

FL

ÖWG WOHNBAU

HOFRICHTER — RITTER
ARCHITECTS

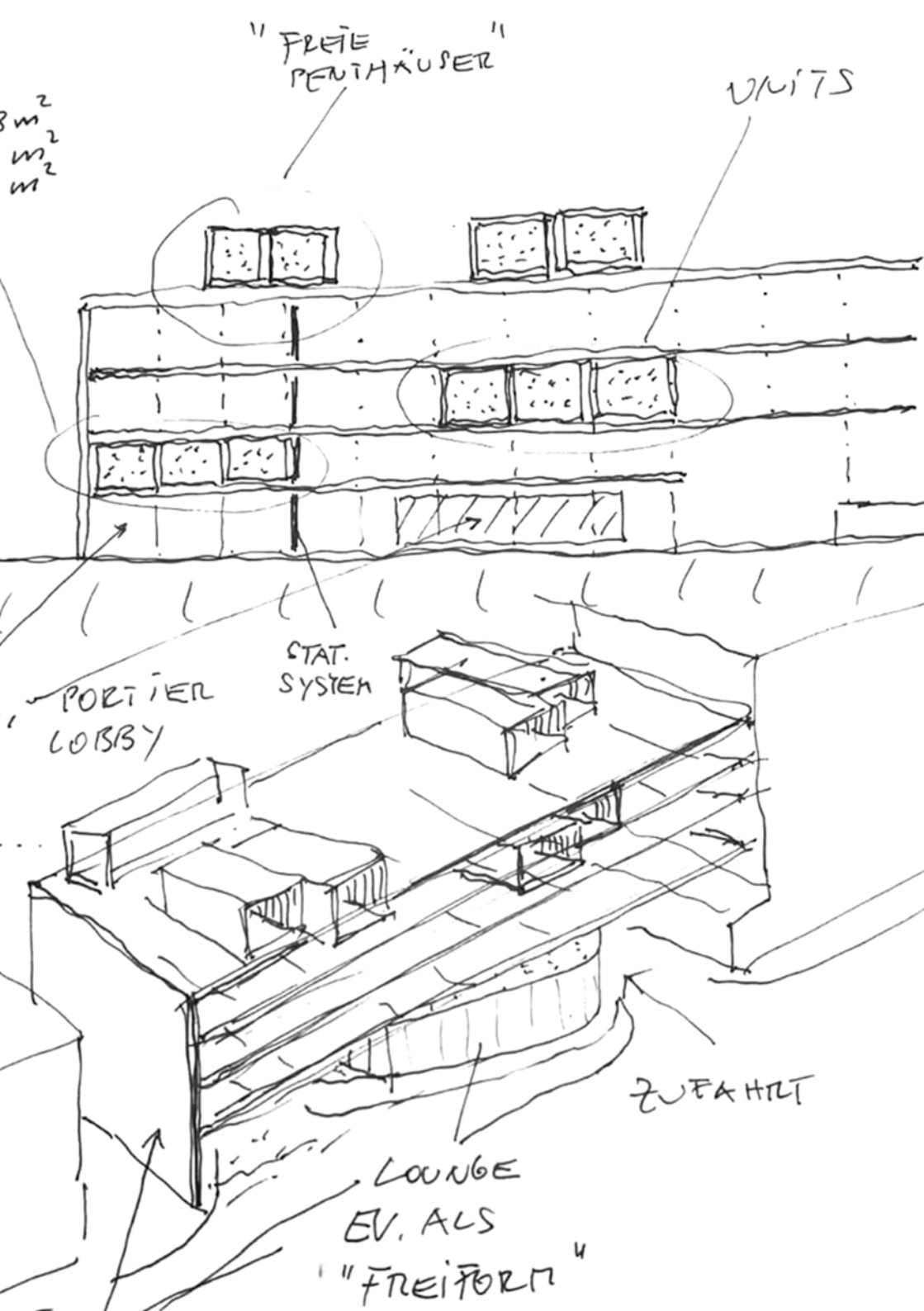
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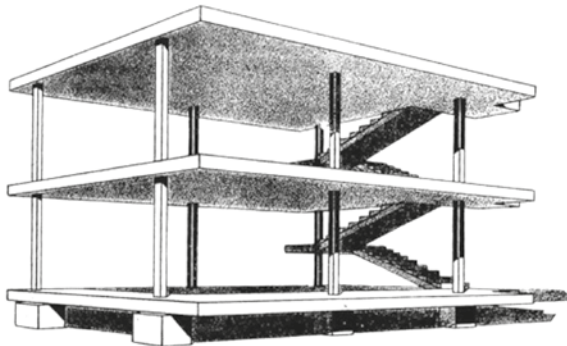


In an increasingly individualised, flexible and mobile society, communal living is becoming ever more complex in its organisation and the demands on living spaces and building are increasing. On the one hand, life and residential biographies are increasingly subject to changes because of changing living and working situations, an issue for which traditional construction has so far not really been able to formulate attractive approaches. On the other hand, modular building systems developed until now have reached their limits in terms of technical possibilities for flexible room designs or have run short conceptually in the face of legal and financial barriers. The working fields of architecture hand-in-hand with open space and spatial planning develop and design future spaces of possibility. This always process-based development can refer to a spatial-functional design, but also to design on a temporal and conceptual level. Such a process creates traditional properties that can only react to changing requirements in terms of dimensions, location and function to a limited extent. The rigidity of the system is inherent. FLEXLIVING attempts to develop solutions based on the requirements outlined by a constantly changing society with reference to historical pioneering work and based on contemporary development in architecture.

