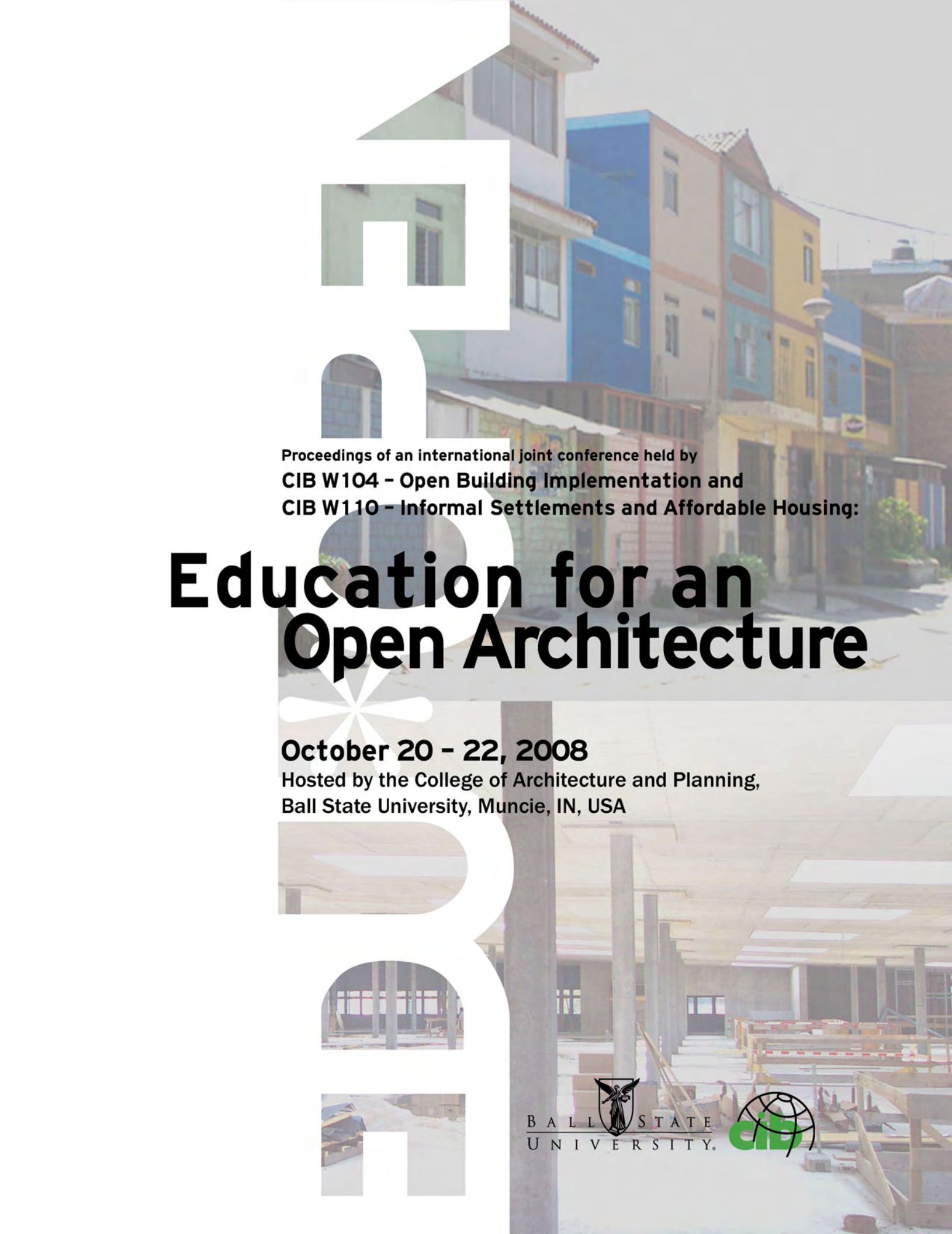

Proceedings of an international joint conference held by

CIB W104 – Open Building Implementation and

CIB W110 – Informal Settlements and Affordable Housing:

Education for an Open Architecture

October 20 – 22, 2008

Hosted by the College of Architecture and Planning,

Ball State University, Muncie, IN, USA

BALL STATE UNIVERSITY

cib

EDUCATION FOR AN OPEN ARCHITECTURE

Proceedings of the Joint Conference of CIB W104 and W110
October 20-22, 2008

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WELCOME

It is our pleasure to welcome friends and colleagues from every continent to this international conference on ***Education for an Open Architecture***. This is the second conference of the CIB W104 Open Building Implementation to be held in the United States, the first one having been organized in Washington DC ten years ago at the National Building Museum. Like that one, this conference combines academic paper sessions and hands-on design exercises.

We are pleased that members of the CIB W110 Informal Settlements and Affordable Housing group could join us. We are all very aware of the impact that informal settlements have in our urban fabric and the importance of intersecting the benefits and challenges posed by informal urbanization with open architecture concepts and principles.

The papers submitted by members of both CIB groups and by friends of both represent a wide and deep range of ways of seeing the role of education in preparing professionals to work in support of a sustainable, accommodating and equitable built environment.

We are particularly pleased that the first and second place winners of the first international student design competition on the conference theme can attend the conference to receive their awards. Their talent and enthusiasm makes us very hopeful about the future of our disciplines.

We want to thank the many architecture practices and construction companies that contributed funds for the student competition. We also want to thank several Ball State University academic units for their funding sponsorship: the Rinker Center for International Programs, the Center for Energy Research, Education and Service, the Institute for Digital Fabrication, and the Building Futures Institute.

We appreciate the initiative of Professor Stephen Kendall, Conference Chair, and Instructor Michael Gibson, Conference Co-Chair, in undertaking and organizing this important event. It is through their leadership and networks that the College of Architecture and Planning at Ball State University has established a robust knowledge base and international recognition in the field of open architecture.

We hope that the content of this book and our interaction with colleagues and friends during the conference will stimulate us towards an ever growing level of commitment to education for a more accommodating and therefore sustainable built environment in the future.

Dean Guillermo Vasquez de Velasco
College of Architecture and Planning
October 2008

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• Institute for Digital Fabrication (Ball State University)
• Center for Energy Research, Education and Service (Ball State University)
• Building Futures Institute (Ball State University)

Paper Review Panel

• Rob Geraedts, Associate Professor, Department of Architecture, Technical University Delft
• Beisi Jia, PhD, Associate Professor, University of Hong Kong; Joint Coordinator CIB W104
• Stephen Kendall, PhD, Professor, Department of Architecture, Ball State University
• Andrea Martin, Visiting Professor, Department of Architecture, University of Washington
• Kazunobu Minami, PhD, Prof, Shibaura Institute of Tech., Tokyo; Joint Coordinator, CIB W104
• Arijit Sen, PhD, Assistant Professor, Dept of Architecture, University of Wisconsin, Milwaukee

Student Competition Preparation and Jury

• *Beisi Jia, PhD, Associate Professor, University of Hong Kong (developed the competition concept)*
• Shigeru Aoki, Architect, Professor, Tokyo Metropolitan University
• Jiasheng Bao, Architect, Professor of Architecture, Nanjing University, China
• Shinichi Chikazumi, Architect, Shu-Koh-Sha Architecture and Urban Design Studio, Tokyo
• Renee Y. Chow, Assoc. Professor of Architecture, U of Cal. Berkeley; Principal of Studio URBIS
• Gong, Kai, Professor, Head of Architectural Department Southeast University, Nanjing, P.R. China
• Jaehoon Lee, PhD, Professor, Head, Department of Architecture, Dankook University, Korea
• Ulpu Tiuri, Architect, Ulpu Tiuri Architects, Helsinki
• John Waugh, Architect, Ellerbe Becket Architects, Minneapolis

Joint Coordinators W110 Informal Settlements / Affordable Housing

• Happy Ratna Santosa,Dr. Ir., Professor, Department of Architecture, Institute of Technology Sepuluh Nopember (ITS), Indonesia
• Liana Arrieta de Bustillos, Centroccidental Lisandro Alvarado Univ. Barquisimeto, Venezuela
• Dr. Amira Osman, University of Pretoria, South Africa

Ball State University

• Dean Guillermo Vasques de Valasco, PhD, Professor, College of Architecture and Planning
• Associate Dean Michel Mounayar, College of Architecture and Planning
• Dean Kenneth Holland, Rinker Center for International Programs
• Conference graphic design: Michael Gibson, Instructor of Architecture
• Proceedings production support: Tyler Sanders, Graduate Student of Architecture
• Conference support: Melanie Smith, programs assistant

CIB

CIB is the acronym of the abbreviated French (former) name: "Conseil International du Bâtiment" (in English this is: International Council for Building). In the course of 1998, the abbreviation has been kept but the full name changed to: INTERNATIONAL COUNCIL FOR RESEARCH AND INNOVATION IN BUILDING AND CONSTRUCTION.

CIB was established in 1953 as an Association whose objectives were to stimulate and facilitate international cooperation and information exchange between governmental research institutes in the building and construction sector, with an emphasis on those institutes engaged in technical fields of research. CIB has since developed into a world wide network of over 5000 experts from about 500 member organisations active in the research community, in industry or in education, who cooperate and exchange information in over 50 CIB Commissions covering all fields in building and construction related research and innovation. CIB Members are institutes, companies and other types of organisations involved in research or in the transfer or application of research results. Member organisations appoint experts to participate in CIB Commissions. An individual also can be a member and participate in a Commission. CIB Commissions initiate projects for R&D and information exchange, organise meetings and produce publications. These meetings can be Commission meetings for members only or international symposia and congresses open to all. Publications can be proceedings, scientific or technical analyses and international state of the art reports.

CIB W104

CIB W104 Open Building Implementation is an international network of researchers, educators and practitioners who subscribe to the Open Building approach to the design of the built environment. In doing so we seek to understand the behavior of the built environment and to develop methods of design, construction and education compatible with it. (*www.open-building.org*)

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 intervention in the built environment, such as those represented by 'support' and 'infill', or by urban design and architecture;*
• *The idea that users / inhabitants may make design decisions as well as professionals;*
• *The idea that, more generally, designing is a process with multiple participants also including 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 applied in a base building;*
• *The idea that built environment is in constant transformation and 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. (http://www.habraken.com/john)*

Open Building provides tools and methods for sustainable buildings and neighborhoods. Designing buildings using Open Building methods enables these buildings to last because they can adjust, meeting changing technical requirements and occupant preferences. This is accomplished in part by decoupling physical elements (building product to urban tissue) in to minimize their mutual

interference. Open Building's most important goal is to combine the freedom of choice and dignity of individuals in their work places, dwellings and communities, with the coherence and stability of culturally appropriate buildings and neighborhoods.

Four basic objectives of the Commission:
• *To increase awareness of the principles of Open Building among professionals who shape the built environment, and among the people who live in that built environment.*
• *To support initiatives at national, regional and local levels that improve the efficacy of building construction and facility adaptation following Open Building methods.*
• *To be a platform for research and information dissemination among professionals committed to improving Open Building practices and methods.*
• *To exchange experiences in teaching methods supportive of an open architecture.*

The Commission has a relationship with the CIB Encouraged Journal OHI - Open House International (http://www.openhouse-int.com)

Joint Coordinators:
Stephen Kendall, PhD, Professor of Architecture, Ball State University
Kazunobu Minami, PhD, Professor of Architecture, Shibaura Institute of Technology, Tokyo
Jia Beisi, PhD, Associate Professor of Architecture, University of Hong Kong

CIB W110

The objectives of W110 Informal Settlements and Affordable Housing are to define means of creating sustainable livelihood in informal settlements, incorporating the inhabitants' participation, and to define how the stakeholders can transfer technology to assist such communities in the development or improvement of the settlement's physical, social and economic conditions.

The detailed objectives are:

• To investigate informal settlements, that has not previously been adequately researched and propose for their improvement to create sustainable livelihoods incorporating people participation.
• To transfer technology, education and technical information and guidance on healthy settlements and housing and social economic improvements, from the universities and scientific institutes, the NGOs or other stakeholders to the communities.
• To create an international focal point for the collection, organisation and dissemination of research results and demonstration related to enabling the provision of affordable housing and informal settlements world wide.
• The scope of the research on informal settlements and housing include; government regulations, informal settlements and housing policies and programmes, social-economic issues and people participations, housing design, housing delivery system, building technology transfer and guidance, land development, site planning and housing for special need groups, such as elderly, women widows, disaster victims.

Joint Coordinators:
• Eng. Liana Arrieta de Bustillos, Centroccidental Lisandro Alvarado University, Venezuela
• Dr Amira Osman, University of Pretoria, South Africa
• Prof. Happy Ratna Santosa, Institut Teknologi Sepuluh Nopember, Indonesia

Preface: The Conference Themes and Purposes

Our idea from the beginning has been a conference that would enable us to work together as teachers, practitioners and students on teaching methods for an open architecture. We also wanted to include lectures and in-depth discussion of peer-reviewed papers from both CIB W104 Open Building Implementation and CIB W110 Informal Settlements and Affordable Housing.

We therefore organized a program consisting of public lectures by well-known practitioner-educators, parallel design exercises and paper sessions, and plenary presentations and discussions, exhibits of the winners of the international student competition held as part of the conference, as well as posters of built projects from around the world.

What is "open architecture"?

The built field - bigger than any profession's contributions and following its own laws - embodies environmental patterns and social structures of influence and responsibility, where conventions, levels of intervention, and shared themes frame our individual efforts. Both everyday and exceptional places coexist in the built field, in which designing and invention are continuous processes.

Open Architecture concerns at least three main principles. The first principle is change; the built field is never finished and changes part-by-part. We thus find ourselves being invited to propose transformations to a built field that is continuous across time and space, proposals that are requested, approved and implemented by others, for buildings and places to be used by still others.

Second, we find ourselves, as professionals, working on levels of intervention, such as urban design, building design, interior design and so on. These levels are not the creations of the professions, but are a reality to be reckoned with, in their own right. The idea of levels is familiar to those working on projects in which higher-level designs are made (by teams of experts from many disciplines) providing "capacity" for subsequent inhabitation, without the need (or usually the possibility) to specify the lower level decisions, decisions that are invariably made later by other actors.

Third, and linked to the idea of levels, we recognize that built environment comes into being and transforms by way of distributed design. This means that no one party designs everything. Except for the rare case, design tasks are distributed among a number of parties, including many specialists, non-professionals and also users. For example, when we design an office building, a number of experts are needed to complete the design of the core and shell, or base building. Later, tenant spaces are designed by still other teams. This is common in shopping centers, hospitals, schools, housing and other building use types, and is the way urban design works.

These three principles are very important to understand, especially when design professionals are given large projects to design – horizontal or vertical, newly built or involving the reactivation of existing buildings or built fields. When projects are small we can more easily hold on to the romantic idea of the master architect/builder. But in large projects, professional designers and their clients have learned how to conceive, partition, phase and coordinate the work of many players. In some cases we set the stage for others to play on (when an urban design plan, devised by many specialists working together, sets the "rules of the game" for lower level interventions to follow over time). In other cases we take part in an environmental game the rules or themes of which we were not asked to formulate but which we must nevertheless follow (or try to persuade others to change). We see an example of this when we fill in a tenant space in an office building designed by someone else, or design a house in a streetscape whose ecology and typology existed before we were born.

Success in the face of these realities requires good coordination as well as sharing patterns, systems and types. It may be that built results of our efforts and collaborations may frequently be disappointing. But it is not for want of hard work on the part of dedicated practitioners and their development partners. The evident shortcomings of many projects in modernist times, especially large ones - evident around the world - may be in part due to the fact that the three principles noted above are not discussed enough, nor the next generation of practitioners

prepared with the skills, attitudes and methods needed to handle this work well. The traditions we come from are evidently not congruent with the today's challenges.

The problem is international in scope. Because little shared or explicit understanding exists about these principles, and because such large and complex projects are difficult for a single person to design, few are assigned in design studios. When they are, they are conventionally treated as just another large undertaking under single-handed and unified control, which makes little sense. Or, they are treated as so-called interdisciplinary student projects, in which confusion often is evident about the disciplinary knowledge base from which students can connect to their peers in other disciplines.

How can environmental design education – around the world – do better in meeting these challenges? How are we doing and what needs to be done?

What are design exercises?

In teaching design, some of us employ teaching methods that can be called DESIGN EXERCISES. Built around a particular selection of design constraints, issues or themes, such exercises are similar to those used in learning a musical instrument, or how to play a sport such as basketball. They contain a limited number of "moves", and can be repeated, in a developmental sequence, allowing students to hone their skills and develop greater confidence. Design exercises can be long or short in duration, handled by individual students or small groups, done singly or in a sequence of increasing complexity and difficulty, over the course of a short workshop or an academic term or longer.

Design exercises, while abstracted from the full complexity of a "real" project, deal with real design issues. But they are not "studio projects" in which the expectation is a completed design with a functional program and a site, yielding a fully synthesized proposal.

It goes without saying that neither design exercises or the methods they relate to can replace enthusiasm, talent and imagination. But without the skills and confidence exercises help students develop, design endeavors may falter under the pressures and complexity of contemporary practice, and may well fall short of the excellence we aspire to. We may be suffering the plight of the jilted suitor when we try to contribute to the built field, not for lack of passion but for lack of sharpened and demonstrable skills, methods and knowledge.

It also goes without saying that the idea of DESIGN EXERCISES is not exclusive to education for an open architecture. Other ways of seeing the built field and our roles in it should lead to design exercises different from those we explore in this conference.

During our conference we will run several parallel design exercises, organized and lead by experienced teachers from different parts of the world, all of them familiar with the concepts of open architecture. The exercises have been prepared by Renee Chow (UC Berkeley) on Urban Tissues; Jia Beisi (University of Hong Kong) on Interactive Design and Andrés Mignucci, FAIA (University of Puerto Rico) on Housing Support-Infill Design. The exercises will be introduced at the conference. Ball State faculty, visiting conference participants, and Ball State students of architecture will take part in them.

The Keynote Lectures

(in the order of presentation at the conference)

Stephen Kendall, PhD
Professor of Architecture
Ball State University; www.bsu.edu/bfi

Renee Y. Chow
Associate Professor of Architecture and the Eva Li Chair in Design Ethics
Department of Architecture
University of California Berkeley
Principal of Studio URBIS http://www.studiourbis.com/

Andres Mignucci, FAIA
Architect, Andres Mignucci Architects
Professor of Architecture
University of Puerto Rico http://andresmignucci.com/

Beisi Jia, PhD
Associate Professor
University of Hong Kong
jia@arch.hku.hk

Dietmar Eberle
Professor of Architecture ETH Zurich and former Dean
Principal Baumschlager and Eberle, Architects http://www.baumschlager-eberle.com

Paul Lukez, AIA
Paul Lukez Architecture
1310 Broadway
Somerville, MA 02144
plukez@lukez.com, www.lukez.com, www.suburban-transformations.com

WHY OPEN ARCHITECTURE, AND WHY DESIGN EXERCISES?

Stephen Kendall, PhD

Professor of Architecture, Director Building Futures Institute, Ball State University
www.bsu.edu/bfi

John Habraken, in various writings and teachings over the past 25 years, has offered one of the most consistent, coherent and cogent views of architectural education and where we should guide it. His contributions are regrettably not debated. But his questions are truly radical, meaning that they go to the root of issues and questions that will not go away. There seems to be little taste for that today, which is a shame, because architectural education is far less effective than it should be in preparing students to meet new realities in the built field.

One of the first such contributions appears in an article he wrote in 1981 in MIT's Plan, titled "Around the Black Hole".(1) In that essay, he suggested that the sacred cow of architectural education – the design studio - was dangerously close to achieving the situation of the emperor without clothes. Its claims were more often than not at odds with the reality we were supposedly preparing our students to meet. He asked what the studio offers beyond the implicit, suggesting that while practice could not get along without "the artistry and passion of practice" - as Donald Schön points out so effectively in his writings - implicitness and passion are not enough to sustain a profession. His conclusion was that the long love affair with and overdependence on the studio in architectural education did not auger well for the profession's future, or for the development of its knowledge base. Parenthetically, it was Habraken who instituted the first post-professional Master of Science in Architectural Studies, research-oriented degree at MIT in the late 1970's.

Later, in an article in "Places" (1995) titled "About an attitude when making architecture", and in his most recent book Palladio's Children, he discusses the importance of a willingness on the part of architects to cooperate in the making of the built field. (2) This willingness, to him, is largely about the ability to look beyond one's self-expression, to recognize the "quality of the commons" – to understand how shared patterns, types and systems make built fields at once coherent and varied. Having identified cooperation as the cornerstone of our work in cultivating the built environment, he goes on to argue that methods constitute a fundamental professional knowledge. He shows how the teaching of methods in architectural education can and should complement the studio, making us more capable professionals operating in situations of complexity, environmental change, distributed responsibility, and shared values.

The first article was written when he had been Head of the MIT Department of Architecture for six years. The second came later, after he had experimented with a course in design at MIT that was not a studio but that was nevertheless about designing. The design faculty encouraged students to take the course, because it made their work in studio better. That course, no longer taught, was an architecture course equivalent to the exercise sessions done in most structures or environmental systems courses. Those courses provide knowledge of specific technical "moves" independent of functional programs or specific sites. Similarly, his "thematic design" course provided an education in architectural knowledge and design moves that could be applied in studio projects, large and small, with different programs of use, sites and other specific conditions. The course was, however, quite directed: it focused on how to manipulate complex form seen from an open architecture perspective.

There are a number of lessons to be gleaned from these writings and teachings, and from the efforts of a handful of teachers who chafe under the limits of the dominant curricular structure of architectural education and who want to find additional ways to teach design, while not rejecting the studio for its important contribution to and role in design education. We are fortunate to have several of those colleagues with us at this conference, from every continent. They are here because this conference is part of the search for better ways of teaching design in light of certain realities in the built field. Thus the theme - DESIGN EXERCISES in support of OPEN ARCHITECTURE.

OPEN ARCHITECTURE has a particular meaning here, as does DESIGN EXERCISES, so I should explain both briefly.

