

Extended Process of Architectural Design: Sustainable Development without a Master Plan. The Case of Kagran Area, Vienna

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Abstract

The model of architectural design proposed in this paper aims to incorporate contingencies of everyday life into the project itself. By loosening the parameters of the master plan, this trial-and-error approach can catalyze the sustainable process of urban development. Over recent decades we have witnessed the failure of great urban expectations and promises. Therefore, the paradigm of testing could be an efficient tool in preventing the shortcomings of conventional urban planning models.

Testing as a method in architectural design and urban planning allows for bottom-up planning, starting from a unit towards the urban system, therefore offering a possibility for reflection and reaction. Most importantly, it introduces the trial-and-error approach in architectural design and planning that presents the opportunity to learn from one's preliminary steps and adjusts the plan if necessary. By generating scenarios rather than functions, one can verify that the preliminary assumptions were correct and that the project should continue developing in a certain direction, or that the preliminary assumptions were wrong and that different solution is needed.

The issues that are going to be addressed in this paper are focusing on the role of architectural design process in relation to sustainable urban development. These issues will be analyzed through a case study project for urban development of Stadlau Shopping Park in Kagran area, Vienna.

1. Introduction

A complex task like growing a city community demands a strategy. It is not primarily about aesthetics and the appearance of objects, but rather about the sequential design of the order in which they appear and the resulting relationships thus created. Cities are developing at an accelerated rate, making it difficult to predict contingencies that any architectural design will have to face.

The proposed extended process of design based on trial-and-error method corresponds to incremental planning model developed by Lindblom: '[...] the development of an area proceeds step by step, adapting over the long term to changing factors and actors. New developments grow, as it were, out of existing uses, on the basis of place-specific characteristics.' [1] This model incorporates risk management into the proposal. By loosening the parameters of the master plan, this trial-and-error approach can catalyze the sustainable process of urban development. According to Lindblom and his Incremental Development, change is understood as evolutionary and not as revolutionary, therefore the design is focusing not merely on delivering typologies and *finite* architecture but rather on designing a potential which can evolve over the time responding to the needs of both users and market.

Lindblom's model of incremental development has been successfully used for decades in various disciplines, but it hasn't been applied to design process so far. The topic of the research is a proposal of how incremental model can be applied in design process itself.

2. The problem of divergent durations

The pace of contemporary life inevitably raises the question of duration in architecture. The physical object of architecture presumably lasts longer than merely to meet the current needs of those for whom it was intended; it lasts longer than what constitutes the duration of the contemporary socio-political processes.

Keywords: Extended process of design, Inhabiting, Interim, Contingency, Trial and error, Sustainable design

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[2]. Therefore the answer to the question of duration in architecture could be found in shifting the focus from the conventional procedures of urban planning and architectural design towards the relation between individual and generic. According to Iain Borden, social and political aspects of architectural production lead to the understanding of architectural space as a social category, rather than merely a question of building [3]. This research project argues that the conventional understanding of a building as a typologically determined product with an imposed function implies the divergence between architectural project and the life of the building. This paper questions the status of architecture of housing as an over-defined structure, both in space and in time. In this research, the existential space is seen as an interface (a mediator) influencing socio-political processes in order for the inhabitant to appropriate the space.

At the same time, the sustainability of architectural project is seen in the scope of extending the process of architectural design and overlapping the design process with the physical lifespan of architecture. Lifespan of the physical object of architecture inevitably exceeds the intent, purpose and function of the users for whom it was created, therefore making presumed program compromised and obsolete. Thus, there is a distortion of two durations - the lifespan of architecture as a physical object and the temporality of content, users, and circumstances. In relation to this, Jeremy Till argues "that time, not space, should be seen as the primary context in which architecture is conceived." [4]

From this discussion we can conclude that the over-determined physicality of an object of architecture is incapable of allowing and supporting the contingent elusiveness of everyday life. What is needed to overcome this discrepancy of two durations? How to encode a change into design process itself?

