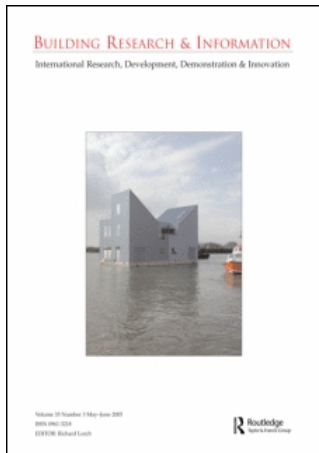


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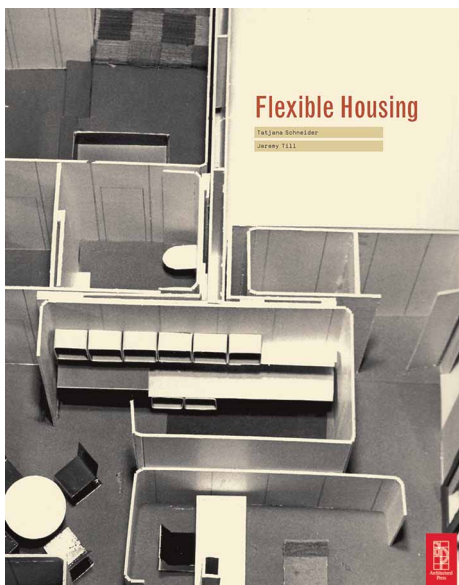
Design for flexibility

N. John Habraken

Towards a Research Agenda

Tatjana Schneider and Jeremy Till

Flexible Housing, Architectural Press, UK, 2007; ISBN 978 0 75 068202 2



It takes courage to devote a book to the concept of flexibility in architecture. Words like ‘adaptability’, ‘flexibility’, and ‘polyvalence’ have multiple and often overlapping meanings that make it virtually impossible to come up with a vocabulary acceptable to everybody.

Confusion in terminology is typical for architectural discourse. Other professions – those of medicine, law or engineering, for instance – define themselves by a precise vocabulary employed for internal communication. Architects take pride in coining their own words to describe the world as they see it, aiming to promote a personal or tribal vision.

In the introduction to their book, Tatjana Schneider and Jeremy Till discuss the issue of terminology then to decide to use the term ‘flexibility’ to cover the entire range of possible design decisions that aim to loosen rigid functionality. One therefore finds, among their many examples, Auguste Perret’s famous Rue

Franklin apartments in Paris (1903) – where physically everything is fixed, including bathroom and kitchen, but none of the other rooms seems functionally determined – as well as the entirely empty territories offered the user by the brothers Arsene-Henry in the early 1970s.

That sensible approach successfully highlights a problem peculiar to contemporary architecture: the desire among architects to recognize the spontaneous variety of user preferences and the unpredictability of future use.

A broad exposition

More than 160 projects are documented of which more than 70 are given a page each for ‘case studies’. I found quite a few instances that were new to me but noted a Western slant in the selection. The extensive Japanese record on flexible housing is poorly represented, about which more below.¹ But the authors’ selection of examples approaches completeness in a more important sense: designers inclined to ‘go flexible’ will find it difficult to come up with an idea that is not already present in this book.

The book’s title is somewhat misleading in that the contents are entirely about the *design* of flexible housing and not about the broader interaction of interdisciplinary influences that shape it. Within that limitation, the first two chapters sketch the larger context. We are first introduced to major motivations leading designers to address flexibility such as the rise of the restricted and minimal dwelling in modern times, the industrialization of housing, and the movement towards user participation.

