

FÓRUM FORUM

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UNDER THREAT: THE METASTADT BUILDING
SYSTEM

V OHROZENÍ: STAVEBNÝ SYSTÉM
METASTADT



Metastadt Bausystem,
Model House Project, panel
system, Lauenstein, 2008

Metastadt Bausystem,
projekt ukázkového
domu, panelový systém,
Lauenstein, 2008

Source Zdroj: INIK / Lars Scharnholz

Stavebný systém Metastadt (Metastadt Bausystem), ktorý v šesťdesiatych rokoch 20. storočia vypracoval Richard J. Dietrich, je v dejinách stavebníctva unikátom. Spája v sebe urbanistické plánovanie, architektúru a štrukturálne inžinierstvo. Vo svojom programe, organizácii a metodológii, ako aj v koncepcii, vývoji, plánovaní a realizácii výrazne predbehol svoju dobu. Stupeň logiky, s akou bol Metastadt Baumsystem rozpracovaný, od makroúrovne urbanistického plánovania po mikroúroveň štrukturálnych detailov, bol majstrovským dielom v oblasti plánovania, organizácie a technológje.

Napriek odporúčaniam CIAMS, aby funkcie a priestory boli oddelené a decentralizované, Dietrichov prístup nabádal k postupnému zahusťovaniu mestských centier. Jeho stavebný systém sa rozrystal do tretieho rozmeru a tiahol sa ponad ulice či železničné koľaje, teda miesta, ktoré boli predtým nevyužitú. Standardizácia, industriálna

prefabrikácia a štrukturálna koordinácia umožňovali voľné a individualizované priestorové plánovanie a exteriérový dizajn, ktoré sa odlišovali od typickej sociálnej výstavby a umožňovali, aby sa celý systém prispôbil meniacim sa požiadavkám a používateľom.

V roku 1969 začal Dietrich implementovať svoj Metastadt Bausystem spolu s Berndom Steigerwaldom a ďalšími s finančnou podporou spoločnosti OKAL, v tom čase najväčším výrobcom prefabrikovaných domov v Nemecku. Nasledovalo niekoľko ďalších projektov.

Zbúraním ukázkovej budovy Metastadt z roku 1971 v Lauensteine v Dolnom Sasku, ktorému väčšina profesionálnej verejnosti nevenovala pozornosť, zmizol pozoruhodný mílnik nemeckej povojnovej architektúry. Modulárny prototyp, ktorý dočasne slúžil ako administratívna budova a bol takmer v pôvodnom stave, bol poslednou ukázkou myšlienky metamesta.

Until recently the Metastadt building system was considered among the failed architectural ideas of the 20th century. This utopian architectural concept attempted to introduce pioneering changes in modern urban planning and to test in practice the possibilities of industrialized building. Its innovation consisted of combining engineering solutions with the newly possible computer-based methods for statics calculations, aiming towards fitting built structures of various functions into vacant urban lots with the aim of gradually increasing the density of the existing space.

Nonetheless, on closer inspection of the technical details, the systemic approach and the fundamental objectives, the Metastadt approach appears to be well thought through and ambitious. The composition of personnel within the development and consulting teams, the participating professional companies, all of which were market leaders in their respective fields, as well as the participation of one of the largest producers of prefabricated housing in development, production, and marketing leave no doubt as to the seriousness of the endeavor. Even the idea for the design reveals that the architects of this ambitious idea

struggled not only to achieve innovative construction methods but equally towards high-quality design. Nonetheless, to this day the vision has been so largely forgotten that the most recent demolition of the Metastadt trial building in Lauenstein near Hannover passed without any comments by the professional community.

IDEA AND REALIZATION

The Metastadt building system marks the culmination and the final point of the architectural utopias of the 1950s and 60s. Stimulated by increasing industrialization, radical technical innovation, and an explosive growth in world population, architects, artists, planners and civil engineers began to develop new modern urban utopias that achieved a hitherto unknown degree of radical innovation in established living and working conditions.

