whole. Visions in which city users have no involvement.

All participatory moments in the approval of master plans are a necessary evil for their designers. An evil that they would prefer to eliminate as it limits and reduces efficiency and quality. I think even the creation of these entries was taken as an insurance policy, not a method of creation. It is merely a control mechanism. A mechanism that almost always comes too late.

Then I further distinguish rules into fixed and flexible. State legislation is flexible and is modified by parliament. It takes time, but it works. Local legislation unfortunately is more fixed and this is where there is space for "structuralist" thinking.

Of course I am aware that there is no space without rules, regulations etc. For example at *Hertzberger's* Centraal Beheer we have different degrees of regulation. Especially the structural grid, which is too dominant. You can still feel from the structure that there is the ARCHITECT somewhere who controls everything. For this reason I like the text Junkspace by *Rem Koolkaas*, which has a short but important passage going back to classical structuralism.

Just the fact that classical structuralism is so rigid, yet didn't have to be, leads me to look for new ways. Currently, the closest thing to this is *MVRDV's* Freeland (Almere Oosterworld) project and in Czech context, the Territorial Study for Prostějov by *C+HO_aR and Tomáš Pejpek*. This is what I would expect from today's "structuralism".

The works of *Herzberger, Van Eyck, Friedman* or *Metabolist* are amazing, but

the greatest pearl is New Babylon by Constant. There, the ARCHITECT is not felt.

New Babylon was not meant to be designed by the artist/architect, but by society, a vision that is still difficult for most architects to imagine.

Hranice Strukturalismu

Rozhovor s architektem Szymonem ROZWAŁKOU, Brno 9. 2. 2023

JN – Vnímáte tvoření architektonické struktury pomocí pravidel, bez fyzické konstrukce, stále jako návaznost na strukturalismus nebo se jedná pouze o alternativu něčeho existujícího a běžně používaného? Například stavební legislativa, které nám definuje, jakým způsobem můžeme stavby navrhovat a umisťovat v území, je ve své podstatě také soubor psaných pravidel v rámci, kterých si můžeme dělat co chceme.

SR – Rozdíl je malý ale podstatný.

O tom, jak veřejný prostor vypadá, jak působí rozhoduje většinou někdo anonymní. Například matka mojí ženy bydlí na sídlišti, kde si lidi z parkoviště vydupali cestu do domu, zkratku. Posléze tam někdo postavil plot podél chodníku a oni teď musí chodit okolo. Někdo to rozhodl a skuteční uživatelé prostoru ani neví proč. Nějaký správce toho veřejného prostoru rozhodl bez jakékoliv komunikace s lidmi, kteří tam bydlí. To je hlavní důvod, proč obyvatelé necítí téměř žádný osobní vztah ke svému okolí.

Často se mluví o tom, že problémem sídlišť je vztah zastavěného a nezastavěného. Já se přikláním k názoru, že základním problémem je právě neosobní charakter onoho vztahu. Člověk, který na sídlišti bydlí a používá ten prostor necítí, že je to její/jeho prostor. Nemůže si tam ani vydupat tu zmíněnou cestu.

A teď k Vaší otázce.

Pokud by nová struktura, kterou bych hledal byla městem, mohli byste chodit jakýmsi patchworkem individualit, kde

jednotlivý člověk rozhoduje pouze o fragmentu veřejného prostoru.

Ten fragment by mohl splňovat individuální požadavky jednotlivce, ale už by zde nebyla žádná ambice, rozhodovat ve jménu celé veřejnosti o městě jako celku, což se velice často používá jako metoda manipulace veřejnosti.

Příliš často naše svoboda končí za dveřmi našeho domu. Uvnitř si dělejte, co chcete, ale venku už ne. Regulace se často dotýkají mého soukromí za hranou pro mě přijatelného, například barevnosti mého domu nebo výšky zástavby, funkčního využití nebo použitých materiálů.

V tom regulačním procesu někdo rozhodl, ve jménu „nás“, že „já“ už nejsem my, kteří rozhoduji ale „já“ jsem ten, který se „nám“ musí podřídit. Pro mě tohle je ten zásadní rozdíl, i když se zdá být malý. Věřím, že klasický „strukturalismus“ se věnoval tímto otázkám. Otázkám, které se na docela dlouho vytratily z architektonického diskurzu.

JN – Není to tedy spíš problém nesprávného pojmenování, co je a není struktura? Protože z toho, co říkáte se stále zdá, že principiálně je to stejné a směřujeme k úvaze, že struktura může být vlastně všechno.

SR – Musím říct, že osobně vůbec nemám rád slovo struktura, protože je příliš zavádějící. Bylo by vhodné proto využít možná jiné slovo. Systém? Logika stavby? Logika území?

Struktura se pro mě vždy asociovala s konstrukcí. Pak strukturu vnímám jako něco stabilního, protože konstrukce je stabilní. Můžete odstranit okno, dveře, příčku ale nosnou stěnu ne.

JN - A není to stejné i se psanými pravidly, které akorát nejsou viditelné?

SR – Jsou různé typy pravidel.

Máme statní legislativu a normy. Ty nejsou spojeny s konkrétní lokalitou. A pak jsou lokální pravidla ve formě Územních a Regulačních Plánů – ty jsou psány přímo pro konkrétní lokalitu. Osobně nemám problém s normami a legislativou na úrovní Státu. Dokonce jsou konstantně upravovány v rámci vývoje společnosti.

Problémem pro mě je forma lokální legislativy (Územních Plánů atd). Tady si pojmem „common good“ architekty a urbanismu tvoří své osobní vize celku. Vize, do kterých uživatele města nemají vstup.

Veškeré participativní momenty v schvalovaní územních plánů jsou pro jejich tvůrce nutným zlem. Zlem, které by nejraději odstranili jako omezující a snižující efektivitu a kvalitu. Myslím, že dokonce vznik těchto zápisů byl brán jako pojistka nikoliv metoda tvoření. Je to pouze kontrolní mechanismus. Mechanismus, který přichází téměř vždy pozdě.

Dále rozlišuji pravidla na fixní a flexibilní. Statní legislativa je flexibilní a je upravovaná parlamentem. Potřebuje to čas, ale funguje to. Lokální legislativa bohužel je spíš fixní a právě tady je prostor pro „strukturalistické“ myšlení.

Samozřejmě jsem si vědom toho, že neexistuje prostor bez pravidel, regulací atd. Například u *Hertzbergera* v Centraal Beheer máme různé míry regulovanosti. Hlavně konstrukční rastr, který je až příliš dominantní. Stále je z té struktury cítit, že je tady někde PAN ARCHITEKT, který to vše kontroluje. Z toho důvodu mám rád text Junkspace od *Rema Koolhaase*, ve kterým je krátký ale důležitý odstavec odnášející se do klasického strukturalismu.

Už jenom proto, že klasický strukturalismus je tak rigidní, a přece nemusel být, mi dává smysl hledat nové cesty. V současnosti tomu má nejblíž projekt Freeland (Almere Oosterworld) od *MVRDV*. V Českém kontextu Uzemní Studie pro Prostějov od *C+HO_aR a Tomáše Pejpka*. Toho bych očekával od současného „strukturalismu“.

Práce *Herzbergera, Van Eycka, Friedmana* nebo *metabolistů* jsou úžasne, ale

největší perlou je New Babylon od Constanta. Tam PAN ARCHITEKT není cítit.

New Babylon neměl být navržen umělcem/architektem, ale společností. Vize dosud těžce představitelná pro většinu architektů.

System

Description of my vision for a new structuralism.

Could we set rules for a 3D system without shape limitations?

Can there be a structure where the user holds both private and public?

Summary of The Existing

Most of the projects of contemporary structuralism, which have been described in more detail in the previous pages, do try to break away from the physical representation of the system and work only with abstract rules. However, some of them, such as *Barba*, hit the technological limits of our time; others, such as *wEgo*, work with a predefined group of people and do not further adapt the result to the user's needs. In the project *A Zero Star Hostel*, as in *Barba*, we encounter the problem of changing the environment too dynamically and losing the user's orientation.

Moreover, in *Barba, wEgo, A Zero Star Hostel, Centraal Beheer and Half-Houses,* there is still a feeling of homogeneity in the final form of the building. *Barba* is formed by differently sized bubbles, *wEgo* through voxel discretization of space works only in a rectangular system. In the project *A Zero Star Hostel,* the building is constructed by a single beam repeated many times.

This homogeneity is the resulting image of the boundary of the system designed by the architect, after which users' freedom ends.

The *New Babylon* and *Freeland* projects come closest to a system that is not homogeneous. It offers more freedom, while framing the whole with rules. Rules that help users fill the space over time.

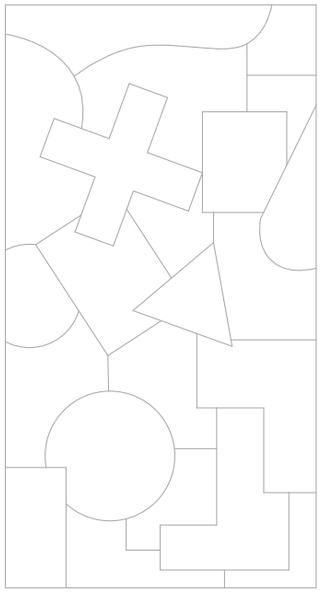
However, the problem with *New Babylon* was that the rules were too vague. The system was created in unclear conditions through a sculpted framework. In *Freeland*, on the other hand, the basic framework is clearly defined through rules. However, it is only an urban project where the set rules only work in 2D space.

The proposal of this thesis aims to propose a new concept of the system, combining the dynamics of the New Babylon project, represented by the dialogue of individualities that, even without strict order, can form one unpredictable whole, and the Freeland project with its additive principle framed only by the necessary relationships between users.

Moreover, the project works with an alternative conception of the design and use of public space. The main aim is to shift the responsibility for design and management closer to the real users.

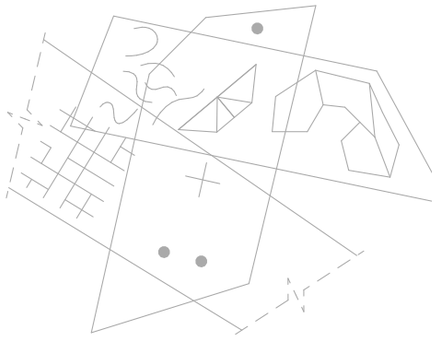
The outcome is a set of rules that allow users to define their space within a defined framework. As an example of the relationships that can arise in the system, the designed rules are applied to a fragment defined only by its total volume, and orientation to cardinal directions.

While this project tries to uplift the role of users and their influence on the outcome of the architectural project, it would be naive to believe that we can simulate the wishes, preferences and decisions of potential users. Therefore, the final form of the fragment is an example of what it would look like if the users' wishes were processed by only one architect.



Addition
Freeland

+



Layers
New Babylon

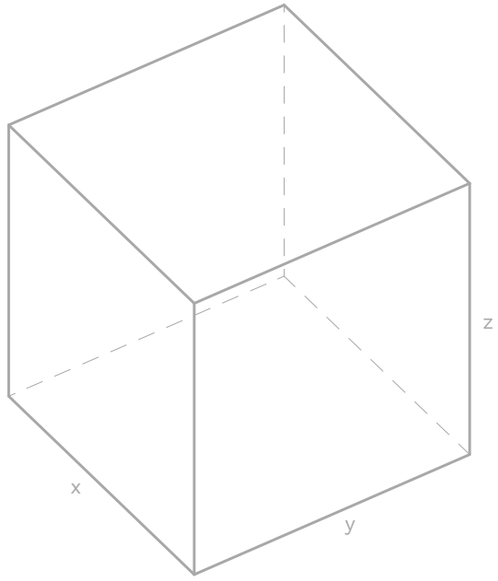
=

3D Addition

Framework

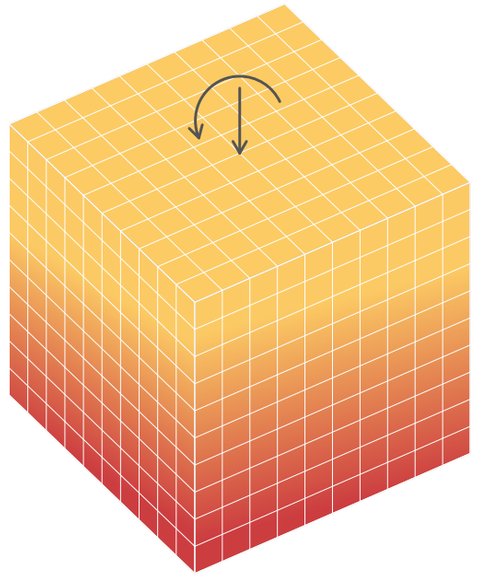
Space for future development.

Framework



Volume

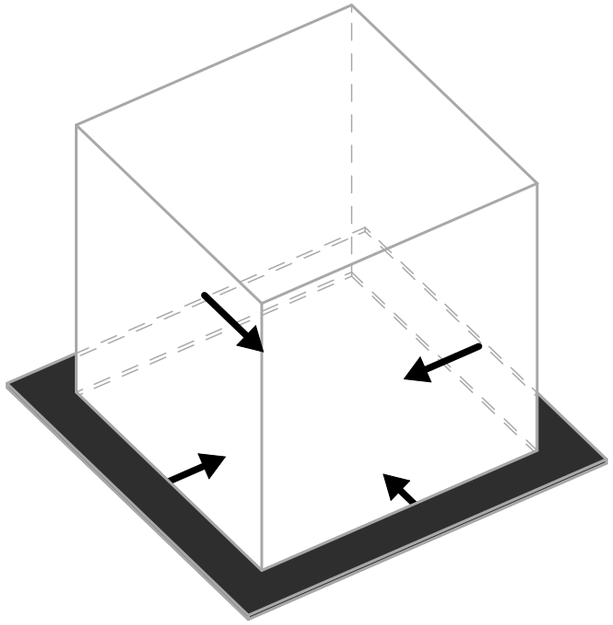
Before development begins, the volume must be set. It can have different shapes, heights and it can also grow during the time depending on the context conditions. This will be the playground for the future inhabitants.



Distribution of loads

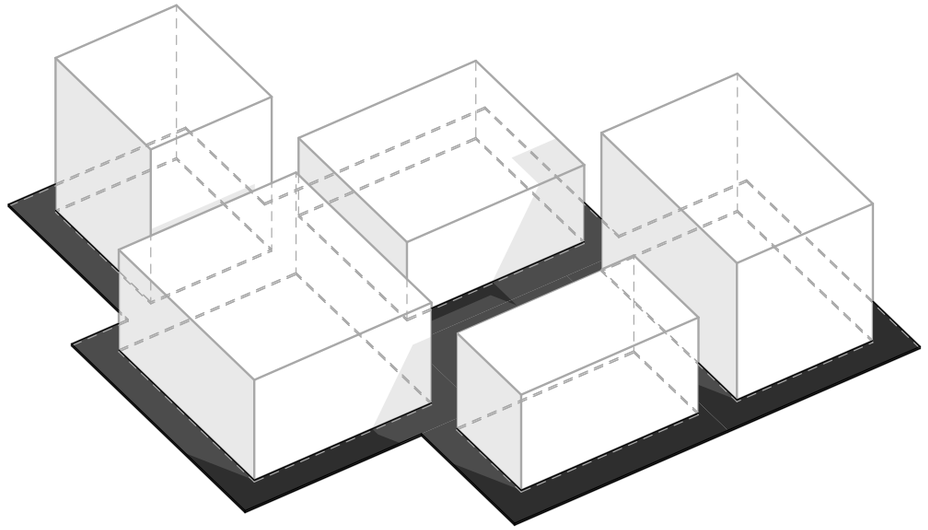
As the shape, location, type and construction system of the future infill can be very different, the volume calculates the expected construction loads and creates a discretized matrix that must be respected.

Infrastructure



Connection with infrastructure

The urban infrastructure will be designed all around the framework volume to allow easy access and circulation.



Urban arrangement system

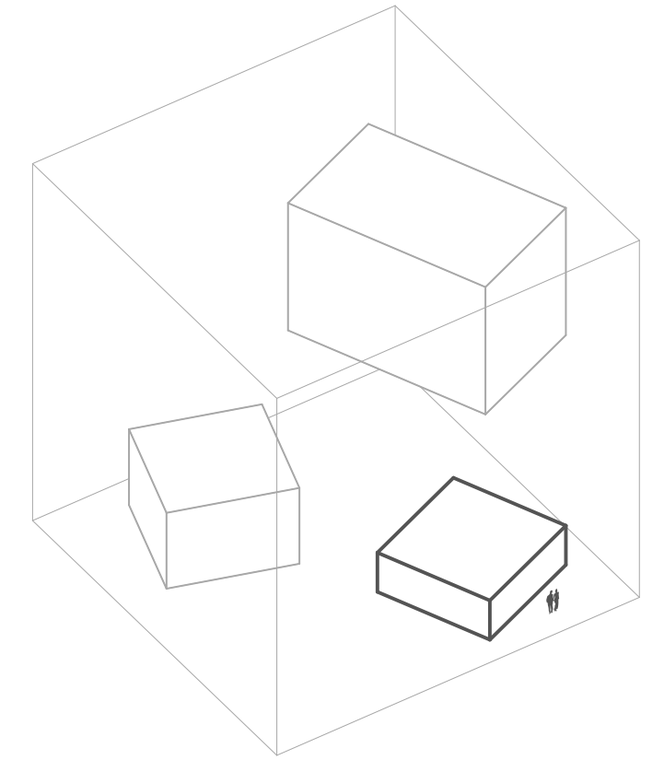
The volumes with different shapes must always be related to the current urban situation. If there is a potential of overlap of an infrastructure space it can be shared with more framework volumes.