Next, the case for flexible design is made. Here as well the authors are very well informed and mention most if not all relevant views and instances from various parts

of the world,² but the narrative, as far as I could check it by personal knowledge, is superficial. We hear, for instance, that house builders worldwide benefit from planned obsolescence in housing production by way of inflexible plans, but it is not mentioned that it is technically much easier to modify the balloon-framed suburban house in the US as well as the timber-framed one in Japan compared with the apartment or row house in Europe built in masonry or reinforced concrete. Nor do we hear in this context that home owners will change their houses no matter what, even when the latter are functionally determined when bought, because ownership is empowerment; while units for rent tend not to be adapted to a user's wishes even when technically flexible. As a promoter of Open Building, I raised eyebrows when reading that apparently the:

history of Open Building ... suggest[s] the dangers of allowing technical issues to over-determine the design of housing at the expense of an original intent to create housing that empowers the user ...

(p.48)

as if technical innovation implies abandonment of user empowerment or that trying to facilitate such empowerment technically is to be frowned upon. It also does not clarify much first to cite criticism by a third party and then add that it is probably unfairly given (p. 47). Lapses like this in an overall sensible exposition show how an attempt to cover a complex subject by that many references in just about 20 pages requires disciplined editing.

Further chapters look upon the available selection of examples from the perspective of design: the organization of space and material each are reviewed and a final 'manual' summarizes the many ways flexibility can be provided, such as by external addition, internal transformation, or the combination or subdivision of territories.

All in all, a designer who is new to the subject is served a full plate, including much that can help to avoid the first handful of mistakes.

The wide range of information, both historical and morphological, that Schneider and Till provide is conveyed in a clear and relaxed prose, devoid of jargon. The authors do not hesitate to give an opinion, usually sensible and illuminating, but they do not seek to provide the reader with criteria or guidelines by which to find a way in all this evidence. The approach is descriptive, not analytic. It reminds one of a design studio conversation, focused on ideas of form, and somewhat removed from a more complex world.

Questions arising

Schneider and Till expose, but do not probe. Obvious questions that might be asked after perusing the vast amount of evidence offered remain unanswered. For example, why is it that, after more than a century of attempts by architects to design with flexibility in mind, the issue is still marginal to the profession at large? Which of the many design ideas thus documented had some broader or more lasting impact on the way housing is done in the world? What theories and ideologies have been advanced attempting to frame the topic? If, for practical reasons, such questions may best be addressed separately elsewhere, some recognition of their validity and some reference towards answers might have helped the sceptical reader to stay with the subject.

Most importantly, however, for a book about design, one would like to know in what way flexibility might inspire the making of a new architecture. Is it simply a social service some of us feel morally bound to pursue, or does it imply a new and challenging kind of architecture? This question is not raised in the book either and there is no sign that the authors see an architectural perspective.

Taking such questions seriously also helps to find out how further study and experiments can advance the cause of flexibility. As always, questions lead to research, in this case not only for the architect, but also for other professional parties involved in housing.

To begin with the matter of the architectural profession's involvement in design for flexibility, or lack thereof, consider the wide array of architects mentioned by Schneider and Till, some well known, who all aspired to a new way of doing housing design. The long list, spanning about a century, may give the impression that flexibility has always been a serious occupation for the profession, but the opposite is true. Of the few practising architects who actually built a career on doing flexible housing, only Avi Friedman and Frans van der Werf are found in the index. Lucien Kroll in Brussels certainly also belongs to that short list, but does not feature in the book. Neither do Tatsumi and Takada in Kyoto who, for several decades, proposed and implemented their 'Two Step Housing' approach. Others, like Nabeel Hamdi and Nicholas Wilkinson in the UK, did an influential project after which user participation subsequently dominated their entire career, but removed them from architectural practice. I must have missed names that could be added to the exceptions, but overwhelmingly the examples documented in the book are one-off cases, done by architects who managed to get their flexible project built, but then moved on, flexibility remaining marginal to their careers as it has been for the profession at large.

The good reason for this lack of engagement is that the pursuit of flexibility is a risky and cumbersome affair. It depends heavily on the cooperation of other parties in the process and is therefore difficult to implement. The ten architect's offices that initiated the SAR (the Foundation for Architect's Research) research foundation, who paid for its research in the 1960s and 1970s and took pride in its mission and publications, never acted in their own practice along the lines our research advocated. They sensibly did not want to jeopardize their business.