OPEN ARCHITECTURE

First, open architecture is the kind of architecture that recognizes that the built field is under constant change, if at varying cycles. It is never finished. It is continuous in time and space and our profession would not be needed if it were otherwise.

Secondly, open architecture recognizes that design responsibility is distributed. We each are asked to design a part – a big part that someone else fills in later, or a small part filling in a larger intervention designed before by someone else we never met. In normal circumstances, we have no direct contact with either those who follow or those who preceded our intervention. Our contact and communication occur through the forms we make. Our success in leading or following largely depends on convention, shared understandings about form and territory, and good methods.

Third, we can't avoid levels of intervention. This is what we mean when we recognize the existence of urban planning, urban design, architecture, interior design, and so on, each responsible for a certain "level" of the built field. This is not a technical view but more of a business or organizational view. These professions have emerged for a reason. No single profession could command all environmental design expertise. No one profession – or individual or firm – would be given the chance to decide everything in the built field - unless we are in a dictatorship, and even then, no one can do all the work. Except for the small project, tasks must be partitioned and work farmed out to colleagues under some sort of design management structure and shared understandings.

Generally, urban planners, working in their multidisciplinary teams, make urban plans, and governmental bodies implement them; urban designers working with their teams make decisions about the shape of public space and urban morphology, whether for public or private clients; architects, working for developers or other clients, make proposals to fill in the empty parcels, working with their own teams of consultants; and interior designers fill in the buildings and fill them again when inhabitants change. All of this happens over time, each level relating to the others in a hierarchy of dependencies. In time, interiors change without disrupting the base building, and buildings are replaced without disrupting the city fabric, and so on. Of course there are exceptions, when, for example, powerful players force a change of the public urban pattern to realize their private investment priorities, or when a powerful public entity disrupts private territory to implant its own vision. But they are exceptions and only go to reinforce the prevailing hierarchical order of the built field, an order that relates form and control and change, and makes what coherence we have possible. Such levels also help reduce friction among the players, since there are rules of the game that everyone learns to work with. Each level looks both "up" in the environmental hierarchy to find its place, and looks "down" in setting up space for inhabitation by those operating at the next lower level.

These are normal circumstances and we would be more than concerned if it were otherwise, declaring it to be a kind of environmental tyranny if someone designed an entire environment from table to urban form. If an environment never changed we would think it to be a museum, frozen and dead, and if we did not instinctively understand levels of intervention, we would find our jobs – and the necessity of cooperation - quite impossible.

Unfortunately, we teach in accordance to these three realities only unevenly, if at all. Instead, we discuss in our studios and classes the mastery of the heroic individuals whose work is recognized for its exceptionalism. Or we refer to the manifestos of architects who insisted (and still do) that the only good design is top-down and centrally controlled design, everything else being a sad compromise. Thank goodness we do have masterful special buildings and places. Yet all interventions cannot be special. It is only in the context of a high quality ordinary built field that we recognize the occasional special work, old or new. Our task seems to be two-fold - to bring about an ordinary "thematic" environment of high quality, and to understand how to make the excellent and occasional "non-thematic" or special building or place. It is the former that gets too little attention.

Beyond pointing out these realities, open architecture helps us see that it is not always suitable to design buildings for fixed functions. Denise Scott Brown makes an effort to codify the relationship of form and

function in Architecture as Signs and Systems: For a Mannerist Time, suggesting that form must accommodate changing functions, or that perhaps form may evoke function. (3) Hertzberger, Habraken, Brand and others have posed similar questions. Adolf Loos wrote in 1924: “An apartment mustn’t be finished at any time, because men themselves are never finished in their physic and mental aspects. The rules of apartments are valid as well for working areas, where not only the working men but also the whole market and a lot of structures are changing elements. Therefore we need buildings that are changeable, adaptable, because we can’t afford to destroy and rebuild the whole building to reach these adjustments.”

This rethinking of the formulation “form follows function” constitutes an important element of an open architecture view of reality. A substantial part of our building stock is designed intentionally to accommodate changing uses; another substantial part changes anyway, with excessive waste and conflict, even if the buildings were never explicitly designed for change. The AIA recently forecasted a few years ago that in the near future, something like 75% of architectural commissions will be for converting, adapting or adding to existing buildings, not new buildings built from scratch on green fields. At the same time, many clients now ask that their investments be long lasting - contributing to their return on investment and at the same time contributing to a sense of place representing social memory and continuity. While there are exceptions (for example, the cheap building made to last a short time), the need to balance change and stability exists in the office, retail, medical and housing markets, as well as laboratories, educational buildings and manufacturing facilities. Taken together, this constitutes well over 80 - 90% of the built field. These are not first of all technical questions neatly captured in the word “flexibility”, but are more complex.

Meanwhile, most of our studio projects – if not other courses in our architecture curricula - focus on the 10 - 20% - the special buildings that are presumed to be largely static. Its no wonder that after school, many young architects leave the profession or grudgingly adjust and find themselves making excuses for not following the dream of the master architect designing the special timeless building, and gravitate back to be guest critics in an academic world too often detached from the large project, the everyday environment, the problems of distributed design responsibilities, change, and the opportunities inherent in an attitude of shared values and cooperation.

The realities in the field that open architecture recognize present a problem for everyone who has grown used to specifying functions and their adjacencies in detail as the starting point for planning and building investment. Indeed, in school, everyone, students and faculty, are greatly discomfited if they don’t have a fixed program to start with. At the same time, no one believes that plans or designs come from programs. In fact, in a studio where a given program is the starting point, students will be criticized for making a design like a fellow-student. Sharing design ideas is seen as cheating. Confusion is inevitable.

Parallels in the Design of Infrastructure

There are parallels between these issues and the problems in designing infrastructure. Road networks on different scales, railway lines and canals come to mind, as do water and sewer systems and communication networks. They all serve multiple users and frame physical conditions for inhabitation – as buildings do. In large capital assets such as these, whose design and use stretch over large territories and over long periods of time, control is often hierarchically distributed and design is guided by both convention and by explicit regulatory processes. Governmental entities as well as private parties are involved in complex and changing patterns of initiative, financing and management.

In our field, large buildings serving multiple and changing users show similar characteristics by offering space for customized user settlement. We know that shopping centers and office buildings, for instance, have behaved this way for some time. Now we see residential buildings and hospitals shifting toward this mode. The implications for design, for regulation and for innovation in the building industry are important. These project types, however, are rarely seen in the design studio in the University. If they are, they are often treated as exercises in sculptural expression, or the mastery of the one-off.

In the real world, these complex buildings - sometimes providing space for thousands of people – would never come into being without good methods. The professionals involved know how to tackle problems of varying

cycles of change, share values, and recognize the importance of distributing work, over time and often at great distances, using advanced software tools essential to cooperation.

When cooperation is seen as the mode of operation for doing good architecture and good urban design, it will soon be evident in the academy that good tools for working are needed – that intuition and convention, strong personalities and good speaking skills, while invaluable - aren't enough.

That is where open building comes in. Open building is about operations and methods – how to work when cooperation is a primary requirement for success in a built field subject to change, and requiring distribution of design responsibility to get the job done. Open architecture does not impose a certain style but does say that reality presents us with challenges we ought to be ready to face.

Of course, it may seem self-evident that change, distribution of design responsibility, levels of intervention and cooperation are part of the game. But in an educational and professional culture which places high value on being expressive and different; when the unique and the special dominate the critics writings and much of the discourse, a focus on these "the quality of the commons" can seem banal and less than inspiring. So they are rarely heard about nor put into play except under the vague ideas of "teamwork" and "context" are usually relegated to – but rarely fully explored – in the ever -unpopular "professional practice" course.

DESIGN EXERCISES

Like practicing scales or etudes in learning to play the violin, or practicing plays in football or handball, design exercises are what we use to teach students to be ready for complex design tasks. (5) They are not a substitute for creativity that is, in the end, inscrutable. Design exercises are only one kind of educational tool. Since there is more than one way to see the built field's reality, there surely are more than one sort of exercise needed.

In this conference we are exploring design exercises in accord with the way of seeing the built field in an "open architecture" way as I've explained already.

When we have to cooperate, distribute responsibilities and do so at levels of intervention, particular kinds of exercises are needed to get students ready for the full complexity of the new realities I've outlined. When various parties work at the same level – for example on a building design - we need to understand how to partition the whole and work successfully on our part. When work happens across levels – some call this interdisciplinary work - good ways of distributing, sequencing and coordinating tasks, evaluating capacity to accommodate interventions to follow at a lower level and so on are vital to making environments of excellence and sustained value.

The picture I have painted of the way built environment comes about and transforms in an "open architecture way" is only one view. Other views exist, and will generate their own kinds of exercises. For example, if the view is that decisions about the floor plans of offices and houses and building footprints are all tightly coupled or integrated with the layout of streets and parks, and must therefore be made at the same time preferably by the same team, then exercises will be needed to match that picture of reality. I don't know what those might be, but I am sure others could develop them. It is only healthy that multiple views of reality co-exist, and that a variety of design exercises emerge to prepare students for these competing views of how the world works. Inevitably, the field will impose its order on those who want to help cultivate it. In this conference, we are exploring exercises based on the ideas of an open architecture.

References

(1) Habraken, N.John. "Around the Black Hole", Plan, MIT Department of Architecture, 1981
(2) Habraken, N. John. Palladio's Children. Taylor and Francis, New York and London, 2005.
(3) Venturi, Robert and Scott Brown, Denise. Architecture as Signs and Systems: For a Mannerist Time (The William E. Massey Sr. Lectures in the History of American Civilization), 2004
(4) Adolf Loos (unknown source).
(5) Kendall, Stephen. "Teaching Architecture Students to Work with Distributed Design" in Design Studio Pedagogy: Horizons for the Future, (editors) Salama, Ashraf, and Wilkinson, Nicholas. Urban International Press, London, 2007

FIELD EXERCISES

Renee Y Chow

Associate Professor of Architecture and the Eva Li Chair in Design Ethics, Department of Architecture, University of California Berkeley; Principal of Studio URBIS http://www.studiourbis.com/

Figures and Fields

Today, we find design education dominated by a culture of self-expression. It is a culture rooted in architectural commodification and the expression of uniqueness of each design. What has been fading is education of architecture as a discipline situated in place. The first sees the educator's role as nurturing or challenging the development of each individual; the second teaches design as a tool for inquiry into a knowledge base. The second is not the antithesis to an individual designer's generative expression (this cannot be suppressed), but sees architecture as situated in complex and local relations -- formal, cultural, economic, political and technological -- that can be described to be shared amongst participants and to serve as a source of design generation and transformation.

Architectural design education began rooted in the local. Students served as apprentices to masters, and all practiced in the places in which they worked and lived. As such, they inherently and often unconsciously designed with knowledge about their place. As education moved into the academy, for example, the Beaux-Arts, designers shared methods and building types -- a knowledge base -- from which students learned how to transform, combine, and make variations upon the knowledge, proposing and then developing a parti, the fundamental concept. While the profession shared a knowledge base, in education there was a shift away from concerns of the local setting.

In The Decorated Diagram, Klaus Herdeg describes the next stage in design education, where the parti has become the "diagram," often a pragmatic, programmatically driven scheme with an applied appearance that is formulated out of context, or as Herdeg writes, "oblivious, if not outright injurious, to its physical and often its social context."[1] Today, the diagram, the concept, the big idea dominates design education. How often have we sat in reviews and heard the question, "What is your big idea?" with favorable assessment based in how well the student achieves that concept. The emphasis is on the authorship, cleverness in interpreting the problem and attribution of meaning to key words, analogies, or images. In a culture of star architects, "concept" has become "brand." Every city needs a "Gehry."

Whether education promotes or follows a culture of commodification, design as self-expression promotes discontinuity, a fabric of figured icons and gated enclaves, a cacophony of competing markers. We are losing the tools to make neighborhoods and districts, the knowledge that supports making fields, the continuities and relations shared amongst individual actions.

Field tactics

If history has propelled us into splintering global practices, how does an architecture of the field get reinserted into the architectural dialogue? And, how can we relearn previous strategies and find new paradigms that build cities experienced as textures of neighborhoods?

It begins with a reinvigorated architectural dialogue about the potentials of the field and the dialogue needs to engage broad audiences. With a heightened awareness for the protection of resources, we now have a catalyst to promote the building of fields over figures, to highlight the values of an open as opposed to a closed architecture. We are on the edge of a tidal shift from a culture of consumption to a culture of conservation. To be made more compelling, the arguments and education about the field need to be linked to this shift. Building the field is a way to a more robust, dense, situated and ultimately sustainable city form.

We need to learn about the ways in which fields are robust -- able to hold change and multiplicity. By recognizing and embedding differentiated lives of systems, a tabula rasa erasure for change is avoided. Instead, places grow richer over time.

We need to educate about the field's potential to hold density -- not by duplication of singular solutions that lead to uniformity, but as a morphology that holds coherence with variation. As we build more, we should expect to get more: a greater variety of experiences, a range of places to meet, and a diversity of ways to live.

We need to advocate on how to make fields situated, open to the local setting, extending rather than isolating, connecting rather than splintering, transformational rather than substitutional.

We need to illustrate ways in which the field will allow us to conserve resources, the potential of day-lighting and solar orientation at the collective scale, the elimination of wasted interstitial spaces. With a field, no space is left over, a buffer or a no man's land between built objects. The experience of cities should make one feel "inside," even if it happens to be outside -- in the city, in the district, in the street, in the park, in the building, and in the room.

We need to argue on how making fields - as well as figures - develops a culturally as well as ecologically sustainable urbanism.

Field exercises

This conference focuses on teaching methods for open architecture with an emphasis on the design exercise. As a short, structured design activity, the exercise allows the designer to become quickly absorbed in a situation from which issues and questions emerge. It is what Rowe[2] describes as a process of acquisition. Often, I give a design exercise to students prior to lecturing on the topic. The students often complain, if they had heard the lecture first, they would have done a better design. My premise and experience has been that despite giving introductory lectures, the lessons are not engaged without the "acquisition." After completing a few exercises, the students understand -- the objective of the exercise is not to produce a completed design or fully formulated answer. The design exercise is a way to ask informed questions for the next step; it is a way to explore new concepts or ways of working. It is a form of exploration that generates disciplinary knowledge as well as solves problems.

In my studios and seminars, each course is explicitly defined as a discovery about the significance of fields and how to design continuity between discrete actions. The assumptions and significance are reiterated throughout the semester. In the past four years, my studios have focused on urban fabrics in China. For these studios, there are three kinds of exercises that have been imbedded in each of the studios.

The first type of exercise places each student "in the field." The goals are for students to immerse themselves in the quality of the place and to learn how to describe those qualities to others. This is a necessary first step for any collaboration and a primer for situating architecture. Exercises include describing the shared characteristics in a place as well as the variation through graphic representation, with an emphasis on a description of systems.[3] Another exercise to put students in the field is transformational, in which students begin with an existing urban fabric and incrementally change one system at a time: the access, the dimensions, the construction, with the goal of increasing the FAR or increasing continuity between sites (Figure 1.) After working with each system, the students are better able to describe the operative systems in a place. None of these exercises involve site documentation or analysis. That work is done in parallel or after the exercise. Again, the design exercise helps students define what to see when they are literally in the field.

The second type of exercise asks students to "describe the field." Students work collaboratively to design the shared, continuous characteristics of a fabric. Individuals or groups of students develop graphic descriptions on one system at multiple levels. This is an iterative exercise in which groups work independently and then together to determine how dependent or independent relations are between the systems. These form a set of agreements about a place that they can then negotiate changes with neighbors and with the entire team. In this way, the parameters for the field are seen as dynamic and can be refined to increase their robustness (Figure 2).

A third set of design exercises asks students to "cultivate the field." [4] These exercises test the capacity of a field to hold multiple readings or change over time. These exercises test the potential of agreements and building forms to support a variation of interpretations and still hold continuous characteristic in the field. In the China studios, which have been multi-block interventions, infrastructural elements are quickly inhabited with building to person-size components to see if the form, position and dimension of the infrastructure limits growth of the field (Figure 3a and 3b). Likewise, fields are inhabited with a change in program to test the singularity of the design. Homes become preschools, office or restaurants. Single family units become three household. And the best one hour design exercise is to ask students to remove all furniture and room labels from plans and sections and pass their design to someone else in the class.

For the conference, I will conduct a series of sequential exercises in the last category. In the first exercise, students are given a small site with limited contextual information. The goal of the exercise is to introduce students to the potential of working with systems: in particular, containment, access, light, dimension, and construction. A second exercise extends the field from a single lot to multiple lots. Working with the same set of systems, the students explore the potential of building a residential fabric based upon a field approach. Students work in teams and are allowed to negotiate agreements with their neighbors. The objective is to explore theme and variation among individual design actions. A third exercise asks the students to record and develop their designs in both plan and section, to illustrate and test the ways in which the field is inhabited and can be made more robust.

The design exercise is an equal opportunity tool -- it is used to generate figures as well as fields. Like all design, values are imbedded in the problem definition. Therefore, to teach about continuous relations or about an "open architecture" requires a commitment to teaching architecture as a discipline, a body of knowledge that can be shared. It also takes commitment to the field -- to structuring relations between levels, within levels, and over time.

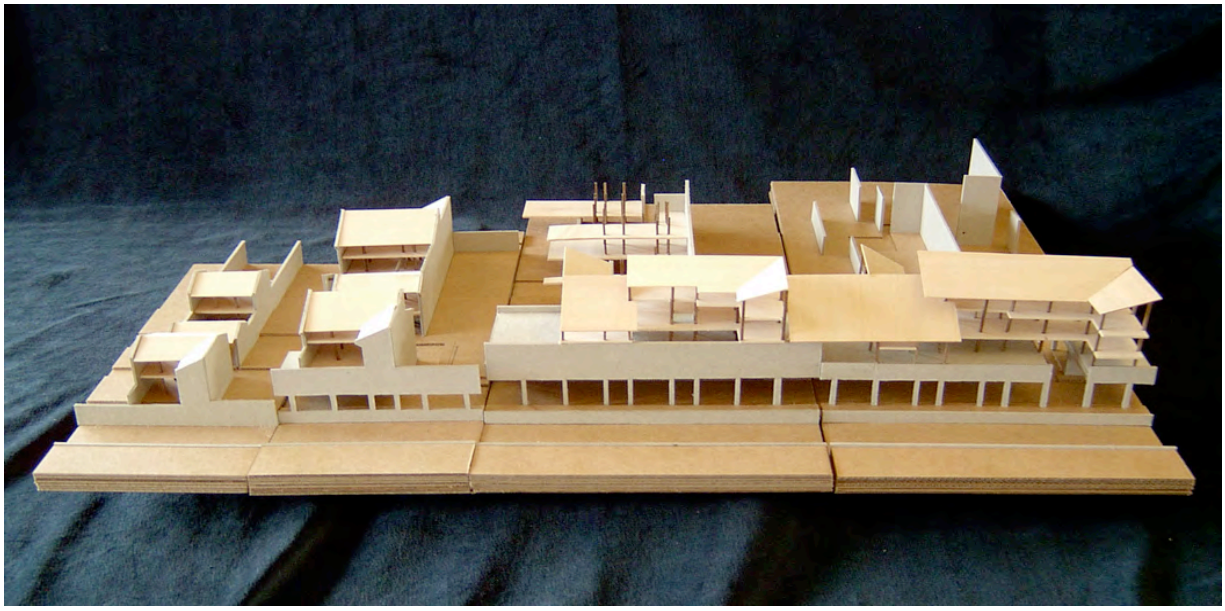


Figure 1. An exercise that puts a student "in the field." Beginning from left to right, the student was asked to transform a Chinese courtyard by working with systems of light, access, and construction, incrementally increasing the density and continuity across party walls. (K. Richardson- Spring 2004 Zhujiajiao Studio- UC Berkeley)

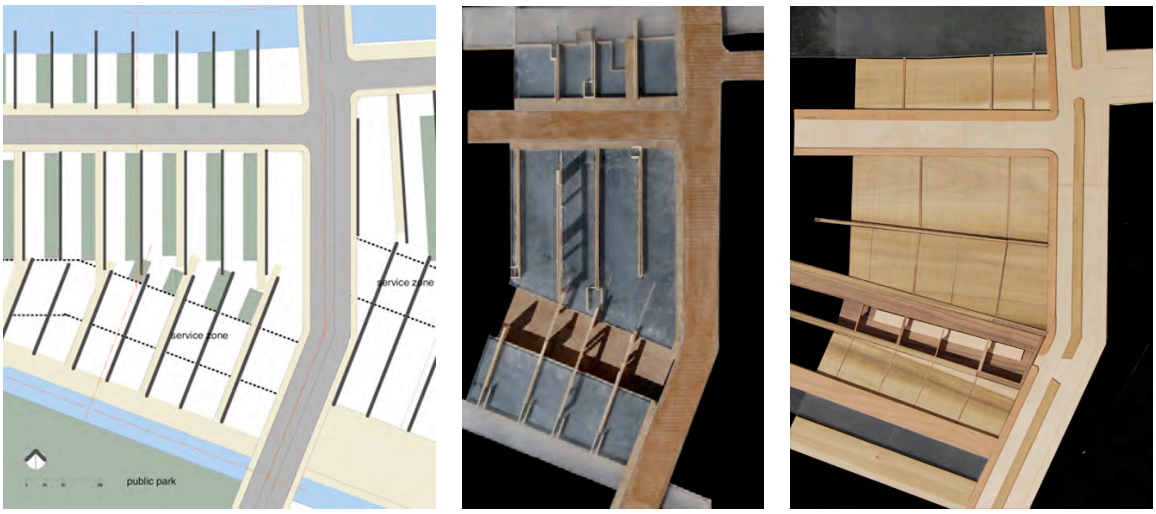
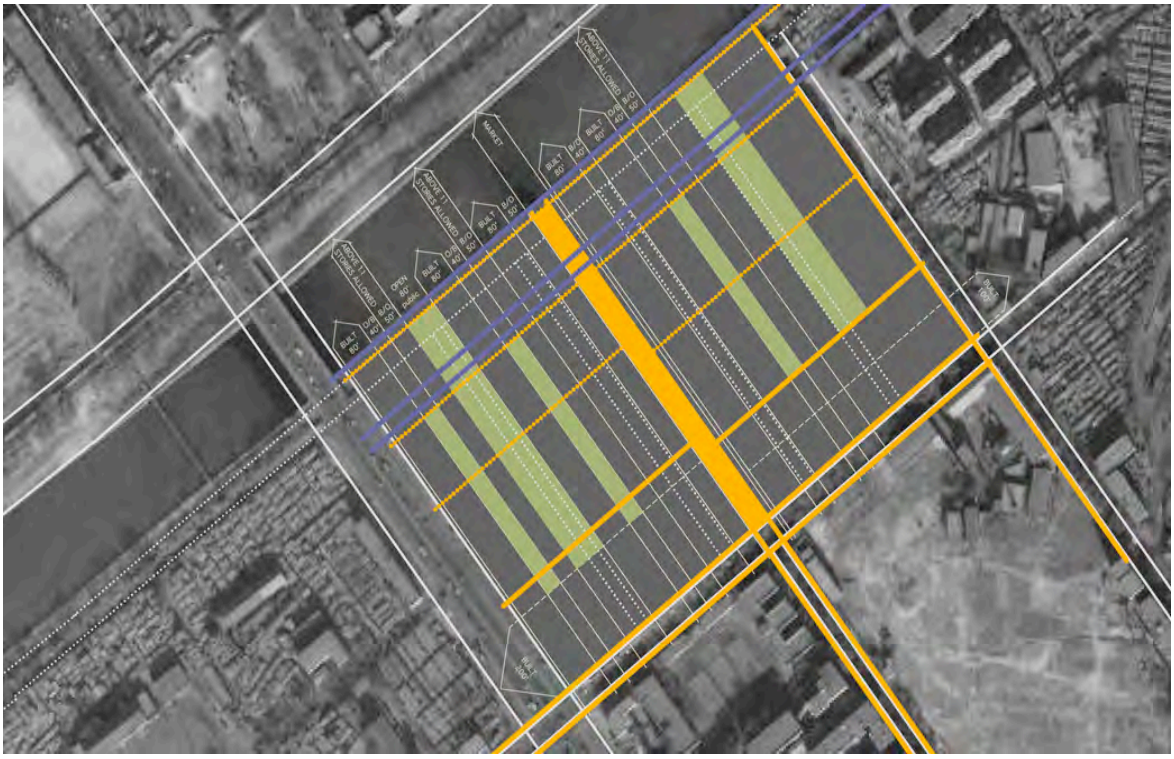


Figure 2 (above): An exercise that asks students to “describe the field.” Students work in groups to describe how systems organize the field and do sketch exercises to test and refine their agreements. One version of the agreements is on the left, and two tests of the infrastructural implications on the right. (E. Spletzer, left and A. Navarro Sertich, right- Fall 2007 Zhujiajiao Studio- UC Berkeley).