3. The extended process of architectural design for sustainable planning

The projected space of the urban plan or the architectural project is produced through the drawing. Commonly, this process of producing the space through a drawing presents a one-time, limited situation, because only after the design is finished begins the duration of building of architecture in physical space. Despite the inevitable loss in translation from the architectural drawing towards the physical building as Jeremy Till notices [5], the architectural project is nonetheless conceived as a crucial link in the iterative procedure between intentions and results, and therefore may be nominated as a tool for research in the field of architecture during the extended process of searching for the intelligent spatial configuration. [6]

Unlike commonly criticized open-ended design models (flexibility in space), this approach implies the extended duration of architectural design process (flexibility in time and space). Since it is carried out according to previously defined values, this iterative procedure establishes a specific set of results that can later be evaluated (trial-and-error).

Bringing the user's needs closer to the design process, as well as involving the users in designing and building their own environment, incorporates one's personal experience, character and thought into the process of spatial decision making. After a user is included into a process of constructing (his own) territory, the user has a distinct feeling of ownership of the space. In theory, a user is being transformed into an inhabitant. This understanding of the notion of inhabiting theoretically approaches Heidegger's concept, whereas building means dwelling [7]. This research project introduces a strategy of encouraging negotiations and identity building into the process of community planning, into what is conceived as an extended process of architectural design.

The extended process of architectural design transgresses the linear logic of decision-making process and consolidates itself in the iterative method where feedback information creates new positions for observing and understanding the design task. The design process is expected to provide answers to the constant need for dynamics and transformation, as well as to provide the position that encompasses multiple solutions. Christopher Alexander in his doctoral thesis published in a book "Notes on the Synthesis of Form" argues that the process of adapting and the concept of variability are associated with the process of architectural design, rather than the spatial characteristics of form. The discussions about the operationalization of diagrams, and a review of the analytical nature of architectural design take the central spot of his thesis. According to Alexander, architectural drawing is expected to offer more than its conventional meaning and understanding - that it is an exact information-transferring document [8]. The diagram does not have a relationship with the visual representation, yet it builds relation with the act of identifying and overcoming a problem. If we adopt Deleuze's idea that diagram has a generative role in the process of creating, the same model can be seen as an apparatus for using feedback in architectural design. [9] All the information obtained through the iterative process can be applied to modify the existing, or creating new fields of activity. The method used to establish the extended process of architectural design and urban planning is based on the theory of change [10] and is pursued through trial and error method of design.

3.1. Trial and error: Testing as the method

Testing as a design method allows for bottom-up planning and opens possibilities for reflection and reaction. Most importantly, it introduces the trial-and-error method in architectural design and urban planning that presents an opportunity to learn from one's preliminary steps (mistakes and successes) and adjusts one's plan and design if necessary. By generating situations, one can verify that the preliminary assumptions were correct and that the project should continue developing in a certain direction or that the preliminary assumptions were wrong and that different solution is needed.

In relation to everyday life, the trial-and-error method enables us to acknowledge individual specificities as a variety of needs existing on all levels, which defers from the logic of designing standardized spaces. Instead of implying presumed optima, testing enables inhabitants to express individual spatial needs as to incorporate them into the design process itself.

4. Trial project: Kagran area urban development case study

The issues raised in previous section concerning the design process and methods in relation to sustainable city growth will be explored further through a case study for Kagran area development project. This research project is produced as a proposal for European 12 competition with a topic The Adaptable City. Kagran area is situated in the city of Vienna whose population grows annually for 20.000 new inhabitants. One of the city strategies is to converse large dispersed areas and re-qualify them for being suitable for populating. The site is positioned between two intensive traffic infrastructures- the rail tracks and the motorway. This feature at the same time isolates as well as connects the site to the city and region on the wider scale. Recently, the new tramline is introduced, which is a precondition for inhabitation. Still, the area is based on car and truck logic that affects dimensions, distances, character and texture of the space. Therefore, the site has to be redesigned in order to attain anthropometry.