The bad reason for keeping flexible housing at arm's length was that, when participation came to the fore, many architects resented the idea that users would make design decisions. And many still do. I remember emotional reactions from colleagues, ostensibly in favour of participation, who, when pressed, finally blurted out that users could not be allowed to make design decisions. Of course, user involvement, like motherhood, cannot be criticized, so the arguments put forward against flexibility in public debate tend to be about costs, technical difficulties, and also the notion that dwellers are incapable and in need of guidance.

In this context, Schneider and Till perceptively note two opposite tendencies among those who actually did design for flexibility. Architects prepared to let go, seek to provide a context that stimulates unforeseen results of user action. Others attempt to build in constraints intended to steer the user towards a 'good' result.

A sense of being invaded in their domain of expertise is shared among other professions involved in housing.³ We are all the product of a culture, already more than a century old, in which the exclusion of the inhabitant is regarded unavoidable and efficient. In that culture we only need to agree among ourselves about what is to be done. A common methodology is applied: The design of any housing project begins with the floor layout. Once these are known, everybody can do their part: consultants can design structure and services, builders can calculate, bankers can assess financing, developers can figure marketing. Without a predetermined floor plan the familiar system of mutual accountability and cooperation is destabilized. As a result, the indignation at infringement of expert territory is exacerbated by anxiety: One is asked to operate in an unknown world where responsibilities shift and risk mounts.

Developers and owners taking initiative

Indeed, what is there to gain by embracing flexibility and re-educating oneself for another methodology? But times change, and while the limitations of current habits and conventions become more evident, a new

generation of professionals appears willing to explore more promising terrain. This is demonstrated in recent projects all of which, unsurprisingly, were initiated by developers and owners of real estate. (These projects are not mentioned by Schneider and Till, presumably because they became known after the due date of their manuscript.) Avi Friedman and Witold Rybscynski may have been the first to introduce successfully a systemic and flexible new house type that found its way in the market,⁴ but as architect/academics they may turn out to have been the exception rather than the rule.

The city of Helsinki, for instance, called a competition for Open Building design. Sato Developing Co. built the first two buildings of the winning scheme, which was designed by Architect Esko Khari in combination with Tocoman data processing group.⁵ All units were sold, executed within budget, and completed in time, yielding a profit. As a result, Sato offered Khari and Tocoman an open-ended contract for several such projects each year.

In the Netherlands, Lingotto Developers⁶ took the initiative to build a multi-function building in which both residential and commercial uses can find space in any desired proportion. They recovered the extra costs for making space flexible by selling the empty building to a client who saw advantage in exploiting it.

Frank Bijdendijk, Director of the Amsterdam housing corporation Het Oosten, concluded that internal flexibility makes long-term investment feasible. Construction for an entire city block formed by nine-storey-high buildings will start this year. Eventually, more than 40 000 m² of interior space will also be rented out and filled in by the leaseholder for whatever function is fancied.

In Moscow, with the rise of a wealthy class, buyers of expensive apartments instantly had their new homes gutted to have an architect of their own choice design the interior to their taste. Appalled at this waste of capital, developers asked their architects to design 'empty buildings', blissfully unaware of any precedent. Today, thousands of units have been built that way (Lorichev and Goldhorn, n.d.).

If developers and owners of real estate are the new pioneers in flexible residential construction, they were preceded as such by their peers in commercial real estate. In the US and increasingly in Europe, office buildings are designed with empty floors to be fitted out by tenants who hire their own architects and fit-out companies. Similarly, no shopping centre will be built without offering free space to retailer occupants.

Finally, governmental bodies begin to take initiative as well. Already cited was the Open Building competition

called by the Helsinki municipality. A month ago, the town of Almere in the Netherlands concluded an overwhelmingly successful competition on flexible buildings for private home ownership among developers and housing corporations. The seven winners from more than 60 entrants each committed themselves to around 150 units each.