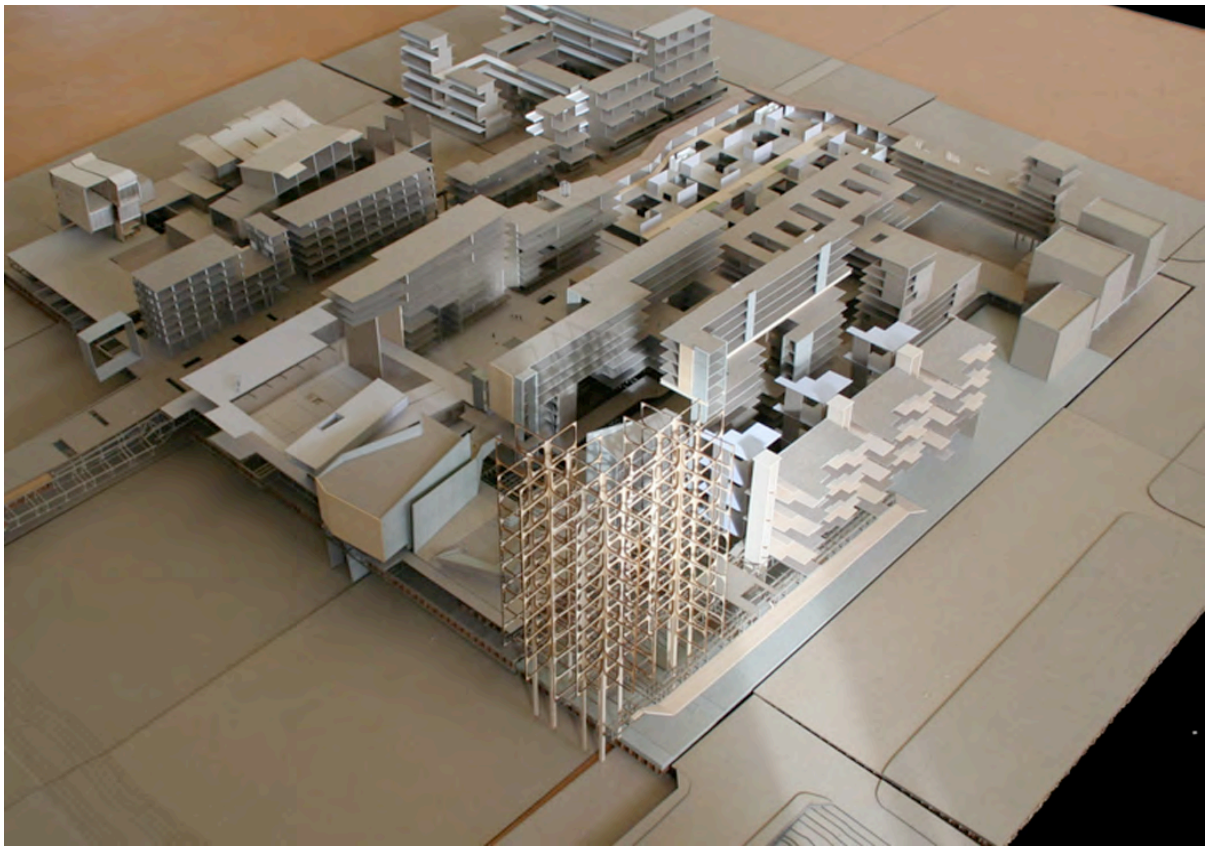


Figure 3a (above) and 3b (below). An exercise that asks students to "cultivate the field." Again, from a set of agreements developed from a previous exercise that extended the local urban context and pattern of dwelling (3a), students then developed portions of the site to test the continuity of the agreements (3b). We concluded that the agreements were not robust enough and changed to the agreements to include stronger formal attributes as well. (Fall 2006, Tianjin Studio, UC Berkeley)

Endnotes:

[1] K. Herdeg. The Decorated Diagram: Harvard Architecture and the Failure of the Bauhaus Legacy. Cambridge, MA: The MIT Press, 1983. p 2.

[2] P. Rowe. Design Thinking. Cambridge, MA: The MIT Press, 1987. ??.

[3] A typical starting point is to ask students to graphically describe a shared set of systems: access, dimension, light, construction are just a few. These systems are defined in my book, Suburban Space: The Fabric of Dwelling. Berkeley: University of California Press, 2002.

[4] I borrow the phrase loosely from Habraken. N.J. Habraken. "Cultivating the Field: About an Attitude When Making Architecture," Places 9:1, 1994.

The Barcelona Workshop

Andrés Mignucci FAIA

FAIA, Architect, Andres Mignucci Architects; Professor of Architecture, University of Puerto Rico
http://andresmignucci.com/

Abstract

This paper is a report on a design workshop held in Barcelona in April 2008. It was directed by N. John Habraken and Andrés Mignucci. The workshop explored the concepts of Support-Infill, Levels and Thematic Design as working methodologies in the design of multifamily housing. The workshop focused on a combination of theoretical lectures and design exercises as tools for teaching open building methods.

KEYWORDS: Thematic Design, Support-Infill, Levels, Design Exercises, Barcelona.

INTRODUCTION

The Barcelona Workshop[1] explored, in an intense compact format, two distinct but interrelated theories. The first centers on the complimentary concepts of SUPPORT STRUCTURES and INFILL SYSTEMS. The second deals with the idea of THEMATIC DESIGN as a method for understanding and intervening in complex environments. The concept of LEVELS serves as a bridge between both and plays an instrumental role in our understanding of the built environment.

Both, SUPPORT-INFILL and THEMATIC DESIGN, constitute bodies of knowledge where design theory and methodology are intricately intertwined. Consequently, the workshop was structured as a hybrid fusion, which combined the lecture format of a seminar course with design exercises and projects typical of the studio format. The daily four to five hour sessions featured one-hour lectures with review and discussion of design exercises related to the topics presented in the lectures.

Thirty students of the Masters Program of the Laboratorio de la Vivienda del Siglo XXI enriched the process with their individual experiences, local knowledge, and diverse cultural backgrounds. With over fifteen nationalities[2] represented, the workshop brought forward not only the natural plurality of thought and experiences that comes with multicultural exchange, but perhaps more important, a process of discovery as to what they hold in common – what is shared. It is here, in the realm of 'shared understanding' that both SUPPORT-INFILL and THEMATIC DESIGN find their common ground.

SUPPORT-INFILL

Four fundamental questions lay at the core of housing as a design problem:

1 How do we address the multiplicity of family structures in a given project - from the single person to an extended family living together?

2 How do we insert the equation of change and transformation as one of the built-in qualities and capabilities of a housing project? Consequently, how does a dwelling unit transform as time and the circumstances of a family change?

3 How do we incorporate the user as a bona fide participant in the design process? How do we address the issue of control beyond the Architect's realm in determining the form of the specific portions of a design project?

4 How can we integrate industry-manufactured components so they can be manipulated, controlled, replaced, and transformed in different configurations independent from the primary structure of a building?

Upon stating them one immediately realizes that these issues transcend the realm of design engaging a broader field that ranges from public policy to industrialization and production methods. They point toward three axioms as key drivers for design:

Housing must be diverse,

Housing must accept change and transformation,

Housing must incorporate the user as part of the decision-making process.

These questions were first posed in N. John Habraken's seminal book " Supports: An Alternative to Mass Housing" (1962)[3]. Habraken calls for a paradigm shift as to how mass housing is conceived, produced, built and ultimately occupied. Habraken's challenge, rather than limiting his arguments to a theoretical critique, was accompanied by a pragmatic methodology designed to give form to his theories. This methodology is based on the recognition of two distinct spheres of action and control in a dwelling unit: the act of building and the act of inhabitation. To a great extent, Support Buildings and Infill Systems developed as concepts correlate to these two spheres. As a method, Support-Infill has been developed primarily to address issues related to the design of multi-family housing. In theory, however, it can be applied to any design problem where issues of building and inhabitation, change and transformation and, levels of design control are present.

Supports, as physical entities, constitute distinct architectonic structures with specific spatial qualities. They hold the primary building definitions - structure, access and infrastructure systems - inside which independent dwelling units and layouts can be developed. As such, Supports consist of the physical components which directly serve and affect all of the building's inhabitants On the other hand, infill systems are non-structural physical elements determined and controlled by the user, be it the client-developer, the owner, or the inhabitant. Infill elements may be combined in a variety of configurations, sizes, and levels of complexity as to reflect the circumstances, needs, resources and preferences of the individual dweller. Once selected, these interior elements are assembled in the Support generating a dwelling unit that reflects the lifestyle and personality of the resident. By accommodating a broad range of unit variations, a Support structure possesses an inherent capacity to change and transform through time. For Habraken, Support-Infill provided a method with which to restore a natural order, recognized and observed in the everyday built environment in which people played a primary role in determining the character of their dwelling.

Primary research on Support-Infill was developed in The Netherlands by SAR (Stichting Architecten Research)[4] with Habraken as Director from 1965 to 1975[5]. In "Variations: the Systematic Design of Supports" (1974)[6], Habraken and his colleagues present a systematic exposition of the design methodology. Habraken's theoretical framework has laid a foundation whose influence can be seen in diverse projects such as Ignacio Paricio's *Casa Barcelona* (2001), experimental projects like *Next 21* in Osaka Japan (1993) or housing projects like Baumschlager & Eberle's *Living in Lohbach Housing Project* in Hötting-West, Austria (1998).

SAR's subsequent research into the realm of urban design and urban tissues developed further the idea of the distinct spheres of control observed in housing into the broader concept of LEVELS.

LEVELS

The built environment is a layered hierarchical structure in which each scale of intervention embodies a specific sphere of decision-making, control and responsibility. Each of these levels serves as the setting and context for lower levels to operate. In simple terms, higher environmental levels are independent of lower levels while lower levels operate according to the opportunities and constraints set up by higher levels. From the large scale of the territory to the intimate scale of furnishings and objects inside a dwelling unit, all environmental levels take part of this order.

The term *Levels* describes the interrelated configurations of physical elements and their decision-making sphere occurring at different scales in the built environment. Environmental levels include (from higher to lower level:

Territory
Landscape
City
Urban tissue
Block / public space
Buildings / support structures
Unit / infill
Furnishings
Artefacts / objects

Once we see different *levels* operating in the built environment we can recognize agreements between the agents that take part in its production. These agreements may be explicit - as norms, codes, and ordinances, or they may be implicit – passed down from generation to generation and made alive through culture and tradition. As such, these agreements form the basis of a shared understanding as to the role each level plays in the built environment, its hierarchical structure, and the scope and limits of what they control and how this control is exercised. These agreements become physically manifest as types, patterns and systems of form, which reflect a shared understanding between people.

THEMATIC DESIGN

When we visit cities we observe the recurring types, patterns, and systems, which give them their distinctive character. These themes are expressed in physical form not by the repetition of singular design solutions but by endless sets of variations which at once give individual character to each intervention while maintaining intact and recognizable the set of ordering principles common to each. The walled city of San Juan, Boston's Back Bay, Amsterdam's Canal District and Barcelona's Eixample all have in common that they are based in a strong thematic set of rules and agreements, themes and variations, which allow us to understand the whole through the physical manifestation of its individual parts. In other terms, it is through the individual variations that we see and perceive the architectural theme of distinct city fabrics. These cities also have in common that they are developed over time by different people. They are not the product of a single act or of a single hand. Although at first glance we may think this as self-evident, the concept of 'building over time' is all but lost in today's prevailing large-scale master plans, developer-based mono-functional subdivisions, and suburban tract developments. Variations are therefore not static architectural or urbanistic objects, but the reflection of changes in people's aspirations, wealth, cultural values, fashion and taste, and certainly, changes in their personal needs and circumstances.

Figure 1.1 Photo-collage of the Paseo de Gracia / Aragó / Rambla Catalunya / Consell de Cent block.

Friday April 18

EXERCISE 1: READING BARCELONA

This weekend-long exercise dealt with understanding the built-environment through observation[7]. Students were divided into six groups of four to five students each. Each group was assigned a block[7] in Cerda's Eixample[9]. Students were asked to 'read' each block through notations, sketches, photographs, verbal descriptions, diagrams and measured drawings. The only rule presented was that any inference, conclusion or

theory drawn must only be substantiated by what was seen, experienced, and recorded directly in place. In observing and experiencing their selected blocks, students were asked to look for the following:

- Patterns, Types and Systems of physical organization;
- Entry Zones and Access Systems
- Relationship to Open Space / Definition of Public-Private
- Building Heights and Regulating Lines
- Façade Alignments and Relationship to the street and sidewalk
- Recurring Façade Elements
- Rhythm and Modulation
- Vertical Disposition of Uses
- Parcelling Size and Increment of Property Delimitations
- Signs of Territorial Control
- Material and Tectonic Relationships

The fundamental task was to find signs of shared values, rules, and agreements manifested in physical form. Also important was the recognition of the dimension of time and change as key to understanding the built-environment.

Each block selected had an important iconic piece of architecture that formed part of the block. Some of these like Gaudi's La Pedrera, Jujol's Casa Planells, or the outstanding collection of modernist architecture formed by Gaudi, Puig I Cadafalch and Domenech I Montaner's in the 'Manzana de la Discordia', formed part of the 'thematic' fabric of the block. Here we sought for students to recognize what these outstanding idiosyncratic buildings shared in common with the quieter, more 'normal' buildings that conform the city block.

Other blocks had 'non-thematic' elements - civic, public, and cultural buildings such as the 19th century market Mercat de la Concepció and the modern Sant Antoni Library by RCR Aranda Piagem Vilata Arquitectes. This posed a number of questions. How do thematic and non-thematic elements co-exist within the block structure? How do these uses adapt to the form rules established in Cerda's regulating plan? How does an old nineteen-century fabric incorporate new, modern structures as part of its urban structure?

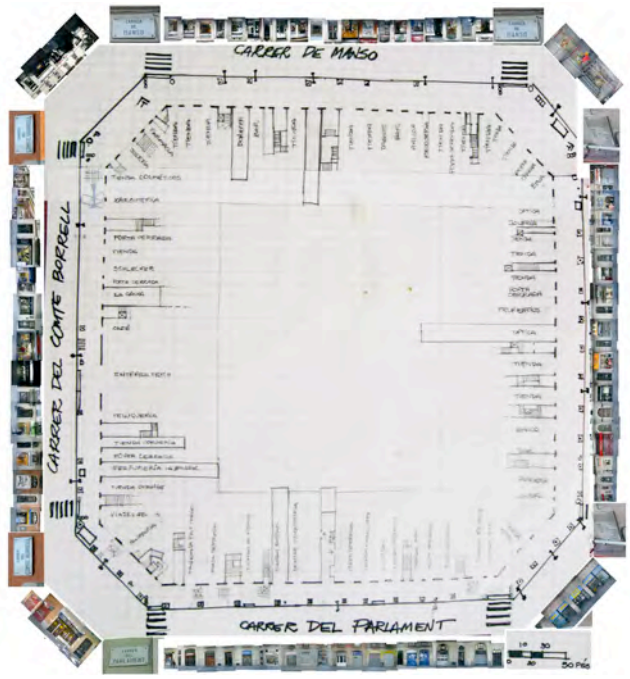


Figure 1.2 *Observation drawing by Raquel Sabará of the entry systems at the Manso - Comte Borrell – Parlament - Comte d'Urgell block.*

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Monday April 21

EXERCISE 2: VARIATIONS 1

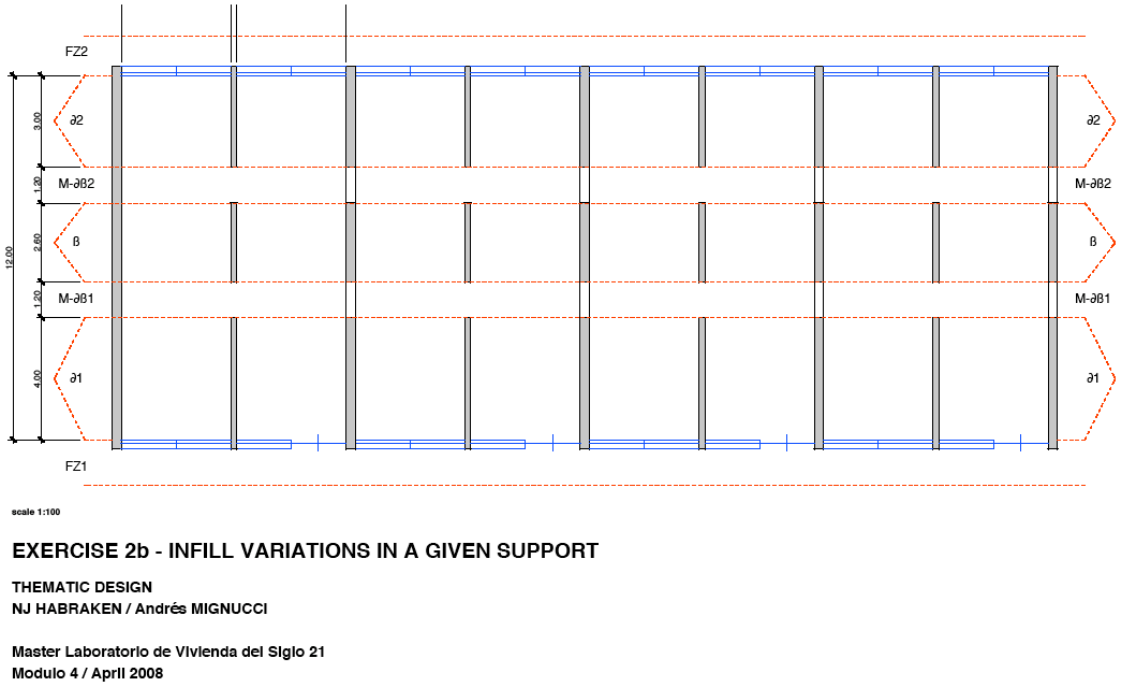

Figure 1.3 *Variations Exercise by Andrés Mignucci*

The following three sets of exercises relate to building skills in multi-family housing working specifically with the S-I methodology. The design of single-family houses has always been a fertile field for experimentation and innovation. Multi-family housing as well has seen a number of outstanding design by architects throughout the world. These, however, are a mere fraction of the mass housing produced worldwide. In parallel, housing design has fallen short of addressing effectively issues of diversity, change and transformation, and user participation. To effectively address these issues, designers, developers, policy makers, and, as participants in the decision making process, users, must be equipped with a methodology that considers these tenets as central to the housing equation.

Figure 1.4 *Variations by Ursula Troncoso.*

A fundamental aspect of this methodology lies in the clear delineation of design responsibility – who operates at each given level of intervention, what is the scope, the responsibilities and the limits of each of these levels One of the basic skills involved in the S-I methodology has to do with how we test the capacity of a given support to hold and facilitate a range of floor plan variations. This is an exercise between two levels of intervention – the support and the infill levels. This design exercise dealt with understanding the capacity of a support structure to:

1) Integrate / facilitate User Participation at the Infill / Unit Level.
2) Support a range of family compositions and lifestyles.
3) Support growth, change and transformation of the dwelling unit.