Rules

How to create your own space within this framework?

Instead of buying a plot in the current city system, you can now buy a 3D space.

Choose a specific volume and shape for your home and place it in the framework!

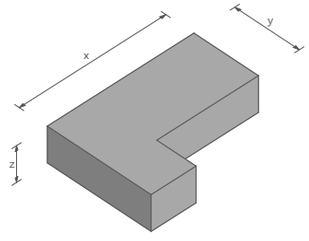


My space inside the framework

Inside Your Space

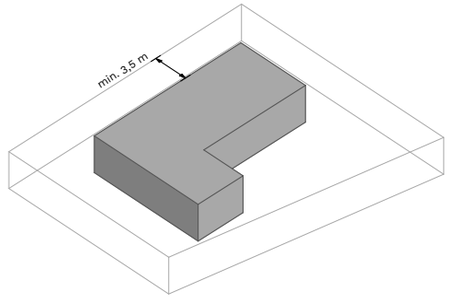
Volume & shape

Inside your space you first define the volume and shape of your future house. One-storey or multi-storey, compact, L-shaped or curved, etc.



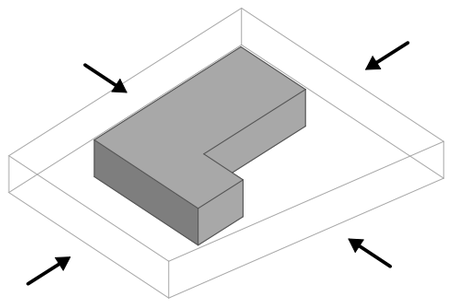
Distance from others

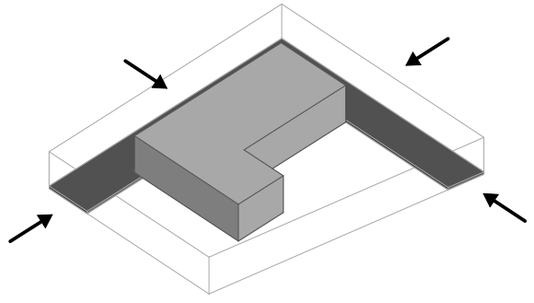
Keep distance from other neighbors. Make an offset of min. 3,5 m from your house. Distance is used as a privacy creator and for other exterior spaces of your new home. The boundaries of the offset will define the volume of your space in the framework.



Access

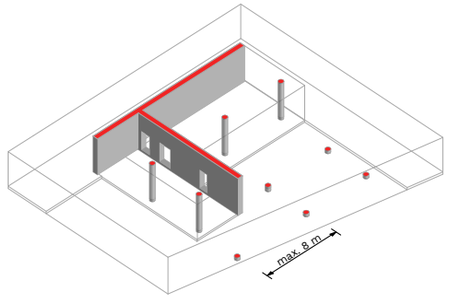
Infrastructure is a necessary part of neighborhoods. Unlike the current urban system, there are no pre-defined paths. In your space, you decide where the entry points will be. You must have access from 4 different sides. How you do that is up to you.





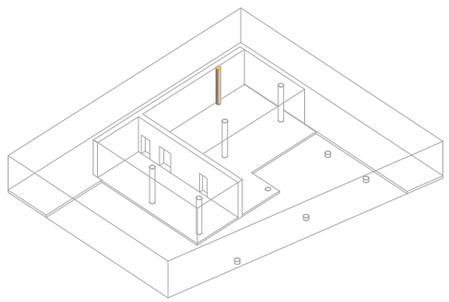
Pathway

Once you have decided where the access points will be, you need to connect them. The path can go around the edge of your space, diagonally through your house or as part of your garden, etc. It is all up to you. And because it is still your pathway, you can design and use it in your own way. Just remember that the path will be used by your neighbors too.



Statics

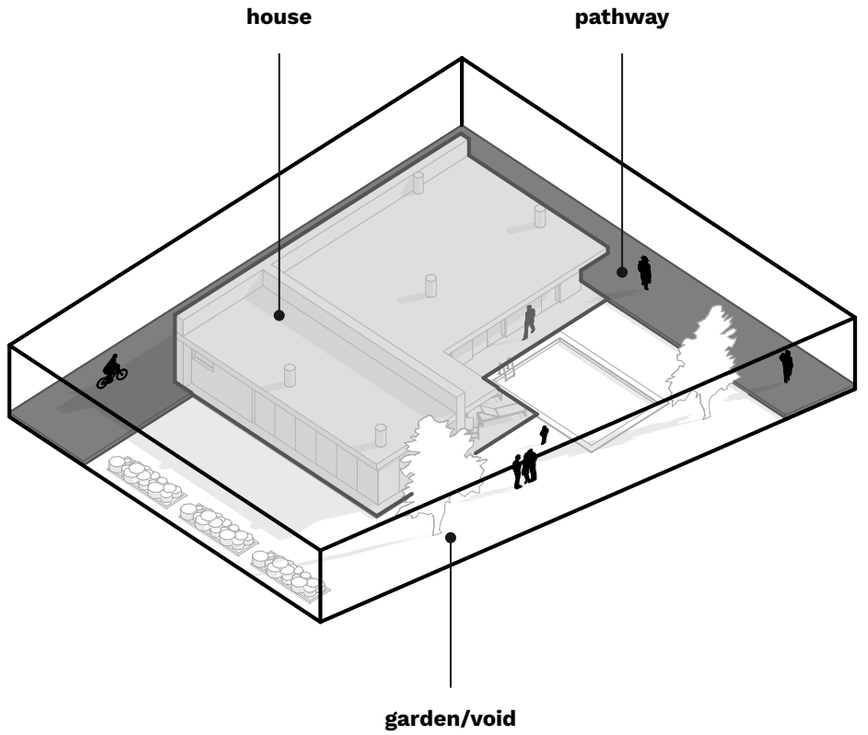
Statics is a key factor in how well the 3D framework can be layered. Within your space you can use any type of load-bearing elements, but no more than 8 metres apart. You have left their highest point as a support for future neighbors. This also applies to your garden, where you can define the place for supports that will help others to build their houses.



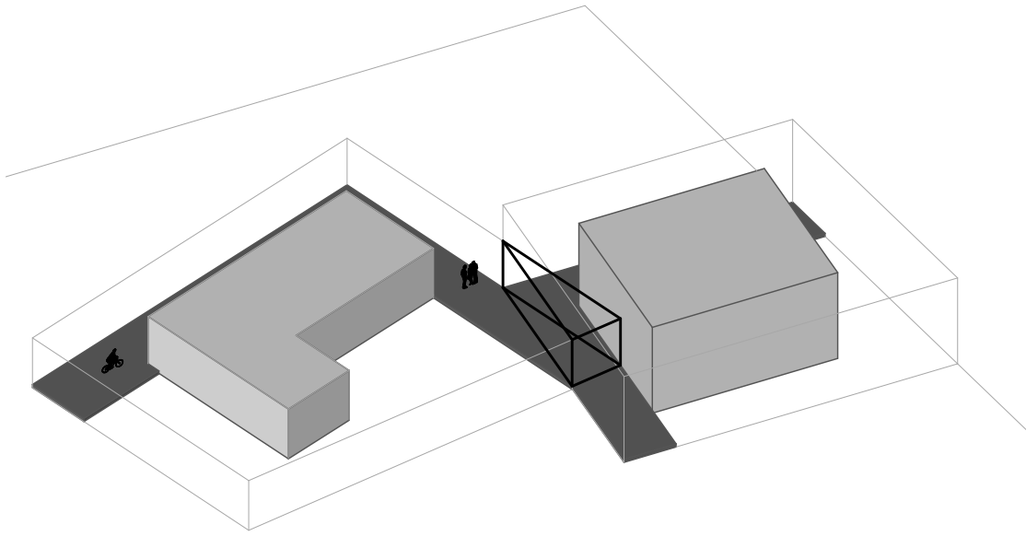
Utilities

Instead of a central distribution system in current buildings, the utilities in the frame work in a similar way to the load-bearing system. In your space, you create a place for an installation shaft next to a load-bearing element. Future neighbors can use the top as a connection point.

Inside my space I’m the owner and creator of both private and public.



Contact With Others

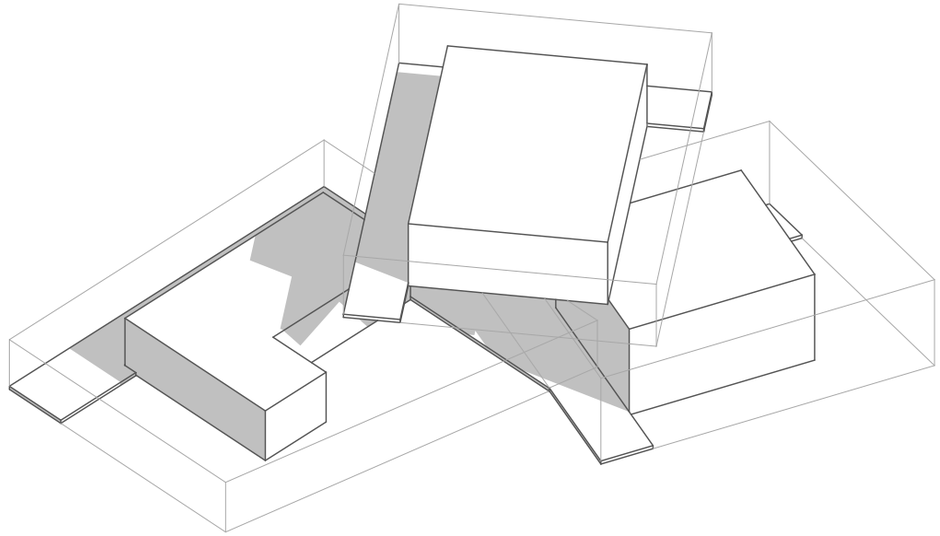


Follow others corridors

To keep the access in the framework, you have to connect your corridor to another or to the edge of the framework.

Corridor space can be shared

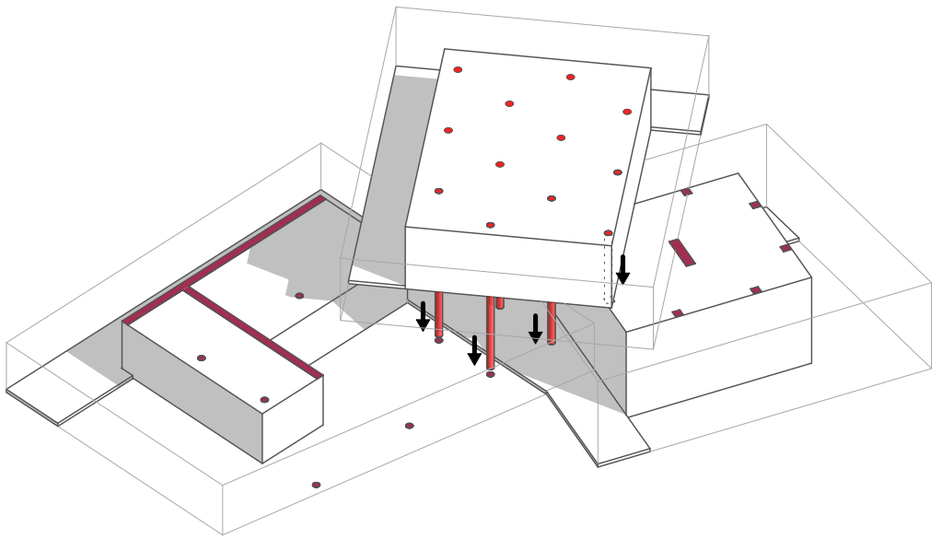
If you want, you can also share the corridor with other neighbors and save the money you would have to pay for a path.



Sun

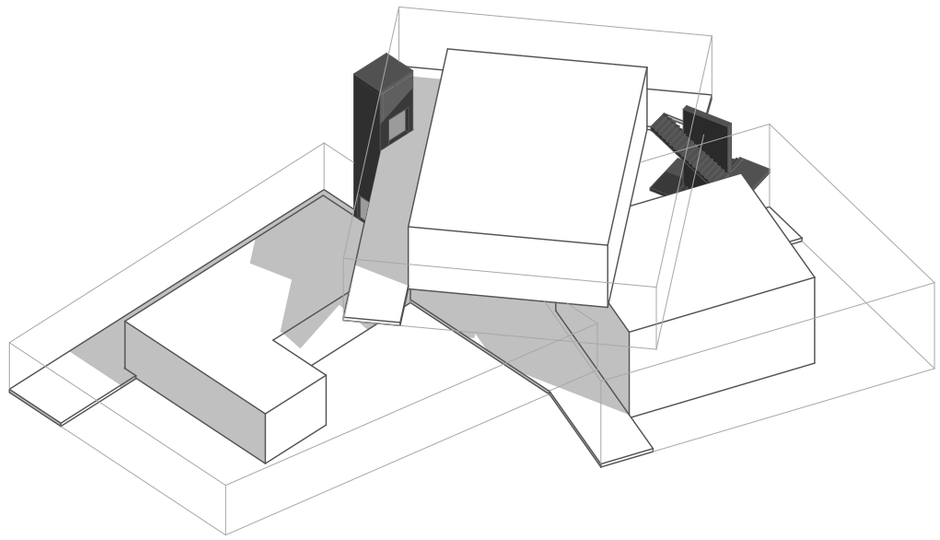
When adding a new space to the framework, keep in mind that the sunlight legislation is still in force. Every building must have enough minutes of daylight by 1 March.

Contact With Others



Places for supports

If you decide to build your house over the previous neighbors, you can follow their load-bearing elements or use the corridor spaces. If there is an unused space in the framework, you can also use it and place your new columns there.



Vertical communication

Need stairs or an elevator? No problem. You can put them into corridors that overlap. If there isn’t enough space you can also use the unused space.

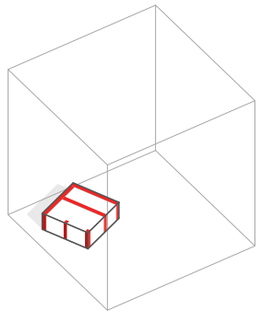
Same rules

Different players

Different strategies

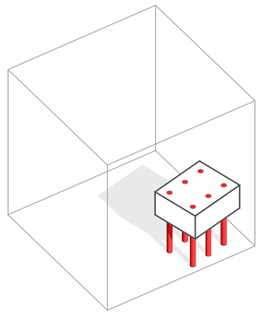
Different results

Different Strategies



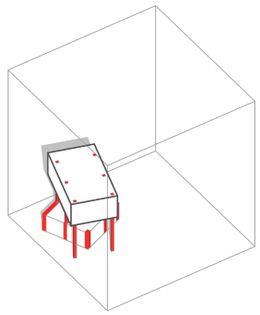
On the ground

+ More options where place the statics
+ Easier access to the space
- Less expensive construction
- Must construct foundations
- Must connect a utilities with the city infrastructure
- Risk of shadows or cover the view from futures spaces



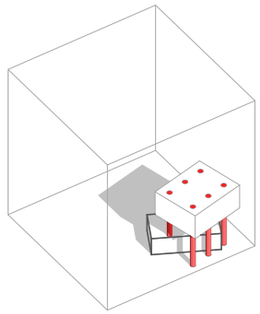
Up to the ground

+ More options where place the statics
- Difficult access to the space, must construct vertical communication
- More expensive construction
- Must construct foundations
- Must connect a utilities with the city infrastructure
+ Lower of shadows or cover the view from futures spaces



Up to the other

- Less options where place the statics
- Difficult access to the space, must construct vertical communication
- More expensive construction
+ Doesn’t have to construct foundations
+ Can connect utilities with the previous
+ Lower of shadows or cover the view from futures spaces