How can the impact of the new tramway stop be exploited in order to develop a new kind of urban quarter around this node within the next decades? How can a hyper-fragmented, "car-driven" area be converted into a sustainable and attractive urban quarter without neglecting the current reality? How can the existing structure adapt, step by step, to another idea of urbanity? [11].

The proposal offers creative possibilities for a project to incorporate uncertainty, lack of funding and the long-term territorial transformations that affect the site.

This "waiting period" before actually implementing a project is designed to facilitate multiple scenarios, to involve numerous stakeholders and ultimately to allow changes to the initial vision. The project depends on different processes that emerge out of the dynamics of the site context; therefore it can organically grow out of the site.

4.1. The specificity of the site: The context of Stadlau Shopping Park in Kagran Area

The area of interest is divided into three zones based on their main features, problems and possibilities. The intention is to orchestrate the process of three different areas to function as a harmonious whole (Figure 1).

The most prominent feature of the Zone I is the fact that it is the single empty area; the only building on this site is used as infrastructural support for the flea market, happening once a month. The location is, from time to time, used to accommodate travelling circuses.

Dominant in Zone II are the shopping malls, with the vast empty space between two sides of the 'street', occupied with the parking lots. Unprogrammed and unused space between the shopping malls is recognized as the biggest obstacle in transforming this location into an urban neighbourhood, as well as the biggest spatial opportunity.

The most striking negative characteristic may be attributed to Zone III. As the consequence of long-term activity of the oil refinery this location is contaminated. The main intention is to take the responsibility and repair what previous generations damaged, while promoting a truly sustainable model of urban existence.

4.2. Planning without a master plan

The focus of the proposal is not on the end product itself, but rather on designing and stirring the process in order to satisfy the needs of the potential inhabitants, through understanding the dynamics of changeable circumstances. The main characteristic and intention of this project is developing sustainable design process, both in the field of architectural design and in the field of designing social relations. Hence, there are four stages to the proposal as four acts in a scenario. The scenario starts from a structural framework, and as the vision extends further into the future, the form of the proposal is becoming looser, guided by the inhabitants rather than controlled by the vision of a planner. The first and fourth stages of the process deal directly with the physicality of space through building, while the second and third stages are program-based and mutually informative.