The exercise consisted of two explorations:

The first dealt with variations using Zones and Margins in Sectors of varying width. The second concentrated on Infill Variations in a given Support Structure. Students worked individually. Each student was expected to prepare two sets of Exercise 2a and two of 2b. Review and discussion themes centered on:

1) Understanding why variations are important: the recognition of the user as a player in the form-making adventure;
2) The idea of identity within a larger shared structure;
3) The idea of generating variations as a way to test the capacity of a support;
4) Thinking of different lifestyles and priorities that inhabitants may bring with them, rather than assuming just one given or assumed 'program';
5) Incorporating the element of change, time and transformation; and
6) The acquisition of skills: seeing different possibilities in a given situation and exploring them.

Tuesday April 22

EXERCISE 3: DESIGN OF A SUPPORT

The third exercise dealt with designing a SUPPORT STRUCTURE. The design of Support Structures depends on an understanding of the concept of Levels and the notion that each level serves as setting for agents to act at a lower level and is subject to rules and agreements (it is servant / dependent) to higher levels.

Discussion associated with this exercise concentrated on:

• The distinction between architectural systems vs. technical systems and the notion that Supports are not neutral or merely technically defined forms, but hold specific spatial qualities that potentiate inhabitation.

• Concepts related to jurisdiction and hierarchies of design control.

Consequent with the notion of Levels, this exercise was to serve as setting for exercise #4, which will be making Variations on someone else's Support. So, this exercise was about making form decisions and rules of intervention that will serve as context and setting for someone else to intervene at the infill level.

Wednesday April 23

EXERCISE 4: VARIATIONS 2 (VARIATIONS ON SOMEONE ELSE'S THEME)

This exercise was intended to deal with making variations on someone else's theme. To a great extent it forms part of the essence of Thematic Design as both method and discipline. In jazz it relates to the solo of the individual instrumentalist over the composer's melodic structure. In classical music it can be heard in the cadenzas of the pianist performing a Mozart Piano Concerto – structured improvisations over the composer's theme. It reflects on the designer's ability to create unique environments as well as the Support's capacity to potentate / facilitate them.

Considering the limited schedule of the workshop we decided to cut this exercise in benefit of an additional day for the final exercise.

Thursday April 24

FINAL EXERCISE

The final exercise brings the workshop full circle to Barcelona's Eixample as an urban context in which to design. The exercise was an opportunity to bring together the observations about place and context produced as part of the first exercise along with the skills and outlook developed through the individual exercises.

Students were divided into the same six groups who worked in the first exercise. Each group was assigned a segment in a one of Cerda's regulating diagrams for the construction of urban blocks in the Eixample. As part of his 1859 regulating plan for Barcelona, Cerdá prepared clear design rules and guidelines to direct development and building initiatives in the Eixample.

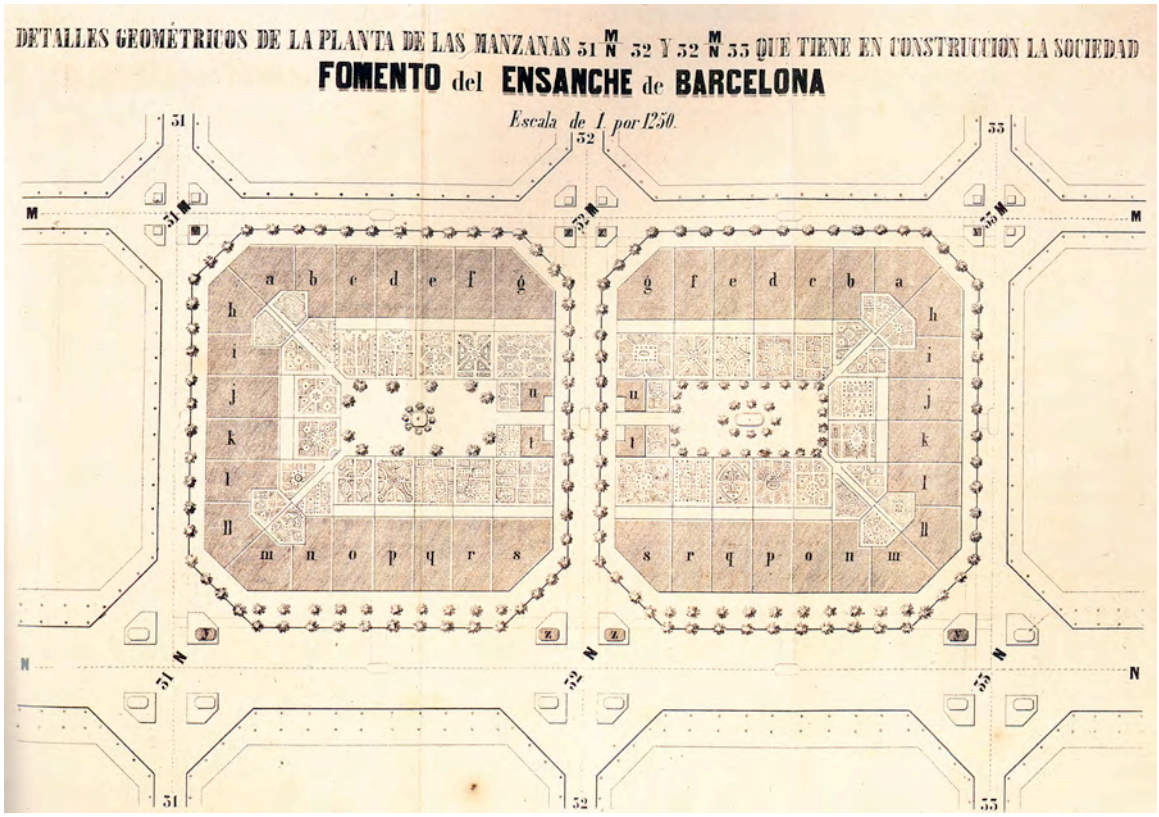

Figure 1.5 *Geometric Details of Block Plans / Detalles Geométricos de la Planta de las Manzanas by Idelfons Cerdá, 1859.*

Students were to use both Cerdá's rules as well as the patterns, types, systems, and relationships observed in exercise 1. The challenge of intervening collectively in the same piece of fabric forced the students to assume positions regarding their extent of design responsibility within their project and to build a set of rules to serve as a framework to guide their individual interventions. This was as much a design problem as the actual assigned project. In the most successful projects, the rules of design control and intervention between designers were more explicit and clear. It was evident that the agreements between designers rather than limiting design expression actually enabled and facilitated the design process. Rather than putting the weight and attention on the specific designs carried by a few talented designers, the discussion centered on the project as an extension of a shared knowledge base were a common understanding of design methods serves to underpin both individual and collective work.

Friday April 25

CONCLUSIONS AND BEGINNINGS

Given the short duration of the workshop, discussion and review of the design exercises was more about process than a specific critique on individual production and design solutions. This distinction is important given the fact that the workshop was based in sharing and exploring a design methodology. To this extent the workshop was about planting a seed to be watered and cultivated by individual students according to their particular experiences and interests. Needless to say, in the context of a multicultural laboratory such as this, each student's specific cultural optic enriched each others experience. Form definitions regarding public and private, dimensional standards, and spatial sequences, among others, reflected the student's particular backgrounds and experiences.

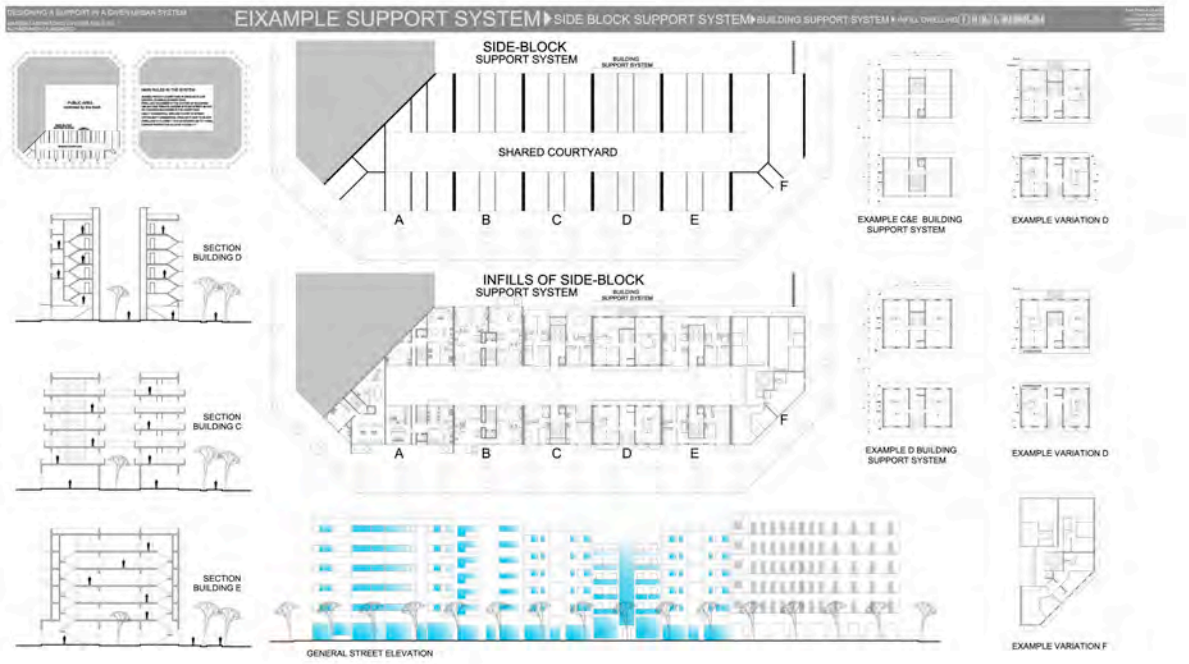

Figure 1.6 *Design Exercise 5 – Design of a Support in a Given Context by* Ana Paula Nosè Leães, Yumi Nagata, Fernanda Riotto Fernandez, Dhaian Miranda, Juan Ramírez.

Three basic lessons may be distilled from the Barcelona Workshop experience. First, we should recognize the potential of the fusion between the theoretical lecture and the design studio format complementing theory and methodology with hands-on design work in both the exercise and design project context. We can recognize that this will be a valuable instrument in putting forward a method-based approach to design, particularly as it relates to housing.

Second, attention has to be paid to the value of direct observation and experience of place as a primary reference for design. The understanding of the local context, accompanied by the use of precedent, type and systems analysis are therefore critical tools in the design process. This lies in direct contrast to design education based strictly on a formal compositional approach or the recently more popular reliance on abstract analogies and metaphorical references.

Finally, the recognition of the concept of Levels, were there are distinct jurisdictions of design control and intervention, forces us to come to terms with the idea that the architect is but one of many agents that form part of the design process. A more encompassing exploration of housing as a design discipline, must examine the role each level plays in the production of housing - from the scale of the city and the neighborhood to the intimate detail of user's appropriation of space. This must be anchored in the understanding that the finality of housing does not lie in the project's design or even in its construction, but in the more sublime act of inhabitation.

Notes

[1] The Barcelona Workshop was directed by N. John Habraken and Andrés Mignucci. It was held from April 18 to 27, 2008 at the ETSAB (Escola Superior Técnica de Arquitectura), Universidad Politécnica de Cataluña in Barcelona as part of the Master's Program of the Laboratorio de la Vivienda del Siglo XXI directed by Josep María Montaner and Zaida Muxi. Luciana Tessio served as assistant and coordinator.

[2] Countries represented in the workshop included Brasil (7), Mexico (5), Perú (2), Venezuela (3), Uruguay (1), Dominican Republic (1), Portugal (1), Italy (3), Bosnia-Herzegovina / Greece (1), Vietnam (1), Colombia (3), Spain (1), Cataluña (1) plus Argentina (Muxi & Tessio), The Netherlands (Habraken) and Puerto Rico (Mignucci).

[3]Habraken, N. John, Supports: An Alternative to Mass Housing, Urban International Press, London, 2000. Reprint of the English edition by the Architectural Press, London, 1972.

[4] Stichting Architecten Research translates as the Foundation for Architects' Research.

[5] For further reading on Habraken's early work and the history of SAR see Bosma, Koos, with Dorine van Hoogstraten and Martijn Vos**:** Housing for the Millions, John Habraken and the SAR (1960-2000), NAI Publishers, Rotterdam, 2001, ISBN 90 5662178 5.

[6] Habraken, N.John, with J.T.Boekholt, A.P.Thyssen, P.J.M. Dinjens, Variations**:** The Systematic Design of Supports, MIT Press, Cambridge, USA and London 1976.

[7] This exercise tied with the Master's Program's first workshop by Ricardo Flores and Eva Prats **"**Through The Canvas: Architecture Inside Dutch Paintings" which deals with the observation of environments portrayed in Dutch paintings as a point of departure for design exploration.

[8] The blocks selected were**:**

i: Passeig de Gracia / Rosselló / Pau Claris / Provença (with La Pedrera by A. Gaudí and Vinçon)

ii: Passeig de Gracia / Carrer d'Aragó / Rambla Catalunya / Consell des Cent ("La Manzana de la Discordia' with Casa Amatller by Puig I Cadafalch, Casa Batlló by A. Gaudí and Casa Lleó-Morera by Domenech I Montaner).

iii: Comte de Borrell / Consell des Cent / Viladomat / Diputació

iv: Manso / Parlament / Comte Borrell / Ronda de Sant Pau (with the Sant Antoni Library by RCR Arquitectes)

v: Avinguda Diagonal / Carrer de Sicilia / Carrer de Napols (with Casa Planells by J.M. Jujol)

vi: Bruc / Valencia / d'Aragó / Girona (with the Mercat de la Concepció).

[9] Ildefons Cerdà i Sunyer (1815-1876) was the progressive Catalan civil engineer who designed the 19th-century "extension" of Barcelona called Eixample (Ensanche in Spanish) in 1859.

Design Studio as a Platform of Open Interaction for Students

Dr. Beisi Jia

Associate Professor, University of Hong Kong
http://www.arch.hku.hk/~jia/Jia_web3/index-1.htm

Abstract:

Design studios in architectural schools face the current challenge of rapidly changing industries, economies, and societies. Design is generally taken as a student's individual creation. When group work is introduced, students are likely to be uncomfortable with the defined hierarchies imposed by the norms of convention, that is, the studio teachers themselves. This paper therefore introduces a new concept of studio organization, in which both the students' individuality and their shared common values are interwoven. The concept is based on critical observation of contemporary urban planning in China wherein narrowly defined modern city ideologies and land-use economics are imposed. The observation likewise reveals suppression of the city's vitality and the designers' and residents' creativity, as well as restraint of the city's momentum for evolution. In this paper, the studio was assigned a Guangzhou urban slum redevelopment project, which was employed to investigate two particular issues in urban design practice: (1) negotiation among various designers and (2) capacity to accommodate changes in needs. The process is comprised of three phases. Each phase has defined objectives but at the same time remained open for intervention in the next phase. The paper concludes that investigation of any new methodology in studio training is necessary to be able to take into account both the designers' and users' interventions, the present and future needs, and the defined and undefined objectives.

Keywords: design studio, open process, coordination, overlapping layers

1. Introduction

The design studio of an architectural school is an important instructive component. It is a unique teaching and learning center that distinguishes an architectural school from other professional schools. A design studio can also be seen as a complex social environment where architectural ideas and skills are presented, evaluated and imparted through student and studio master interaction. This is because it is where simulation of the real world occurs in that real cities and buildings, among other structures, are designed, improved and transformed. On the other hand, as Donald Shöne (1985 p.5-6) has pointed out, what students and studio masters do in the studio is, in some ways, unlike the reality of architectural practice.

The project described bellow is located in Guangzhou contemporary city of South China. Tianhe District of Guangzhou a large expansion area established in the mid 1990s. High-rise buildings literally sprout up with some of the new projects in gigantic size. The new urban expansion was built on original farming land with scatted villages around. The government nationalized the farming land with paying a high compensation to the farmers. However the farmers who legally own the lands in the villages put up various buildings for rental to the urban population. This was a clever and money earning by taking advantage of the tight land and housing supply in the fast growing city. In 2001, there were a total of 138 "villages inside the city" in Guangzhou. Labor migrants from other parts of China pour into the village leading to an increase in population. It is estimated that up to 1-2 million people live in "villages inside the city". In these villages the internal structure changed due to the dismantling and replacement of the old, low buildings. The old physical village structure is not longer visible and the villages are characterized by recently constructed buildings, mostly mid-rise, and high-density. Because of exploration of land and construction in these villages are unplanned and sometimes in utter disorder, the living conditions is appalling. Liede village showed in **Fig. 1** is the first to be removed by the joint effort of the government, developers and villagers.

Fig.1. The bird eye photo of the project site, Liede Village to be removed and built with high-rise buildings similar to those in the surroundings.

Based on the context of Liede village and an understanding on the the problems of simplified modern city prototype as partially realized in the Tianhe district, a group of Master of Architectural students investigated an alternative ways of urban reform. The objective was not confined with project as a design product, rather exploration of all the potentials of design process, which consists of three phases. In the first phase, exercises were introduced focusing on a few important issues in urban design: transformation, negotiation, and flexibility. The second phase was a group work on the urban planning of the new urban fabric, which is both decisive and open for further interpretation. In the third phase, individual works were invited on the divided precincts which accommodate all the planning requirements and at same time represent individual characteristics of student designers.

2. The Problems of Architectural Studio

Without underestimating its value as environment of learning-by-doing, the architectural studio has been criticized for its ill defined content and methodology. Kelbaugh dismisses the tendency that Architecture and its process is perceived as art, as creation of new and extremely special objects, as one-off building, or as media graphics, serving for special groups with large expensive consumption of energy and resources. To reverse the tradition, he suggests that *urbanism* and *sustainability* are the most promising and synergistic sponsors of good architecture today. Habraken sees studio as no longer capable of imitating the reality and common built environment in teaching contents, or it actually separates the designers from the reality. He points out that "in the studio it is impossible to exercise distribution of design responsibility, or to deal with the sharing of values and qualities designers, or to handle issues of change". (Habraken 2003:40) Jeremy Till (2005:3) sees that studio is a place removed from the norms of social life, and it becomes a place where the power of the tutor presenting the narrow and irrelevant view of professional body can be enacted. He named a few famous architectural schools in the history such as Gropius at the 1920s Bauhaus, Kahn at 1950s Penn, Boyarksy at the 1970s Architectural Association and Cook at the 1990s Bartlett, and concludes that their differences are the appearances, but the similarities in their operation are essential. In all these schools the students dutifully, and often painfully, copy the actions and forms of the studio master. The result is, shared with Habraken, an architectural education that effectively removes students from the world reality, "instigating a denial of the ordinary in the pursuit of the extraordinary. (Till 2005: 10)

Architectural studio which is supposed to be a simulation to the reality of the built environment and a socially interactive and creative environment has suffered from two interrelated and fundamental problems. Firstly it is not a successful and truly simulation to the reality, because in the teaching subjects there is a prevailing ignorance to the common and shared values of ordinary environment, to the issues of time and

transformation, and to the distribution of responsibility. In terms social relationship, there is a power structure in the studio that the tutor should knows what the students should know and the students should accept what is given by the tutor who representing a specific values about architecture. The two problems are interrelated. An ignorance of the ordinary enhances the power of the tutors because they know about extraordinary. A power structure inside the studio tend define specific subjects and specific ways of learning which provide no chance for students to learn and explore the reality outside the studio.

Habraken suggests that there is need to build up a knowledge about everyday environment in three aspects – how values are shared in environmental design, how change and permanence make environment live, and how the distribution of design responsibilities can make it bloom. (Habraken 2003:39) The knowledge here is about today and also in the past. It should be organized in such a way that its implication is possible in the future. He also suggests that skills and methods of cooperation need to be learned. Skills include, for instance, making variations on an accepted typology, or using agreed upon patterns, or setting up a system of parts and relations for the creation of different forms in the same style. The knowledge and skills meant by Habraken are the subjects of learning.

Till seems disagree with the necessity of building up new forms of knowledge: "what is crucial is to encourage multiple modes of thinking rather than specific methods of doing." (Till 2005:8) The architectural education should help the students a capability as he called "making judgments". To achieve this objective, students should develop and attitude of doubt first, then search for answers from a human, not from a professional perspective. "It is about being human; develop ontology, but not a fundamental ontology; develop a phenomenology, but not an 'authentic' phenomenology." (Till 2005:15) The teacher should act as questioner and students are responsible to find the answer. And he address that there is necessity for the students to development their own structural of thinking, to build a self-critical response, and to form their own judgments and intentions. (Till 2005:14) It suggests there maybe a possibility that students can development different way of learning in the studio.

3. Design as a collaboration: OB Studio at University of Hong Kong

4.1 The purposes

In this paper, the design studio continued to uphold learning by advocating the basic teaching and learning methodology employed in an architectural studio as recognized by Donald Shöne. This is so because aside from assignments of readings and reports presented both in text and in lectures/seminars, the students are encouraged to work on models and graphics even on their first day in the studio to be able to present ideas and receive comments.

Students are also devoted to exploring the methodology of collaboration among designers to elucidate both the reality of the built environment and the design skills. In fact, as one student observed from Tianhe District, one of the problems in a modern city is the monotony in both urban form and function due to the strong hierarchies of the decision-making structure at the planning level. On the other hand, the new city falls apart into individual land developments with little collaboration on any intellectual level. In addition, the students found themselves in situations wherein they constantly worked on individual tasks which, most of the time, were simultaneously part of a group project. Both individual and group projects constantly changed; each individual student or "designer" of a "built environment" worked on two parameters at the same time, with the theme a contribution of the individual designers, and its integration a result of their collaboration with others.

This studio likewise encouraged students in the understanding that a good urban environment is never a result of one master planner's one-time construction; it has to go through a long process, hundreds if not thousands of years of evolution, and collaboration from designers of different generations. Nevertheless, the objective of this project was not problem solving, but an observation of actions and reactions through a process of transformation. The issues that were given emphasis included *density, evolution, participation, open structure, complexity, neutrality, integration, temporary, mobility,* and *infrastructure* rather than *architecture*.