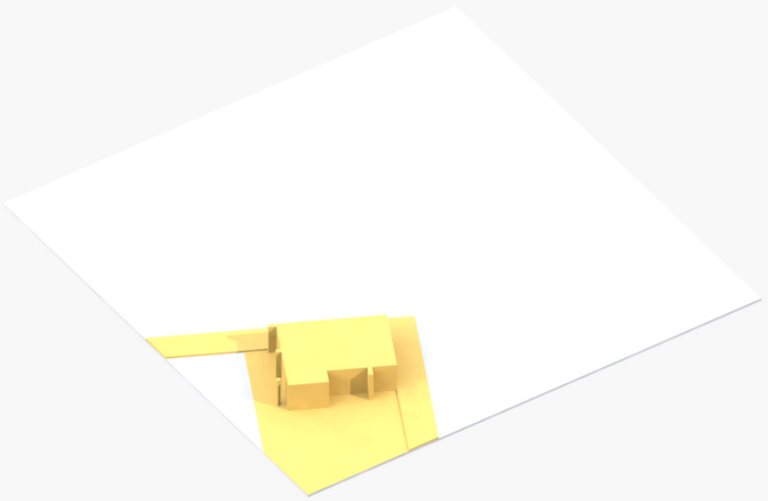


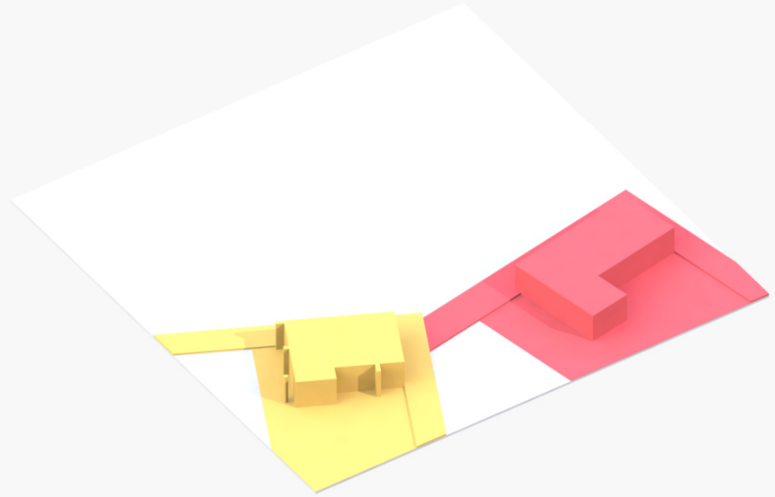
Below the other

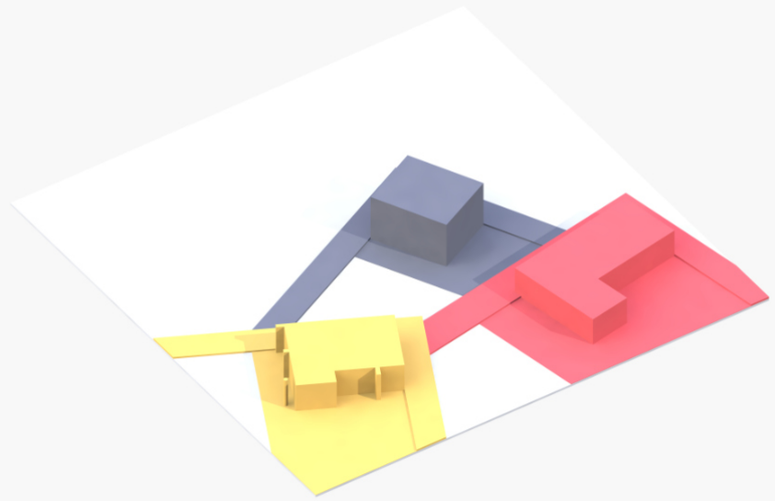
- Less options where place the statics
- Difficult access to the space, must construct vertical communication
+ Less expensive construction
+ Doesn’t have to construct all foundations
+ Can connect utilities with the previous
- Risk of shadows or cover the view from futures spaces

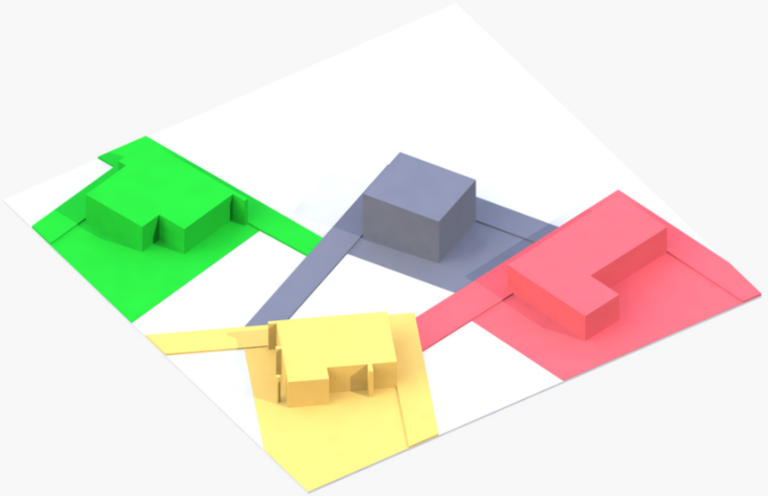
Example of Infilling

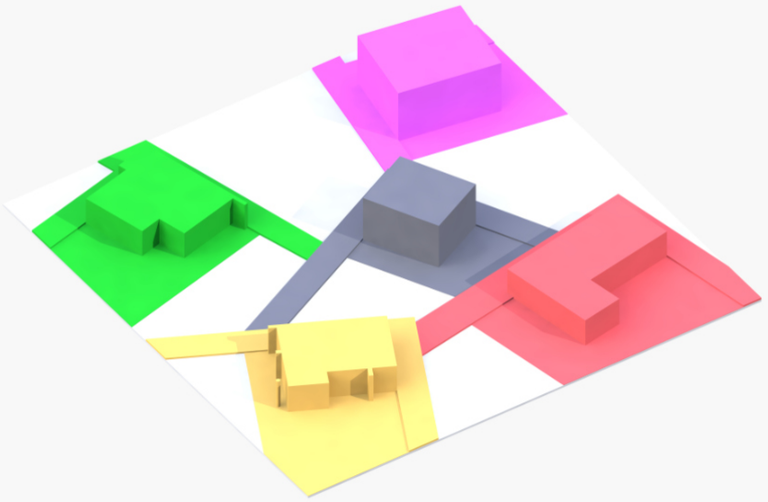
A sequence showing how the framework could be fulfilled by different users over time.

