International Council
for Research and Innovation
in Building and Construction

**December 2011**

**Around the Commissions**

**W104 - Open Building Implementation**

# Report of the 17th W104 Conference held in Boston, USA - Architecture in the Fourth Dimension


This conference - embedded in Build Boston - engaged participants in considering architecture as a long-term investment imbued with the capacity for incremental change. The focus was on residential and healthcare architecture, and their potential intersection.

Building for the long haul is an urgent societal agenda and a vital part of the goal of a sustainable built environment. But preparing buildings to last while adapting to inevitable change is not easy. New methods, business practices, policies and attitudes are called for.

The conference immersed participants in lectures, panel discussions, paper sessions, exhibits of student competition winners, exhibits of exemplary built projects, and hands-on charrettes hosted by local architecture firms. More than 150 people attended, from every continent as well as from the local professional community. Many more saw the exhibition of built projects and others viewed the movie of NEXT 21, a ground-breaking project in Osaka, Japan, that exemplifies open building.

At the concluding W104 gala dinner the hosts for the 2012 conference made a formal invitation to come to Beijing. This invitation, from the largest architecture office in China, is exciting and planning is underway by the host organization and the W104 joint coordinators: Professor Stephen Kendall (skendall@bsu.edu); Professor Jia Beisi (jia@arch.hku.hk); and Professor Shin Murakami (shin@sugiyama-u.ac.jp).

Hereafter follows a description of the conference outcomes.

## Background and future of the Commission

The Open Building Implementation network (www.open-building.org) was formed in 1996, under the auspices of the CIB (International Council for Research and Innovation in Building and Construction). Members and friends of the CIB W104 now come from many countries - including the incubators of open building Japan and the Netherlands – as well as the USA, the UK, Denmark, Finland, Spain, Portugal, Italy, Switzerland, Korea, China, Taiwan, Indonesia, Mexico, Canada, Brazil and South Africa.

In the last few years, developments internationally suggest that the commission – and the open building movement more generally needs to both continue its focus and expand its arenas of investigation. Residential open building is no longer a speculative idea of a few pioneer practitioners and theorists. It has or is poised to become mainstream. While disseminating information in professional journals,

books and scholarly publications about the technical and methodological dimensions of residential open building still makes sense, there is reason to pose new questions and re-examine old ones. In fact, a new subgroup of W104 has been initiated focusing on open building in the healthcare facilities sector.

## State of the Art

Open Building is the term used to indicate a number of different but related ideas about the making of environment, for instance:

- The idea of distinct levels of work in the built environment, such as those represented by 'support' or 'base building' or 'core and shell', and 'infill' or 'fit-out' or 'tenant-work'. Urban design and architecture also represent two levels of action.
- The idea that users / inhabitants may make design decisions in their sphere of control, as well as professionals;
- The idea that, more generally, designing is a process with multiple participants, among whom are different kinds of professionals;
- The idea that the interface between technical systems allows the replacement of one system with another performing the same function - as with different fit-out systems capable of being installed in a specific base building;
- The idea that built environment is in constant transformation, and that, as a consequence, change must be recognized and understood;
- The idea that built environment is the product of an ongoing, never ending design process in which environment transforms part by part. (www.habraken.org)

Many observers have recognized for some time that shopping centers and office buildings exhibit the characteristics of open building. As far as we know, no theoretical or methodological work preceded their coming of age. Their first appearance and subsequent evolution progressed pragmatically, as a response to new realities, led by real estate developers and business entities of all kinds. Architects and contractors learned how to provide the needed services, often producing work of exceptional quality. Product manufacturers and their supply chains began introducing suitable products, fabrication and construction methods. New standards, regulations and financing tools were developed to match the new realities. These developments are international in scope, crossing economic, political, cultural and technical boundaries.

Mainstreaming of open building is apparently a response to the pressures, conflicts and waste caused by continued adherence to rigid functionalism – that is, defining functions and designing buildings to accommodate them. The problem is that functions change often and if buildings are not properly designed, the future uses will not be accommodated well.