Modernist architecture and its visions had claimed its place by the middle of the 19th century at the latest, fuelled by the development of prefabrication and assembly technology as well as the reduction of a formal design language as evidenced by constructive milestones such as Paxton's Crystal Palace in London in 1851 and the Eiffel Tower in Paris in 1889. The new building materials glass, metal and later concrete allowed buildings to be constructed with new dimensions and in a short time. The Prinzip Konstruktion allowed for visionary ideas and utopias. At the core of modernist architecture was a striving towards the complete industrialisation of building. This vision was to be realised through buildings of unprecedented dimensions built in a truly short time using new materials and techniques. The design of the building was given an essential priority.

The Venice Biennale of 1914 can be seen as a starting point for modernist residential construction. At this exhibition, Le Corbusier presented his design for the Maison Dom-ino as a 1:1 project. On the one hand, its name reflects the composition of houses like dominoes. On the other hand, the word is a combination of domus, the Latin for house, and the word innovation. The starting point for the design was a housing shortage in Europe at the beginning of the 20th century. Le Corbusier's solution was simple: A standardised, two-storey house made of concrete slabs without walls or rooms, a structural skeleton ready for individual expansion. Due to the conceptual reduction of the house to its ceilings, floors, supports and the stabilising staircase, the design required a self-confident and consistent separation of the building construction and the individual expansion.

Dom-ino System,
Le Corbusier 1914

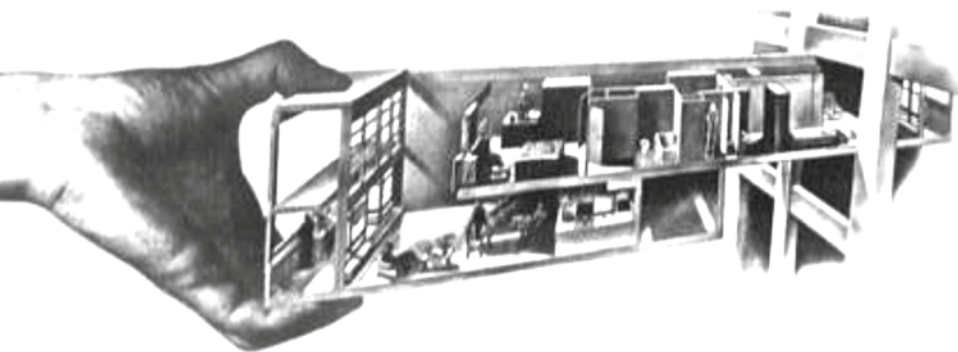


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The Maison Dom-ino was the first residential building in architectural history to have been conceived as an open system, a structural-constructive platform for contemporary understandings, which the residents are able to expand or complete at their own discretion and according to their own wishes. Le Corbusier hoped the idea could be patented. In partnership with his friend Max Du Bois' concrete company, an assembly line for buildings was to be created, much like the one Henry Ford had invented for the automobile the year before. Using assembly technology, the Maison Dom-ino resembled a typical industrial product. Le Corbusier, however, was already developing his idea further in the direction of the assembly line production of wooden houses for the French residential construction market. Le Corbusier thought the rare combination of highly qualified specialists and factory conditions in the construction industry would be ideal for the realisation. Ultimately, however, the Dom-ino system could not be produced due to a lack of investors, but it became an emblematic project of 20th century architecture and the starting point for the industrialisation of construction. Le Corbusier developed his conceptual idea even further in other projects such as the Cité Radieuse in Marseille with first occupancy in 1952. The resulting series of Unités d'Habitation was ultimately realised in several European cities. Compared to his contemporary colleagues, he always attached great importance to the urban context of his buildings.

The serial production of the sub-components – from the supporting structure, extension and facade – as separate systems gave rise to hope for an industrialisation of construction.

To illustrate his design principle and thus modular construction at its core, Le Corbusier made a collage – “The Bottle”. Using the terms “bottle” and “bottle rack”, he demonstrated his design principle in a striking manner. His idea was to manufacture every part of the bottle in the workshop, assemble it on the construction site and simply hoist it into the intended spaces in the bottle rack.