In the process, the planners did not aim for a clear gain in space alone as an answer to the problem of expansion opportunities with growth potential. Against the background of rapidly progressing changes in demand and life style within society, the aim was instead to achieve flexibility in

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Metastadt Bausystem,
Model House Project,
panel system and roof,
Lauenstein, 2008

Metastadt Bausystem,
projekt ukázkového domu,
panelový systém
a strecha, Lauenstein, 2008

urban planning and architectural solutions. While recognizing the direction of the modernization process, they saw themselves as hardly capable of formulating a definitive projection of possible consequences; their aim was to design flexible systems that could be adapted to the development, depending on its course.

The starting point of Dietrich's discourse on the theoretical foundations of a new urban planning program, with the visionary title *Metastadt*, was marked by a lecture and exposition series, titled *If We Want to Continue Building*, initiated by Richard Dietrich in 1965 at the Technische Hochschule München, which examines the application of industrial fabrication methods in structural design. Invited lecturers included the chief protagonists of Modernist utopias of the era: Konrad Wachsmann, Jean Prouvé, Eckhard Schulze-Fielitz and Yona Friedmann. Stimulated by the contributions of the invited architects, Dietrich began his work on the *Meta-City Building System*, which led to his dissertation, following the lecture series. A basis for the elaboration of the *Metastadt* project was the architectural-theoretical essay on the same topic

that had been written in cooperation with Rudolf Doernach during the years 1965 – 1966^{1/}.

Hailed for his ideas as a utopian visionary, Dietrich not only dealt with theoretical constructs of future urban planning models but from the beginning pursued the ambitious goal of testing his ideas in practice. Helpful for the implementation of the *Metastadt* idea was Dietrich's encounter with Paul Klümper at the Institute for Wood Construction at TH München in 1968, Klümper then serving as the operating manager of the OKAL Company in Germany's Black Forest. OKAL - Otto Kreibaum Company in Lauenstein in Lower Saxony was Europe's leading producer of prefabricated wood houses at the time.

TRIAL BUILDINGS

In an initial step in 1970, a trial building financed by OKAL was constructed on the grounds of TH München. During a two-year investigation period, a series of tests concerning structural and architectonic physics were conducted and various production methods were investigated and optimized. The trial building was designed to allow for the investigation of all conceivable scenarios as well as constructive and physical building problems to be addressed in future buildings. Thus the trial building was mounted on pylons and featured numerous projections and recesses as well as terraced floors. Individual elements and building components were largely produced by hand.

Following the conclusion of the testing phase in 1972, OKAL constructed its administrative building in the style of the *Metastadt* building system as a demonstration model. In the same year the meta-city building system was presented at the Hannover Trade Fair. The biggest building project became the *New City Wulfen* in North Rhine-Westphalia, built during the mid-1970s. With about 100 publicly financed apartments for 500 inhabitants as well as shops and a nursery school, the project was intended to dispel the very final doubts as to the technical feasibility of a meta-city.

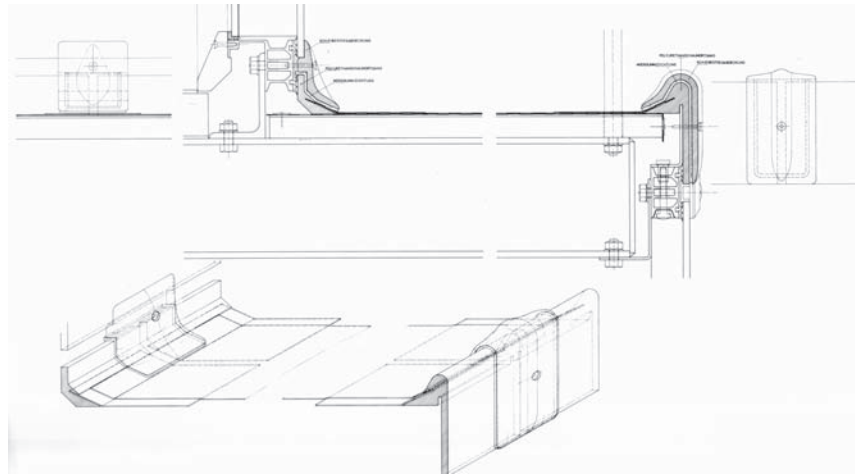
THE END OF THE METASTADT

However, great acclaim did not follow in its wake. Along with criticism of modern urban