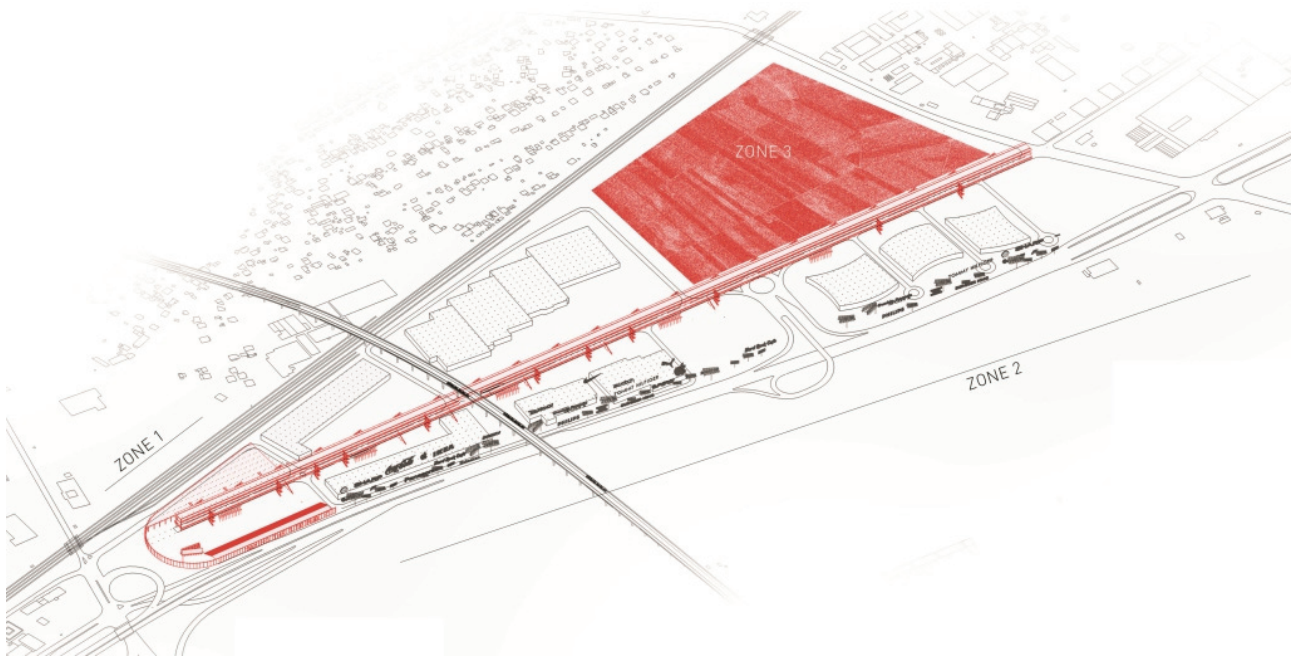


Figure 1. Stadlau Shopping Park

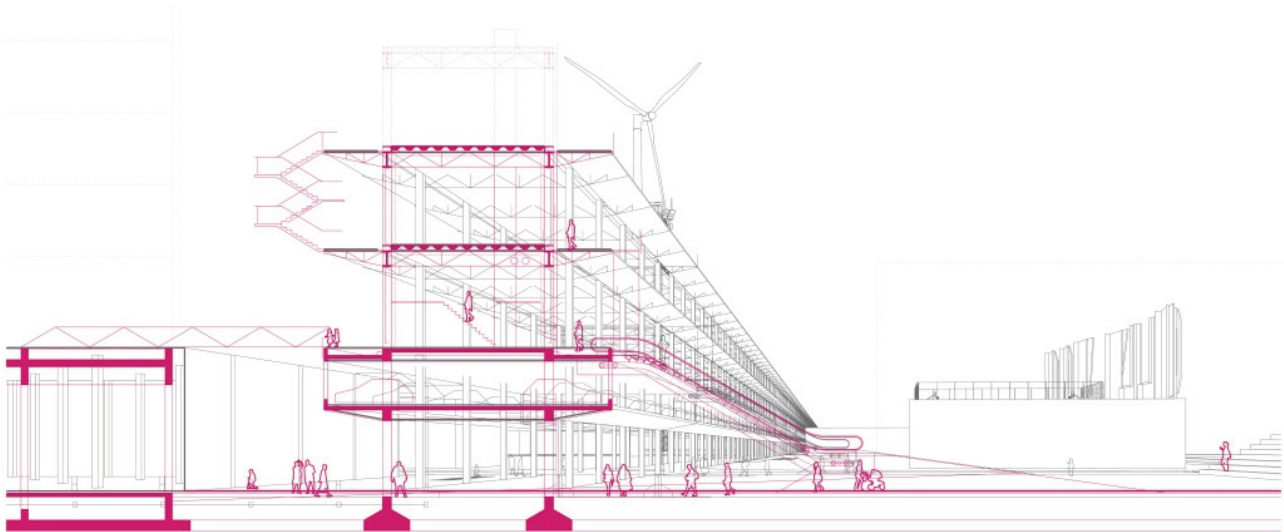


Figure 2. The infrastructural backbone

4.3. Trial and error: Methodology and evaluation

In this research, a set of criteria is proposed, for both organization at the beginning of each phase and for the evaluation at the end. For each phase separately, these criteria are: Intention, Goal, Tool and Target Group. If the Goal is achieved then the next phase starts, if the goal is not achieved, then the Organization process starts from the beginning while redefining one or all of the proposed criteria.