The Bottle, Le Corbusier 1961

Inspired by Le Corbusier’s approach, the 1920s and 1930s were shaped by economic efficiency and technical precision in the design and construction of large residential complexes. A new functional construction method was developed with an attempt to reduce construction costs by developing building typologies for large-scale residential building projects together with set room standards for the minimum subsistence level. The serial production of the sub-components – from the supporting structure, extension and facade – as separate systems gave rise to hope for an industrialisation of construction. The founding of the Bauhaus Weimar in 1919 gave significant impetus to the initial and further development of modernist architecture approaches. The formal reduction and the unity of art and technology were central elements of the Bauhaus teachings. Under the direction of Walter Gropius, a push was made towards the ultimate simplification of forms. The designs extended far beyond pure buildings towards a holistic approach that included furnishings and technical equipment such as lamps, switches and carpets. At the same time, Ernst May began to develop the plattenbau method for industrialised apartment block construction using prefabricated concrete slabs, essentially establishing industrialised urban development. The dissolution of the traditional eat-in kitchen into a pure cooking-only kitchen reached its climax in the Frankfurter Küche of 1926 by Margarethe Schütte-Lihotzky. The developments were accompanied by an international discourse, formalised by the recurring CIAM congresses from 1929-1959. As a figure of the American avant-garde, Richard Buckminster-Fuller also pursued a factual or rather a constructivist position and, with the Dymaxion House in 1927, delivered a residential building as a prototype for series production. The house with a circular floor plan could be dismantled, packed up and moved. With 97 square meters of floor space and a diameter of 15 m and a height of 12 m, it weighed barely more than 2,000 kg including furniture. It was, however, not until after the Second World War that construction of the Dymaxion House first became possible with the development of a new aluminium alloy for aircraft. Only two prototypes were ever realised because no investors could be found for mass production.

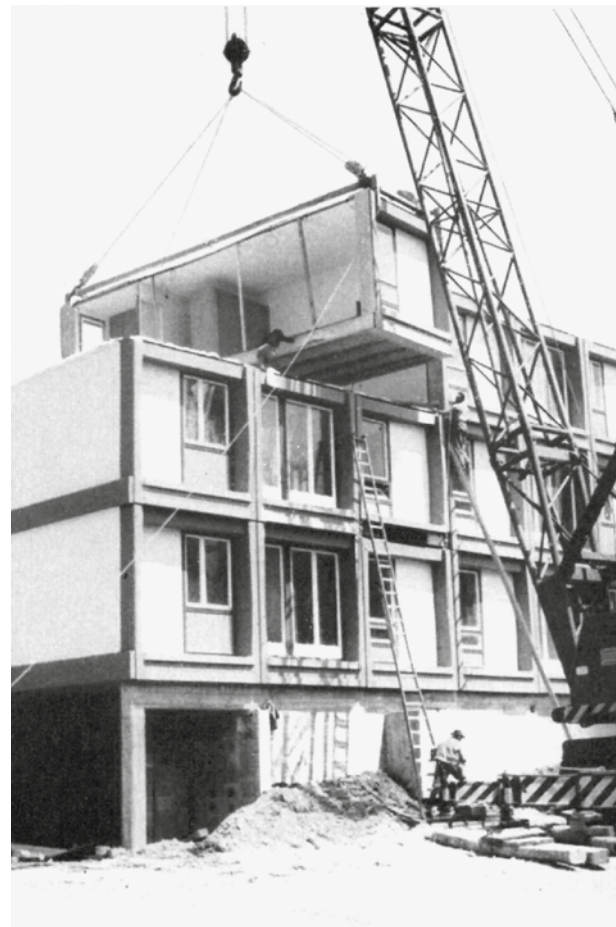


Dymaxion House as installed at the Henry Ford Museum 2005

After a partial interruption due to global political events at the beginning of the 20th century, especially in Europe, architecture in the 1960s once again took up the theme of prefabrication and industrialisation in construction both in real and increasingly in utopian projects centred around future users. A first theoretical work of the post-war period was provided by N. John Habraken with *Supports - An Alternative to Mass Housing* in 1961, his fundamental considerations on urban planning and architecture and against mass housing construction. His idea describes a residential building that is divided into two levels. The first level represents the Supports as a stable and uniformly industrially designed and manufactured structure. These define the urban development, are structurally effective and form a skeleton structure with a ready-made infrastructure to accommodate the apartments. He understands the second level as Infills, which can be individually designed, interpreted and expanded by people. They could be the actual apartments, but also private and communal open spaces. Habraken saw his approach as a modular system and had already devised an industry of manufacturers and service providers that would be able to support both the construction of the skeleton and the individual adaptation of the living space. He saw the static structure as durable buildings, the apartments as inexpensive and mass-produced commodities.