The students also faced the true actuality of the built environment in Asia, specifically contemporary cities in China, and more so in Liede Village where the project was located. In these villages, buildings become higher and denser, while streets and squares on the ground tend to lose their traditional scale, shape, and activity, of which New Urbanism was based upon. Once high buildings are compacted together, building entities that modern architecture addresses such as form, space, and function become less significant. The opposite is true for interrelations in multiple directions and levels among buildings, which intensifies. Moreover, when a highly dense built complex is located in an area of rapidly transforming social and economic systems and multifold culture exchanges, the static portion of the built structure needs to be minimal, moderate, passive, neutral, and uniform.

Therefore, the built structure needs to function as a platform, a structure, and a service channel supporting the intensive flow of users and energy, as well as the diverse and frequent change of demands and interests. The high-dense built structure should also be inclined to obtain characters of infrastructure rather than those of architecture or urbanism (*Allen* 1999, p.54-55). Such importance in infrastructural urbanism is justified because even though its form matters, it is more valued for what it can do rather than for what it looks. Moreover, the form that constantly evolved in the studio always maintained a large scope of uncertainty, indefinites, and abstractum.

On the other hand, the project, upon recognition of Tianhe District's new but monotonous environment, was prompted into contributing a strong identity to the area that would even enable its transformation as a tourist attraction. This was undertaken under conditions of plot ratio maintenance, including sufficient floor areas both for housing and commercial use as imposed by the existing zoning plan. In this aspect, the forms, rather than being simple infrastructures, played extremely positive and active roles.

4.2 Phase 1: Warm-up Exercises toward an Urban Design (4 weeks)

These exercises investigate two particular issues in urban design practice: (1) negotiation among various designers, (2) capacity to accommodate changes in needs, All the students represented themselves as individual designers, working on given plots which should be united together as a coherent "built environment." In other words, when one student created his or her own model, he or she should know what the others were doing, especially his or her adjacent "neighbors." The "built environment" created remains in an abstactum to allow further interpretations and elaboration in terms of use, functions, or identities.

The exercise began with a site map, a paper with lines, dots, and traces which was regarded as representative of anything in the actual world. The map was divided into equal sizes of plots among the participants. A daydream space was invited and constructed into a model by cutting and folding paper copies of the map to create models in a simple but identifiable form.

After that, the participants put their models back to the plots on the large map. They observed and evaluated the visual effect of their individual models in the group of models, which was supposed to be a cohesive community. Suggestions and revisions were made to enhance the visual interaction between *diversity* and *continuity*, and between *visual* relations and *physical* relation.

Fig.2 First exercise of collaborative design were made with folding papers

(2) Land, contour and figurative composed with phenomenal transparency

Following the last exercise, students were required to transform spatial and paper composition into a solid, by studying the visual effect of transparency, and foam board as material. A distinction were made between three elements: the *ground* as spatialized field, the *figure* as object within that field, and the *contour* outlining their common limit.

Colin Rowe's and Robert Slutzky's essay *"Transparency"* was read as a sub-plot of the work, for it investigates fluctuating demarcations of space within the domains of art and architecture. Of significance for the exercise is the declared bias in favor of a syntax of *architectonic components* that initiates spatial interpenetrations and a relative *reading of space*--whether literal or phenomenal. The design and coordination of design, constantly evolved into higher level of complexity.

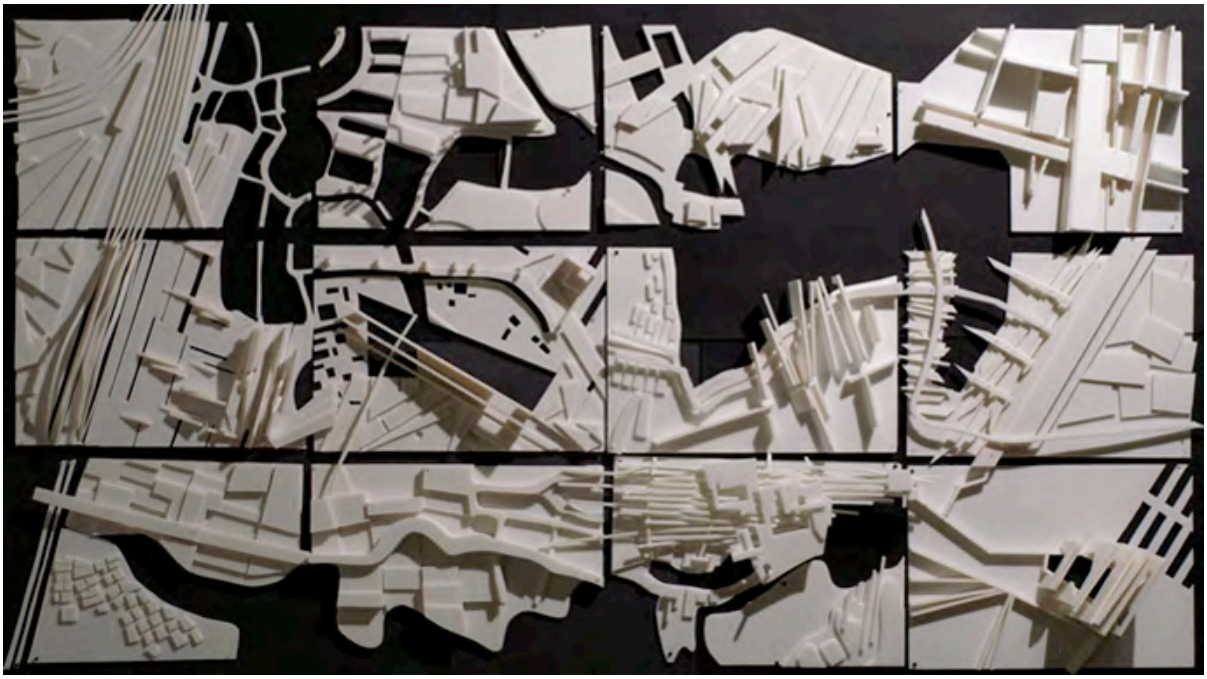

Fig.3 Individual design and coordination of design were presented in higher complexity

(3) Functions undetermined

This step introduced another level of complexity, the notion of spatial attributes determined by functional requirements. The distinctions of functions are maintained as a set of abstract binominal oppositions: *inside/outside, private/public, static/dynamic, served/servant,* which represented in color foam boards. A type of multi-dimensional zoning map identifying an overlay of territories, and their attributed properties were created and subsequently translated into a model. The original design from last step, now charged with additional informational codes, was transformed into a functional structure.

Each participant shall create a model with the color foam boards, but at same time together with all the other participants on the same large map. Constant action and reactions are the main issues of design. In the process, the participants were required to reflect on the different modes of functional classification, and their impact to the uncertainty and changeability of structure. In the end, students should observe and judge the relation and division of functional space in the group model.

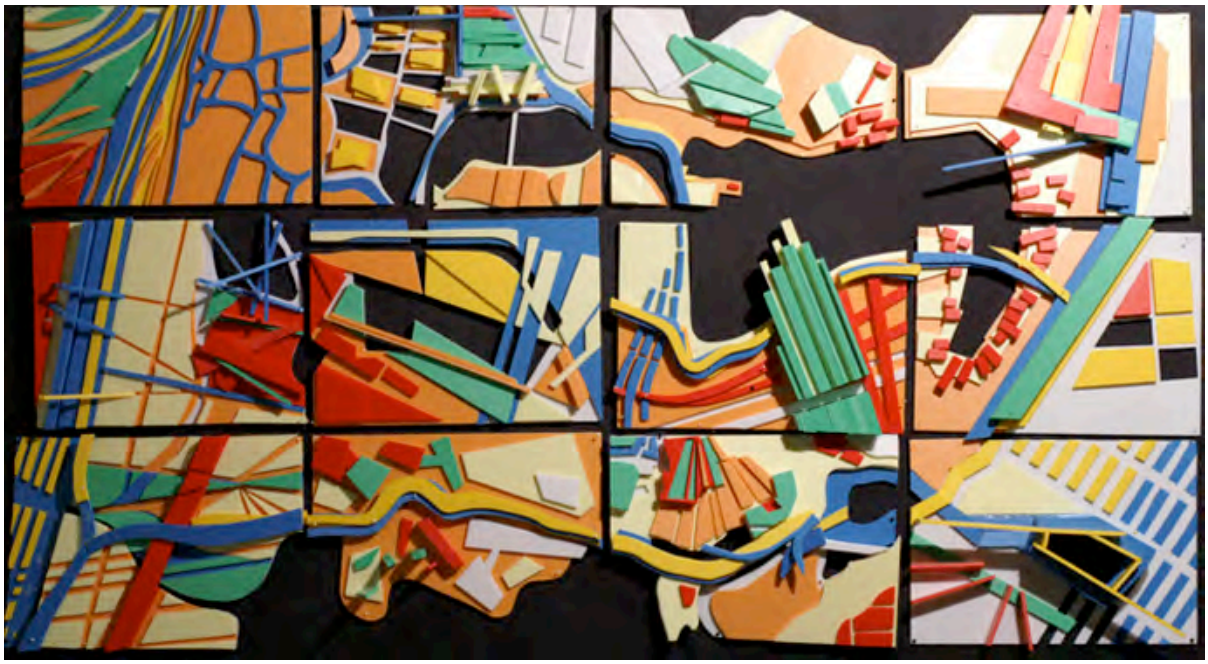

Fig.4 Functional issues were introduced into design and collaboration among designers

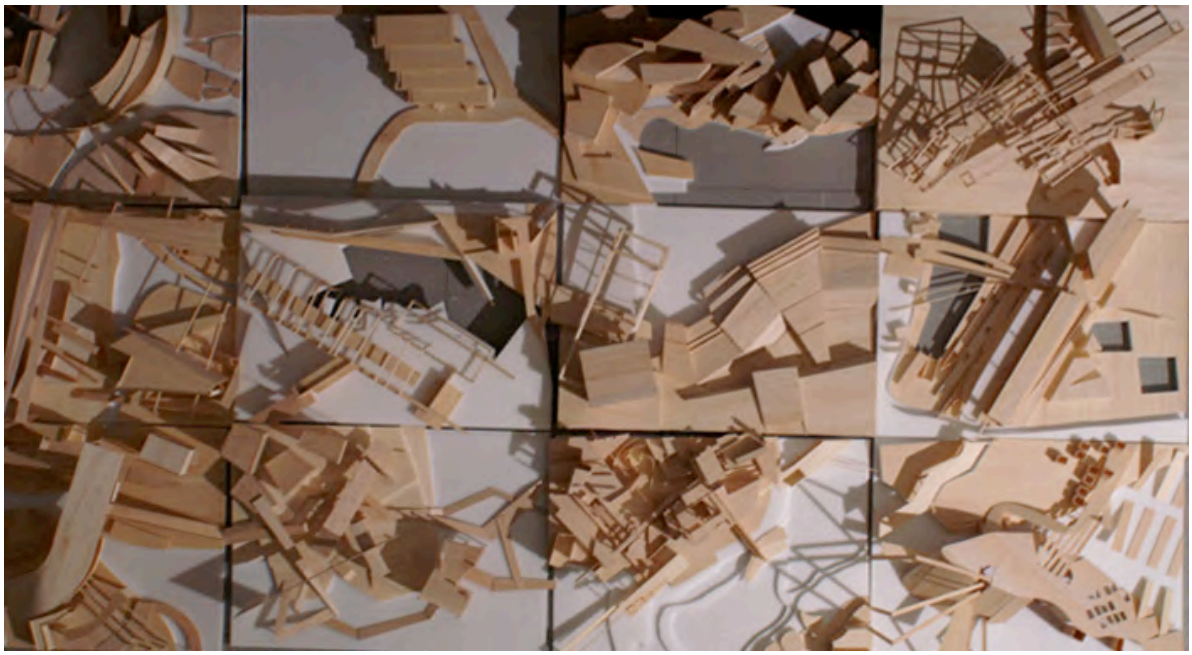

Fig.5 Further development of the exercise with tow new parameters, circulation and structure, introduced

4.3 Phase 2: Shared knowledge investigated in separated levels

In comparison with conventional studio, we placed site visit and analysis in the later stage of the project because the context is background information, which has no difference with the other information we need to explore. The project was dominated by the context or assigned program (regulations, targets of development). Instead, we look for an interactive dialogue with the site and associate requirements.

Remain critical to a deductive reasoning that presupposes particular solutions according to preferred modes of urban plan, the studio observed alternative methods through the convergence of urban analysis, objectives, and proposed urban form. Analysis of a site means construction of that site.

First, we were doubtful with regard to the compositional unities that affirm order and stability. We encouraged multiplicity and indeterminacy with all their forms of divergence, ambiguity, and process of transformation. Second, the urban territory is portrayed as an accumulation of information, material substances, and time, forming compacted or loosely arranged agglomerations. Third, we place emphasis less on the notion of place-making as genius loci than on the production of space. Producing space is characterized by the dispersion of events that remain strategically open. Here, urban design does not submit to finite conditions but begins to circumscribe fields of possibilities, which are open to entice other forms of reading and writing.

The planning was stratified, made of five layers superimposed onto one another. These layers were *topographic field, historical trace, infrastructural net work; programming and notes of attractions*. Students worked in pairs. Each pair investigated one layer into substantial depth and at the same time collaborated with other pairs. The five layers, with each transformed independently according to disciplinary parameters, were always a complete convergence. Here the studio introduced and imitate another aspect of the reality. The built environment is no longer a design a few masters of architects. It must be generated from a joint effort of the expertise from multiple disciplinary.

Fig. 6 A master plan with overlays of determinate parameters remains however open for reinterpretations on the architectural design levels.

4.4 Phase 3 Architecture as an urban design

The master plan was divided into a number of parts equal to the number of students in the studio. Based on the requirements of the master plan in aspects of density, program and location and dimension of infrastructures, individual students was required to develop a project as a way of writing a specific paragraph in the open text. On one hand, this is presented in much more details of spatial and technological configuration and character, while on the other hand, it should be part of the completed whole of the studio. No prescribed theories are given, except the following objectives shared by the all the members:

Environmental objective: We shall expose urban design and architecture to knowledge about the physical quality of the environment, especially that concerning pollution, energy, and resource, and the policy of sustainable development of the City Government.
Social objective: The emphasis is placed on an understanding of architecture as a collective enterprise embedded within societal frameworks, particularly stressing the production and use of space according to local community needs and objects of social justice.
Subjectivity: The individual and personal domains of physical, mental, and sensual activities must be taken into account, whether perceived from the producer of architecture who is the student of the studio here, or the vantage point of the user.

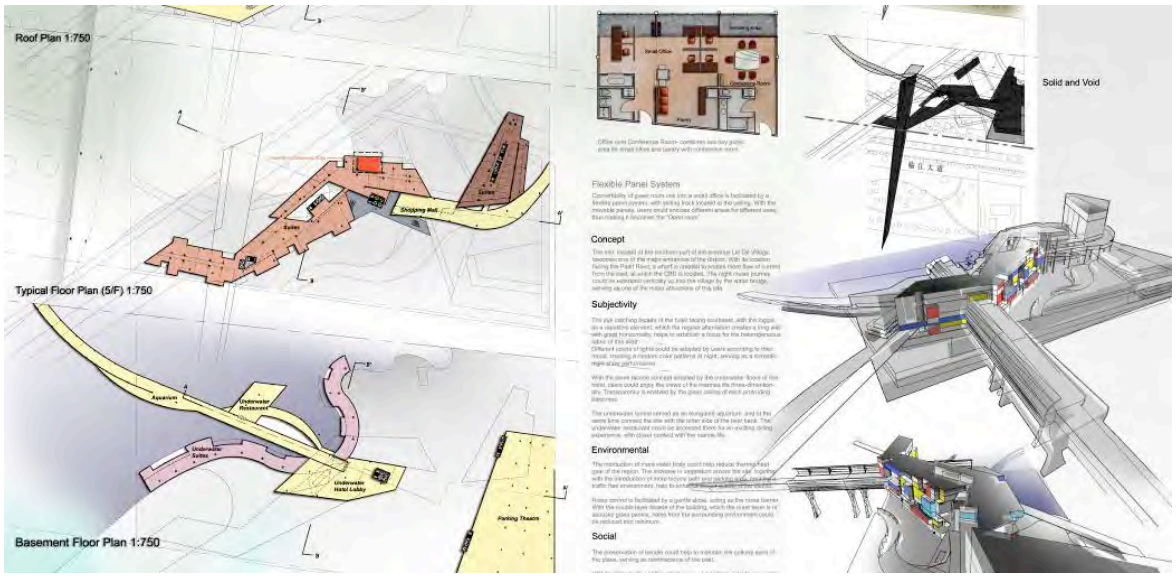

Fig. 7 Individual design by one of the students

Fig. 8 One site model made from combinations individual designs

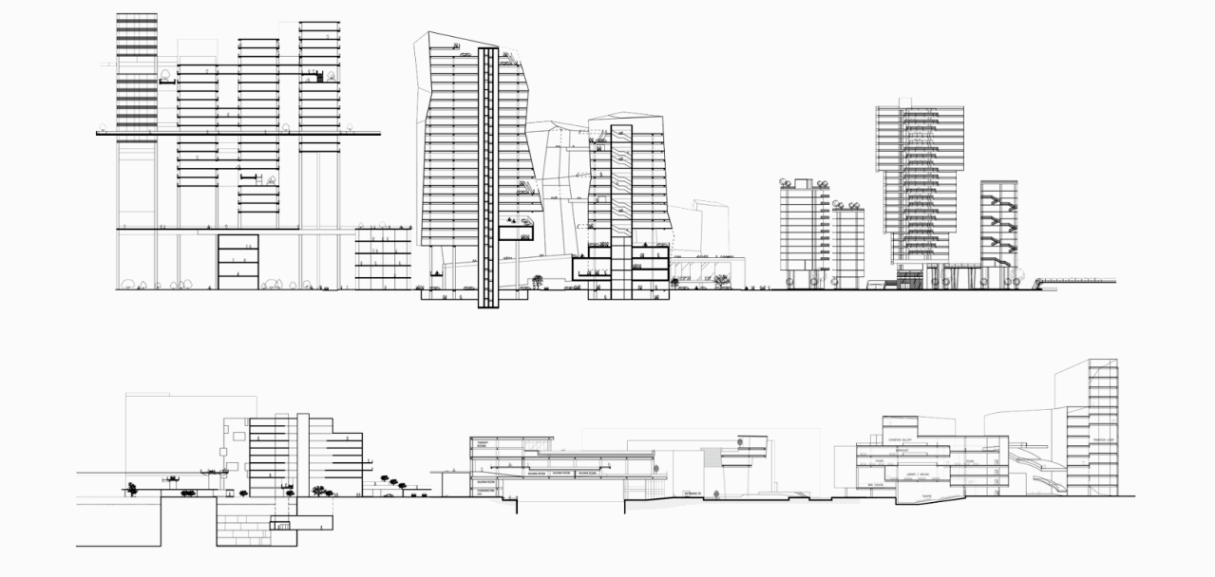

Fig.9 Two cross sections of the projects

5. Conclusion: Open Building in education

Open Building deals directly with the fundamental reality of the ordinary environment. As such, the concept of Open Building addresses two very basic parameters in architecture, namely, time and people. The former implies the understanding of the need for permanency in architecture as well as adaptability to changing circumstances. The latter, however, signifies the importance of actively involved individuals, including all professionals and users, in the design process.

An architectural studio that follows the “learning-by-doing” mode of education is meant to simulate reality. However, architectural studios today suffer the fundamental problem of prevailing ignorance to the common and shared values of the ordinary environment, to the issues of time and transformation, and to the distribution of responsibility. Ironically, tutors and students intended to work in a dreamland wherein a master designer could build everything depending on his or her wishes and ideas. The discussions were always about form, not time. There were no other people involved save for a lone designer and a tutor, talking to each other.

It is apparent that time and people need to be introduced into the studio project with the understanding that the project is merely an imitation of reality, not the reality itself. The effectiveness of the studio is also a pedagogical issue and needs to be studied. In this regard, this paper introduced and investigated one of the Open Building studios conducted by the author.

In the studio process, every student was requested to upload a report of his or her progress, including feedback and reflections on the studio, in approximately two-week intervals. These reports served as basic materials, although in a yet to be systematized fashion, for evaluation of the studio’s effectiveness. The results are summarized as follows.

1. The questions about time and people in architecture were carefully framed with consideration of the limits and potentials of the studio’s resources.
2. In the studio introduced in this paper, the issues about time were framed into the constant evolution of the design project, from its simplified context to its gradually increasing complexity. The time issue was also dealt with open, indefinite, and infrastructure-like forms that remained neutral for further interpretations. In general, the project was always managed in open-ended situations.
3. The issue about time was presented with a new classification of functions. The classification spurred intense debate among students.

4. The people participating in the projects were 12 students representing the 12 individual architects working on the given sites. The collaboration was mainly achieved by negotiation rather than teamwork. The students were enthusiastic in that their individual and subjective inputs were always respected throughout the process. The difficulties of decision-making hierarchies in some of the teams had been avoided.

5. Superimposition of any established theory and attitude through authentic phenomenology was largely avoided. The students, in the process of design and negotiation, were particularly optimistic toward the possibility of formulating their own opinions and goals.

6. Individual design and group discussion as well as architectural project and urban master plan were simultaneously created. Of note, elimination of hierarchies in time, space, and architects resulted in an extremely rich and heterogeneous urban fabric; that is, there was simulation of self-built village communities that were originally on the site. The students were amazed by the fact that it was design methodology rather than particular design ideas that created and enriched the continuity of the urban fabric. They began to realize, by observation in their own projects, that the problem of a modern city is not form but decision making and distribution of responsibility. They felt their projects were closer to the "villages in the city" perspective of Guangzhou, in contrast to others that have the propensity to imitate simply the traditional architectural and urban form.