The building department of the canton of Bern in Switzerland decided on the separation of a 'primary system' from a 'secondary system' for the building of an intensive-care hospital. First, a design competition was called for the primary system and only after the winning scheme was under construction was a second competition held for the fit-out. This abrupt reversal of habitual procedures caused problems that took time to be ironed out, but the initiative caught the attention of major architectural firms specialized in hospital design in Europe and the US. Project time can be reduced if the design of the interior can be done while the base building is being erected, and in the long run alterations will be less costly.⁷

In 1994, Osaka Gas Co. initiated what is known as the NEXT21 project in which a flexible building contains individually designed dwelling units.⁸ Schneider and Till mention its many technical innovations (p. 106) but, in the context of flexibility, its major impact was that, after many years of open-building experiments in Japan and an enthusiastic public acclaim of this project, the government finally embraced the principle of separation of levels of control. Ministerial blessing of 'SI building' (skeleton infill), as it is known, stimulated innovation in areas other than in hardware, such as jurisprudence and financing. At the time of writing, a government-sponsored drive is afoot to promote the idea of the 'long-term building' by way of a competition on an urban scale. A 200-year building lifetime (!?) is mentioned and the SI approach will be mandatory.

Architectural challenges

Although architects cannot take the initiative, they too must develop an expertise in this new game. Some fresh approaches are indicative of what that might mean. Bijndijk⁹ argues that without the love and pride of its users, a building is not assured of a long life even when the requirement of flexibility is met. To earn the love of its inhabitants, a building need not necessarily meet standards fashionable among architects. But it need not be in conflict with them either. Bijndijk's choice of architects¹⁰ proves that he does not recommend a retro architecture or a pandering of mediocrity. He declares himself inspired by New York City's Soho warehouses with their neo-classicist cast-iron facades, occupied in various ways for centuries already. It is no doubt debatable what an

architecture loved by its inhabitants must mean, but the requirement unmistakably connects architecture with the quality of everyday environment.

Between urban design and individual dwelling

Two more opportunities for a new architecture can be mentioned. Both flow from the consideration that a flexible building is not an empty skeleton, but an architectural environment shared by individual tenants. For the distinction between 'fit out' or 'infill', on the one hand, and the 'flexible building', or the 'support', or the 'base building', on the other, the primary criterion is *control*, not hardware. To make this point in the early days of Open Building, I drew a cross over Le Corbusier's famous picture of a skeleton for the Dom-i-no house (Habraken, 1966) (Figure 1). This act puzzled Schneider and Till (p. 166), but understanding it is crucial if one wants to bring the user into the housing equation. The purpose of design for flexibility by whatever name is to enable individual control in an otherwise collective environment. The concept of distribution of control, therefore, is at the roots of flexible architecture. By itself such a distribution is not new. Analogy with urban design is compelling. The urban designer controls the shaping of public space and seeks to make an inspiring context for architects doing the buildings. In the same way a flexible building creates an environment for individual settlement the design of which is done on yet a lower level of control.

The flexible building, properly understood, becomes a collective form performing between urban space and individual inhabitation. As such, it has not yet inspired the profession. The ubiquitous commercial office building is still considered an unfinished building rather than

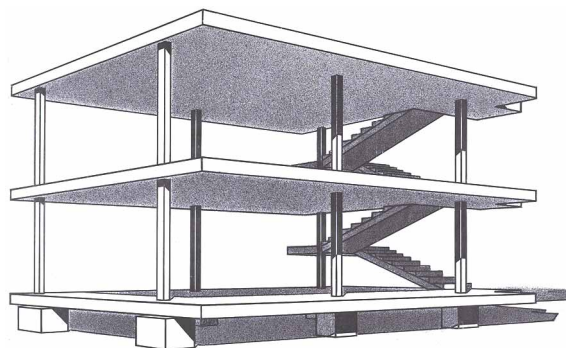


Figure 1 Maison Dom-Ino by Le Corbusier, image © FLC/ADAGP, Paris and DACS, London 2008. An altered version of this illustration was used in the 'Three R's for housing' (Habraken, 1966) with the caption 'A Support is not a Skeleton' to emphasize that the author's concept was not a technical but one of the distribution of design control.