Three criteria used for the evaluation: Intention, Goal and Tool are typical elements of Goal Based Planning used to create business strategies. The fourth criterion – Target Group – is specific to the project's task to "make the site public", with the purpose to attract diverse potential inhabitants over different periods of time through exemptions, favorable building or renting condition etc.

A special advantage of Lindblom's model of incremental development, from which the methodology of this design research departed, is that it supports and follows

an organic progression where the project evolves over the period of time. This is achieved through periodically conducted evaluations that trigger either redefining or sustaining previously defined goals. In other words, extended process of architectural design proposed in this research should challenge rigidity and linearity of the conventional planning. On one hand it is economically much more efficient as the risk of failures often assigned to urban planning is reduced to a minimum, and on the other hand much more flexible and open for timely creative solutions.

4.4. The timeline of infrastructural backbone: Planning and inhabiting as parallel processes

The common element for all three zones and all the phases is the infrastructural backbone. During the first phase the infrastructural backbone is a basic frame, while in the second and third phase, the backbone is program-oriented. In the fourth phase, when architecture and urbanization are taking more permanent presence, the backbone has completed its role as the engine of growth and it begins to dematerialize, serving as an extension of the street as a part of city's slow mobility network (Figure 2).

4.4.1. Phase 1. The frame: Introducing infrastructural backbone

Intention: facilitating; Tool: legislation; Goal: opening up a spatial possibility for an event to happen; Target group: school children, educational institutions.

"New spatial and constructional structures generate freedom, taking time as their departure-point." [12].

The city of Vienna introduces a new spatial policy for businesses that operate in this area. During the one-year period each business is required to release the existing parking lot and transform it into a green public space. Parking space should be located in the newly formed central axis that runs through the middle of the area, above the existing street. Each individual business must independently fund the prescribed changes. In the case of non-compliance with the new spatial regulations, businesses will have to pay a fine. The income raised through fines is used to improve the structure. Adopting these new spatial regulations regarding parking areas is intended to secure new public spaces.

The first stage involves building the infrastructural backbone of the site, providing plenty of parking spaces above the ground level enabling the site to become an open public space. At the same time, this spatial structure is built to open up the possibility for a program to take place. In order for the test site to grow and develop in a natural and organic manner, the structure needs to be habitable. The proposed infrastructural backbone of the site is conceived as a structure for a variety of programs, interconnected to a program of living. The grid is based on the spatial requirements of a car park, therefore generating maximum flexibility for adaptable space above, that can easily be turned into flats, offices or host public programs (Figure 3).

The existing contaminated area is cleaned through the process of phytoremediation – the use of plants that mitigate the environmental problem without the need to excavate the contaminated material and dispose of it



Figure 3. The Frame: maximum structure and minimum program

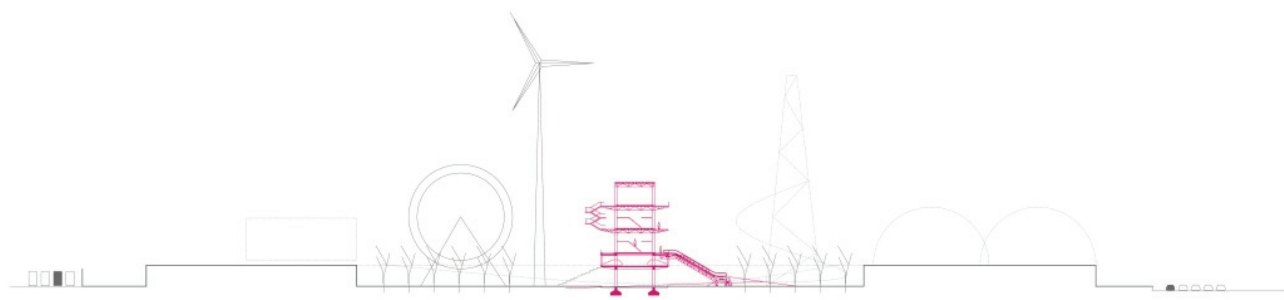


Figure 4. Inhabiting infrastructural backbone with the mixture of programs

elsewhere. Three annual crops have demonstrated the best results for bio-remediating soil contaminated by oil products: maize, oat and lupine. These plants were tested for the phytoremediation of polluted black soil of an oil refinery plant [13]. The maize plants revealed the highest remediation ability: oil content in the soil decreased by 40% in one month. Using