Fig.10 Some students at work in Open Building studio

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7. References

• Schön, Donald A. 1985. The Design Studio, England: RIBA Publications Limited
• Habraken, N. John. 2003. "Questions that will not go away: Some remarks on long-term trends in Architecture and their impact on Architectural education". Shaping The European higher Architectural Education Area—transactions in Architectural Education No 18. Greece: Art if Text S.A.
• Till, Jeremy. 2005. 'The Lost Judgement', EAAE Writings on Architectural Education, Vol 2, Copenhagen , 2005
• Kelbaugh, Douglas. 2006. "Seven Fallacies in Architectural Culture" Open House International, Vol. 31, No.2, 2006, UK.
• Jia, Beisi. 2006. "Reality and Diversity: Reform in the architectural design studio" Open House International, Vol. 31, No.2, 2006, UK, pp.20-31

The Challenge to Architectural Education

Dietmar Eberle
Professor of Architecture at ETH Zurich
Partner, Baumschlager-Eberle
www.baumschlager-eberle.com

Abstract

Architecture can be learned. To ensure high-quality architecture, one has to reflect on how it is taught. To do so requires establishing a methodical approach and didactic objectives. Conveying a way of thinking that is also able to understand complex contexts and act on various levels should be one of the main focuses. This networked thinking relates to praxis and educates the students to be competent architects. In order to achieve this goal the process is simplified for the students considerably through a concentration on individual architectural topics. The topics covered – location, structure, shell, programme and surface – are looked at individually and then gradually consolidated in four separate modules. The topics are given different weighting in terms of the final design decisions in line with the length of the relevant life cycle. This weighting provides the underlying structure for the design process.

Architecture in the true sense is the ability to abstract the utility value of a building to a cultural level – to go beyond the specific demands which a building has to meet and attain a level at which architecture achieves a cultural positioning and in which individual visions have a place. The responsibility carried by the architect derives from both the scale of the resources used and the time dimension embodied in the social and cultural significance of cities and buildings. The fact that architects bring to their profession their own personal creativity does not free them from their responsibility towards society. The aim of the training given to architects must be to provide them with the basis for making objective judgements within what is essentially a subjective process – that of design.

I. Personal Understanding of Architecture

Status Quo

Despite the impression which architecture conveyed through the media would like to make us believe, things do not look good for the architect's position in society. On the one hand, that may have to do with the rate of unemployment in the profession, which is running rampant in many countries, and with the low income levels of architects in general. On the other hand, the architectural sins of the building boom from the 1950s and 1980s are still firmly anchored in the public consciousness. Ever since 'modern architecture' mutated universally into a stock phrase for faceless, uniform buildings, the majority of the public has questioned the design competence of architects.

Other reasons for the sinking reputation of architects lie with the parties directly involved in building. Whereas users often perceive inadequate suitability for the intended use, investors and developers raise the issue of insufficient understanding of the economics. In general, architecture is accused of producing an academic result which is estranged from the everyday world. At the same time, the demands placed on architecture become increasingly complex, while the critical points become more significant as a result of differing interests. This is contrasted with a didactic principle which is sharply reduced to the visual perception of architecture and pays little attention to the real scope of assessment. This development has long since lead to a large professional group of additional players who cover the spectrum of tasks described in architectural contracts by providing an increasing number of partial services.

Architecture as a Craft

For a long time, architects were viewed as artists, and even today some of them like to slip into the role of the autonomous creator who makes his or her decisions alone and is in total command. This image influences the public discourse. This self-image is misguided for two reasons. First, architecture is not an art: whereas art lays claim to creating a counter-world, the essential brief of architecture is to create useful worlds that improve the quality of life. The architect bears a great deal of responsibility towards the public, which is articulated in respecting four fundamental aspects: *cultural contribution*, *use value*, *cost effectiveness* and *useful life*. Second, the quantity of information is increasing explosively, and it exceeds the capacities of any one individual.
As far as the image of the architectural profession is concerned, the generalist aspect needs to be placed in the foreground again. The architect's brief lies in weighting the various demands for each new project and employing the available resources in the optimal way.

Beauty as a Cultural Dimension

Architecture is the environment which influences people most. For the development of architecture, in turn, the place – or the understanding thereof – is the central point of departure. The concept of place does not simply refer to its topographic and physical constitution; it has to be expanded to include a cultural dimension. The latter includes not only the history, the attitudes and the though patterns of the people resident there who have made the place what it is today. The architect's brief consists in evaluating guidelines set by the place and then deciding which aspects to integrate into his or her design. The context provides the background with which the building enters into a dialogue.
There is a tightrope walk between the personal, individual interests of the client and the long-term social and public significance of the building. Architecture is always public and, unlike art, cannot simply be eliminated. A building has to be socially accepted and culturally appreciated first and foremost on the level of perception. The significance of a work of architecture lies in its contribution to the public, and it is perceived above all by those who will never enter it.

Resource Management as a Temporal Dimension

One of the problems of our age is that the use of resources and the associated environmental pollution has massively increased in the way of social development. In highly advanced societies, as much as fifty to sixty percent of total primary energy demand is used to construct and operate buildings. In such countries, a high demand for comfort has been tied to a high demand for resources.
The decisions architects make in terms of materials employed, construction and the associated energy of operation have a considerable effect on resources. The large challenge for architecture is coming to terms with this. In that sense, architecture – and even more so construction – is a question of managing resources. What mattes is the relationship of the means applied to the quality achieved.

A Building as the Sum of Technical Subsystems

If we assume a useful life of more than a hundred years for a building, then it makes sense to divide its individual architectural elements into five levels. These are the design-immanent quantities of place, structure, shell, programme and materiality. This can be explained in terms of the various useful lives of these subsystems:

- The surroundings of a building which define the place – consisting of topography, meteorology, infrastructure, culture and the people who shape the place – is a system with a useful life of far more than a hundred years.
- The supporting system and the safety ascribed to the supporting system, including escape stairs, circulations, cores and so on, have useful lives of more than a hundred years.
- The building shell, façade and roof, as well as the main lines of the building services, last fifty to a hundred years.
- The way in which a building is used – residence, work, leisure and retail – is subject to changes that, as we know from our own experiences, are on a scale of twenty years.

- The materials and surfaces of the inside of a building are the parts most obvious to the users of the building, but because of the mechanical demands on them they usually have useful lives of just ten years.

If all the levels a building generates are related to one another, the relation of city to house can be explained. At the same time, it becomes clear that a building with an ambition to become a hundred years old or more will not be sufficient if the relatively short life of its intended use serves as the point of departure for the architectural approach.

The consequences of such a perspective are:

- As the most important means of architectural expression, the structure of the building generates public space. Public space is, at the same time, the space that gives the building its specific quality and characteristics.
- The prerequisites for ensuring that a building's value is preserved are that it be possible to convert and adapt it to changing uses.
- Separating inside and outside leads to different disciplines. Interior design, whose field of activity is limited to the levels of programme and surfaces, intervenes in already existing structures, whereas architecture concentrates on building within existing structures, in view of expected demographic changes. Such separation of tasks represents a realistic scenario for the further development of the European city over the next fifty years.

II. The Demands of Architectural Education

In view of the increasing complexity of architectural briefs, the architect's true core competence lies in the ability to design, that is, in the coordination and integrating of various subfields. This includes the ability to think simultaneously on different levels and scales and to structure processes accordingly. In that sense, the concept of the ability to design already contains the concrete definition of design in material and construction and is independent of any discipline. Education thus focuses on the question of method, which can only be learnt and cultivated by constant repetition. In architecture, this is based on a broad background of knowledge which is distinguished by an interest in everyday life and experience – just as in everyday life, the combining of different knowledge coming from various disciplines forms the basis from which the specific form is generated. Architecture can be learnt. If we want good, high-quality architecture, we have to reflect on how it is taught. To do so requires establishing a methodical approach and didactic objectives.

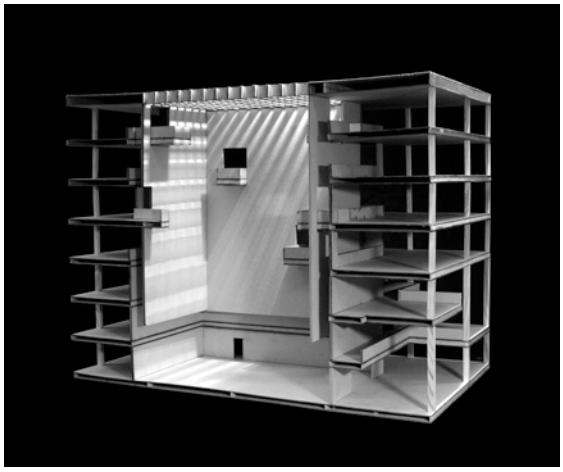
III. Method and Implementation

The course is built on nine exercises in which the themes *place, structure, shell, programme and materiality* are examined individually and together. The final exercise unites all the thematic areas into a genuine project design. This method focuses, first, on the perception of the individual themes. In addition, in a successive condensation it leads to a stepwise understanding of the complex process of design and to the ability to structure a project and implement it accordingly. The time required for the exercises increases, so that the students learn to organise their working time sensibly. This differentiation documents the efforts to guide the design process along the ordered paths of a systematic approach and at the same time offers proof that architecture can be learnt.

In order to understand the themes *place, structure, shell, programme and materiality* in their complexity both for a single house and for the city, each exercise is divided into a city level and a house level. Working on both levels simultaneously resolves the conflict between analysis and object in the working process. Analysis is no longer reduced to documentation but becomes an integrating element in that it occurs in parallel with the process of creating a design. The sequence of the subtasks reflects in turn the hierarchical weighting of the themes, which derives from the differences in their useful lives and at the same time reveals an approach to architectural questions that is separate from the programme. It should be understood as a critique of modernism's focus on the programme, juxtaposing it with an understanding of architecture which emphasises a building's useful life and status. This re-evaluation of the focus on programme in favour of useful life is the consequence of questions of sustainability and resource management which are always latent these days.

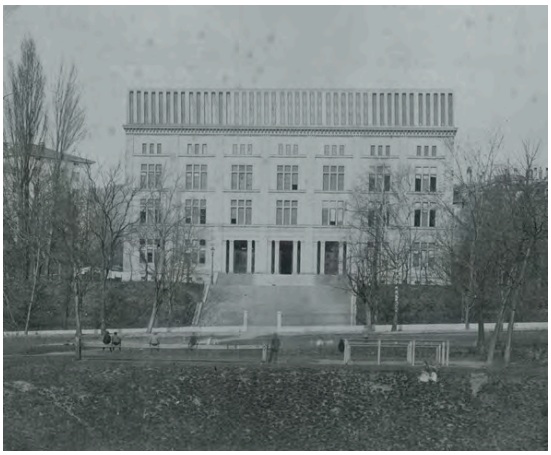
To provide the students with an optimal point of departure for their designs a direct connection to the city must be ensured. The best prerequisite is created by the place where the students are studying. In this case it is Zurich. In order to understand the city as a whole, three concrete building sites with different urban structures are selected. One building is always in the old town, one in a late-nineteenth-century district and one in an agglomeration - three places of various density and openness. Working on three building sites in parallel in a variety of urban-planning constellations accelerates learning by permitting direct comparisons.

Exercise 1
Volumetric addition



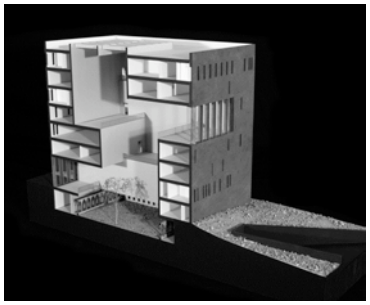
Exercise 2
Static structure

Exercise 4
New façade in existing context



Exercise 5
Extension project

Exercise 8
Sequence of space



Exercise 9
Final project

IV Conclusion

Architecture in the true sense is the ability to abstract the utility value of a building to a cultural level – to go beyond the specific demands which a building has to meet and attain a level at which architecture achieves a cultural positioning and in which individual visions have a place. The responsibility carried by the architect derives from both the scale of the resources used and the time dimension embodied in the social and cultural significance of cities and buildings.

The fact that architects bring to their profession their own personal creativity does not free them from their responsibility towards society. The aim of the training given to architects must be to provide them with the basis for making objective judgements within what is essentially a subjective process – that of design. The didactic concept that is set out here explicitly focuses on the collective aspects of the architectural mandate.

TOOLS FOR TRANSFORMING THE SUBURBS

The Adaptive Design Process

Paul Lukez AIA
Principal, Paul Lukez Architecture
Author, Suburban Transformations (Princeton Architectural Press, 2007)

Prelude

Since 2000, over fifty percent of the US population live in the suburbs.[i] While it is possible to trace the origin of this dominant urban form to the 19th garden city, its contemporary configuration is based on the automobile and the highway transportation model promoted during the post-war building boom. This new urban form, inspired in part by the American Dream of owning a piece of land and a view of the broad horizon, is still evolving. A new lexicon of classifications has been developed to describe the suburban phenomena and its constituent typologies. They include: Edge Cities, Boomburgs, McMansions, Greenfields, Category Killers, Lifestyle Centers, Power Centers and the Strip among others.[ii]

As the suburban form continues to emerge, evolve, and mature, it must transform to meet the needs of the inevitable post-petroleum society. The automobile may have given birth to this dominant urban form, but its survival will depend both on more efficient forms of mobility and on the re-design of the urban-infrastructure matrix that supports habitats and modes of mobility. Transformation of this (historically speaking) young urban form will yield many economic, social, and environmental benefits. Resources can be re-used for future development, in the way that many medieval communities were built on the foundations of Roman towns, allowing a new urban form to emerge. This new urban typology can then develop a unique identity that is rooted to a site's landscape and a community's historic as well as current needs. Awareness of the site's specific identity provides a community with the tools it needs to create flexible plans for future inhabitation and transformation.

This paper (based in part on the author's book, Suburban Transformations, Princeton Architectural Press, 2007) presents a process (The Adaptive Design Process) that can be used by designers, planners, developers, community members and students as they seek to re-make contemporary suburban communities and their environments. The process is based on the premise that the *identity* of a place emerges through the interplay of *site* and *time*, such that **Identity = Site + Time**. Over time, a site is layered with the residue of past actions – *erasure* and *writing* –implemented by human and natural forces. Richly layered sites and their idiosyncratic configurations generate unique identities that can be traced to the circumstances that have shaped a community over time. The Adaptive Design Process offers a contemporary armature for processing information, design scenarios, and decisions about the design and transformation of environments by integrating the temporal dimension as its central axis. A more detailed description of the Adaptive Design Process follows.

Introduction to the Adaptive Design Process

The current mode of development and construction in suburbs and edge cities is based on a highly compressed design and construction schedule. Developers, retailers, and institutions identify a window of opportunity, determined in part by available financing and market demand. Consequently, once the decision has been made to proceed, design and development are propelled through the review and construction process. Because of tight economic margins, developments often rely on set typologies for office and retail construction. The undifferentiated re-use of these typologies contributes to the uniform appearance of so many edge-city conditions. Buildings are plopped onto sites, with less concern for the creation of habitable and unique environments, than with working within parking, zoning, and economic parameters. The current process is geared toward meeting the exigencies of today, with little regard for the latent identity of a site and the impact and promise current developments bring to its future. There is no latitude for temporal depth. The aim of *The Adaptive Design Process* is to create a process that works within the demands of current markets and economies but considers the past and future.

The Process
More explicit and reflective about the present condition than other methods, The Adaptive Design Process can bridge past actions with future possibilities. It does so by reassessing conventional design processes as they occur in the present, breaking the process down into six explicitly articulated phases:

- Mapping
- Editing
- Selecting Tools and Typologies
- Projecting
- Simulating
- Recalibrating

Mapping
The Adaptive Design Process begins with the creation of an extensive database of the site in the form of maps. An enormous array of information from a variety of sources—charts, graphs, quantitative information, site history, natural forces, building histories—all can be translated into the form of a map, thereby creating a consistent visual system through which data about a site can be revealed, analyzed, and interpreted. Mapping is the critical link between the past and the present. Mapping can tell us more about how all the forces acting on a site are affecting current conditions or "behavior." The process of mapping breaks down and represents forces or phenomena into a singular set of conditions.

Pre-mapping
Pre-mapping is the first step in design, and helps determine which maps are most likely to yield useful information. Preliminary research can generate valuable information about a site, its history, and political and economic forces. This helps in deciding which maps are more likely to generate useful information. Interviewing local stakeholders (residents and business owners), purveying local publications, and direct site documentation and observation can offer valuable clues in identifying salient issues, and phenomena that may reveal more about the character of a community, its natural, historical, and demographic features.

Mapping History
History documents the significant transformations of a site over time. Perhaps the street pattern has a compelling historical origin. Or the original settlement was destroyed by flooding or fire. The insertion of major infrastructure elements may have caused significant changes in topography or landscape. Or the construction of major buildings and institutions might have fundamentally altered the nature of the community. Historical maps create a narrative about a place and identify the features that make it unique.

Mapping Site Forces
There is no limit to the types of information or phenomena that can be recorded about a site. Site forces range from historical to economic. Some forces are physically apparent, like natural systems (hydrology, topography, geology, vegetation, and climate), infrastructure elements, (highways, bridges, or rail lines), or buildings (a site's building typologies, construction types, materials, and structural systems). Other forces may be legal or demographic, including ownership, zoning, programming or capital flows. Sensory readings record the sensory information available at any site, including audio, olfactory, tactile, and visual attributes. Visual attributes might include sight lines as one moves across a site, the legibility of figural spaces, as well as lighting levels. Noise readings can be charted for points across a site, to identify effects of major sound sources: airplanes following a flight path overhead or trucks thundering down the highway. Smells of industry, nature, and food can be interpreted and mapped. *Statistical maps* can reveal many quantifiable attributes representing critical information such as demographics, traffic counts, or air quality. GIS data can greatly enhance understanding of complex communities.

Cross-Mapping
The forms of most human settlements arise out of a confluence of natural and man-made forces over time. The resulting elements rarely demonstrate a consistent hierarchical set of relationships. Even in environments where a strong set of principles govern development —Savannah, Georgia, for instance, or Bern, Switzerland— one can observe places where the order breaks down, typically in response to a constraint defined by a natural system like a river's edge, which disrupts a perfect grid pattern, or historic circumstances such as the insertion of a larger bridge required to support heavier traffic. Cross-mapping reveals and confirms the existence of

hierarchies, conflicts, opportunities and problems. It is literally an overlaying of one map onto another to observe and analyze the relationships and disparities between the forces existing on the site. An entire chapter in this book is devoted to cross-mapping to demonstrate its visual power and interpretive possibilities.

Editing
The mapping process generates vast amounts of information about the site while revealing factors that contribute to its identity. It is important that a set of criteria be in place through which this information can be filtered and evaluated. The editing process is an effort to organize information toward the shaping of future design proposals.

Distilling a Site's "Useful History"
A site's built history should be as fully engaged as possible in future developments. Analyzing the usefulness of existing elements will reveal both their potential for transformation as well as their significance in relation to a site's unique identity. Reuse and rehabilitation of existing structures represents the primary way through which history can be actively engaged. The generic quality of many existing structures allows them to be used differently over time, enhancing their chances for survival. Without thinking about time, resources can be wasted through the frequent cycles of building and demolition particularly evident in commercial and retail construction.

For instance, many suburbs witness the quick construction of buildings, such as retail centers, which are torn down only to be replaced by larger structures. These new structures sometimes share the same type of structural systems as the original buildings. Far better it would be to reuse original structures, in part or in whole, provided original designs fit current needs. Often contractors and developers do not proceed with this option, because either the original design does not fit the needs or because labor costs dictate that simply tearing a building down and rebuilding from scratch is simpler and less expensive. As global competition for resources becomes greater with time, this equation may change, such that saving resources will be economically beneficial.

A number of factors contribute to the likelihood that a building can be reused in the future for similar or different uses:

1. Specific vs. Generic Designs
The degree of specificity that a building is configured to meet particular program needs, impacts its ability to be readily transformed for other uses. That is, the more specifically a building's walls opening, roofs, etc. are designed to meet a particular need (a private residence, church, or library) the less likely it is that the structure will be able to accommodate a new use. Conversely, more generic buildings, such as warehouses, industrial buildings, and marketplaces, lend themselves to a multitude of adaptive reuses. That is why, for instance, so many school buildings have been converted to condominium housing units. The regular room sizes and large expansive structural spans allow for greater flexibility in converting spaces to alternate uses.

2. Flexible structural system
Generic buildings are more likely to be linked to flexible structural systems, but not always. What is meant by a flexible structural system? It is one that allows for alterations to its uses without major alterations to primary structural support systems (such as principle columns, trusses, and floor assemblies, etc.) For instance, a factory, with a long span structure is an excellent example of a structure that can support a variety of uses without completely reconfiguring their structure. Flexible systems typically have a repetitive structural system, using equal bays and elements. Nineteenth century industrial and mill buildings provide excellent examples, allowing for easy conversion to residences, and offices.

3. Separation of Lifecycle Assemblies
Structures can be designed that are comprised of distinct "lifecycle groups," that is, assemblies of building components sharing lifecycle characteristics. Most speculative office buildings are based on this concept. The shell and structure of a building have one lifecycle (60 years plus), while the interior walls and partitioning systems have a much shorter lifecycle (about 15 years). By pre-configuring these buildings into lifecycle groups, it is possible for the assemblies of shorter durations to be ripped

out without destroying the structure. In other words, structures can be designed to anticipate the types of uses that might occupy them in the future, and they can be designed such that their structural and building systems are more likely to accommodate changes while working within optimal financing and lifecycle frequencies.