Figure 2 Corner view of the Osaka Gas experimental housing project NEXT21 (1994). Yoshitika Utida, chief architect, and colleagues note the public roof garden and small private 'gardens' as part of the units. Note too the anodized aluminium facade system which allows adaptation to the interior layout of the units; the panels can be dismantled from the inside without exterior scaffolding. Photograph: Osaka Gas.

the continuation of urban fabric in another way. Possibilities, created by a longer life span, for higher initial investment in public interior space and other public amenities have not yet been explored. This is remarkable because, freed from a senseless cobbling together of floor plans, architecture can return to what it always was good at: the making of public environment. For the architect the separation of control is a liberation, not an encroachment.

Two designers of residential flexibility fully grasped the potential for a new architecture that mediates between urban design and individual dwelling. 'I want to do three dimensional urban design' Yoshitika Utida, the chief architect for the already-mentioned NEXT21 project told me when showing his plans. Consequently, he invited thirteen other architects to do the houses in the environment he had designed. Schneider and Till mention the project's systems approach but do not note this distribution of design control among architects which makes the NEXT21 project truly of interest (Figure 2).

When asked to design the 'dwelling of the future', Utida took his Osaka client team to visit the Molenvliet project near Rotterdam done fifteen years earlier by Frans van der Werf (p. 291). For Frans, a 'support structure' was not a building but a means