planning, sharp polemics broke out regarding the very basis of the Metastadt idea. At the same time, the 1973 oil crisis also affected the building industry, hitherto characterized by constant growth. As a consequence, roughly a dozen building projects already in the planning stage ended up in the drawer. The project in Wulfen was abandoned after 13 years; the demolition of the Metastadt in Wulfen marks the end of the entire project. What was left (until recently) to recall the visions of the past were only a small trial building and a not-so-carefully maintained administrative building of the OKAL Company from Lauenstein in Lower Saxony.

Not enough time was allowed for projects such as the Metastadt experiment in Wulfen to assert themselves as convincing urban planning models. After the buildings were completed, expectations were so high and the criticism directed at their ahistorical universality was so severe that none of the necessary subsequent structural adjustments were tolerated.

Although the Metastadt in Wulfen was clearly conceived and constructed as a trial building in the eyes of all participants, in the ensuing time



Source Zdroj: Dietrich and Steigerwald

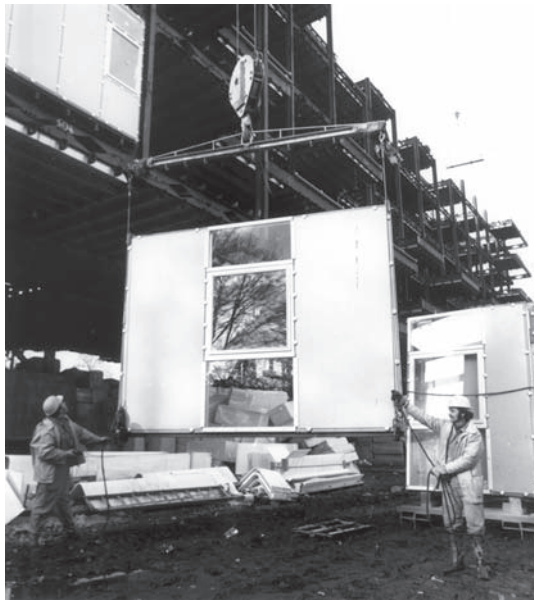
no one seems to have been able adequately to investigate the inevitably occurring deficiencies and their causes and gradually undertake the necessary adjustments. Beyond that, from the beginning the developers lacked the courage to carry out the Metastadt experiment to the extent originally envisioned^{12/}.

The result was that the inhabitants were confronted with an idea of a city that had undergone very little practical testing, and the weaknesses of which were to be discovered and rectified under conditions of daily use. The inhabitants tolerated this laboratory situation to varying degrees. Halfheartedly implemented measures to address or remedy structural flaws were perceived as impositions that did not signify a technical optimization or further development but rather, after a short time, resulted in additional damage to the building^{13/}.

If the energy crisis and the downswing of the building industry that ensued had already resulted in the economic end of the Metastadt society, the demolition of the Metastadt in Wulfen meant an end to the building innovation of Dietrich and Steigerwald as well. The end of the Wulfen project signified not only the demolition of this single housing unit, but also the overall declaration of failure for the Metastadt.

Metastadt Bausystem, detail of construction

Metastadt Bausystem, detail konštrukcie



Source Zdroj: Dietrich and Steigerwald

Metastadt Bausystem, panel on construction site

Metastadt Bausystem, panel na mieste stavby

FLEXIBILITY AND UNIVERSALITY

Today, we must ask, however, whether the Metastadt visions of the past were indeed an undesirable development and marked the cul-de-sac of an architectural view of postwar Modernism that was too imprinted with ideology. What was the technical innovation of the Metastadt idea? How would its structural problems be solved today? What prospects of success might the Metastadt idea have if one considered it further?

The outstanding achievement of the participating architects and civil engineers was to found the Metastadt building system on a constructive system that, while in operation, allowed for continuous interchangeability of individual units of use within the entire system without considerably

Metastadt Bausystem,
 Model House
 Project, Munich
 Metastadt Bausystem,
 projekt ukázkového
 domu, Mníchov

detracting from it. It was possible to make slight changes in the ground plan within a unit as well as a more complete modification of the whole system by extending or undoing entire sections. Thus the constructive system of the Metastadt encompassed a highly ambitious range of productivity and remains unparalleled to this day.