4. Location, Location, Location
A building might have a very adaptive structure, but if it is positioned against the "grain" of an evolving community, it may fall victim to demolition. For instance, primary traffic patterns might run north and south in a community. While most buildings may be oriented parallel to the north—south axis, one very long structure runs east-west. As the town grows, and needs more roads, the building's contrary orientation may allow it to fall victim to demolition. This occurred for instance in the redevelopment of Boston's Waterfront in the 1960's onwards. The large wharf structures that were oriented parallel with the flow of pedestrian and vehicular traffic (from city center to waterfront) survived and were renovated. Those large warehouse structures that were perpendicular to the dominant flow, were more likely to be torn down.

5. Perceived Value
Every building and its components need to be maintained and replaced incrementally over time. If a building has an anticipated 100-year lifecycle, on average 1% will be replaced each year. At the end of its useful life, that is, when the building no longer generates an economic return equal to or exceeding its operating expenses, a building will fall into disrepair. There are buildings, though, that for cultural or other reasons generate value outside of conventional economic calculations. These buildings are primarily religious or cultural institutions and can be sustained through subsidies or patronage.

Engaging History's Traces
The remnants of past interventions, such as old railroad beds or foundations, are imbued with meaning. Selectively referencing these traces through new construction can contribute to generating a powerful and unique identity for a community, by reinforcing links between past actions and future intentions.

Evaluating Site Forces
Once the cross-maps have been generated, observations about their content can be organized thematically (category by category), and hierarchically, in order of importance. Cross-maps yielding information of secondary importance can be ignored or discarded. These observations, and their distillation, are a critical act of design, in that they identify themes that serve as the springboard for design proposals.

Assessing Community Values
It is essential to determine a community's values, and how these values shape visions for the future. It can be argued that the construction of the community as built is in fact an accurate representation of its values, since the structures built and decisions about land use are determined in part by community representatives. But are edge cities and their attendant problems and negative associations a true reflection of what a citizenry and its representatives desire for their community? Economic interests may or may not balance collective long-term interests with the immediacy of current individual and community needs. A wide-ranging effort to assess community interests and values would include investigating planning reports and surveys; tracking public debates, community activism, and local marketplaces; attending town meetings; and holding community-wide charrettes and creating web related surveys and forums.

Selecting Design Tools
Design tools consist of building typologies, spatial models, and conceptual frameworks that offer mechanisms for translating raw data into coherent design proposals. It is important to select the right tools for transforming a site. Mapping and cross-mapping a site's features and understanding a community's values tell us whether a certain typology or spatial model is suitable.

Building Typologies and Hybrids

New Infrastructure Typologies

Infrastructure and its adjacent spaces are vastly underutilized in the American suburban landscape. By evaluating the land use of the space on either side and above or below infrastructure, it is possible to increase the value of infrastructure and the land it occupies. Buildings and landscapes can be fused with different forms of infrastructure to create hybrid typologies. Infrastructure can also serve as a buffer, and container, for urban form or landscape.

Programming and Land-Use Strategies

Transforming the edge city and its context into more habitable and sustainable environments will require radically redefining land-use strategies. Considered over a longer time frame, it is possible to redistribute building mass. As buildings decay and fall out of use, those that do not have a "useful history" can be rebuilt in locations that support community objectives, while a strong landscape presence is reestablished in other locations.

Creating Suburban Fabric

Connections between people and the spaces that support their activities define community. However, the edge city and its context, is typically comprised of isolated and disconnected buildings, spaces, and clusters thereof. To create community, it is helpful to generate new kinds of public spaces. Through an incremental process of erasure and writing, connections between buildings and public spaces can be stitched out of an emerging suburban fabric.

New Building Types

The development of new digital technologies allows buildings to perform many different functions in addition to their traditional uses. Emerging e-buildings offer new possibilities for the organization of suburban space and its ability to provide greater efficiency with fewer resources. For instance, e-tailers, who have optimized the distribution of resources, are developing typologies that combine the best features of traditional retail spaces with electronic distribution systems. The management of limited resources can also be improved by time-sharing. This allows school buildings, day care centers, and community theaters, for example, to serve multiple uses during the course of the day, week, or month.

New (Hybrid) Landscape Typologies

The desecration of the landscape resulting from the suburban settlement patterns, calls for its reconstitution. Landscape presence can be asserted through restoration of a lost landscape, construction of a new landscape, or, where necessary, building an "artificial landscape," which is a new kind of *terra firma* capable of supporting other uses. Similarly, landscapes constructed as berms can serve conventional building uses, but can also contribute to the landscape as "green" surfaces. Buildings of all kinds can become ubiquitously "green" such that the landscape runs over, through, and under their profiles.

Taming Parking

Parking management remains one of the most difficult problems facing the land-use patterns of suburbs and their edge cities. Accepting the fact that the car will be with us in one form or another, what options exist for reducing its footprint, or mitigating the unsightliness of fields of asphalt parking? Moshe Safdie suggests a form of compressed parking lots, while green urbanists provide a wide array of options for taming parking through landscaping and parking structures that are integral to buildings.[iii]

Community Spatial Models

A spatial model serves as an overriding design guideline capable of governing or influencing larger decisions about how and where buildings, spaces, roads, landscape, and infrastructure are organized across a community. Each spatial model is based on a set of principles, objectives, geometries, or collection of building types. The spatial model is an abstract and pure form, providing a hierarchy for urban organization. Grids and radial plans represent classical precedents of spatial forms. Generating a variety of community spatial models opens up many conceptual avenues for how a site can be developed and organized. As an idealized type, it too, will undergo transformation once it is overlaid onto the complexities and contradictions present in each site. The transformation of idealized community spatial models generates the idiosyncratic qualities of place. For

example, idiosyncratic moments happen where Manhattan's generic grid accommodates the slashing cut of Broadway, or the carving out of Central Park.

Projections

While most consumer products are designed for a specific moment, community design must consider the element of time. A community is a dynamic living system that supports the lives of its citizenry and their changing needs. Additionally, the very economic structure and social fabric of a community may be in flux. How can design proceed when there are so many variables? What resources and tools might be available in the future, and how might they be incorporated? What if the needs of a community change before a proposal is built? Projections must be made to anticipate future needs and allow for changing circumstances. The projection phase consists of four steps: 1) shaping a vision, 2) developing plans, 3) simulating results, and 4) recalibrating plans as circumstances change.

A community must be willing to imagine an ideal representation of itself in the future, one that is an outgrowth of its current and desired identity, one distinguishable from its neighbors yet linked to a regional network of similar communities. This is an opportunity to dream, for without ambitious aspirations, it will be difficult for a community to consciously redirect the inertia of past policies and practices. This dream is translated into a "strategic vision," which is a collective and explicit articulation of what a community is to become at some future date. It accounts not just for land-use preferences and social and economic objectives, but also for how these objectives may be manifested in physical form, without necessarily specifically designing each structure or landscape feature.

This strategic vision is accomplished through "tactical" plans. A tactical plan defines the steps that must be executed in order to achieve the larger strategic goals. This can be achieved by breaking down a project's implementation into phases or "time frames" not unlike the individual frames of a filmstrip.[iv] So, for instance, a strategic vision for some 25 years in the future could be broken down into 25 time frames, illustrating actions required to bring about the desired changes in each year.

It may be useful to break down the investment of physical resources into the categories describing the physical environment. Andres Duany and Elizabeth Plater- Zyberk, in *Suburban Nation*, observe that the suburban environment is comprised of five distinct categories of land uses: Infrastructure, Institutional, Retail, Office, and Housing.[v] One important omission is Landscape. Zoning these separately over the past sixty years has created the very suburbs and edge cities that are in great need of repair. The Adaptive Design Process requires that we mix these components in ways that are particularly suited to site. Rather than separating them spatially, it may be useful to separate them temporally. For instance, an early investment in infrastructure (a high-speed bus service for instance) might spur development around transit locations. Or creating new multi-family housing for local office complexes (which might mitigate traffic) will in turn require institutional investments in larger schools. By breaking down the tactical plans into specific investments, it is possible to coordinate development through time and plan catalytic effects.

Simulations

The matrix described above is also an effective tool for evaluating the probable and actual effectiveness of strategic and tactical plans. By using time-phased "simulations" it is possible to test the results generated by specific tactical plans generated in the service of a strategic plan. Simulations project a series of design transformations, over multiple time frames, showing how a place can be transformed from its existing condition to something that represents a community's strategic vision. A computer model showing incremental changes in the future is useful in illustrating the transformation of a community. The physical elements represented by the computer model can also be linked to sets of attributes. These attributes can be linked to information about a building's economic, engineering, environmental, and demographic information. Cumulatively, such an integrated model serves as a collective database for a site.

Simulations generated by computer models allow communities to evaluate the likelihood of certain tactical plans to meet the stated strategic objectives. This process provides a means for testing the designs before they are built. The simulations are especially useful in testing the sequencing of different investments in different categories (infrastructure vs. institutional). For example (as noted in the previously sited example), at what point

should schools or infrastructure be built to support a community's increased population, and what are the economic consequences of these decisions? Will the tax base be big enough to support such investments?

Recalibration

The best-laid plans are rarely carried out as imagined for a multitude of reasons. Design compromises may be required as budgets and available resources change. The demand for specific uses and markets shift in response to demographic and macro-economic changes. Significant historic events, such as, war, energy crisis, or technological revolutions, can completely alter the assumptions that generated a community's original strategic vision. That is why The Adaptive Design Process favors flexible structures and building typologies that can accommodate change, balanced by timeless values represented in the shape of a community's public realm, its open spaces, natural features, and institutions. Missteps are to be expected, but through thoughtful and incremental erasure or writing, remedies can be tested and found for any challenge facing a community.

Strategic plans are most effective when they are dynamic representations of a community's condition and aspirations through time. Being able to respond to changing circumstances will be easier if each member of the community has information at hand regarding its current condition. This can be achieved by continually "updating" the "community database" at each "time frame." As new structures or landscapes are built, this information can be integrated into an evolving representation of the community. The updated community database, also allows communities to new opportunities and challenges in an informed and timely fashion.

Conclusion

The Adaptive Design Process serves as a useful tool in allowing communities to more explicitly define their current and desired identity, and the steps required to achieve these goals. It does so by recognizing that design is an iterative process of erasure and writing. The Adaptive Design Process serves as an "operating system" of sorts for the development of suburban context. It provides an open and dynamic platform, capable of accommodating a wide array of information, stakeholders, and contexts. As an instrument for change, it is not meant to be prescriptive, but instead capable of itself mutating into variants, based on specific needs and circumstances.

As its central structural principle, it builds on time as the means of linking data, design, and experience as communities seek to find the fit between their community's form and its intended use, and all its associations. While the individual steps such as cross-mapping or distilling a site's useful history may improve any design process, Adaptive Design is more effective when the entire process is employed.

This process is not meant to impede spontaneous and idiosyncratic actions that break the rules or evolutionary trends. Instead, it serves as a means of recording, registering, and reminding stakeholders of consequences and opportunities implicit in their actions. Mindful and informed decision-making improves the chance of building thoughtfully conceived environments. The balanced application of analytical tools provided by this process is capable of generating well-tempered environments, by embracing unusual circumstance and the accidents of history, so as to enrich the identity of a place.

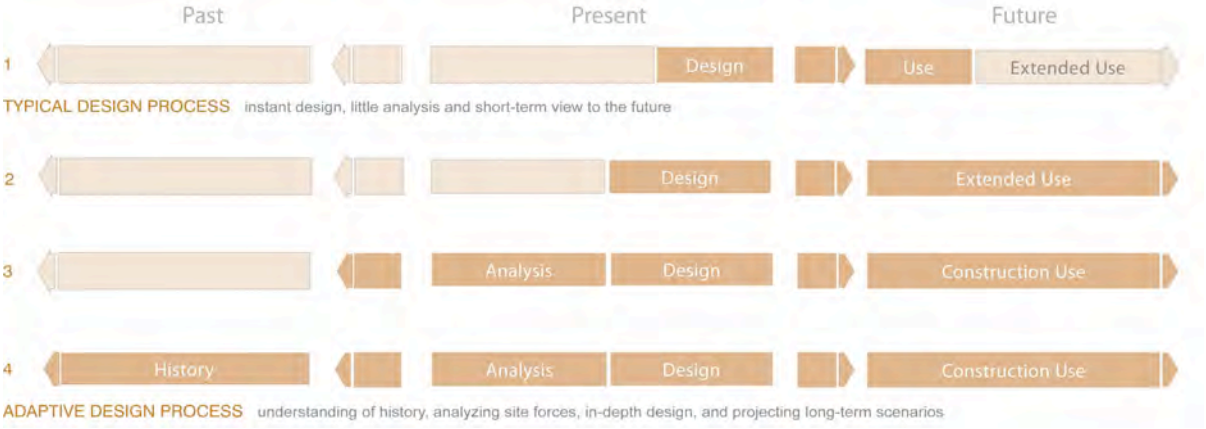


Figure 1. A schematic diagram compares implementation of a typical design process with the implementation of the Adaptive Design Process

Figure 2. A diagram of the Adaptive Design Process, both sequential and iterative, yields many design scenarios that interact temporally and can be tested against program and design parameters, allowing for dynamic re-calibration.

Figure 3. "Film Strips" illustrating three different scenarios, each of which is driven by a different program or set of community values. Each "Film Strip" shows the potential transformation of a site over time.

Figure 4. The "Green Dream" scenario illustrated here is an example of how an asphalt dominated suburban environment can be transformed into a sustainable community. This scenario builds a on a site's history, restores its ecology, and incorporates demographic and programmatic density.

Figure 5. The highway, once dividing a suburban community, is now bridged and spanned with new uses, while integrating new "hybrid" building and landscape typologies. These typologies help heal and repair the scars on the landscape while integrating contemporary uses and programs into new idiosyncratic configurations, driven both by site and circumstance.

Endnotes

[1] F. Hobbs and N. Stoops. US Census Bureau, Census 2000 Special Reports, Series CENSR-4, Demographic Trends in the 20th Century. U.S. Government Printing Office: Washington, DC, 2002. www.census.gov/prod/2002pubs/censr-4.pdf (last accessed on 9/30/2008).
[1] D. Hayden. A Field Guide to Sprawl. New York: W.W. Norton & Company, 2004.
[1] Moshe Safdie with Wendy Kohn, The City after the Automobile: An Architect's Vision. New York: Basic Books, 1998. p 142.
[1] Walter Benjamin describes the power of film, by saying: "Couldn't an exciting film be made from the map of Paris? From the unfolding of its various aspects in temporal succession? From the compression of a centuries-long movement of streets, boulevards, arcades, and squares into the space of half an hour? And does the flaneur do anything different?" See Convolute, *Ancient Paris, Catacombs, Demolitions, Decline of Paris*. p 83.
[1] A. Duany, E. Plater-Zyberk, J. Speck. Suburban Nation: The Rise of Sprawl and the Decline of the American Dream. New York: North Point Press, 2000. p 5

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Ren, Zhijie, Architecture Department; Rm217, Graduate House, The University of Hong Kong, Pokfulam Road, Hong Kong, CHINA, renzhijie@gmail.com, LI Haile, ZCHS Architects, Chongqing, China lhail@vip.sina.com, and JIA Beisi, Department of Architecture, The University of Hong Kong, Pokfulam Road, Hong Kong, jia@arch.hku.hk

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Shi, Yong-gao, SCHOOL OF ARCHITECTURE; Room 0629, Shi-Dai-Hua-Fu, Jin-Xiang-He Road 33-2, Nanjing, P. R. China, 210008, archistone@163.com

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Sone, Yoko, Professor, Department of Architecture and Architectural Engineering, College of Industrial Technology, Nihon University; 1-2-1, Izumi-cho Narashino-shi, Chiba 275-8575, Japan, sone@cit.nihon-u.ac.jp, and Makiko Taguchi, Graduate Student, Department of Architecture and Architectural Engineering, College of Industrial Technology, Nihon University; 1-2-1, Izumi-cho Narashino-shi, Chiba 275-8575, Japan

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Maria Chiara Torricelli, Nicoletta Setola; Department of Technologies for Architecture and Design "P. Spadolini"; Via San Niccolo' 89/A, Florence, 50125, ITALY; mariachiara.torricelli@taed.unifi.it

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Wu, Yi-Ling, Department of Architecture, Ming Chuan University,Tao-Yuan County, Taiwan, R.O.C. Yilingw@hotmail.com

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Zhou, Li-jun, Harbin Institute of Technology, Architecture Dept.; Number66, West Dazhi Street, Nangang District, Harbin, Heilongjiang Province, China 150001, mailto:ccc82281438@163.com, Shao Yu, Harbin Institute of Technology, Harbin, Heilongjiang Province, China, shaoyuu@163.com, and CONG Ning, congningjiaojiao@163.com

The Enlightenment Education Based on the Idea of Open Building

Shao, yu, Zhou, lijun, Shao Yu, Harbin Institute of Technology, Harbin, Heilongjiang Province, China shaoyuu@163.com

Contemplation on Open House Concept during Teaching Process in Southeast University

CHEN Shang-feng

Southeast University, School of Architecture; Nanjing 210096, P.R.China, sunphone@live.cn

ABSTRACT

Among the earliest schools to advocate and promote open house concept in architectural education in China, Southeast University (Nanjing Institute of Technology) started the research work of residential housing and adopted the theory of "STICHING ARCHITECTEN RESEARCH" (SAR) in the 80s. The Centre of Open Building and Development (COBRD) which was founded in 90s has helped to put open building theory into residential house design practice. Based on the work the SEU-ARCH had done in teaching and researching related to open house concept, the paper offers some strategies and suggestions concerning about arming future architects with open house concept.

KEY WORDS : **Footprints of exploration, teaching strategy and promotion**

1. INTRODUCTION

Reinstating open house concept on architectural education in today's China

As an important part of open building theory, open house concept stems from Europe after World War Ⅱ, and was formed on the experience of residential housing mass construction. The theory of "STICHING ARCHITECTEN RESEARCH" (SAR) proposed by N·J·Habraken was one well recognized at that time and was introduced by Prof. BAO Jia-sheng to China where the mainstream of architectural education was still strongly influenced by the "Beaux-Arts". Concerning with open house education this paper is based on the work SEU-ARCH (founded in 1927) has done and offers some research strategies and teaching advice. In this specific time when China faces critical issues such as rapid city expansion and mass construction, reinstating open house concept also has following reasons.

- Issues such as how to improve students' abilities in self-learning, independent thinking in the new era and to transfer the traditional architectural education system which concerns mainly about passing on knowledge, technical skills; experience to students toward new system which puts more attention upon cultivating students' creativity and ability in solving practical problems causes more attention. The work done by SEU-ARCH can give some hints.
- After 20 years of rapid economic growth and urban development in China, issues such as population aging and a decrease of arable land affect architectural education in China. For the open house concept advocates the participation of users and adoption of ranking system in design as well as in construction to insure the space can survive in the future, which has real meaning in today's China.
- For the procedure of modern property development has become so complicated, few users of apartment have the chance to take part in the architectural design process. When China makes progress, issues such as: personality, individual freedom has gain more attention than before. It is well recognized that behavior, psychology, habit of each person is unique and should be respected. Open house concept advocates that some space should have multi-functions, which has a better response toward our time.
- The advance of science and technology bring terms such as: information era, artificial intelligence, ecology and energy saving into daily family life. Just like constant upgrading of computer components, the interior environment of house needs to be renovated when the economic situation of users improved or new household products come out. All these affect the architectural design process in the long run. Maintenance also gains more attention than before. In 2003 architectural education forum, Prof. Wang

> Jian-guo (dean of SEU-ARCH) suggested "to design for the buildings' maintenance and management, and to lower the energy consumption and the cost of the buildings' daily operation". (WANG, 31: Line 6-8)

All these views above can find their place in the open house concept which we call dynamic design and construction. Some principles in open house concept such as ranking control system, industrialization also offer new ways of thinking when it is the time to reform architectural education system in today's China.

SEU-ARCH in the process of promoting open house concept in China.

In 1981, Prof. BAO Jia-sheng was a visiting scholar of MIT where he accepted the SAR theory from N·J·Habraken and put it into teaching and researching practice immediately when he returned to China. Some open house experimental projects charged by him such as: Library of Tong-lin Finance College, Hui Feng Xin Cun had gained big success at that time. The Centre of Open Building and Development (COBRD) was founded in 90s to facilitate the research and project practice of open house. Prof. Bao Jia-sheng, the director of The Centre of Open Building and Development (COBRD), proposed establishing sustainable open house concept for 21st century, which is the continuation of the SAR concepts. And he thought that many new building types could be better understood and designed by following the open house concept when he attended the 10th conference of Modern China Architecture Design and Research Group in 1994. (Bao 17)

Many graduates of SEU-ARCH have become teachers or researchers of major architectural schools in China, which helps promoting open house concept throughout the nation. Gradually courses related with open house have been included in curricula of major architectural schools. Recognizing the important role dwelling house plays in society, the Dwelling House Industrialization Promoting Centre of Construction Department [KHIPC] was founded by Chinese government to facilitate the research work of dwelling house. The journal "Science and Technology in Dwelling House" was created by the Centre served as an academic platform for sharing residential housing research work nation-wide. The open house concept has always been a hot topic of the discussion since the creation of journal. In the time when China has faced rapid urban development, recalling what SEU-ARCH has done in terms of open house concept has a far reach meaning. After all, we live in an era where architectural education faces many challenges.

2. FOOTPRINTS OF EXPLORATION

Brief history of open house research.

Early in middle 80s, Southeast University (Nanjing Institute of Technology) started the research work of residential housing and adopted the theory from "STICHING ARCHITECTEN RESEARCH" (SAR). The Centre of Open Building and Development (COBRD) which was funded by National Education Committee in 90s helped to put open building theory into series of residential house practices. The dean of COBRD was also a member of editor committee of "Open House International" (a British journal). In 1987, Residential Housing International Conference was held on SEU, which became one of major events of that "Government's Housing Year" in China. In 2003, the International Architectural Education Forum was held in SEU which further promotes the research work on open house.

Production of research work.