phytoremediation is cost effective, has aesthetic advantages, and long-term applicability.

The installation of the main infrastructure on the site facilitates the process of phytoremediation over the contaminated zone. A research institute, as a state founded project, should slowly start to inhabit the site,

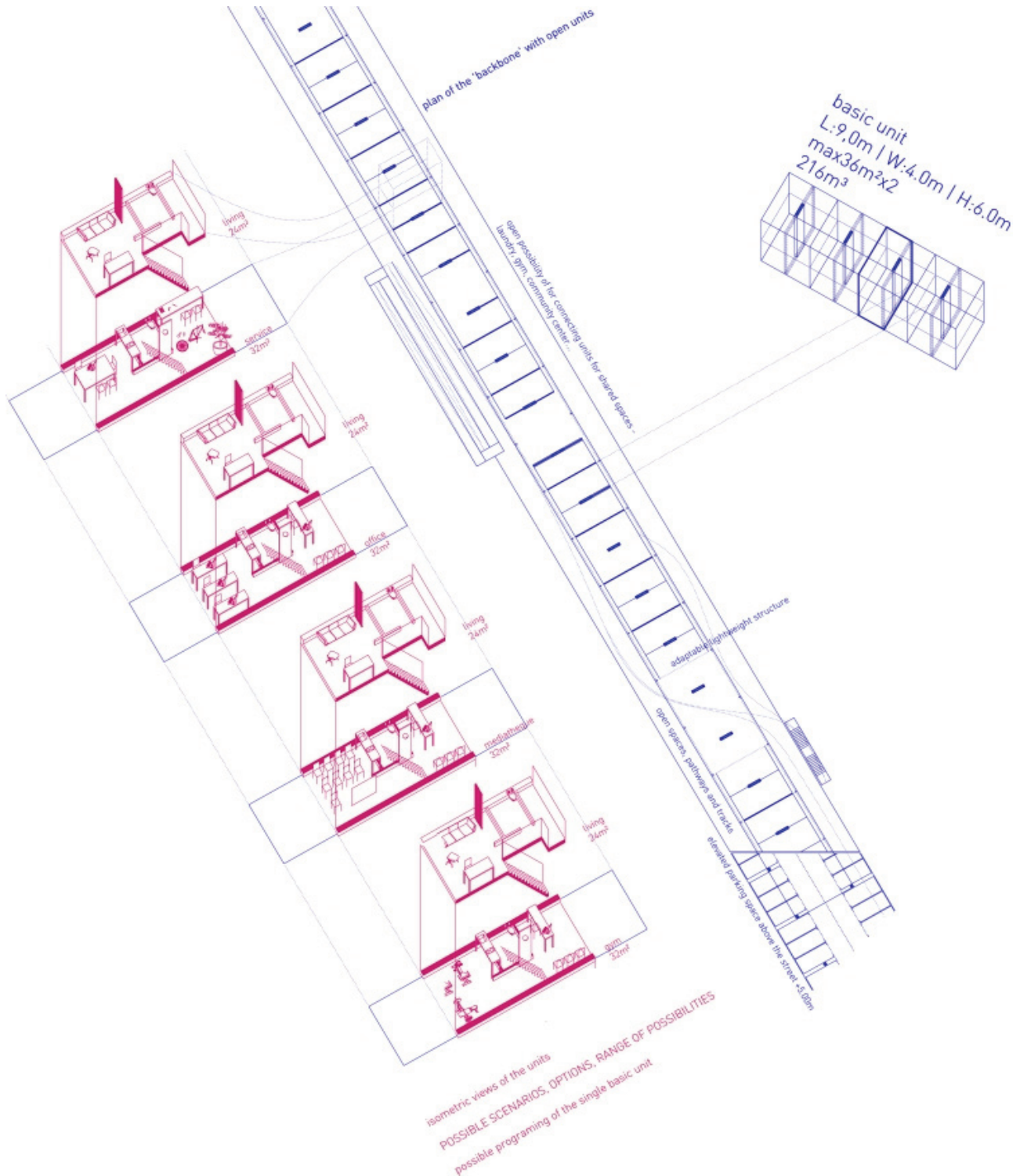


Figure 5. Bottom-up planning: From the unit towards the urban system

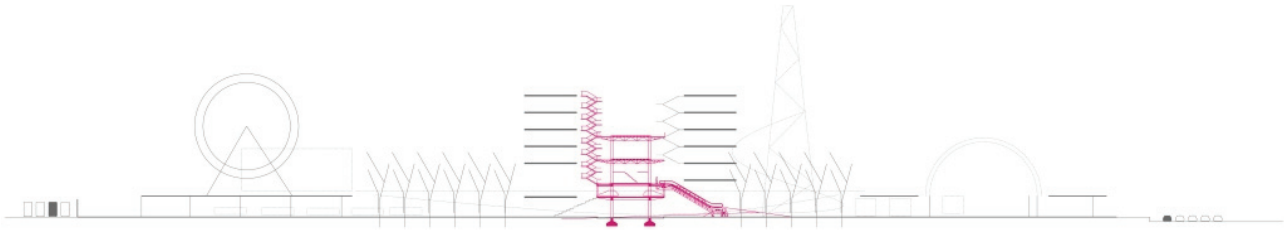


Figure 6. Maximum infrastructure and maximum program

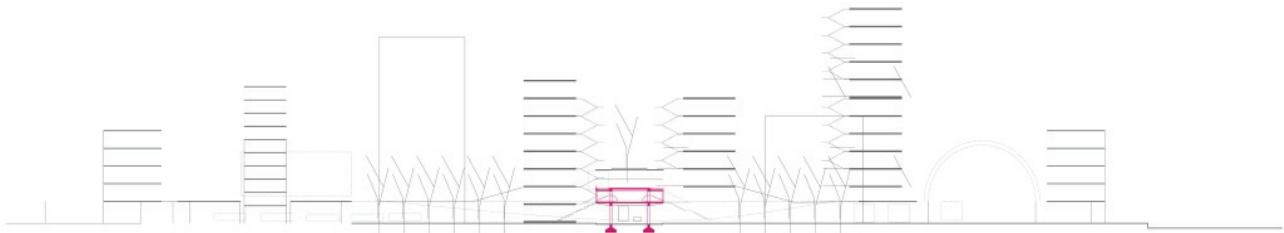


Figure 7. Infrastructural backbone becomes slow mobility network

at the begging on the very temporary basis – daily activities and workshops. The main objective of the first phase is to start building up the identity of the place by conducting research and education on the site, focusing on finding solutions for the contaminated part of the site.

4.4.2. Phase 2. Inhabiting: The temporal state of living

Intention: Making the site public, Inhabiting; Tool: Promotion through events, favorable rental conditions; Goal: Raising interest, attracting future users/residents; Target group: People in interim The main purpose of this stage is to make the site public through a series of events and programs with the different time spans, from one day to a few months. This time window is used to display the new vision for the area – as a result of the previous stage, what used to be parking for shopping malls is now green public space. Together with the inhabitable spatial structure the site is becoming a field of possibilities for events to occur (Figure 4).