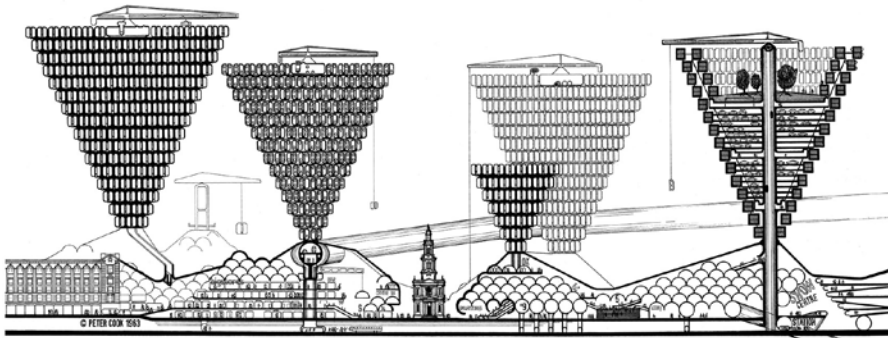
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Variel-System, Fritz Stucky and Rudolf Meuli 1966



A first promising implementation of these theoretical ideas was the modular construction system Variel by Fritz Stucky's Elcon AG. The Variel system, patented as early as 1954 and used internationally, was a 90% industrially prefabricated concrete modular construction method comprised of room elements that were mass-produced in the factory. These could be assembled within a truly short time directly on the construction site using transport and hoisting technology. The value of the Variel system was in its open conception in terms of both vertical and horizontal expandability and thus a resultant astonishing freedom and vitality in the design. Different room programmes from single- and multi-family houses to schools, kindergartens and offices could be tailor-made with the greatest possible variability. Stucky expanded his Variel system worldwide by the early 2000s.

Less realistically oriented but all the more utopian were the ideas of the British avant-garde architectural group Archigram, inspired by Habraken and Buckminster Fuller, among others. They designed nomadic alternatives to traditional living modes in the 1960s, including portable homes and Walking Cities – mobile, flexible, volatile architecture they hoped would be liberating. In the 1960s and early 1970s, they developed visions for the future of architecture that cast a spell on an entire generation. One of Archigram's best-known ideas is the Plug-In-City. Here, a permanent infrastructure framework was proposed that could implement modular residential units according to the residents' wishes. The individual living capsules were to be industrially prefabricated in accordance with the size and design desired by the residents and would remain adaptable over time.



Plug-In City, Housing for Charing Cross Road, Peter Cook @ Archigram 1963

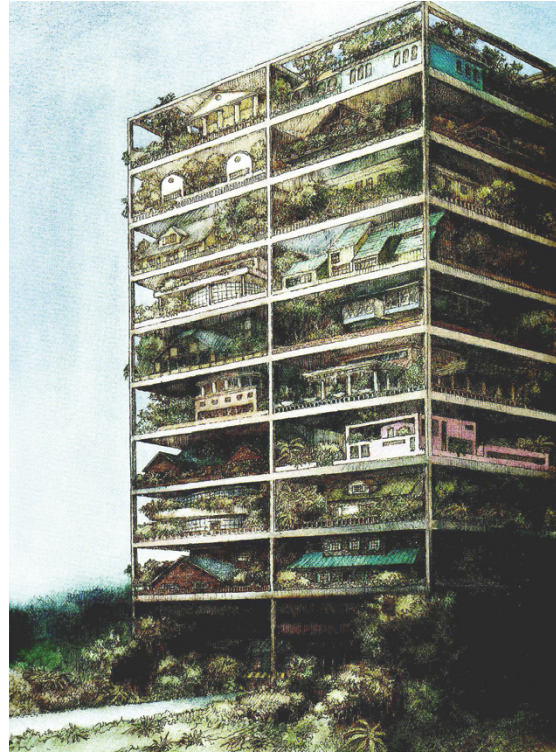
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Free Time Node, Trailer Cage, Ron Herron @ Archigram 1966

At the time of the Archigram studies in the 1960s, a marked transformation occurred in society, with the traditional family and home changing and becoming more flexible as individual mobility increased. Archigram's experiments examined how architecture could respond to these trends by developing new construction systems that allowed more flexibility compared to traditional methods. The Archigram concepts were based on shared and innovative use of space. In their opinion, people should always be ready to improve spatial realities. Archigram's flexible buildings and way of thinking were inevitably part of such a logic. The Free Time Node Trailer Cage from 1966 is designed as stacked mobile homes and caravans inserted into an existing infrastructure using Plug&Play.

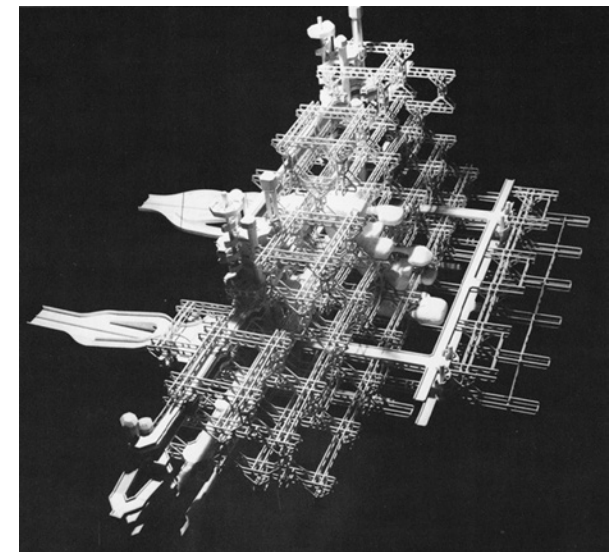
Archigram's utopias have been widely discussed internationally and interpreted by architects around the world through their own concepts and projects. The American architect James Wines, the initiator of the architecture and art group SITE, provided a design in 1981 that shows a multi-storey matrix. The building is a steel and concrete matrix that supports a vertical community of private houses that join to form village-like communities on each floor. One of the goals was to offer an alternative to conventional housing in the cityscape – an urban collage of indeterminacy, creativity and cultural diversity created by the residents themselves. The borrowings from the basic understanding developed by Habraken and the further development through Archigram's utopian projects are evident.