These changes in attitude and priorities are now taking the force of law. In part this can be explained by the widespread – and parallel adoption of a sustainability agenda. For example, the Japanese parliament passed new laws in 2008 mandating 200 year housing, accompanying the legislation with enabling tools for use by local building officials who have the responsibility to evaluate and approve building projects. Projects approved under the new law receive a reduced rate of taxation. Other incentives may be added. In Finland, one of the largest real estate companies is regularly developing open building projects for their residential portfolio.

*(Arabianrants in Helsinki, developed by SATO Development Company, Architect: Esko Kahri*

In the Netherlands, a number of companies – from product manufacturers to developers to architects – are doing open building, by other names. Around the world, old office buildings, retained their social and economic value, are being converted to residential occupancy, after being "gutted" to prepare them for new uses and layouts. *(the SOLIDS in Amsterdam, developed by Stadegenoot, Architect: Baumschlager Eberle)*

We also see that in many countries, under the pressure of a rapidly evolving health care sector, hospitals are moving toward open building. We see this in the United States, Switzerland, Germany, Belgium, the United Kingdom, and the Netherlands. Similar developments are undoubtedly happening elsewhere, under the radar screen. Hospital clients can no longer afford to let short-term functional programs drive facilities procurement methods and investment decisions. They are demanding "change ready" facilities, assessed by their accommodation capacity

over time, rather than by short-term functional performance. But significant regulatory and financing barriers remain.

## An important task to continue

While much remains to be done to make open building projects come about with architectural excellence, to improve coordination, and to make long-term adaptation take place without fuss and at high quality, those in the trenches have little incentive or time to report on and generalize from their work. A role continues to exist, therefore, for academics and researchers interested in careful observation of what happens in the world of practice, with the expectation that new insights and sound generalizations may emerge to serve the built field.

Much remains to be done – on a continuing basis – in reporting on and accounting for developments toward open building. This effort should aggressively encompass not only residential but other ordinary classes of projects such as hospitals, schools, retail/commercial and office buildings and mixed-use properties and sites. The recent interest in new urbanism and other movements seeking thematic coherence of urban tissues will undoubtedly produce a building stock designed to accommodate varying occupancies.

Now that evidence is mounting that open building is not an aberration but a norm, we can expect building economists to develop data on the economic advantages of this way of working and to study the migration of economic activity toward the fit-out level. It should be possible for studies of buildings-in-use to track and evaluate user response to varying cycles of building and equipment change. Building information modeling software will soon enable designers and researchers to keep good records of how buildings change, enabling clients to make better decisions on their next investments. These signs of the evolution of the building stock should be carefully studied and general principles sought.

In the Boston, conference, we saw evidence of a number of important developments, both in the keynote speeches, but also in the seminars, workshops and academic paper sessions, including:

## An Infill Industry

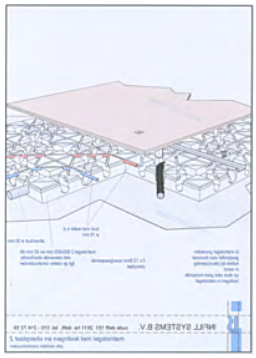
A new kind of business entity with a new customer value proposition is needed to meet the demand of variable fit-out in open building projects.

Base buildings do not cost more. This was established by sound economic analysis decades ago for the residential sector, most clearly by work done in the Netherlands. Recently, a developer in Amsterdam built an open building project, accepting an initial up-charge of 5%, but recouped that investment within 2 years.

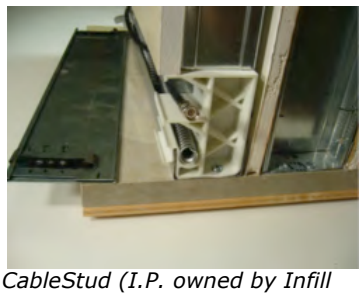
This return on investment is evident in the office building and retail sectors, even though little or no building economics' evaluations have been done to prove empirically what is already a matter of course. Base buildings in the health care sector will soon become the norm, albeit with little in the way of theory or economic analysis to back it up, out of the force of necessity. While there is much to be done in improving the design and construction of sustainable and energy efficient base buildings, we can reasonably say that these developments are already well on their way. From an Open Building perspective, these trends signals the growth potential of an infill industry.