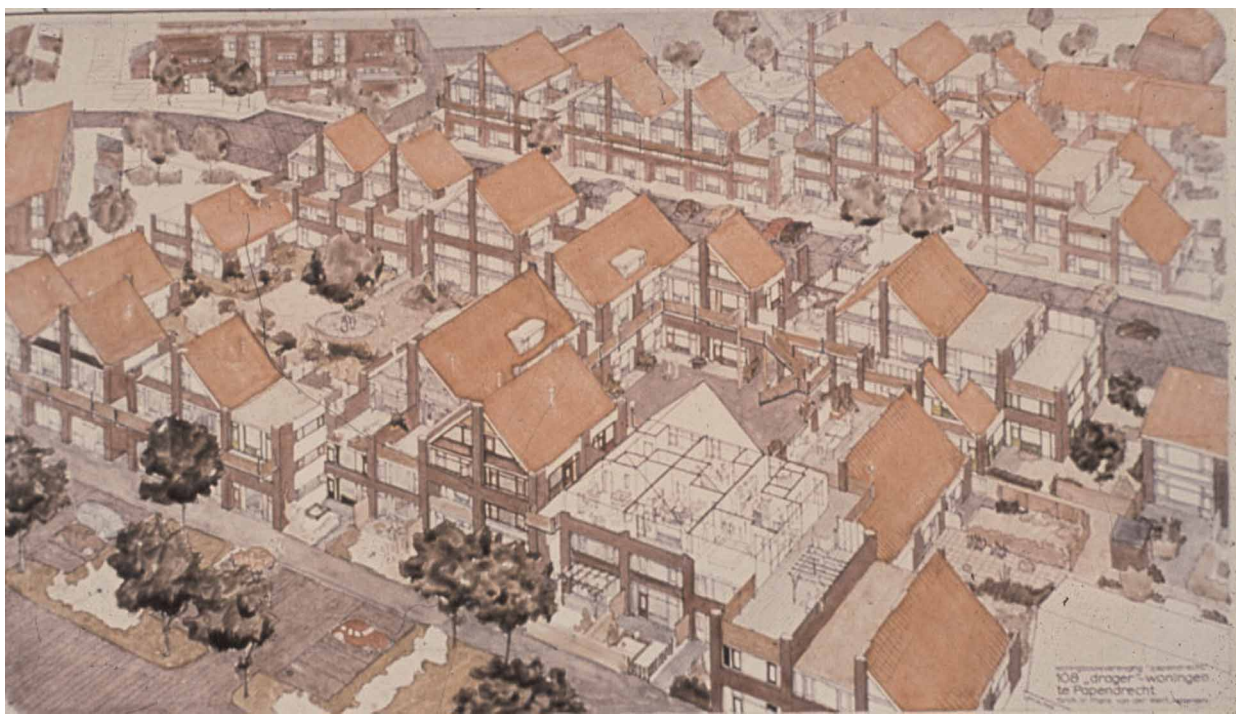


Figure 3 Molenvliet housing project in Papendrecht, the Netherlands, by Frans van der Werf, architect (1974). Drawing of the project as it was built which was only a small part of the continuous structure intended to form an urban fabric. Courtesy Frans van der Werf.

to form a continuous three-dimensional urban fabric. He wanted to deploy a single structural and architectural principle at a neighbourhood scale. It shapes major streets giving access to public courtyards, while other courtyards offer space for gardens. The Molenvliet project as built is only a fragment of that initial competition entry, but it remains a compelling demonstration of the flexible building's potential for shaping the extended urban fabric. Where, for Bijdendijk, the unit's flexibility allows long-term investment, for Van der Werf internal flexibility, including facade parts, enables urban-scale continuity without uniformity. Van der Werf's project is still visited by flexibility devotees as a demonstration of what the future may hold (Figure 3).

The distribution of design control

The third architectural challenge to be mentioned also relates to the distinction between domains of control. Where should the flexible building stop and inhabitation's domain begin?

Each of the projects shown by Schneider and Till draws the line in its own way, but that variety only reflects architect's preferences. We lost our bearings here because professionals cannot determine the true boundary among themselves. Design control must first be delegated before the correct balance can be found by trial and error and post-occupancy research. Moreover, there will be not just one solution. In today's world the answer may vary with place and circumstances.

Several decades of Open Building experimentation have taught, however, that, at the very least, bathrooms and kitchens must be under full user control. As industrially produced durable goods they have entered the millennia old tradition of human settlement only recently, somewhat in the way the car entered the world's historic road network.

Given that first separation, how much fixed material, in the form of columns and walls, should be found in a dwelling unit? The range between the proposals of Perret and the brothers Arsene-Henry, as noted above, is still wide open. Today, pre-stressed floor slabs make it easy to build large empty spaces, thus maximizing the use of fit-out material. In the early days of rampant mass housing it was considered axiomatic that flexible parts were more expensive and had to be limited in number. Perfectly flexible solutions were achieved with small span bays and a good deal of load-bearing walls in each unit. Architecturally shaped human size dimensions need not be in conflict with freedom in a user's settlement, and can stimulate user decisions.

A similar question applies to the design of the facade. To what extent must it express inhabitation and to

what extent must it help shape outside public space? This is a cultural issue as well. Georgian Londoners were quite happy behind monumental communal facades, while the burghers of the Dutch republic wanted each house to have its own. Here, too, long-term user feedback must teach us.