Highrise of Homes, James Wines, SITE Group 1981

A vertical community of private houses that join to form village-like communities on each floor.

Archigram's ideas also found widespread application and approval in the Graz architecture scene. In this regard, Domenig/Huth's design of the "Neue Wohnform Ragnitz", which was awarded the Grand Prix International d'Urbanisme et d'Architecture in Cannes in 1969, is emblematic. At the heart of the design was a three-dimensional framework consisting of a primary and secondary support structure, which was to be produced from industrially prefabricated elements. The infrastructure was added at a later design stage and, depending on the use and size, various residential boxes were to be implemented onto the framework. Like Archigram's utopias, this project also never came to fruition. In the spring of 1967, as part of an exhibition in the Forum Stadtpark, the work of the planning group Domenig/Huth and the Werkgruppe Graz was presented publicly and discussed. The planning group Domenig/Huth gave their contribution the title 'Propositions'. They now presented their project Stadt Ragnitz to the public in Graz for the first time, as it was a further development study for the Ragnitztal Valley originally commissioned by a Styrian building cooperative.



Exhibition Model
"Neue Wohnform Ragnitz",
replica, Domenig/Huth 2001

The Werkgruppe Graz presented a cross-section of their projects from 1963–1966 in the exhibition 'Crystallisations'. It was here that they presented their draft of the "Terrassenhaussiedlung" in Graz-St. Peter for the first time. In his opening speech, Eugen Groß, a member of the Werkgruppe Graz, called for specific research contracts to be awarded within the framework of legally stipulated building research, for demonstration building competitions to be held, for experimental projects to be constructed and then also for a commitment to be made to them, i.e. for

At the same time, future residents were to be given the opportunity to articulate their needs within a flexible and structuralist system.

the money spent on these projects to also be put to use. Every experiment comes with failures; thus, it is just as important to discard solutions and identify wrong paths. With these words, Gross anticipated a development that was formulated and implemented around 15 years later as the internationally known residential building Modell Steiermark. The design of the 'Terrassenhaussiedlung' is based on a separation of the planning levels into a primary, secondary and tertiary structure. This principle goes back to the elaboration of structuralism in architecture, inspired by the models of the Japanese Metabolists and Team X. By referring to methodical structuralism, the architects of the 'Terrassenhaussiedlung', one of the first Graz projects in structuralism, attempted to abandon any ideologies, dictates and the pursuit of mass production. At the same time, future residents were to be given the opportunity to articulate their needs within a flexible and structuralist system. The primary structure of the residential complex encompasses the concept of the shell structure of the facility in terms of urban development, the cubature, the load-bearing system and the infrastructure. The design level of the secondary structure relates to the apartment as a place of individuality. The architects tried to offer diverse

floor plans and forms of living for diverse people. An apartment could thus meet the human need for identity. In the 'Terrassenhaussiedlung', every family was to experience the living style of a single-family house without having to forego a sense of community. The principle of individuality also stood against monotony and submission. The architects developed a total of 24 apartment types based on four basic designs. The design level of the tertiary structure encompassed the theme of participation and saw itself as an integral part of the primary and secondary structure. The involvement of the interested parties ranged from the floor plan and facade design to the apartment furnishings to decisions regarding the common rooms. The architects saw the apartments as building blocks that had to be put in a box according to certain general principles.

Terrassenhaussiedlung Graz-St. Peter, Werkgruppe Graz 1973



Inspired by the international success, the Styrian architecture scene entered a phase of experimental residential construction by the beginning of the 1990s, internationally known as Modell Steiermark – the heyday of the Graz School of Architecture. Through real-time housing experiments, innovation in social housing could be experienced and lived. These activities formed a counterpoint to the prevailing reproduction of standardised housing and resulted in 28 residential buildings with diverse concepts and characteristics. The development approach of the Modell Steiermark was based on fundamentally rethinking the housing construction process by analysing the interrelationships between the requirements and structures of society, politics and planning and taking them into account accordingly. The processes of design, manufacturing, management and use of the living space as well as the self-image of the residential architecture were put up for discussion.

Through real-time housing experiments, innovation in social housing could be experienced and lived.

While the development of visionary approaches and residential construction projects quieted down by the 1990s at the latest, modular construction continued. European and US architects as well as construction companies pushed the further development of modular construction. Today, modular construction is booming worldwide and seems to keep the promise made by modernist architecture – the industrialisation of construction triggered by Le Corbusier with the Maison Dom-ino at the Venice Biennale in 1914. Building with modular and prefabricated elements has enormous potential in reducing costs as well as planning and construction time while keeping the quality consistent. It represents a fast, flexible and at the same time ecological space solution. Due to technical developments and new design concepts, modular construction has by now become a real alternative to conventional construction.