*An Infill Company will operate a showroom, a logistics center and will deliver integrated fit-out packages to be installed on-site.*

In the residential open building market, no fully integrated fit-out companies exist. Early business ventures such as Matura in the Netherlands (1990-95) provided important technical and business models that deserve careful analysis. That infill system is now being upgraded and is re-entering the market as a related kit of parts rather than a fully integrated system.



*Matrix Tile System Infill Systems BV, The Netherlands*



*CableStud (I.P. owned by Infill Systems BV (adapted for the US market by Infill Systems US LLC)*

NEXT Infill is finding a market for its integrated infill for the new construction and renovation market in Japan. Developments in Finland will almost certainly evolve into fully integrated logistics and infill delivery. Time will tell if these business ventures will succeed in

displacing the conventional, disintegrated fit-out delivery process and if similar developments will take root in other countries.

But in general, a mature infill industry has yet to be born. In this arena, open building knowledge is crucial, and here, too we can be useful.

## Incremental Housing in Developing Societies

In developing economies, in which the informal sector is a vital part of the housing process, open building principles are evident.

*(Elementa Project in Chile; Alejandro Aravena architect)*

New housing, designed by professionals, is incrementally adjusted, added to, and modified over time by the action of each household. This, too, is not new. New forms of public/private partnerships emerge, old technologies are used in new ways, and informal settlements become stable in ways that can only be understood by long-term observation. Recognition of the role of the user in the creation of environment is alive and well, if too often forgotten as part of the future of architecture. In developing economies, as in developed economies, experts in large bureaucracies and corporations are usually loath to relinquish control. But some learn to make money and protect the public interest by careful repositioning of their ways of working, harnessing the often invisible but complimentary economic engine of individual and local initiative in the housing process.

## Open Building for Healthcare

The dynamics of the healthcare sector present tremendous challenges for which open building principles may be useful.

*Inselspital Hospital, Bern, Switzerland: Dynamic Master Plan*

Many experts now recognize that hospitals and medical facilities, more than any other building type, are functionally diverse and technically complex, and never finished. Changes in demographics, diseases, treatment procedures, equipment, doctor's preferences, and regulations – with their demands for new spatial adjacencies and configurations - are forcing the emergence of a shorter use-life "fit-out" level of investment in more stable base building infrastructures.

*Martini Hospital, Groningen, SEED Architects: "Uncertainty as the only Certainty"*

The focus on varying life cycles of technical and management systems is important because of changes in medical practices, insurance, demographics, regulations and other dynamics in 21st century society. Medical facilities are under unremitting pressure to adapt – physically and organizationally. But, most medical buildings procured following conventional practices have less than optimum capacity to adjust appropriately to these dynamic conditions. Given the extreme technical and organizational complexity of medical facilities, new insights are needed to manage these dynamics. Simply "tweeking" existing paradigms may not solve the problems.

The literature on the architecture of care environments is unambiguous in respect to the importance of patient-centered theory and practice. More than 40 years of methodical research in the "environment-behavior" field has produced useful insights, a good deal specifically related to medical facilities and users. The recent focus on "evidence-based" design practice is a sign that this research literature is finally being taken seriously.

Less recognized in the literature, however, is the fact that – given the dynamics of 21st century society – the functionalist approach to facility design is obsolete. While this way of thinking has been the norm, we can no longer assume that if we determine a program of uses and design a hospital to suit, the future functionality of such a facility is assured. The opposite is more often true; that is, buildings designed according to the functionalist paradigm perform poorly, while those designed to accommodate varying functions gain value over time.

These experiences are not restricted to any one geographic region – they are ubiquitous. Studying these widespread instances in depth and over time may well lead us to recognize general principles. These in turn may help us develop better methods to cope with the new realities facing all those involved in the design, management and use of health care facilities of all kinds.

## Additional Information

For further information about CIB W104 contact the Coordinators: Steve Kendall, PhD, skendall@bsu.edu Shin Murakami shin@sugiyama-u.ac.jp and Beisi Jia jia@arch.hku.hk.

You can find more information on the activities of CIB W104 in the CIB online Database "Commissions": see here. In the shown search engine type "W104" in the field "Commission number" and press "Find records".