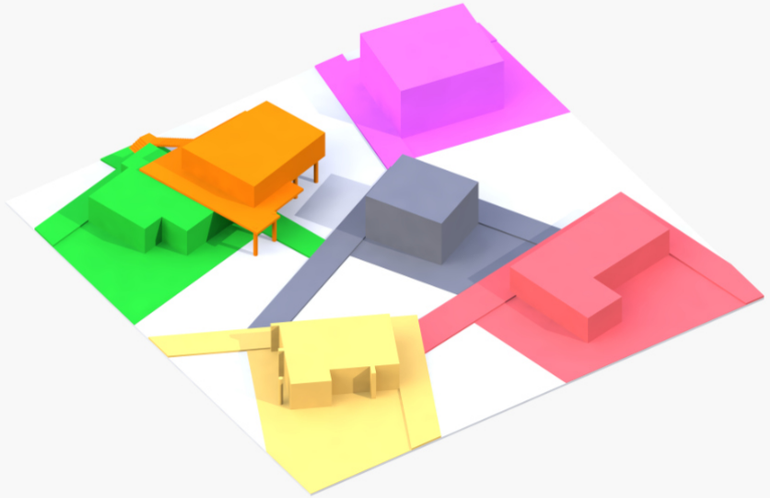


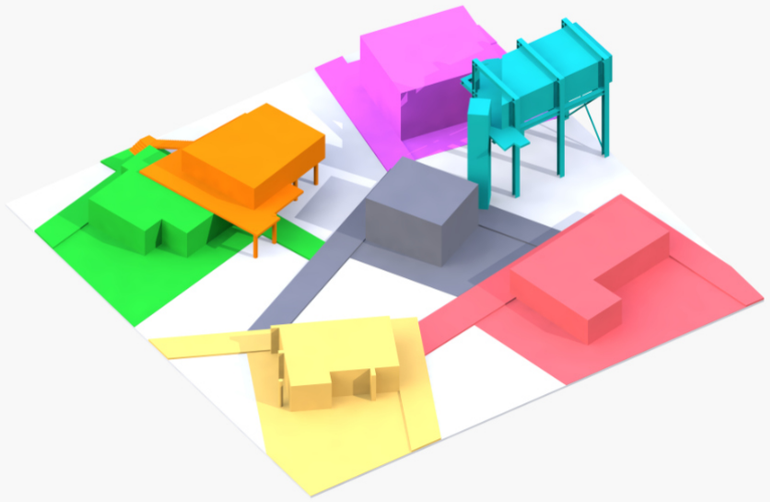


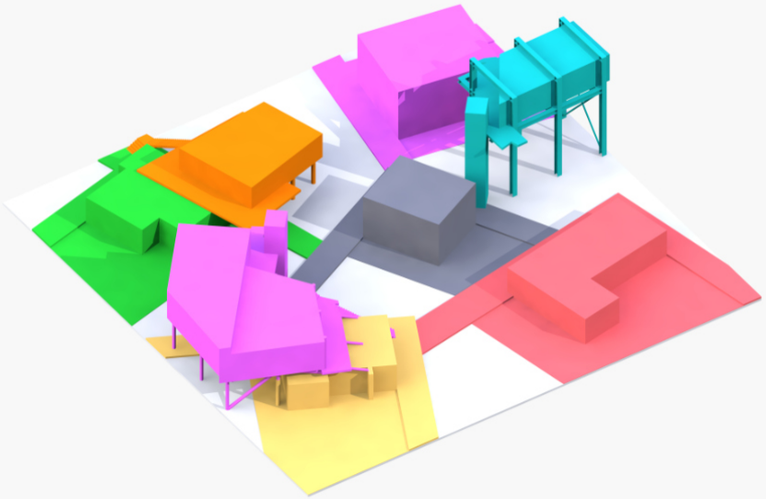


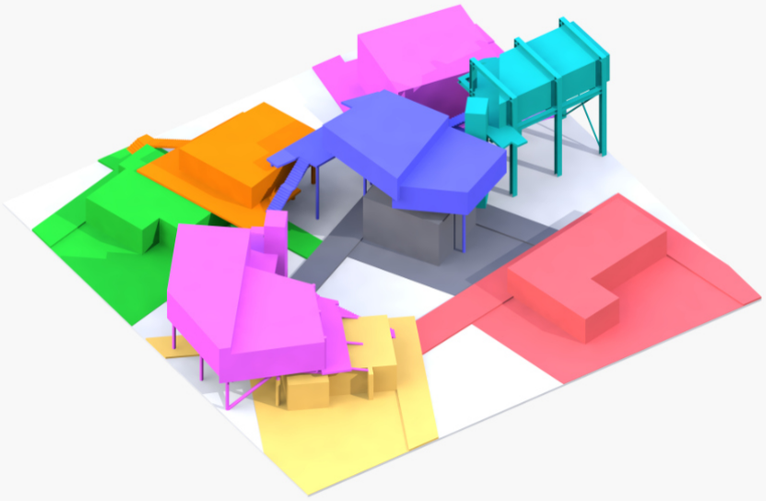


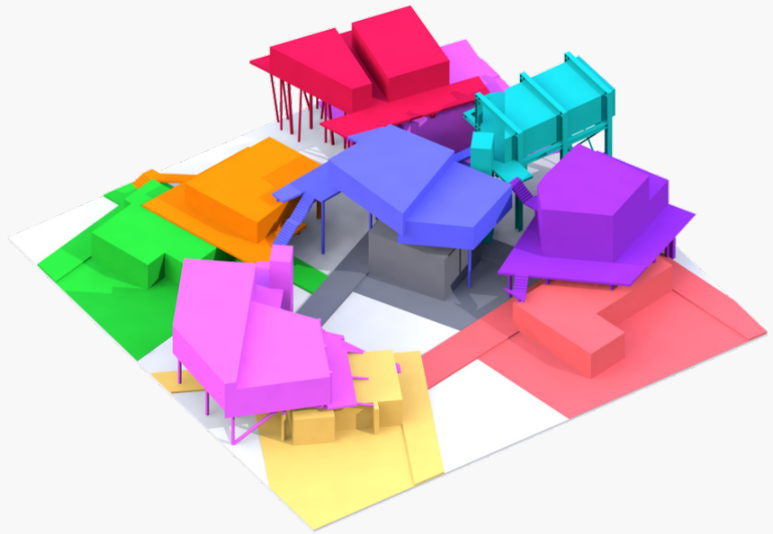


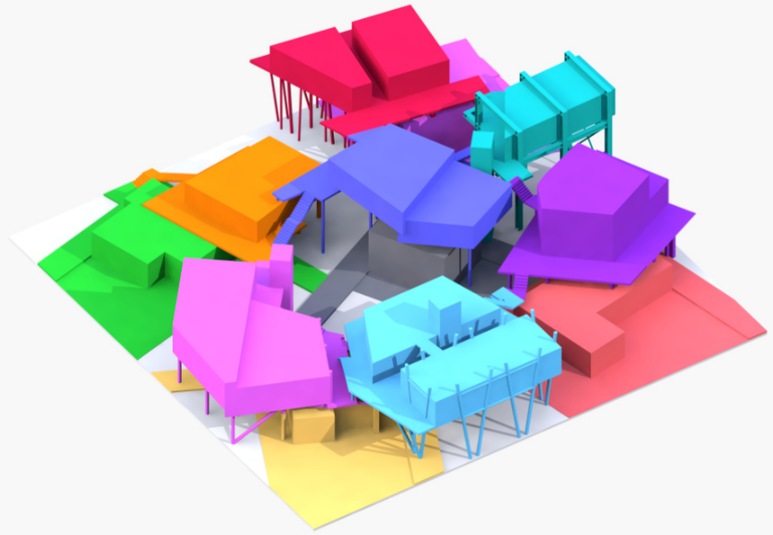


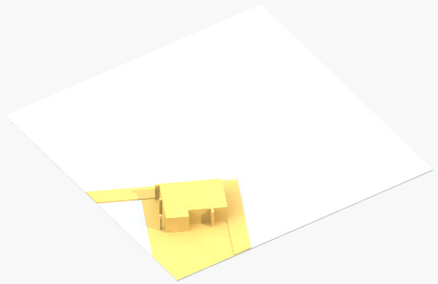


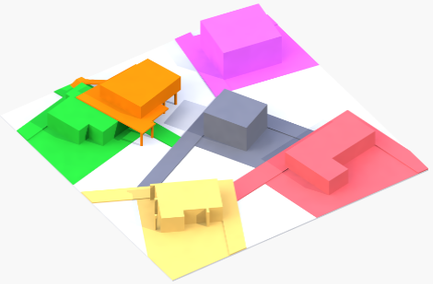


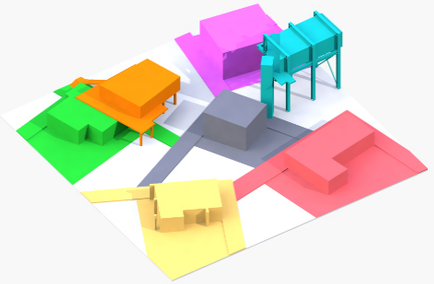


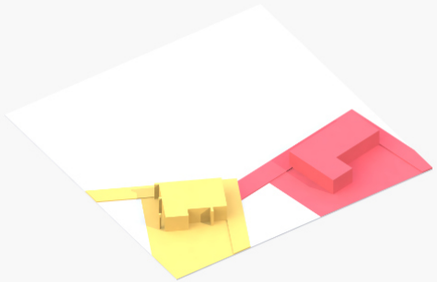


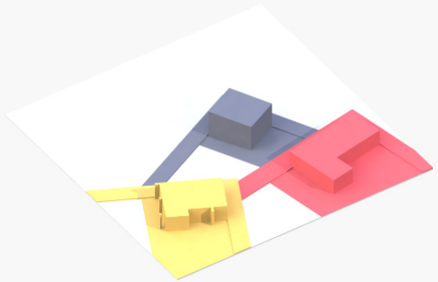


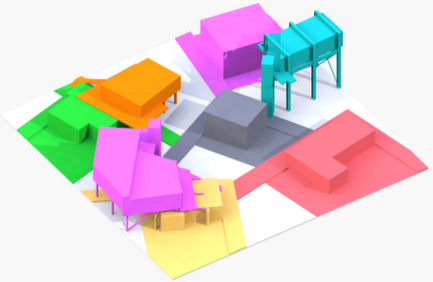


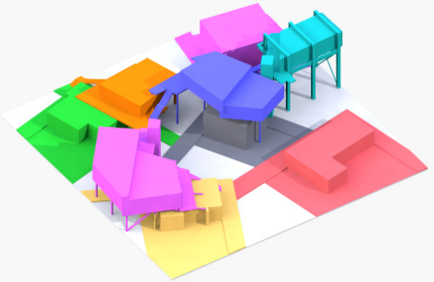


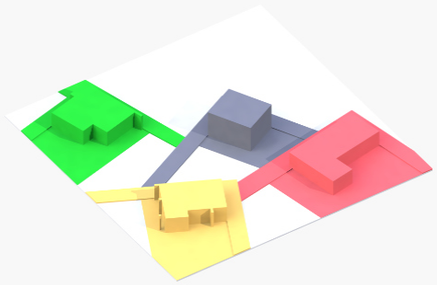


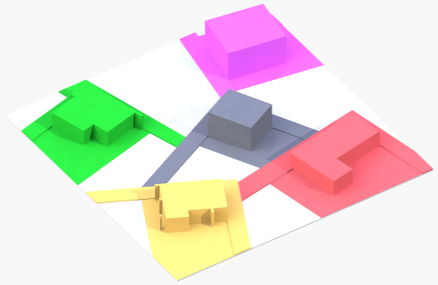


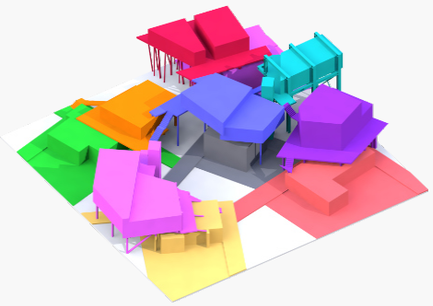


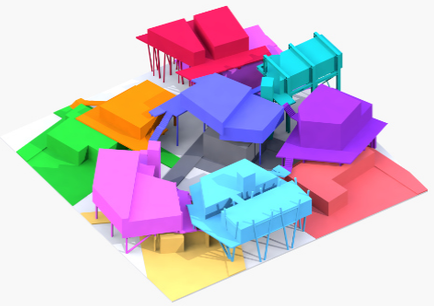




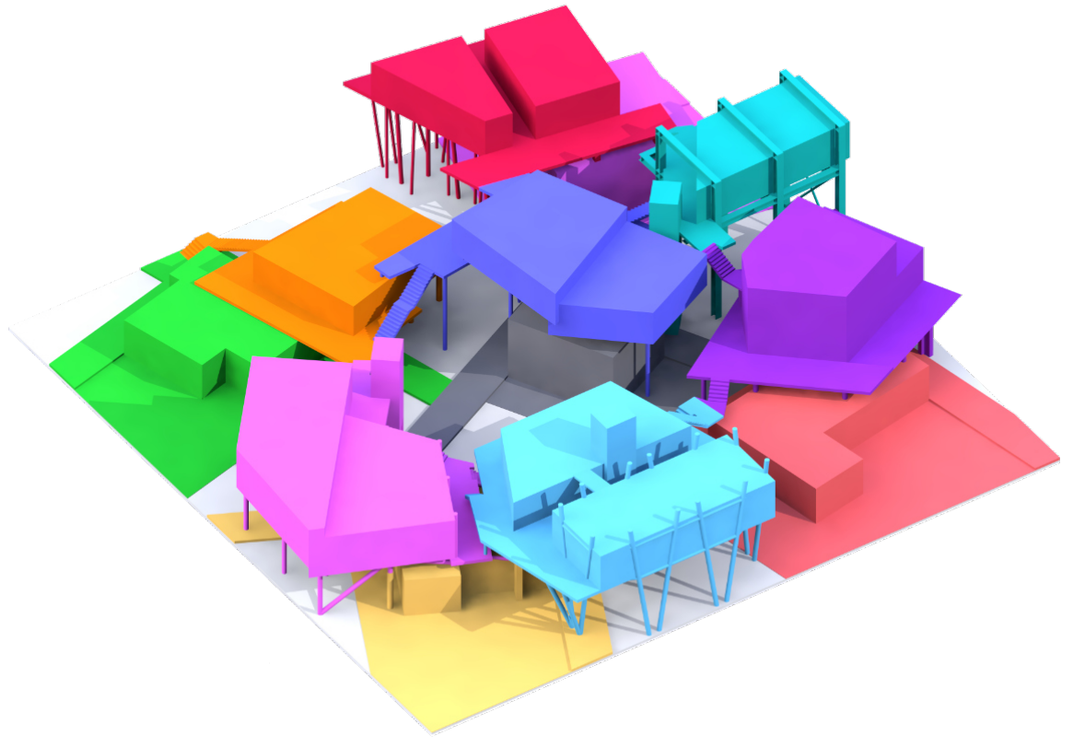








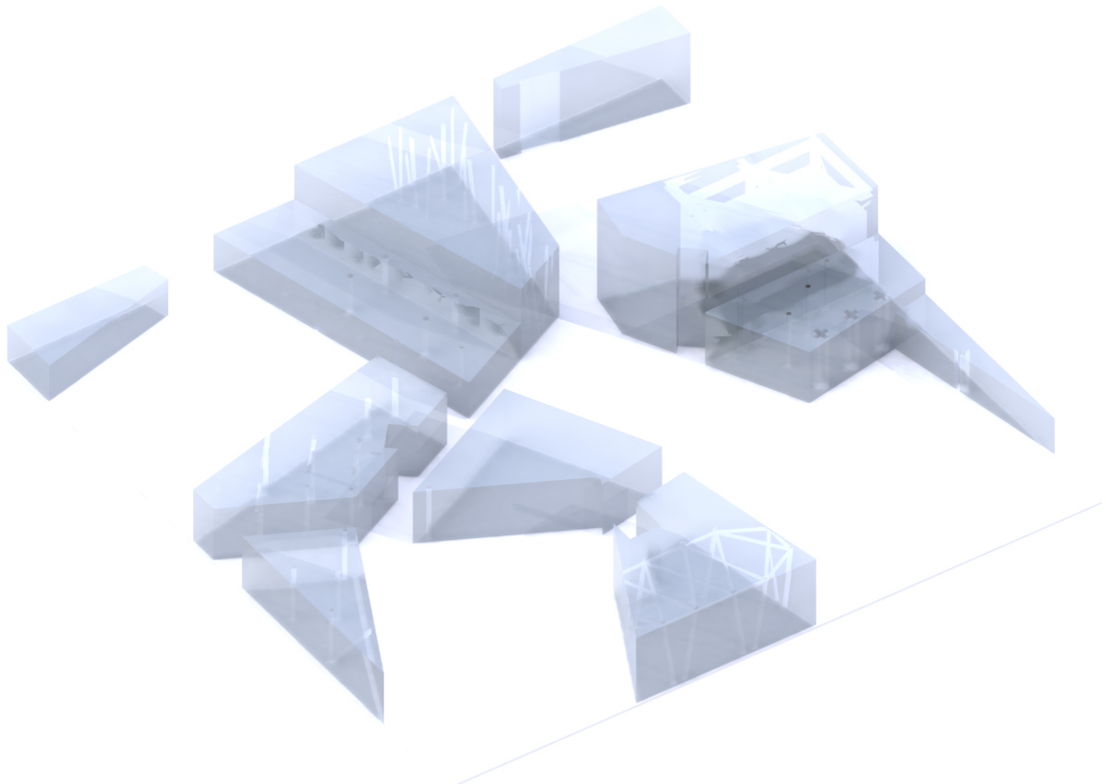
The system is fulfilled over time. How it will end and where the next neighbor will be is not defined ahead of time but only by the volume of the framework.



In-Between Space

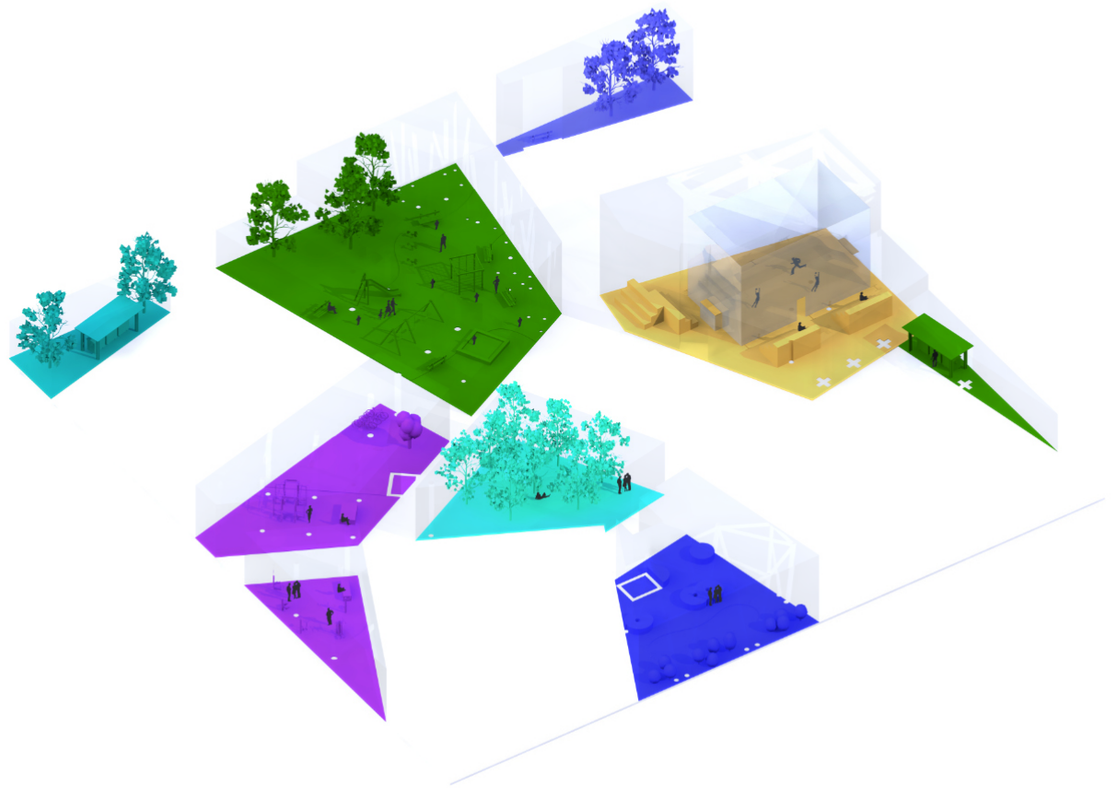
The space left between the private is a place for the public.

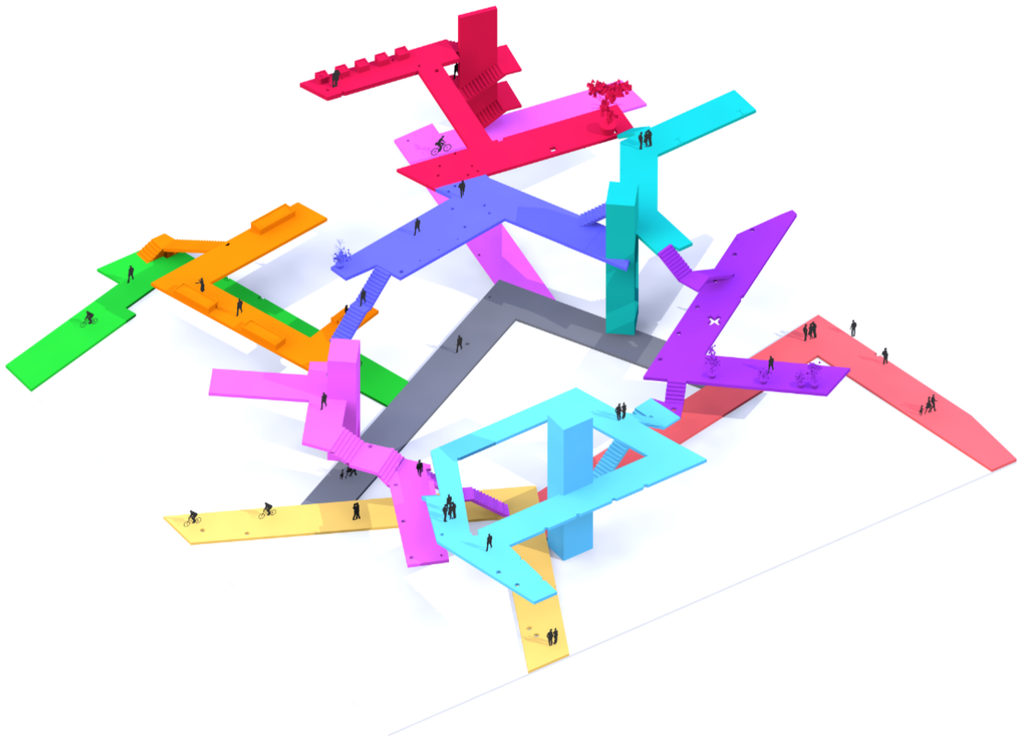
Private and semi-private spaces



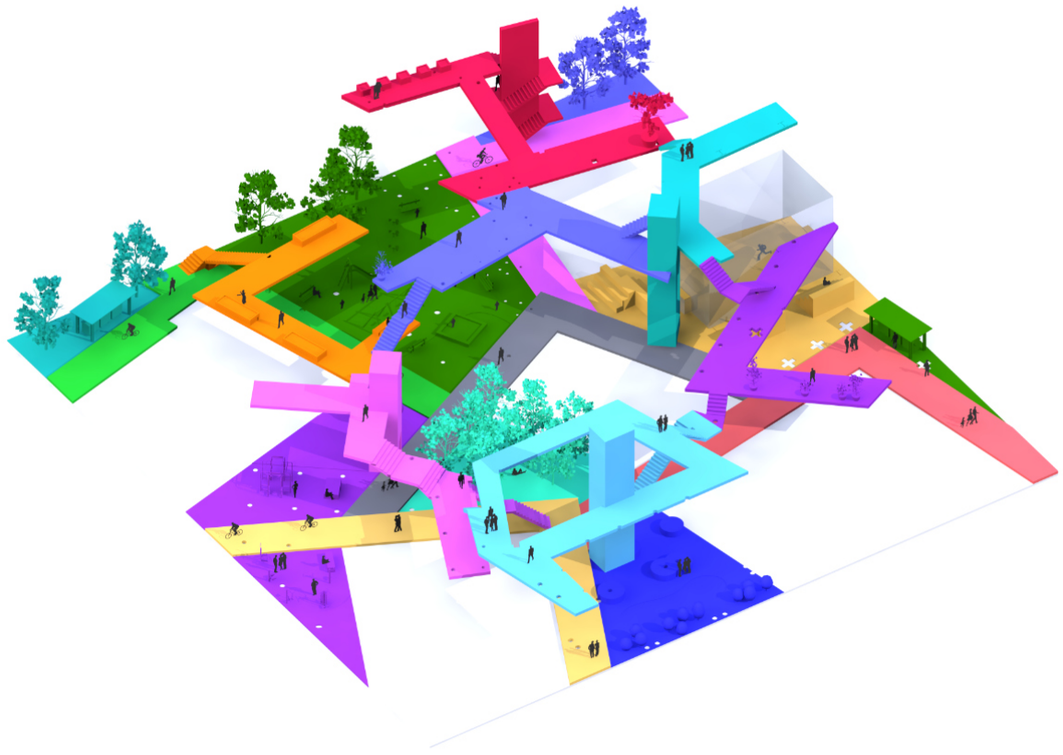
In-between common space

The formed private spaces create unexpected voids in the framework. Each one has specific conditions that depending on its volume, orientation, location and the building elements that pass through it. These voids create public spaces where social interactions, both expected and unexpected, can take place.