In the building industry, parallel to technical advances, discussions revolve around the central question of how our coexistence can be positively influenced and organised in the future. This question of the future goes far beyond the planning and construction operations and on a closer look shows that there must be a stronger focus on the social design of the environment. A holistic sustainable development in construction cannot be understood as a purely technical problem and therefore cannot be achieved with technical means alone. A consolidation of these complex conditions is needed. The living space as a place and living as an activity is embedded in a multi-faceted network of ecological, economic and social aspects. In combination with everyday activities outside the home, it significantly defines our living environment. The interactions between built residential structures, conception and planning as well as the effects on the behaviour and quality of life of the residents represent a central pillar in the sustainable design of our cities and settlements.

In the area of living, fitting together living needs as a sociological-psychological phenomenon and apartments as a design-spatial aspect, linked to economic conditions and embedded in an ecological framework, can create new added value. Ideally, this would result in higher living satisfaction while simultaneously requiring less resources. There are currently two trends in living space over the past few decades. On the one hand, the statistics show increasing living space per capita and on the other hand, a simultaneous decline in household sizes. According to forecasts, these trends will continue. This demographic change in combination with the change of the traditional family structure mean that more and more people are living in the lonely splendour of larger and larger spaces. Hans Drexler developed the Open Architecture concept to solve two possible architectural problems. On the one hand, we need more adaptable and flexible residential buildings based on demographic change, pluralised household types and an individualised and multilocal society. He concludes that sustainable planning and design must be less specific and that the buildings must be adaptable for varying uses. On the other hand, he sees a meaning

in communal forms of living to counteract the loneliness and isolation of people. With simultaneous resource efficiency, these projects, from Drexler's point of view, promote living satisfaction and hold special potential for society in particular. Internationally, architects such as Alejandro Aravena and OO from London, designer of the Wikihouse, argue that self-empowering systems are needed in construction – not finished houses. Buildings that can be flexibly designed and used can contribute to a resilient society, as changeability and multifunctionality can create security through the ability to react quickly. When architects combine the standardised details of modular construction with their own creativity, aesthetic structures can be created that are unsurpassable in terms of speed, flexibility, quality and use of resources as well as urban and social added value.

FLEXLIVING – THE CONCEPT AND SYSTEM

FLEXLIVING sees itself as a further development and self-confident, consistent interpretation of historical and current pioneers. The basic idea of FLEXLIVING dates back to 2002. Gernot Ritter, at that time assistant at the Institute for Building Theory and Housing at the Graz University of Technology, and Hans Schaffer, an architecture student, developed a concept with the aim of making spaces mobile through dynamically usable structures that serve people. The concept was no longer to develop pure prototypes but to build standardized, serially producible units that can be used flexibly. Hans Schaffer, today CEO of ÖWG Wohnbau, one of the largest non-profit housing developers in Austria, and Gernot Ritter, today architect and partner at HOFRICHTER-RITTER Architekten in Graz, developed their concept further together. After almost 20 years, the idea is now becoming reality through FLEXLIVING. The FLEXLIVING concept consists of a hybrid system that consistently separates the shell from the fitout, combines rent and ownership, and offers adaptability to the individual life cycle. The main building structure is implemented using a stationary or mobile support unit in the form of a terminal. This terminal is built in as a resource-saving concrete or wooden skeleton structure and consciously inserted into the location-specific context. The building system is then completed

with prefabricated units in the form of individual modules. Users purchase one or more modules according to their individual requirements and rent one or more spaces in the terminal. These modules are connected to the building services of the terminal using the Plug&Play principle; thus, the module is already fully functional once it is connected to the terminal. Thanks to the high degree of standardisation and the simple connection principle, these modules can be used with another terminal at any time or even as a free-standing element, both in an urban and in a rural context. Each individual module can fulfil a multitude of functions – a permanent or temporary residence, a workspace, a care facility or a cultural and catering space. If more space is available, additional modules or open spaces can be flexibly connected to an existing unit at any time. The terminal reacts dynamically to changing needs by accepting multiple combinations of prefabricated mobile modules and allowing multiple occupancy states. Simple additive systems up to the development of complex spatial designs are conceivable. Such a high degree of prefabrication and serial production enables high-quality and weather-independent manual work, a large part of which takes place independent of location in production halls and no longer on construction sites. FLEXLIVING combines the advantages of immovable and movable property. The flexibility of the system is inherent. The first project is currently being built in Graz with first occupancy in autumn 2021. The FLEXLIVING project sees itself as a platform and open process for a new type of building. There are no limits to the ideas – there is space for everything needed. The development of the system, a project by experts from different disciplines under the direction of ÖWG Wohnbau and Hofrichter-Ritter Architekten from Graz, aims to intensify further thinking by other actors.

With this in mind, please contact us at flexliving@oewg.at and/or visit us at the first project location in Graz.