A research agenda

It is to be regretted that the commendable compilation by Schneider and Till does not draw attention to these architectural challenges and opportunities. This could have stimulated research and experimentation by architects. But the redistribution of control, implied by the concept of flexibility, is not only of architectural import. It invites adjustment of method for all parties involved in housing, and as such opens new avenues for research. It suggests, for instance, a dedicated residential fit-out industry, delivering and installing the dwelling unit's fit-out as a single product. This industry-to-be has a potential comparable with the automobile industry. Separation between fit-out and collective building also asks consultants on utility systems to reconsider how main lines are best distributed in the flexible building to feed and drain a dwelling's territory at the boundary of which the fit-out contractor will take over and distribute lines to kitchens and bathrooms. Because the durable part of a housing estate will shift towards a much longer use-life, the division of design control is of interest to the economist as well. Whereas the flexible building becomes a truly long-term investment for collective use, the fit-out is more in league with durable consumer goods like the motor car. (An installed fit-out kit, apparently, costs about as much as the occupant pays for a car.) New financing mechanisms are called for: long-term mortgage service on one side of the divide, short-term bank loans on the other. A sound legal framework for the separation of control must be worked out as well. All such issues are in need of closer study. In recent decades various ad-hoc suggestions have been made in the directions suggested here, but the field for a comprehensive research agenda is wide open.

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Endnotes

¹There is a long track record of flexible design in Japan, in terms of both user participation and technology, initiated by public agencies as well as private companies. The approach is pragmatic and much less encumbered by ideology than is the case in Europe. Professor Katsuo Tatsumi and his younger colleague, Mitsuo Takada, have for several decades advocated what they call 'Two Step Housing', which has produced a number of projects over the years. The Japan Housing Corporation, a semi-governmental institution for subsidized middle-class housing, has consistently experimented with the same idea. Professor Stephen Kendall, in a report titled *Developments Toward Open Building in Japan* (1995), mentions some 17 recent or ongoing initiatives. In the last ten years after the influential NEXT21 project was built, a spate of other projects has been done.

²The search for a new professional methodology replacing that based on predetermined floor plans, which was SAR's (the Foundation for Architect's Research) major research agenda item, is not mentioned at all. SAR was founded in 1965 by ten architects offices to investigate the implementation of the 'Support-Infill' idea.

³Only recently I found myself in a conference of professional experts in the business of housing, when someone mentioned the need for more user participation. The response was one I have heard for half a century: 'let's first deal with the shortage of houses before we address user participation'. I could not resist raising my hand and ask: 'Can you tell me what you have to gain from an end to the housing shortage'. After a painful silence, the moderator of the meeting asked: 'Prof. Habraken, are you accusing us of a conspiracy?'

⁴At my request, Avi Friedman e-mailed me the following: 'Of the Grow Home (which I designed with Witold Rybczynski) by conservative estimate some 10,000 units have been constructed in the

Montreal area by various private builders. The Next Home which I designed alone as part of a research project and which we constructed on our university campus was also adopted by builders. I estimate the number of built units at 1000'.

⁵Arabianranta (Arabian Shore) competition 2001. The winning project was completed in 2005. There were two different support structures and 80 apartments; SATO Development Co., Esko Kahri & Co. Architects, and ToCoMan Group cost, data, and Internet consultant: PlusKoti Arabian Kotiranta, PDF/Adobe Acrobat – html version.

⁶Multifunk project, Lingotto real Estate, 2005; concept by Bob Jansen, President and CEO, design ANA Architecten (<http://www.lingotto.nl>).

⁷Giorgio Macchi, Director of the Bern Kanton (provincial) Building Department, has decided to make the distinction between a primary and secondary system general policy in his department.

⁸Osaka Gas Next21 project 1993, supervised by Yoshitaka Utida with Kazuo Tatzumi, Mitsuo Takada and Seiichi Fukao, and executed by Shu-Koh-Sha Architectural & Urban Design Studio under Shinishi Chikazumi.

⁹Bijndendijk calls his flexible buildings 'Solids'. His contribution to Open Building theory lies in his emphasis on the building's 'lovability' as a precondition in conjunction with full interior flexibility for its long life. An English language book by him is expected to be published this year (<http://www.solids.nl/>).

¹⁰The eleven-building, 40 000 m² project for which construction will start in 2008 is designed by Ditmar Eberle, Baumschlager & Eberle (<http://www.baumschlager-eberle.com>). An earlier 'Solids' building in Amsterdam is under construction; it was designed by Tony Fretton.