The steel construction system developed for this endeavor was executed as an orthogonal skeletal structure with rigid joints. The basic module was a cube consisting of 24 quarter frames on a basic grid of 420x420 mm and of variable height. The detailed building elements allowed for a precise adaptation of the building to the current space requirements. Steel pylons suspended the skeletal structure, into which space-delineating elements and technological infrastructure were inserted. The maximal use of space and flexibility were achieved without diagonal bracing.

Especially remarkable in this context are the pioneering achievements in planning in the area of automated numerical calculation procedures to register the constant changes in the load-bearing structure and to enter these changes into the construction according to the changing load conditions. A specifically developed software application automated the calculations of the changing load conditions within the entire system and determined the changed escape routes to guarantee constant adaptability.

REDISCOVERED AND DEMOLISHED!

Recent years have seen a rekindled interest in the Metastadt idea and the modular building visions of the 1960s and 1970s. This small renaissance is connected to the most recent entry of computer-based planning and production methods in architecture. Compared to current development in the construction industry, however, Dietrich's and Steigerwald's constructive conceptual work was far ahead of its time. Today's approaches hardly match the depth of the Metastadt idea in terms of objectives, technique and organization. Missing in the majority of current projects is the universal claim of the Metastadt building system, in particular, concerning the solution of living problems in publicly funded apartment construction. Thus the



Source Zdroj: Dietrich and Steigerwald

Metastadt building system and its still extant prototypical legacies mark the beginning of a development that is likely to increase in significance in the decades to come. Recently, the far-reaching influence of these urban visions was brought to focus through the exhibition, *Home Delivery: Fabricating the Modern Dwelling* at New York City's Museum of Modern Art ^{4/}.

In the face of this renewed interest, it is all the harder to understand the demolition of the unique Metastadt trial building in Lauenstein in the spring of 2010, which also was temporarily designated as a historic building and protected during the 1990s. There has been no response from the professional community to this day. The reasons for this demolition are utterly incomprehensible, even if during recent years no buyer could be found nor was a change of use of the building possible. The building was in acceptable condition and could have been rescued. Its windows, facade elements and interior walls were nearly undamaged ^{5/}.

With this demolition, the link between the first trial building and its serially reproduced product has been destroyed. Now the aim is to secure the remaining structure for future building research. The basis for this research can and should be provided by a thorough investigation of the Metastadt building system, which would shed light on all aspects from conception and development to the abandonment of the idea and will integrate them into past and present contexts.

Perhaps the most recent demolition can become a signal point for positive action, one that could result in the adequate protection of the



Source Zdroj: INIK / Lars Scharnholz

remaining Metastadt buildings in Lauenstein and the urgently needed building research. It should become apparent that, as a unique testimony, the Metastadt building system unifies construction history, urban planning, architecture, and constructive civil engineering. Its objectives, organization, procedures and means of conception, development, planning, and execution were far ahead of the time. The consistency with which the Metastadt building system was drawn up, from the macro level of urban planning to the micro level of constructive detail, constitutes a masterpiece in planning, organization and engineering.

Metastadt Bausystem, office house, Lauenstein, 2008

Metastadt Bausystem, administratívna budova, Lauenstein, 2008

POZNÁMKY NOTES

¹ Dietrich probably received additional stimulation for his ideas from having worked for Konrad Wachsmann at the Institute of Building Research at the University of Southern California, Los Angeles, USA from 1966 – 1967 and from his interest in Pueblo Indian settlements in the American West during this time.

² Consequently, only a fraction of the original extent and planned functional complexity was realized in Wulfen.

³ See GESTERKAMP, Thomas: *Der schiefe Turm von Wulfen*. Die Zeit, Sept. 12, 1986, number 12.

⁴ CHRISTENSEN, Peter – BERGDOLL, Barry: *Home Delivery: Fabricating the Modern Dwelling*. Basel, 2008.

⁵ The authors of this article took a comprehensive tour of the building in 2008.