FLEXLIVING separates construction and expansion into terminal and modules with a prefabrication degree of 90%.

FLEXLIVING pursued a consistent separation between the space-delimiting components and the static requirements while keeping to resource-saving requirements at the same time.

FLEXLIVING modules are weather-proof and designed according to serial, well-engineered principles.

FLEXLIVING shortens the construction time to a few months.

FLEXLIVING makes it possible to precisely determine the quality, deadlines and costs in advance.

FLEXLIVING is the ultimate one-stop service provider for everything from an urban planning concept to construction completion.

FLEXLIVING offers both flexible spatial solutions as well as modular and flexible building structures.

FLEXLIVING is revolutionising modular construction through its ability to adapt to location, time and use.

FLEXLIVING improves working conditions for the construction industry.

FLEXLIVING is more than a building – it is an attitude towards life.

FLEXLIVING signifies a self-confident lifestyle, allowing residents to take responsibility for themselves, their family and society.

FLEXLIVING is not a static product – it is a process.

FLEXLIVING sees itself as a built utopia – as a lived future in the here and now, linked to a spatial-temporal strategy.

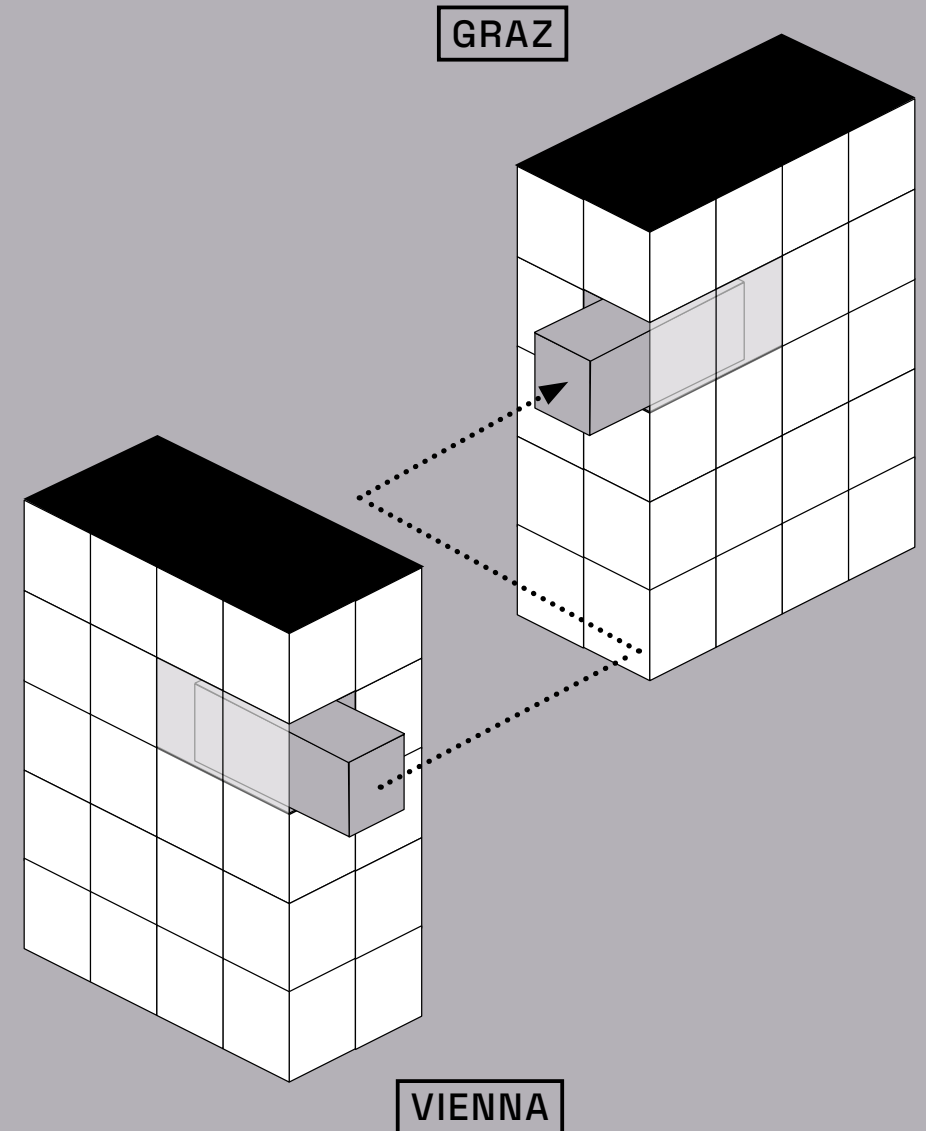
FLEXLIVING contributes to a paradigm shift in urban planning and sees itself as a contribution to its dynamic further development.