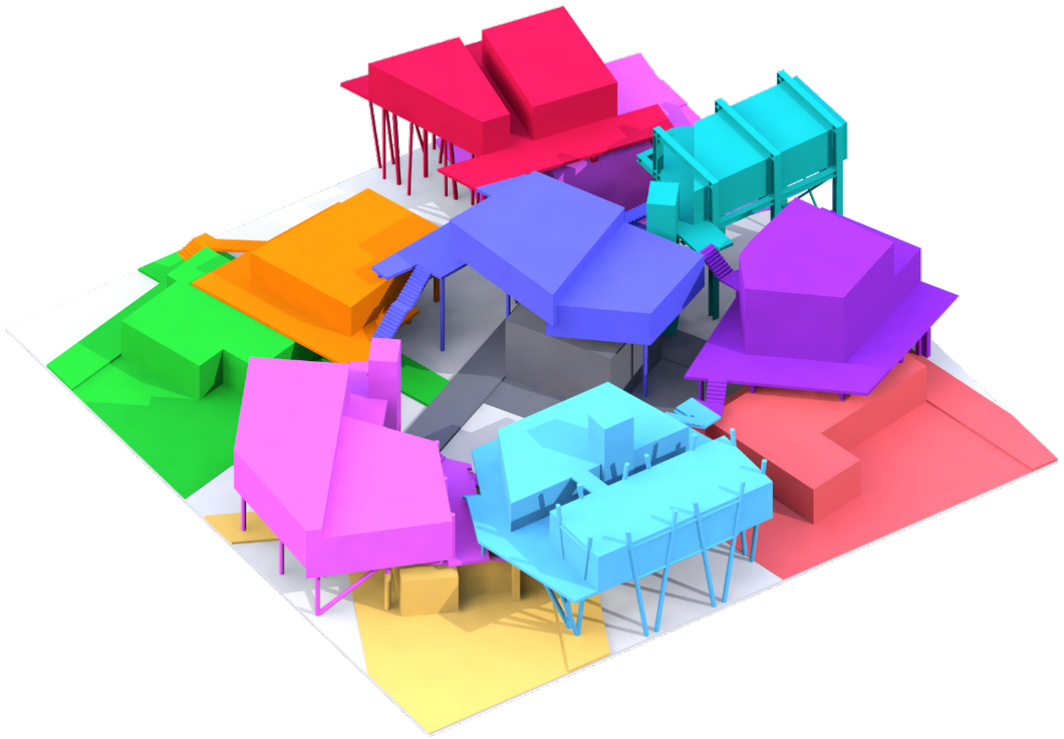




Pathways



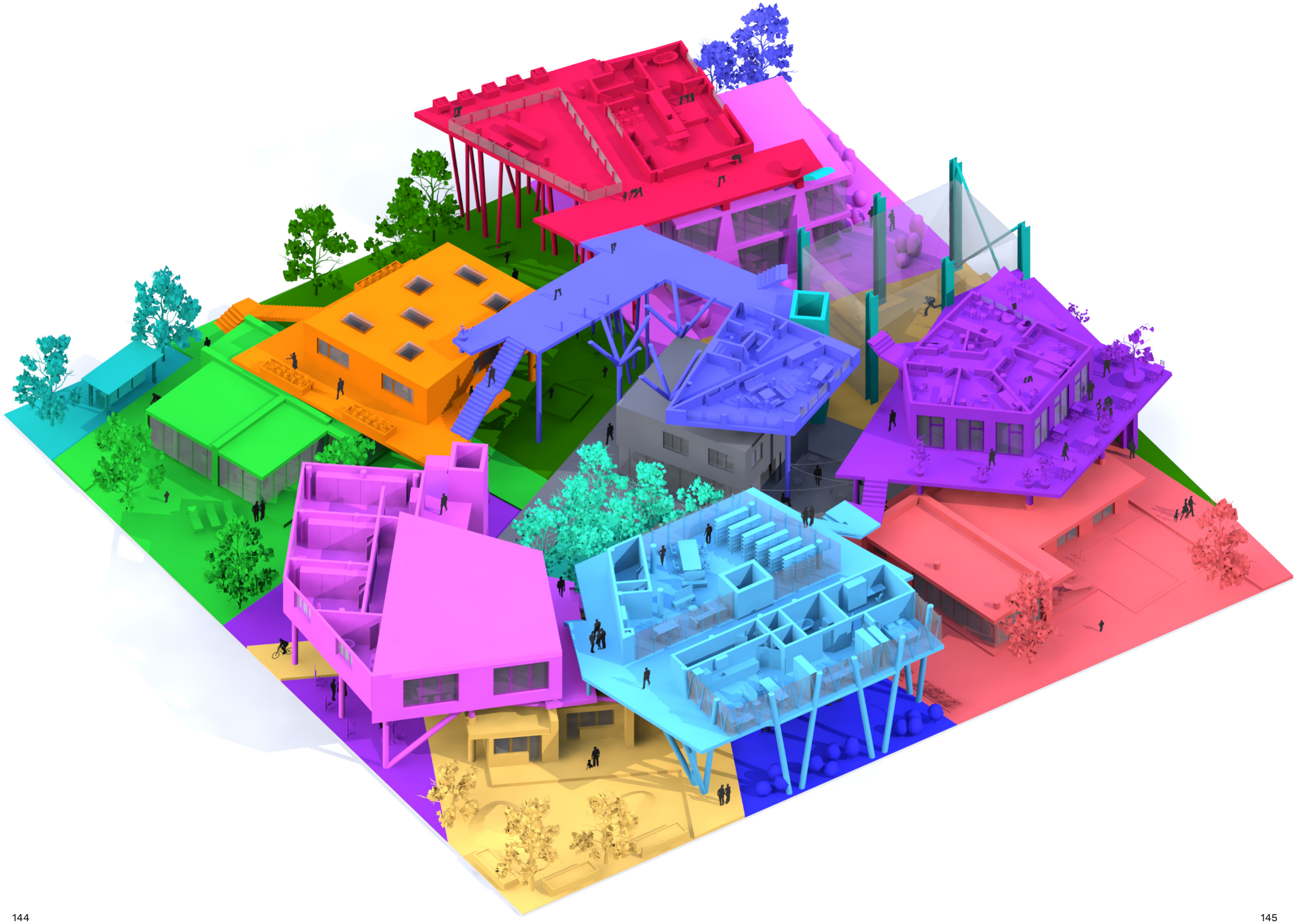
All shared space

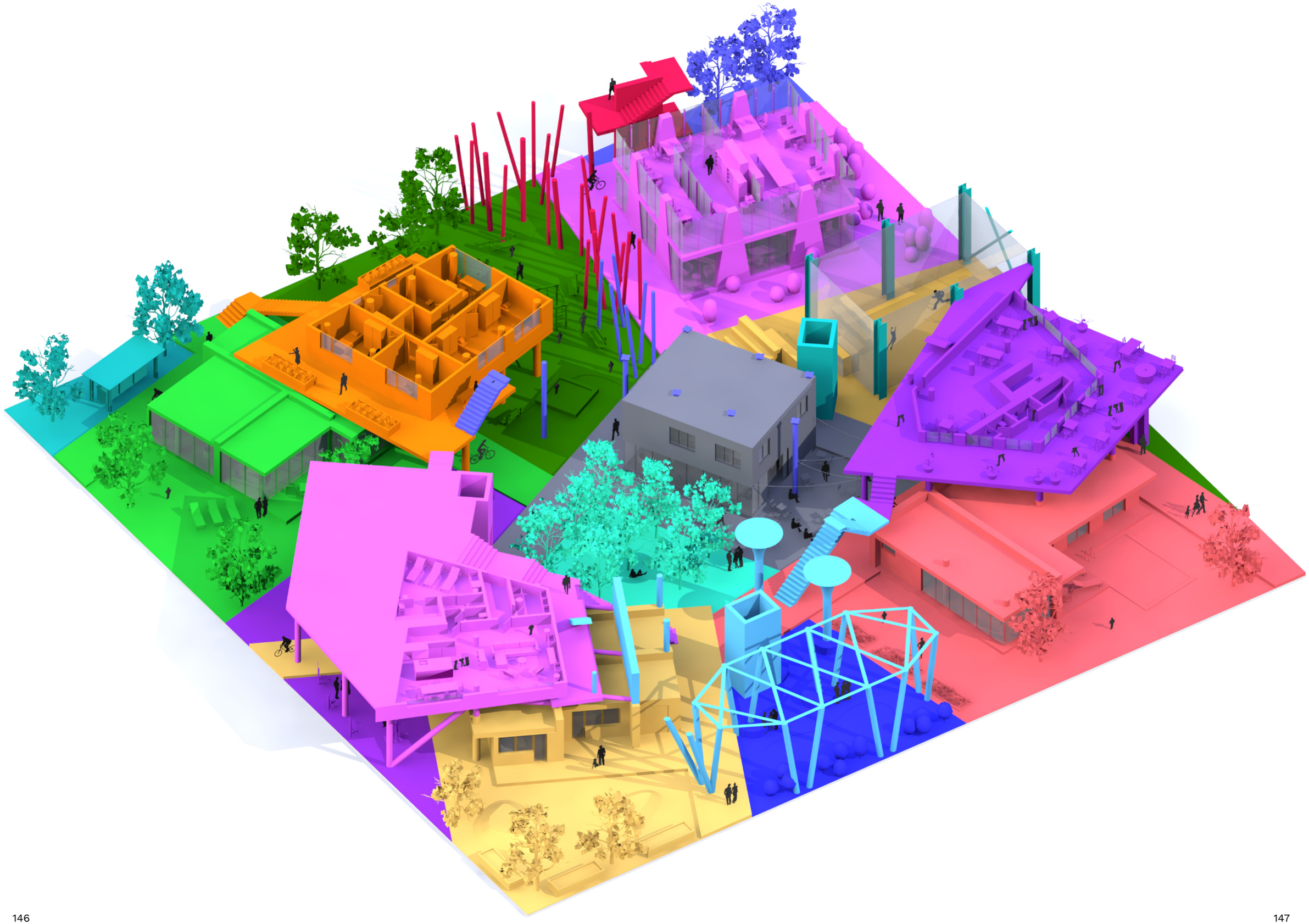


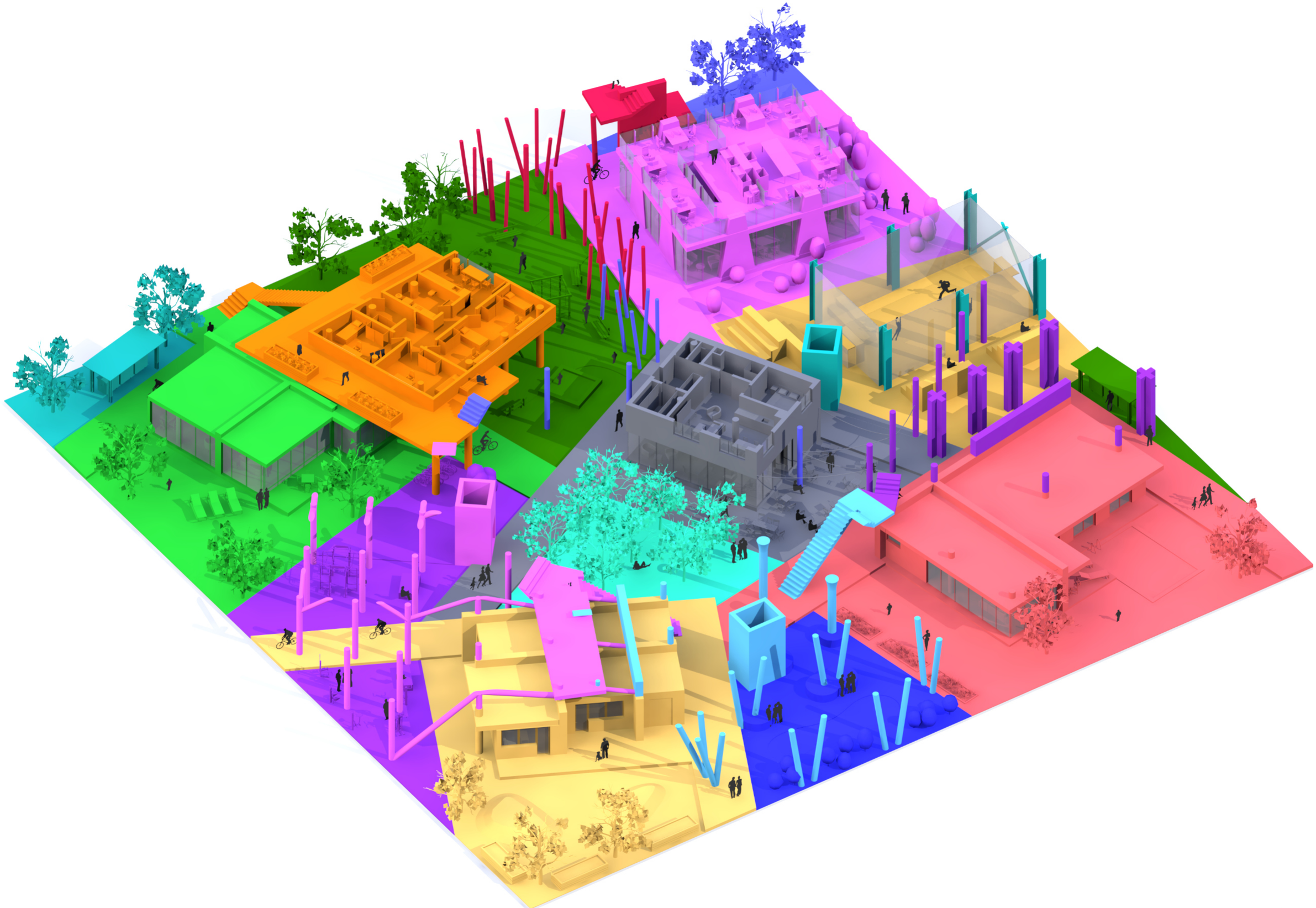
Before filling in-between space

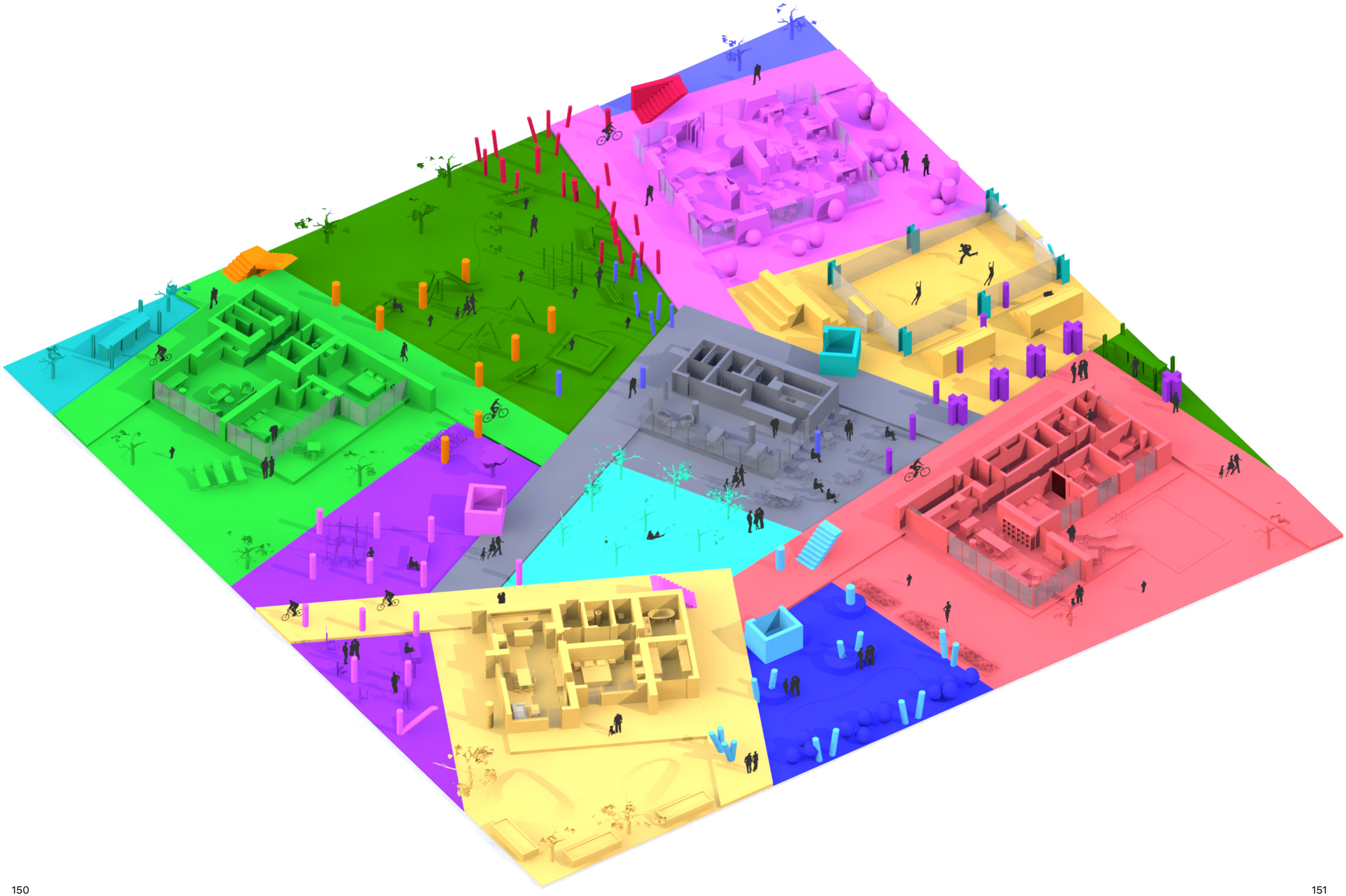
After filling in-between space

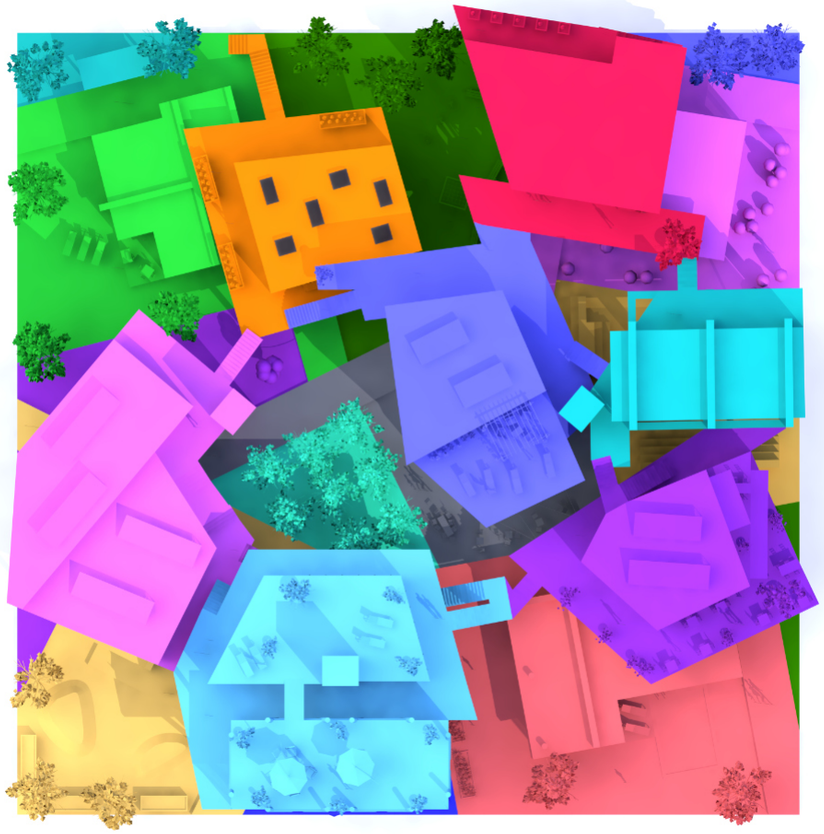
Final Image of The Fragment

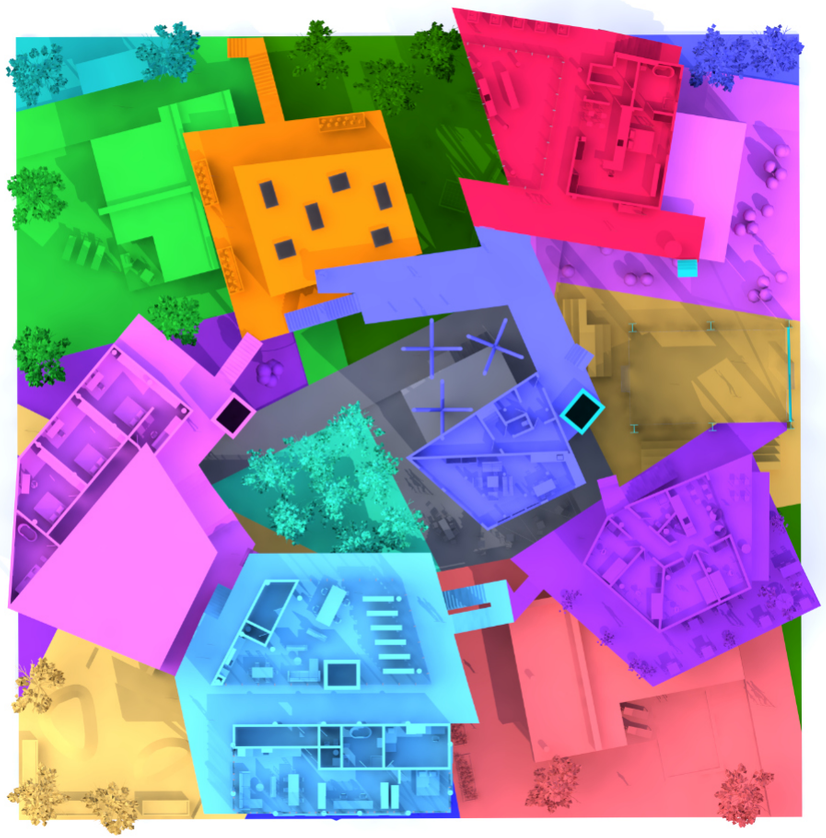


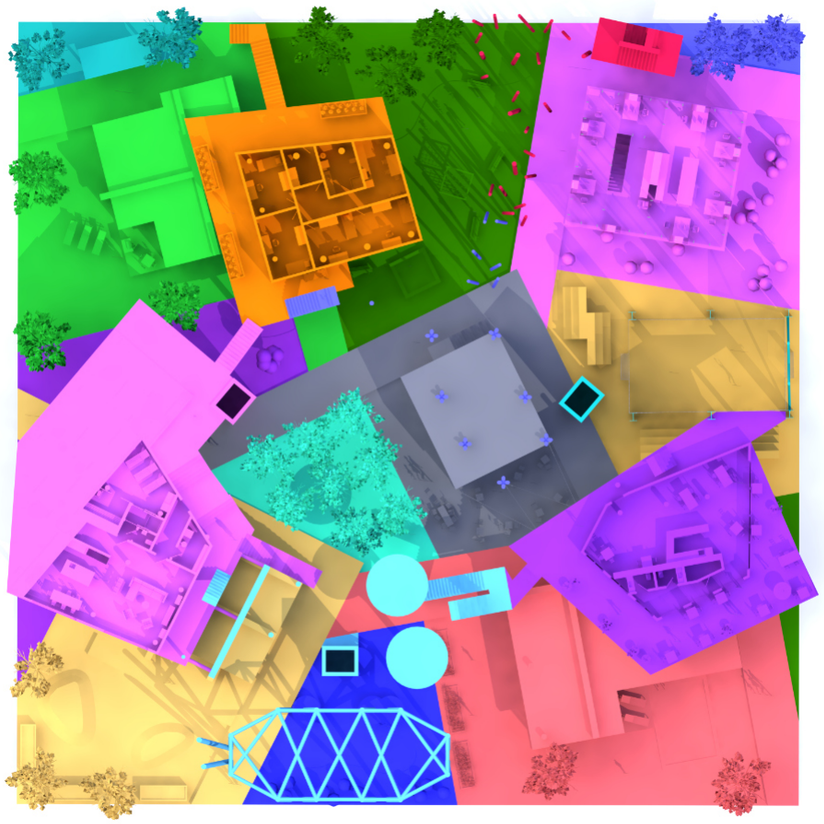


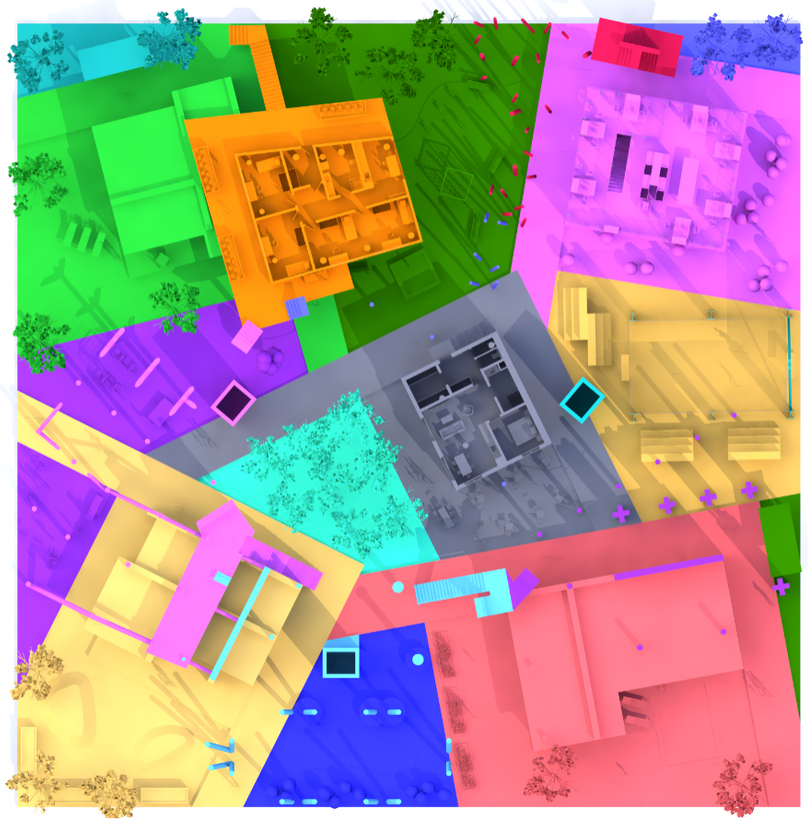


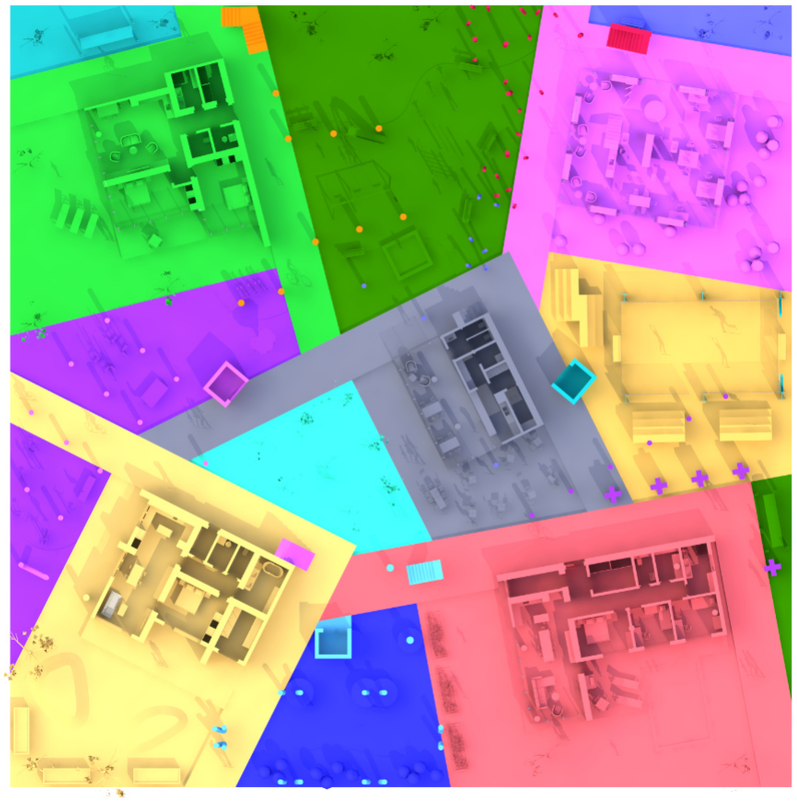