To promote the site as an emerging urban quarter one needs to attract an audience. The goal is to generate a heterogeneous mass, creating a schedule that will bring diverse groups of people through various events, to activate the site during all seasons, at different times of day, different days of the week, fortnightly, monthly, quarterly.

In order to sustain the mixture of programs, project proposes a model of temporal housing that would attract citizens of all incomes and variety of social

backgrounds, but with one particular common preference - need of temporal housing solution.

Initial design is based on a generic unit that would be able to host different programs and activities attached to basic dwelling- concept of living and working -home office, workshops, shops, recreational activities, activities linked to the concept of neighbourhood everyday life.

As mentioned earlier, the project proposes the concept of inhabiting instead of housing. Inhabiting is different from housing because it can last from a few hours to few decades and it is not strictly connected to dwelling as housing. It also questions and decomposes the conventional notion of a house, while introducing contemporary concept of living and working.

During the two-year period, until the infrastructure is completely developed, low cost and favorable conditions, temporariness above all, are what can attract users (Figure 5).

4.4.3. Phase 3. Towards a permanent community

Intention: Fostering dynamic urban development; Tool: Favorable ownership or construction terms; Goal: Creating a hybrid compound of positive urban qualities; Target group: Potential owners, private investors

In this phase the backbone reaches its full capacity both spatially and programmatically. It gains stability as an urban space and the whole site becomes a place in the city. After the mixture of programs and services is

developed during the first two stages (acting as an infrastructural foundation for subsequent residential development), new residents are attracted with favorable ownership, rental or construction terms. In the previous phase the target group consisted of people in the interim of their lives: those who have recently moved to Austria, students, people with new businesses, alternative theatre, bars, a flea market... In this phase, due to favorable ownership conditions or construction terms, permanent residents are attracted. Here, one can build/buy one's home, business and social life. The plug-in working/dwelling units are located in the longitudinal structure, the backbone, and now in the third phase there is the possibility of conventional building to emerge. Residents who moved here earlier and who helped developing urban qualities have the most favorable conditions for obtaining their own permanent residence (Figure 6).

4.4.4. Phase 4. Social density: Sustainable urban growth

Intention: Steering; Tool: Evaluation, Consultation and Guidance; Goal: Cultivating and improving attained; Target group: Public investors.

This is the rapid construction stage of the development. It is reaching its most urbanized state, the area is densely populated and the programmatic diversity is getting very high offering a multiplicity of choices. Design of this stage observes the city of Vienna as a whole and involves the development of an overlapping transport network: public transport, highways and bicycle paths. What is valued and fostered for the future is therefore connected with other strategic points on a larger urban scale (Figure 7).

A special advantage of the backbone is that people don't have to be dislocated from the site during this rapid construction and development. While the permanent, conventional, housing is being built, residents can continue to live in the infrastructural backbone. After the buildings are finished the residents can easily move in. In this moment the backbone completed its previous function and slowly begins to deconstruct until when it becomes purely infrastructural again, collecting elements such as pedestrian and bicycle lanes, slow mobility network of the city.

5. Conclusion

Over recent decades we have witnessed the failures of great urban expectations and promises; the paradigm of testing could be an efficient tool in preventing the shortcomings of urban planning. It is suggested that the emphasis would be on improving the tools, and drawing *time* instead of space, therefore simulating scenarios,

rather than merely representing the upcoming spatial configurations. Nowadays, architectural techniques for representing and rendering *reality* are developed to perfection. The proposal is to use these tools for simulation of different scenarios, offering virtual reality as testing ground, rather than merely portraying *finite* architecture.

A project shouldn't offer just a final product but also steps to get there, allowing more organic development of the project, increased flexibility and therefore decreased risk of financial or programmatic, thus social failures.

Finally, it should be noted that in order for the extended process of architectural design to be possible, it is not sufficient to have the understanding and tools for dealing with the contingencies of urban life, but it is crucial to initiate and define new legislative framework that would allow a productive feedback between divergent times of planning/designing on one hand, and building/inhabiting on the other.

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