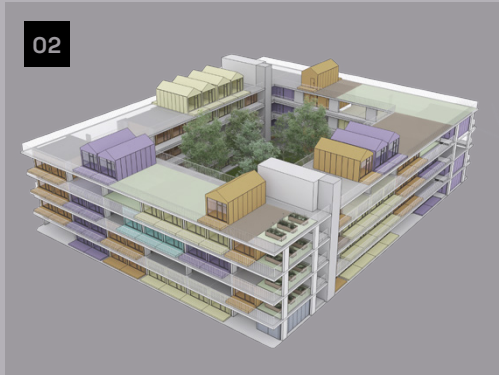
FLEXLIVING is a hyper-reality.

FLEXLIVING is a hybridisation of space production, legal relationships and lifestyles.

FLEXLIVING combines the advantages of serial production with sophisticated architecture.

FLEXLIVING adapts to life and is tied to moments and stories, not to places.





02

01 Development study
FLEXLIVING

02 Urban planning study
FLEXLIVING



03

03/04 Installation
of modules at the
prototype, Kulmer
Pischelsdorf/Austria

05/06 Detail of the
FLEXLIVING model



04

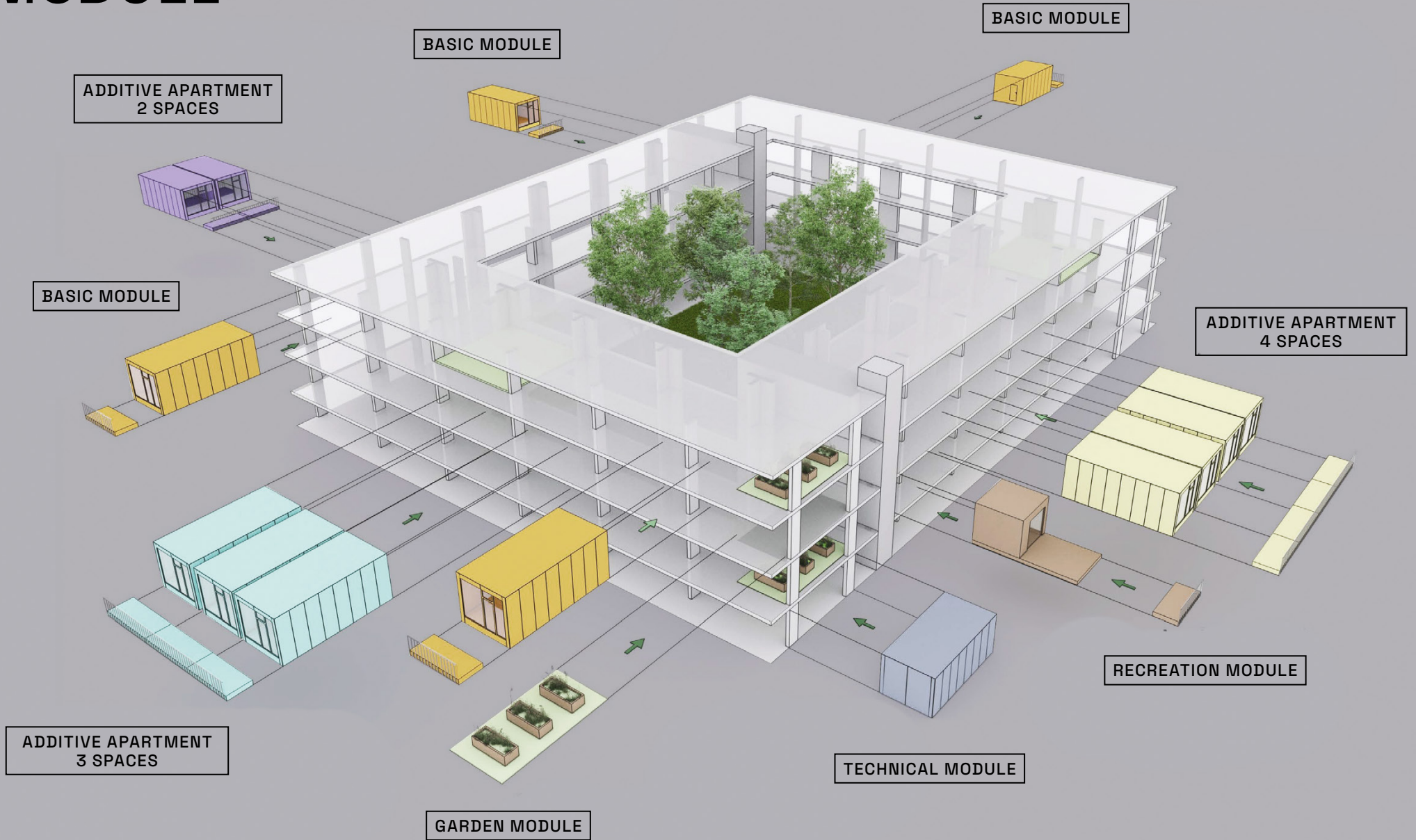


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FLEXLIVING MODULE





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IMPRINT

This booklet is published in the context of the contribution FLEXLIVING of the Architecture Biennale in Venice.

Publisher: ÖWG Wohnbau und HOFRICHTER-RITTER Architects, Graz
Text: Andrea Jany, Graz
Translation: Y'plus, Graz
Graphic realisation: Brains, Vienna
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