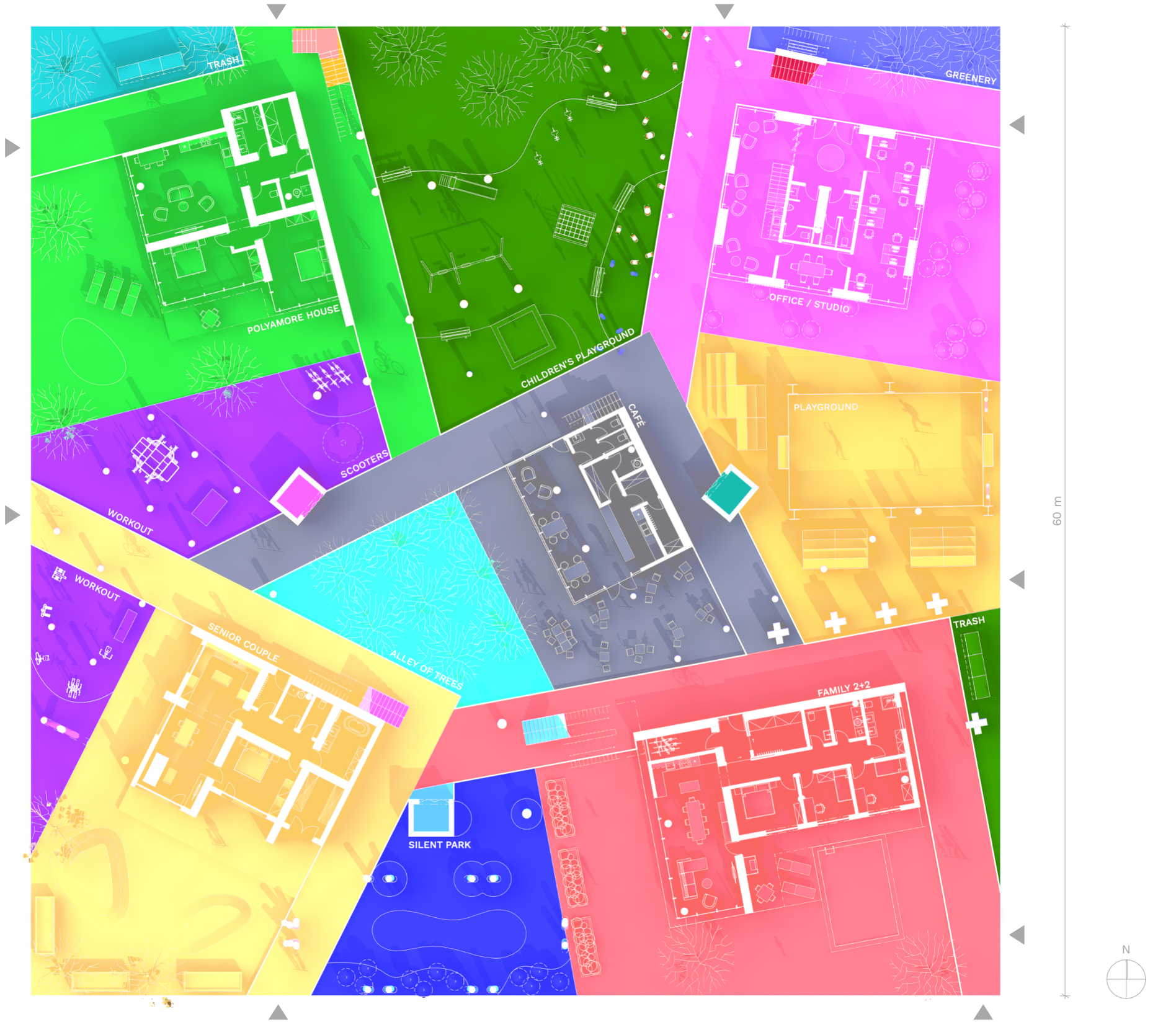


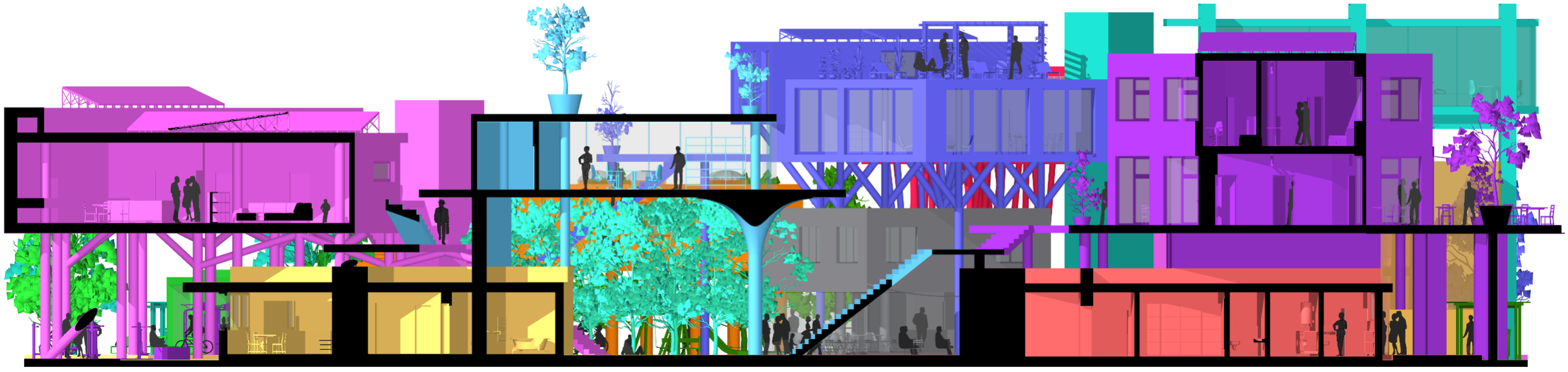


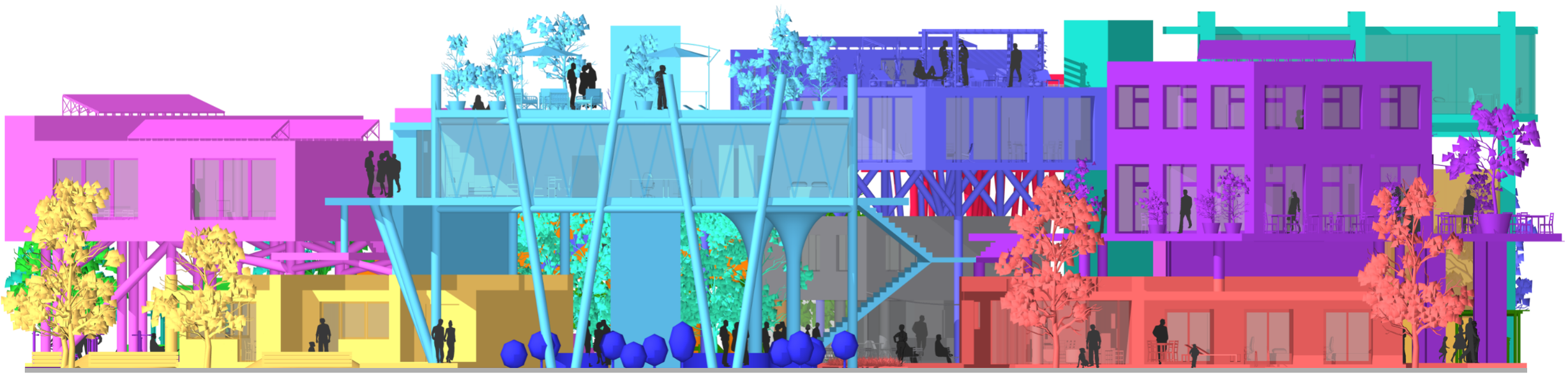


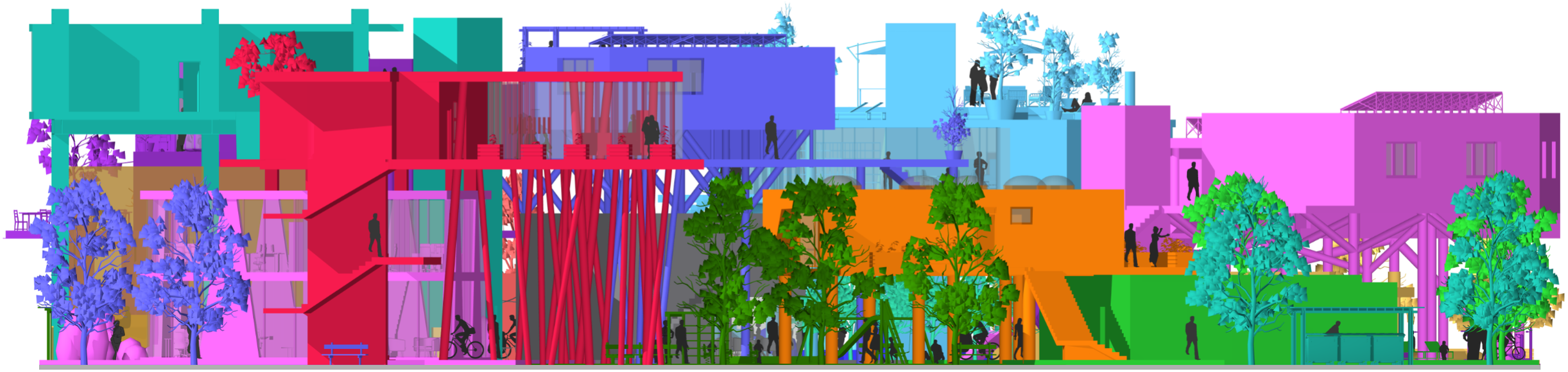


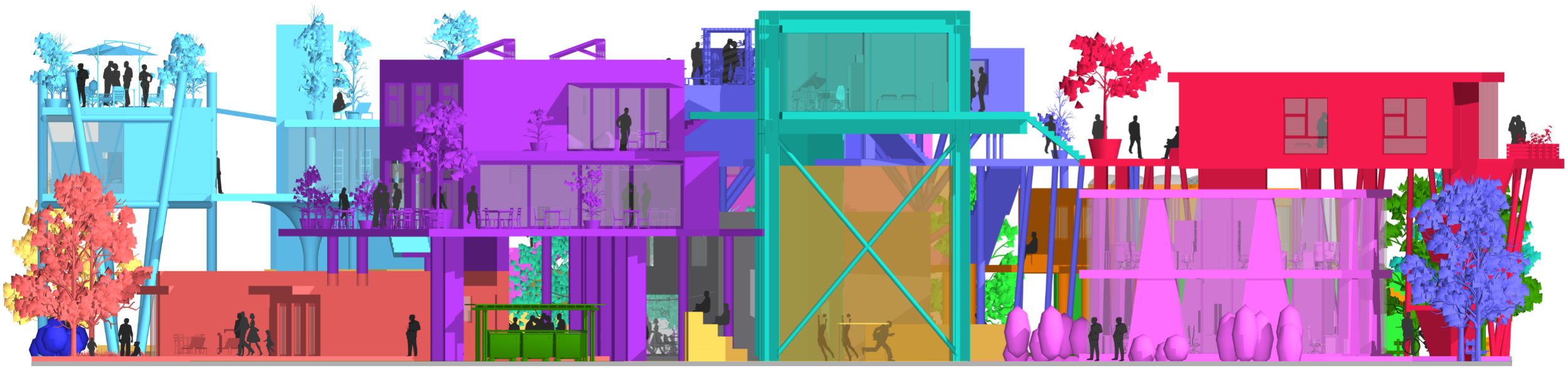


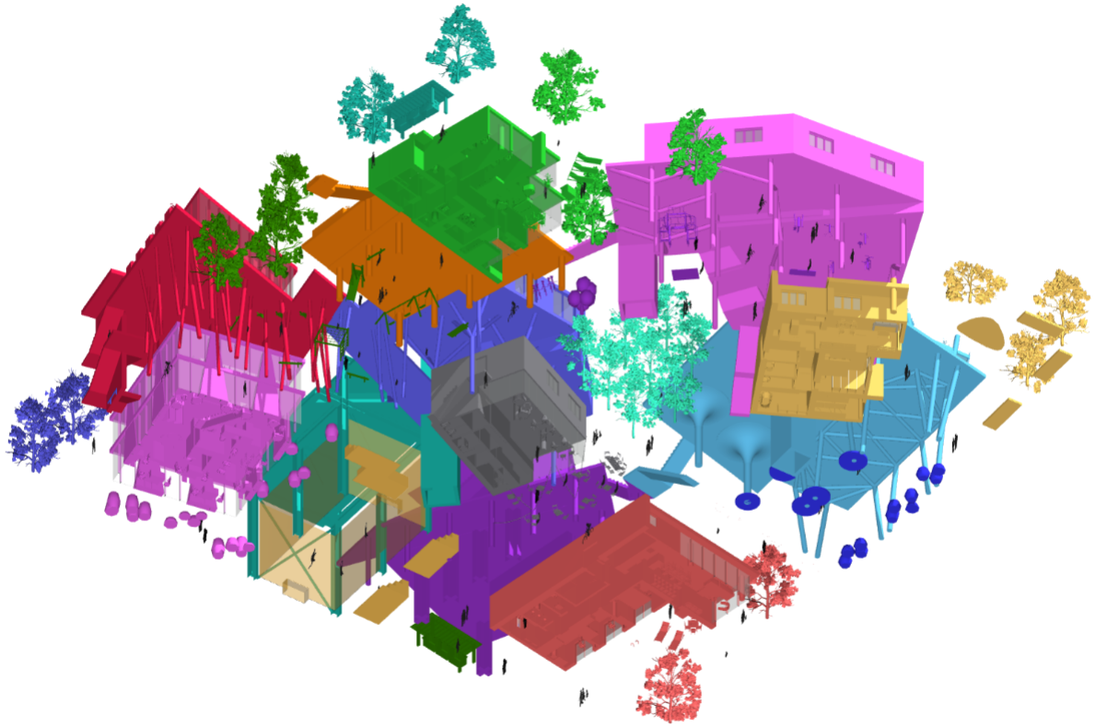

TRASH
POLYAMORE HOUSE
CHILDREN'S PLAYGROUND
GREENERY
OFFICE / STUDIO
PLAYGROUND
CAFE
SCOOTERS
WORKOUT
ALLEY OF TREES
SENIOR COUPLE
SILENT PARK
FAMILY 2+2
TRASH
60 m
N

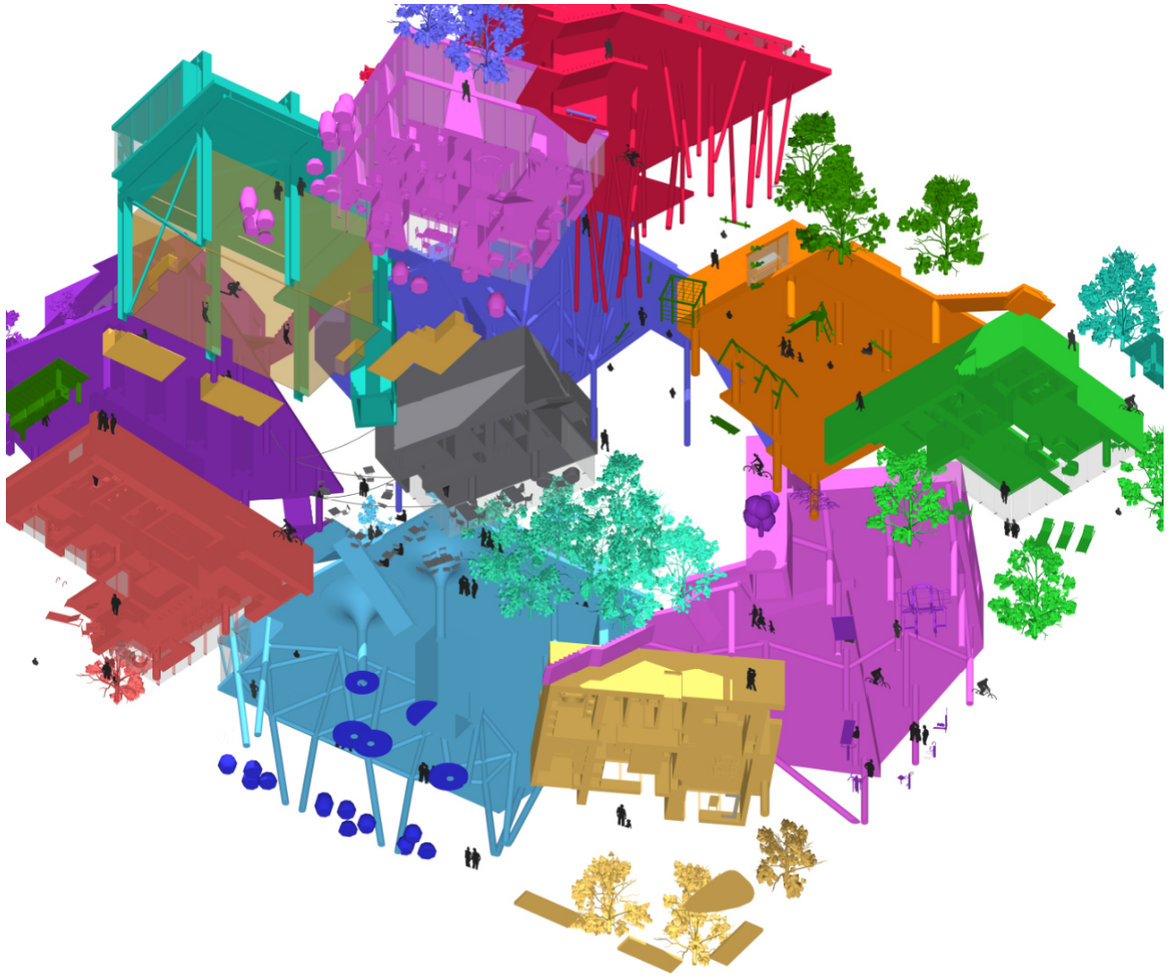


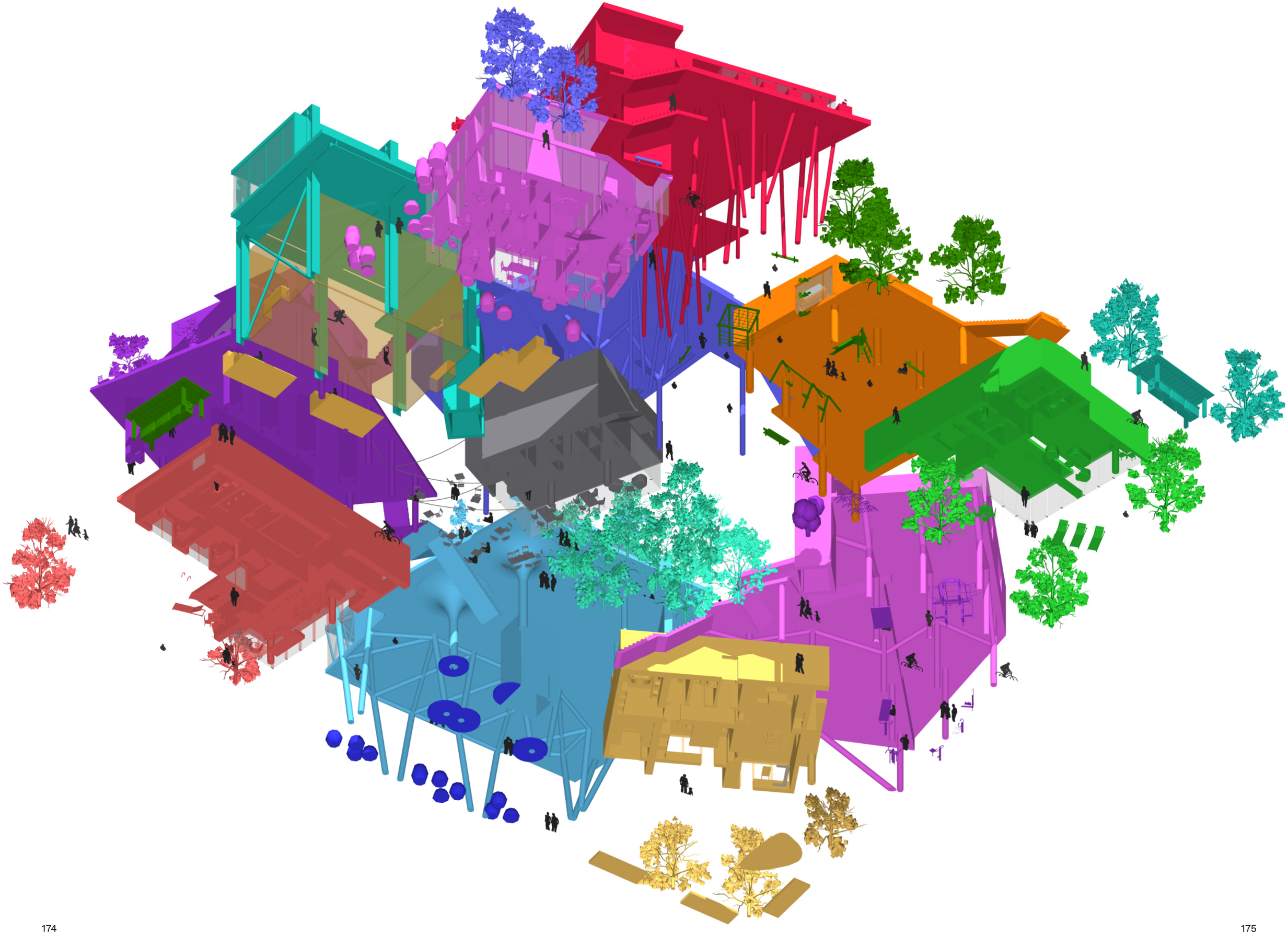


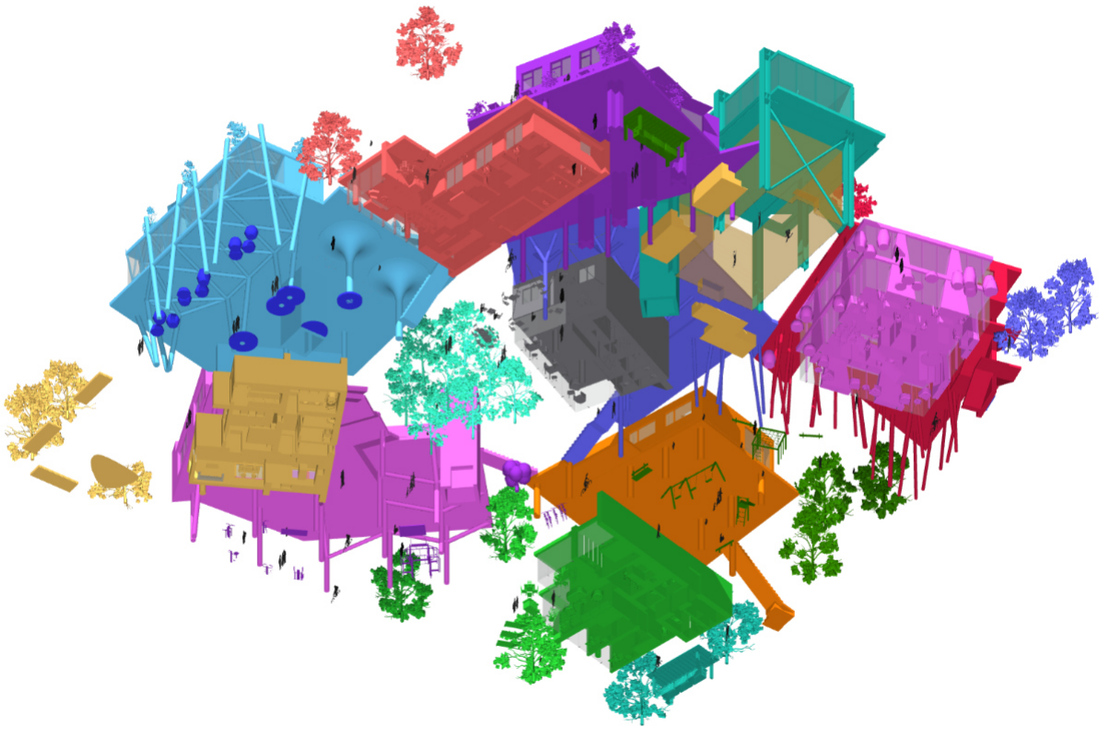


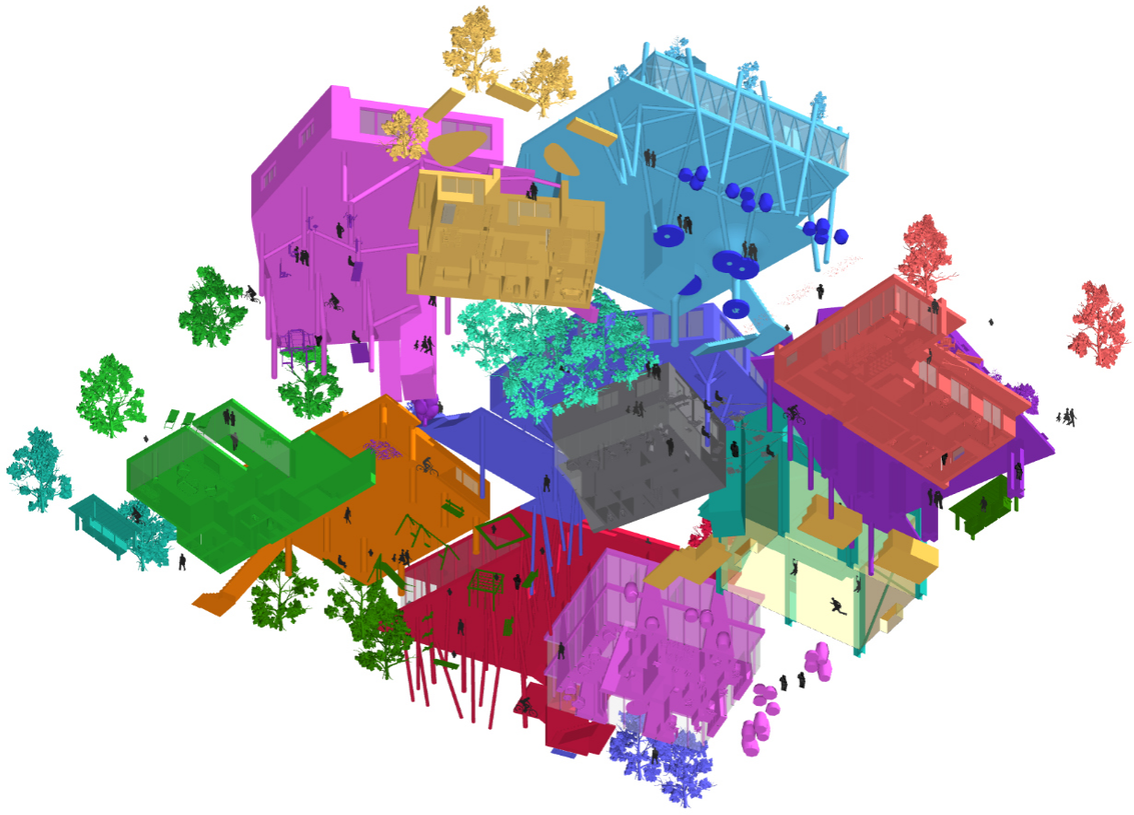












The result of the thesis tried to answer the problem of homogeneity and dominant representation of the structural order, which was the main reason for the end of the original structuralist period in architecture.

The new system that was described and applied to the small fragment, consisted only of the abstract rules. Contrary to the presented examples that were materialized by some kind of physical module with the fixed dimensions, materials or architectural language, this system works only with the relations and the defined domain.

This concept provides a more open and flexible framework for a dynamic and diverse society. It is ready to absorb new changes in technology and society. A framework where each of the users has influence on a public space. This situation generates the unique spatial environment based of the real users than a definitive vision/order made by the "ARCHITECT".

Sources

Books

[1] LÉVI-STRAUSS, Claude. *Strukturální antropologie*. Praha: Argo, 2007. Capricorn (Argo). ISBN 80-720-3713-7.

[2] VALENA, Thomas F., Tom AVERMAETE a Georg VRACHLIOTIS. *Structuralism Reloaded: Rule-Based Design in Architecture and Urbanism.* Stuttgart: Edition A. Menges, 2011. ISBN 978-3-936681-47-5.

[3] MCCARTER, Robert a Aldo van EYCK. *Aldo van Eyck.* New Haven: Yale University Press, [2015]. ISBN 978-0-300-15396-5.

[4] LIGTELIJN, Vincent, ed. *Aldo van Eyck: Works.* Basel: Birkhäuser, 1999. ISBN 3-7643-6012-7.

[5] BAUMAN, Zygmunt. *Tekutá modernita.* Druhé. Praha: Portál, 2020. ISBN 978-80-262-1602-5.

[6] DRÁPAL, Jaroslav. *Architektonické struktury.* Brno: VUTIUM, 2022. ISBN 978-80-214-5858-1.

[7] HERTZBERGER, Herman. *Přednášky pro studenty architektury*. Dolní Kounice: MOX NOX, 2012. ISBN 978-80-905064-0-4.

[8] MAAS, Winy, Ulf HACKAUF a Adrien RAVON. *Barba: Life in the Fully Adaptable Environment.* -. Rotterdam: NAi010 Publishers, [2015]. Future cities series. ISBN 978-94-6208-253-3.

[9] MAAS, Winy, Javier ARPA FERNÁNDEZ, Adrien RAVON a Felix MADRAZO. *(w)Ego: Dream Homes in Density*. -. Rotterdam: NAi010 Publishers, [2022]. Future cities series. ISBN 978-94-6208-530-5.

Interviews

[1] Interview with architect Winy MAAS, Prague 22. 3. 2023, Linked from: https://youtu.be/7_D7kQbMvrM

[2] Interview with architect Šimon PROKOP, Prague 22. 3. 2023, Linked from: https://youtu.be/5msBXS3xb8Q

[3] Interview with architect Szymon Rozwałka, Brno 9. 2. 2023

Internet

[1] Constant Nieuwenhuys. In: *Wikipedia: the free encyclopedia* [online]. San Francisco (CA): Wikimedia Foundation, 2023 [cit. 2023-03-09]. Dostupné z: https://en.wikipedia.org/wiki/Constant_Nieuwenhuys

[2] LOPES, João V., Alexandra C. PAIO a José P. SOUSA. Parametric Urban Models Based on Frei Otto's Generative Form-Finding Processes. *ResearchGate* [online]. ResearchGate, © 2008-2023, 2014, 595-604 [cit. 2023-03-10]. Linked from: doi:10.52842/conf.caadria.2014.595

[3] SCHUMACHER, Patrik. Patrik Schumacher on parametricism – 'Let the style wars begin'. *The Architects' Journal* [online]. UK: Metropolis Group, © 2023, 6 MAY 2010 [cit. 2023-03-10]. Linked from: https://www.architectsjournal.co.uk/practice/culture/patrik-schumacher-on-parametricism-let-the-style-wars-begin

[4] SMITH, Sean. The world needs to build 2 billion new homes over the next 80 years. *The World Economic Forum* [online]. Geneva, Switzerland: The Forum, © 2023, Mar 2, 2018 [cit. 2023-03-12]. Linked from: https://www.weforum.org/agenda/2018/03/the-world-needs-to-build-more-than-two-billion-new-homes-over-the-next-80-years/

[5] Alejandro Aravena: My architectural philosophy? Bring the community into the process. *YouTube* [online]. US: Google, © 2023, 6. 11. 2014 [cit. 2023-03-12]. Linked from: https://youtube.com/watch?v=o0I0Poe3qlg&feature=shares

[6] RETSIN Gilles, *Real Virtuality.* [video] 2019. In: FA VUT, ed. *Gilles Retsin – Mařena FA VUT 2022*. YouTube [online]. United States: Google, © 2023 [cit. 2023-04-09]. Linked from: https://www.youtube.com/live/-Q9Z_9BKnsM?feature=share

[7] MVRDV [online]. Rotterdam: MVRDV B.V., 2023 [cit. 2023-05-07]. Linked from: https://www.mvrdv.nl

[8] The Why Factory [online]. Delft: TU Delft, The Why Factory, MVRDV [cit. 2023-05-07]. Linked from: https://thewhyfactory.com

Sources

Images

[1] CORBUSIER, Le. Skica domu Domino [sketch]. 1914. In: ROWE, Colin. *Matematika ideální vily a jiné eseje.* Brno: ERA, 2007. ISBN 978-80-7366-094-9.

[2] COOK, Peter. Plug-In City [line drawing]. Archigram. 1962-1964. In: BAWA-CAVIA, Anil. Plug-in city, Archigram. In: *Flickr* [online]. San Francisco, California, U.S.: Flickr, Inc., SmugMug, ©2023 [cit. 2023-03-11]. Dostupné z: https://www.flickr.com/photos/kontent/3298134306/in/photolist-7Uaf6E-7SkLzJ-7Uaee9-7Shuxx-4gLUyC-7U6XmZ-7U6UET-7Uafw5-7ShbS2-4nuXUv-VEfZYM-ekijoW-7U75E8-dErc9b-GfsN1U-7ªMu8Z-62rNqA-K48ªkR-ATRSKd-7SkxKC-7TMhmB-5FnVMH-rxErBQ-7tij9Y-4ªGa1Z-8FLDHr-2hZNDLd-829bWD-5T7Yhk-2HDs7c-2hZSft7-98Wfz3-eemwoB-6ZXAAw-6ZTA5g-7ªgdCT-5LpNkA-4m7b5T-5szADp-5Lkwa2-MPqc3z-2hZSfnW-2c5ªnfM-PGHmsn-2c5ªms4-PGHnbX-2c5ªmNV-oPEhZX-2c5ªnM8-NEu8ce

[3] FRIEDMAN, Yona. Spatial City [color painting] 1958-59. In: *Flickr* [online]. San Francisco, California, U.S.: Flickr, Inc., SmugMug, ©2023 [cit. 2023-03-11]. Dostupné z: https://www.flickr.com/photos/soysinew/4040823731/in/photolist-VRFHUA-VRFREf-VdpfvK-WfkKYi-WfkE5z-WfkDuB-Vdpbdg-WfkCGp-WfkEgX-WbZ915-WbYXvY-dns5N8-9pN8Gc-dns6qZ-oDMF6º-oDMJW9-opk5js-LrUw8-LrUBD-opk8xJ-opkAte-opjQbE-7ZhQLq-opjYjy-7ZeCQn-oFPTwD-opjXcU-LrUFt-opkUaB-7ª8Rzc-oFPQK6-opkdJp-oFPRRV-opjZSd-7ZhQMf-2ªebTX3-opkcvH-oFxR3Z-LrUnZ-dns5Ui-2mPoqLi-2mPeGuN-dnvURn-7ª5h7F-Jw5iF3-HCZcfb-HCZh9u-Jq8Gmj-HCVN4M-JshGi2

[4] ANDRÉ, Constant, gemeentemuseum den haag [photo] 2019. In: *Flickr* [online]. San Francisco, California, U.S.: Flickr, Inc., SmugMug, ©2023 [cit. 2023-03-11]. Dostupné z: https://www.flickr.com/photos/andrevanbortel/46634183325/in/photolist-2nu15vp-2e3UnZx-8WyUj7-2jnJhvu-LbXfKN-BCjfmX-9RDM7S-etAEtF-9RDLMo-Cq9pNW-2iGm8yp-28zoTVm-9RDLmA-9RDL1C-9RDKFC-9RDHkC-2pnHEQ-7vNVEW-7vKhU4-9RDKnm-9RAMM6-9RAPmt-9RDGKN-2ekSg5G-tyZ6h7-TizsQL-2ekSgos-7vK4zk-5ªijvx-7vNY9w-bW3wmN-7LGm5Q-91XUtA-wYi3Dy-2iESj69-y1Z1º1-bkc5zf-2m7TJja-8rTJFv-aVthEt-FwVRhN

[5] Aerial view of Aldo van Eyck's municipal orphanage [photo] 1955-1960. In: *Wikipedia: the free encyclopedia* [online]. San Francisco (CA): Wikimedia Foundation, 2023 [cit. 2023-03-11]. Dostupné z: https://commons.wikimedia.org/wiki/File:Orphanage-1ª.Aldo_van_Eyck.jpg

[6] BLOM, Piet. Noah'smArk project, plan of a district unit [drawed plan] 1962. In: VALENA, Thomas F., Tom AVERMAETE a Georg VRACHLIOTIS. *Structuralism Reloaded: Rule-Based Design in Architecture and Urbanism*. Stuttgart: Edition A. Menges, 2011. ISBN 978-3-936681-47-5. Page 11

[7] HERTZBERGER, Herman. Centraal Beheer office building [photo] 1970-72. In: VALENA, Thomas F., Tom AVERMAETE a Georg VRACHLIOTIS. *Structuralism Reloaded: Rule-Based Design in Architecture and Urbanism*. Stuttgart: Edition A. Menges, 2011. ISBN 978-3-936681-47-5. Page 174

[8] TANGE, Kenzo. Plan of Tokyo [photos of the physical model] 1960. In: VALENA, Thomas F., Tom AVERMAETE a Georg VRACHLIOTIS. *Structuralism Reloaded: Rule-Based Design in Architecture and Urbanism*. Stuttgart: Edition A. Menges, 2011. ISBN 978-3-936681-47-5. Page 182

[9] SMITSON, Alison and Peter. SIGMOND, R. Competition project Hauptstadt Berlin, [drawed plan] 1958. In: VALENA, Thomas F., Tom AVERMAETE a Georg VRACHLIOTIS. *Structuralism Reloaded: Rule-Based Design in Architecture and Urbanism*. Stuttgart: Edition A. Menges, 2011. ISBN 978-3-936681-47-5. Page 12

[10] CANDILIS-JOSIC-WOODS. Free University Berlin, [drawed plan] 1962. In: VALENA, Thomas F., Tom AVERMAETE a Georg VRACHLIOTIS. *Structuralism Reloaded: Rule-Based Design in Architecture and Urbanism*. Stuttgart: Edition A. Menges, 2011. ISBN 978-3-936681-47-5. Page 169

[11] NOHEJL, Jakub. *Cube House*, [photo] 2022 At: Rotterdame

[12] BLOM, Piet, *The Kasbah*, [photo], 1973. In: *Wikipedia: the free encyclopedia* [online]. San Francisco (CA): Wikimedia Foundation, 2023 [cit. 2023-03-30]. Dostupné z: https://nl.wikipedia.org/wiki/De_Kasbah#/media/Bestand:De_Kasbah,_Hengelo_ (6921528471).jpg

[13] SAFDIE, Moshe, *HABITAT 67*, [photo], 1967. In: *Wikipedia: the free encyclopedia* [online]. San Francisco (CA): Wikimedia Foundation, 2023 [cit. 2023-03-30]. Dostupné z: https://en.wikipedia.org/wiki/Habitat_67#/media/File:Montreal_-_QC_-_Habitat67.jpg

[14] KUROKAWA, Kisho. *Nakagin Capsule Tower* [photo] 1972. In: *Flickr* [online]. San Francisco, California, U.S.: Flickr, Inc., SmugMug, ©2023 [cit. 2023-03-31]. Dostupné z: https://www.flickr.com/photos/franckmichel/49997988263/in/photolist-2jb9L1p-2hDeH8U-3nkDQu-3nkDKC-3nkDVu-3ngc1i-2mWZBvJ-2nX4f42-5Zo8kN-9rpjHS-3nkCJh-dTXXKJ-dTXXzq-brqmGp-dTXX5q-dTXXjS-dTSjhP-dTSjJe-qffWgV-23HjSRR-r9Lf8u-qUCGut-qffW1z-B4ae2v-brqmB4-rc4DaV-9axMSf-9auC3T-9auDrK-dTXXSf-dTXXYQ-AtbXAC-2nX4fpx-2nX4f7Z-2mqD6f1-2mqvhrJ-QCaaXn-2mqvdRh-2n5jgmA- 2mqzRcz-2n5jJ83-haetHa-hadbK6-dXpUJJ-2n5jgpr-brqmui- 2mqzypg-2mqDtMF-zvjmrv-2mqDdoe

[15] ANDRÉ, Constant, *Yellow, Red, Oriental, Large Yellow sector* [models] 1958-67. In: PINEDA, Mercedes, ed. *Constant New Babylon*. Madrid, Spain: Publication Department of MNCARS, 2015. ISBN 978-84-8026-523-2. Dostupné také z: https://issuu.com/museoreinasofia/docs/constant_ingles_web . Page 158-159

[16] THE WHY FACTORY, *wEgo Hostel secvention* [images of a script iterations] 2021. In: MAAS, Winy, Javier ARPA FERNÁNDEZ, Adrien RAVON a Felix MADRAZO. *(W)Ego*: dream homes in density. -. Rotterdam: NAi010 Publishers, [2022]. Future cities series. ISBN 978-94-6208-530-5. Page 323

Sources

Images

[17] ELEMENTAL, *Viviendas Quinta Monroy, Iquique* [photo] 2001-2004. In: FERNANDÉS-GALIANO, Luis, ed. *Elemental: Alejandro Aravena*. Madrid, Espana: Arquitectura Viva SL, 2016. ISBN 978-84-608-6789-0. Dostupné také z: https://arquitecturaviva.com/obras/viviendas-quinta-monroy. Page 16-21

[18] MVRDV, *Silodam* [photo] 2003. In: *SILODAM*. MVRDV [online]. Rotterdam: MVRDV B.V., 2023 [cit. 2023-04-09]. Dostupné z: https://www.mvrdv.nl/projects/163/silodam

[19] RETSIN Gilles, *Real Virtuality.* [video] 2019. In: FA VUT, ed. *Gilles Retsin – Mařena FA VUT 2022*. YouTube [online]. United States: Google, © 2023 [cit. 2023-04-09]. Dostupné z: https://www.youtube.com/live/-Q9Z_9BKnsM?feature=share

[20] HERTZBERGER, Herman, *Centraal Beheer* [photo] 1968-72. In: HERTZBERGER, Herman. *Přednášky pro studenty architektury*. Dolní Kounice: MOX NOX, 2012. ISBN 978-80-905064-0-4. Page 25

[21] KROKORR. Centraal Beheer office building (w/ Lucas & Niemeijer), Apeldoorn, Netherlands, 1968-72. In: Flickr.com [online]. [cite 2022-12-20]. Available from: https://www.flickr.com/photos/krokorr/5473846487/

[22] Annika ECKART, Markéta Marie ELBEL, Marek FRAIT, Kateřina HRUBÁ, Michaela KIRNEROVÁ, Pavel KONOPKA, Petr KUČARA, Milica MIRKOVIC, Jakub MORÁVEK, Marek NEČESAL, Vojtěch NEJESCHLEBA, Jakub NOHEJL, Katarína PALACKOVÁ, Vanessa RONTOVÁ, Michaela ŠIMANSKÁ, Martin VOJTÍŠEK. *CENTRAAL BEHEER*. Brno, Czech Republic, © 2023. Pre-diploma project, STUDIO ROZWALKA | FACULTY OF ARCHITECTURE BUT | DEPARTMENT OF EXPERIMENTAL DESIGN.

[23] NEW BABYLON [1959] *Constant. Arqueología del Futuro* [online]. [cit. 2023-03-29]. Dostupné z: http://arqueologiadelfuturo.blogspot.com/2008/10/new-babylon-1959-constant.html

[24] THE WHY FACTORY, *Life in Barba* [digital animation] 2015. In: MAAS, Winy, Ulf HACKAUF a Adrien RAVON. *Barba: Life in the Fully Adaptable Environment.* -. Rotterdam: NAi010 Publishers, [2015]. Future cities series. ISBN 978-94-6208-253-3. Page 34, 35, 66 and 102

[25] THE WHY FACTORY, *Vocel Cloud* [digital graphic] 2021. In: MAAS, Winy, Javier ARPA FERNÁNDEZ, Adrien RAVON a Felix MADRAZO. *(W)Ego*: dream homes in density. -. Rotterdam: NAi010 Publishers, [2022]. Future cities series. ISBN 978-94-6208-530-5. Page 306

[26] THE WHY FACTORY, *The (w)Ego Game.* [model] 2022. In: *From Wego to Barba*. The Why Factory [online]. Delft: TU Delft, The Why Factory, MVRDV, 16 February 2018 [cit. 2023-04-11]. Dostupné z: https://thewhyfactory.com/news/from-wego-to-barba/

[27] THE WHY FACTORY, *Zero Star Hotel*. [video] 2017. In: THE WHY FACTORY. *A Zero Star Hotel*. YouTube [online]. United States: Google, © 2023 [cit. 2023-04-10]. Dostupné z: https://www.youtube.com/watch?v=2NRM-mwoGUE

[28] MVRDV, Freeland diagrams. [diagrams] 2012. In: ALMERE OOSTERWOLD. MVRDV [online]. Rotterdam: MVRDV B.V., 2023 [cit. 2023-04-10]. Dostupné z: https://www.mvrdv.nl/projects/32/almere-oosterwold