The success of two research projects about SAR house [NO. 851065, NO. 901013] charged by Prof. BAO Jia-sheng and the publish of "Housing in Long-Term Effectiveness" written by JIA Bei-si in 1993 laid the foundation for further research work on open house in SEU. Hui Feng Xin Cun (an open house experimental project located in Wu Xi city, Jiangsu province), renovation of young journalists' residential building of Nanjing Daily and C type residential building of Yue Ya Lake district (Nanjing) etc. also won wide applause from society both domestic and international. Inspired by the work of COBRD, many graduates have taken part in the research of open house and have produced many research papers on pertinent topic since then. Following are some dissertations:

- LU Ai-ming: Architectonics of Flexible Building Concept, PhD Dissertation of Southeast University, 2001
- WU Jing-xiu: Research on Openness of Construction, PhD Dissertation of Southeast University, 2000

- HE Chuan: Integration Design and Research on Residential Housing. PhD Dissertation of Southeast University, 1995
- HAN Dong-qing: Principles and Methodology of Open Architecture. PhD Dissertation of Southeast University, 1994
- LI Xu: Research on Residential Housing Design Theory Concerning Living and Changing Situation in China, Master of Architecture Dissertation of Southeast University, 1992
- XU Wen-cai: Open House: a New Way of Building House. Master of Architecture Dissertation of Southeast University, 1990

3. STRATEGIES AND SUGGESTIONS

Research strategies

Investigation

By investigating existed buildings we can gain some useful information that is a prerequisite of starting research work. In site investigation also can left strong imprint on students' mind. For facilitating investigating process we cooperate with government department as well as social organizations in carrying out research work, which is very helpful when you want to carry out wide-range research work in China. These methods do bring some convenience (e.g. when we investigate some traditional dwelling houses or new build open house samples). In this way students got more chances to experience the sense of site, which helps them better understand some practical issues such as: budget controlling, structure practicability etc. and learn to think problems which open house project might face on site. All these may help to improve their design ability. The principles of open house like: multi-function, flexibility and ranking control can also be better understood during investigating. So investigation is the first strategy we adopted in carrying out open house research.

Experiment

Not all problems can be solved by just do investigation; the veracity of investigation can be affected in many ways by causes such as: limitation of range or depth or personal preference. In this way experiment is always served as an effective supplement strategy in open house research. Many commonly used manipulation practices in design process can be carried out by doing experiments which save time and money. In class students constantly change the location of service parts of dwelling house model to study the adaptability or flexibility of space. There are many issues one might faced in one project, so it is fine for one student's work to focus on only one or two of them in class. We found that during the process of space manipulation practice, students will quickly learn to analyze the relation existed between space and people's behavior, and to assess the extent of flexibility or adaptability of some design work actively. Yet there still is defect on experiment (i.e. for the lack of concern in people's social level, the result sometimes can be too ivory-towered,) so combining experiment with investigation is recommended.

Discussion

The students of SEU-ARCH come from all parts of China, so their background and former living environments are varied. Such phenomenon is very interesting when it comes to class discussion - students with different perspective come together sometimes can generate creative ideas. In design class, we divide the whole class into several design groups and let each student introduce his group's work or give comments to others. The teachers are suggested to be involved in the discussion process. By inspiration generated from the clashes of creative mind can make the design work a big success. Students also play a major role in seminars held every week where each one can show his group's work or discuss with others. Learning from discussion and communication are typical features of open house teaching in SEU-ARCH. Each student has more chances to be known by others. Especially when come to a specific building project, the student who familiar with the area was supposed to introduce the custom or weather features of the site, which also set a good start for design work. Whenever a design scheme comes out each student can give comments, which is important to develop his character.

Cooperation

A good design work is always the outcome of a group of people's efforts put together. So cultivating the spirit of team work in participants is essential during open house research. Throughout the research process, from initial investigation to final work evaluation, communication and cooperation are among most frequently adopted strategies. Interestingly open house concept itself is a product of integrating several related fields. I.e. by managing tissue level, support level and infill level, open house can be achieved through cooperation. In SEU-ARCH a common way we adopted is to divide large project into small parts which can be arranged into different teaching period. Let student know his responsibility in each period can be helpful in cultivating the spirit of teamwork, which is essential in today's society.

Curriculum suggestion

Curriculum reform

- We should continuing the research work of open house both in theory and in practice by making full use of the education resource in SEU-ARCH. Continue international cooperation and joint scientific research (such as long term cooperation with ETH-Zurich), offer more chances to students who have keen interest in open house research and practice.
- In undergraduate period, we adopt the "3+2" model (i.e. in the first 3 years period professional architect training be put on particularly emphasis and in latter 2 years period creativity development should be paid more attention). We also integrate design studios with group teaching in cultivating students with open house concept. (HAN 16-19)
- In grade 2, open house teaching can be used as supplement to main courses like: space theory, architectonics etc. and be embodied in pertinent design practice.
- In grade 3, we integrate open house concept into some specialized programs. In grade 5, we encourage student to use open house concept in his design work.
- Combining the work done by COBRD, we encourage students to take part in the research process of open house and explore the use of new material, new technology and new energy in study.
- Setting pertinent forum on SEU-ARCH website to facilitate students to exchange ideas concerning about open house.
- Continue intervarsity cooperation such as Prof. Jeffery Stinson of Toronto University had been invited to teach sophomore architectural design class in SEU.
- Regularly inviting expert on pertinent field to give lectures is also an effective way for broadening students' academic sight.
- Some specified design courses concerning about open house can be included in the curriculum of both undergraduate and postgraduate periods, and these can also be included in major architectural design course.
- Set up open house study groups, and students are free to decide whether to join some group or not. It is suggest that teachers arrange seminars regularly according to the progress of each group's work. Let students themselves present the study results in seminar.
- Teachers directly involve in design practice, and it is suggested to employ professional architects from major architectural design institutes in teaching process. In this way, architectural education and project practice can be better integrated.

Evaluation reform

In traditional way of evaluation, attention is mainly focused on the arrangement of specific functional space, while we now concern more about ranking control, flexibility, adaptability and practicability etc. in open house projects evaluation. It is suggested to transfer assessment focus from period results to process manipulation. The standard of evaluation should be flexible. The students are encouraged to present his group's work in class by

which they may form dynamic views about open house and realize that the erect of house is just a beginning of new life for users.

Of course the teacher plays an active role in the evaluation process. He encourages student to think all the possibilities and integrate students' self-assessment into evaluation process. All these are helpful for developing students' potential ability to think and solve problem independently. By reforming traditional way of evaluation, students can better understand the relation between space and people's behavior. And these methods have been improved successful. Students of SEU-ARCH have won many major students' architectural design competitions both domestic and international, and design institute or companies in China generally favor graduates from SEU-ARCH.

4. CONCLUSION

Since introducing open house concept into architectural education in China in early 80s, SEU-ARCH has persisted in carrying it into teaching and researching practice. In dwelling house design course, we integrate open house concept with daily observation and project practice. By studying open house project students gain some knowledge about how to achieve sustainable development of dwelling house, and it help cultivating open house concept in future architects' minds.

During more than 20 years of teaching and researching practice on open house in China, the most common used strategies SEU-ARCH adopts such as: investigation, experiment, discussion and cooperation play active roles in cultivating students' creative thinking. During cooperating students can better fit into work environment, which are helpful when they enter their career in the future. And this has been improved so that graduates from SEU-ARCH are commonly welcomed by most employers.

The issue of open house has gained more attention from society in today's China. Now besides official research works carried by KHIPC, many research departments related with residential house have been set up by large real state developing companies. Open house once an imported theory has set root into the mainstream of architectural design theory in today's China and motivates more people to take part in the research and project practice. Becoming the largest construction site in world, China has many residential housing to be built in decade. So putting open house concept into practice may have long effect on society in China. In this case, the effort made by SEU-ARCH toward open house research is not in vain.

REFERENCES

BAO Jia-sheng, From SAR to Open Architecture, *World Architecture review*, 1995(2),17

HAN Dong-qing, 2001, Exploration of Architectural Education Development in SEU. *Modern Architecture*, supplement, 16-19.

WANG Jian-guo, On the Latest Transition of the Architectural Education in China, *2003International Architectural Education Forum: Regionalism under the Trends of Globalization*, 2005, (Nanjing: Southeast University Press).

The History of Developments toward Open Building in Japan

Seiichi Fukao

Faculty of environmental Sciences, Department of Architecture; 1-1 Minami-Osawa Hachioji-shi Tokyo 192-0397 Japan,
sfukao@tmu.ac.jp

ABSTRACT
Developments toward Open Building began in Japan at the beginning of the 1970s. In this paper, the author describes the history of these developments, discussing mainly developments in which the author was directly involved. In 1971, the idea of systems building was introduced from the USA and UK, referring to the result of famous systems such as SCSD in California. The experience introducing such systems building was utilized in the development for residential buildings in Japan. The KEP project executed by the Japan Housing Corporation was the first trial toward Open Building in the field of residential buildings in Japan. Century Housing System and other trials followed it. The experimental-housing project NEXT21 was constructed in 1993. Then, the SI house concept spread rapidly at the end of the 1990s, and the KSI system was developed. Today, many construction firms and real-estate companies put the name - the SI house - to their housing projects,

Keyword: Open Building, History, Systems building, Japan

1. Characteristics of residential buildings in Japan

The history of open building in Japan has different characteristics from those of other countries. Until about 85 years ago, most residential buildings in Japan were made of wood and there were almost no apartment buildings except row houses or terrace houses. The construction of apartment buildings began immediately after the Great Earthquake in 1923, when reinforced concrete began to be used for buildings, and apartment buildings named Dojunkai were built under the influence of social housing activities in Europe. However, it was still a special case in the context of building production in Japan.

Apartment buildings became popular in Japan after the World War II. In 1955, the Japan Housing Corporation was established as the world's largest organization for supplying residential buildings. Figure 1 shows Harumi Apartment Building, which was built by the Japan Housing Corporation in 1958. It has a reinforced concrete column and beams structure, constructed with the latest building technology at that time. However, the interior construction was designed employing the conventional production organization at that time - namely, a traditional Japanese wooden house was built in a reinforced concrete skeleton (Fig. 2). There were sliding doors, called Fusuma, consisting of a wood frame and paper, to divide rooms. The interiors could be remodeled but actually were not before the building was destroyed in 1997, because the Housing Corporation built the building as rental housing.

The building was thus constructed with the support and the infill being physically separated, although its management and decision-making system was not divided for the support and the infill.

Figure 1 Harumi Apartment Building

Figure 2 Interior of Harumi Project

2. The early development of apartment buildings

In the 1960s the construction of reinforced concrete apartment buildings dramatically increased in number in Japan. In accordance with this increase, organizations specialized in infill for apartment buildings were created, which made the interior of apartment buildings and that of wooden houses more different.

Most skeleton systems had reinforced concrete structures, which were made by concrete in situ, although a construction method using large precast concrete panels was also developed, introducing European systems to respond to mass housing production demands. At first, the Ministry of Construction and the Japan Housing Corporation led the development. However, as the technologies of major general contractors and other private sectors progressed, the Ministry held a competition called the Pilot House Technology Development Competition in 1970. It was a project influenced by Operation Breakthrough held in the United States.

Major general contractors joined the competition and built apartment buildings of ambitious designs as a trial. The floor plans of the constructed buildings are shown in Figs. 3 and 4. In the planning, they proposed to have a large space in the skeleton and divide the space freely with partition panels or storage units. At that time, there were already a considerable number of architects and engineers in Japan who were trying to design various types of room layouts in apartment buildings with movable partitions.

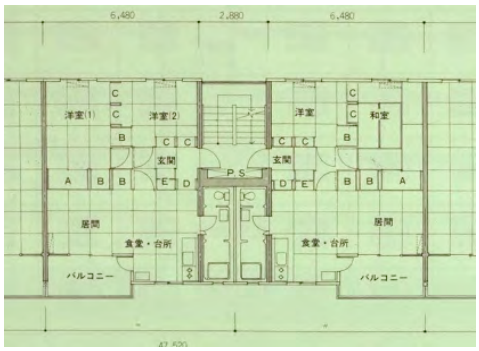


Figure 3 Pilot house (Tokyu)

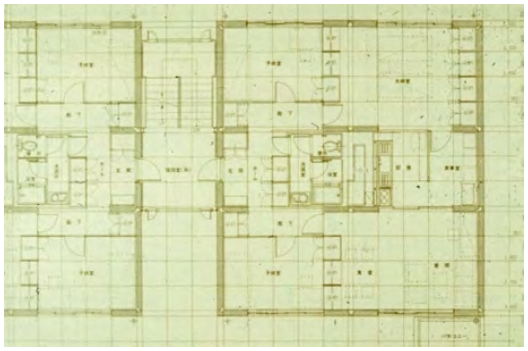


Figure 4 Pilot house (Shimz)

3. KEP system

In 1971, SCSD, a school construction system in the US, was introduced to Japan. This was the first introduction of the idea of systems building. After that, Japanese manufacturers were encouraged to develop building subsystems based on predetermined performance specifications. Yositika Utida, professor of the University of Tokyo, and others played a central role in the promotion of the system. In 1973, the Ministry of Construction established the Housing Components Development Center to develop the interior systems.

Figure 5 KEP experimental Skeleton

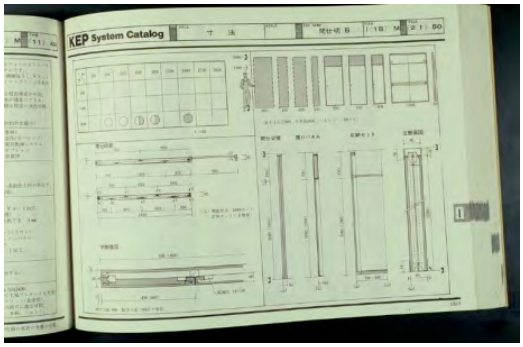


Figure 6 KEP system catalogue

Associated with this movement, the Japan Housing Corporation shifted its focus from technological development, in particular the development of building structures using large precast concrete panels, to the

development of housing components. In 1974, the Corporation started to develop the Kodan Experimental Project (KEP) system, under the supervision of chairperson Professor Utida. The KEP system consisted of four subsystems. The first was a system for external walls, called a shelter. The second was an interior system, the third a system for sanitary facilities, and the fourth a system for ventilation and air conditioning. Performance specifications were set for each of the subsystems and manufacturers developed their products according to the performance specifications. Panasonic, Bridgestone and other manufacturers participated in the development of the infill system, developed various components, and performed assembly tests in the research center of the Japan Housing Corporation (Fig. 5).

The developed components were described in catalogues written in the same format (Fig. 6).

As part of the KEP Development, project staff members visited Europe in 1976 and 1977 to visit a number of projects based on the study of SAR and had discussions with Professor Age van Randen at the Technical University Delft.

Figure 7 JHC Estate Tsurumaki

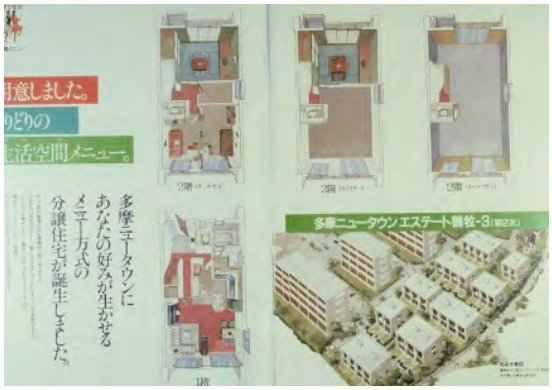


Figure 8 JHC Town Estate Tsurumaki

The research results of KEP were applied to actual apartment buildings starting in 1980, introducing partition panels and storage units in large spaces of the skeleton (Fig. 7: Estate Tsurumaki in Tama Newtown). Japan Housing Corporation sold the apartments under the name “Menu System,” which allowed dwellers to choose their room layouts. Figure 8 is a terrace house with the Menu System. While its room layout on the first floor was fixed, that on the upper floor could be chosen from “no interior finishing at all,” “no interior finishing but a single Japanese style room prepared,” and “completely finished interior prepared by the Corporation.”

Figure 9 JHC Free Space

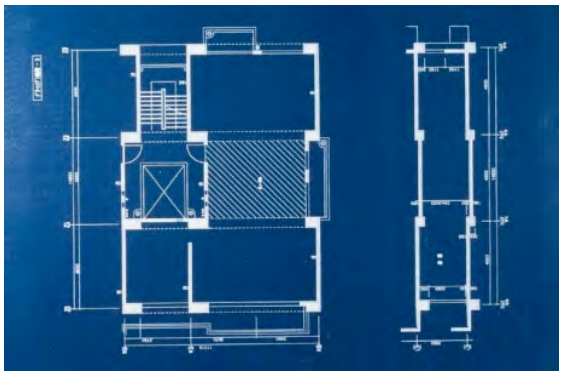


Figure 10 Free Space (plan & section)

Figure 11 presents an apartment building called Free Space, designed by Kudan Architect office at the request of the Japan Housing Corporation. The building has three spaces on the north, center and south sides, and the reinforced concrete floor slab in the center space is 200 mm lower than the north and south spaces. The floor finishing panel is placed 300 mm higher than the upper surface of the slab, allowing free layout of drain and water-supply pipes in the space between the floor panels and the slab. Also there is a light well, where vertical plumbing is set up. Since there are no shared pipes running vertically in each apartment, the apartment rooms as

well as sanitary zones can be freely remodeled. This residential building system was epoch making in 1983 (Figs. 12-14).

Figure 11 Free Space (skeleton)

Figure 12 Free Space (center zone)

4. Other projects

Around the same time, Professor Kazuo Tatsumi and Professor Mitsuo Takada, at Kyoto University, developed the two-step housing supply system. The first building was called Senri Momoyamadai, supplied by the Osaka Prefectural Housing Corporation. In this two-step housing project, the Corporation first provided the building skeleton and dwellers determined the room layout except sanitary facilities, which were fixed in the plan (Figs. 13 and 14).

Figure 13 Senri Momoyamadai Project

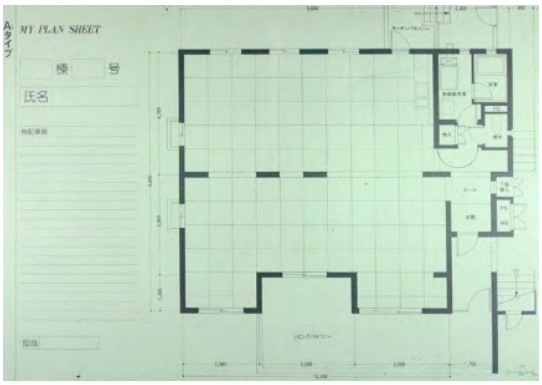


Figure 14 two-step housing (plan)

In addition to these actual pilot projects, in 1980 the Ministry of Construction launched a project called the Century Housing System (CHS).

This study aimed to realize longer life of entire apartment buildings and examined the possibility of independent development of building components of different durability. It determined the expected durability of various types of components and set interface rules for each type. The project also made a rule not to install vertical common plumbing in the center of apartments. Architects offices and general contractors actually designed several apartment buildings according to the rules designated by the project. Figure 15 and 16 show the building named Teradamachi Apartment supplied by Osaka City Housing Corporation, where the apartment unit has a recessed water facility zone as shown in Figure 16.

Figure 15 CHS Teradamachi Apartment

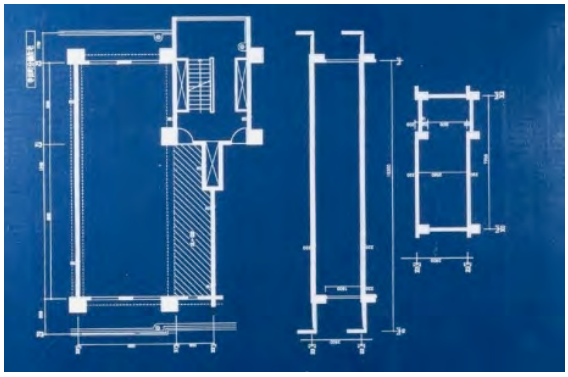


Figure 16 CHS Teradamachi Apartment

In 1986, the Japan Housing Corporation built an apartment building called “Free Plan Rental Apartment house” in Hikarigaoka, Nerima-ku, Tokyo (Fig. 17). The building skeleton (Support) belonged to the Corporation, but the infill, including facilities of kitchen, bathroom and toilet, was owned by dwellers. Dwellers were allowed to freely design the infill according to the planning grid and could realize their room layout according to their own wishes. The residents purchased the infill paying several million yen when they moved in, but the rent was cheaper than other typical apartments by fifty thousand yen or more per month. It was a groundbreaking example of open building at that time (Fig. 18).

Figure 17 Hikarigaoka Free Plan Rental

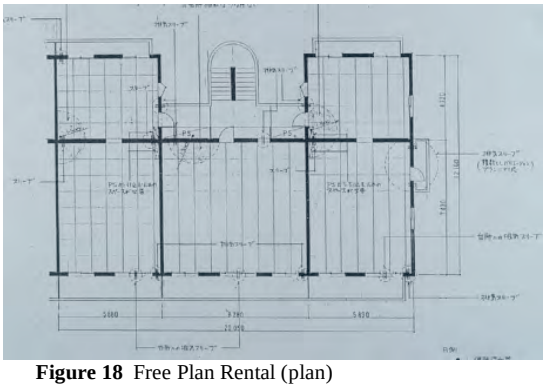


Figure 18 Free Plan Rental (plan)

Dwellers sometimes work together to build condominiums. Such condominiums are usually called cooperative houses in Japan. Cooperative houses have been constructed since the 1970s. Green Village Utsukidai is an open building cooperative housing project constructed in 1992 coordinated by Japan Housing Corporation (Fig. 19). The building has a large void in the center of each unit, which is used as a space for vertical plumbing. As shown in Fig. 20, the central slab of the apartments adjacent to the void is recessed to create a space for horizontal plumbing. The planning and design of about 100 apartments was done by many architects, and the apartments have different room layouts and different finishes. The dwellers are very satisfied with the apartments and have maintained a good community spirit.

Figure 19 Green Village Utsukidai

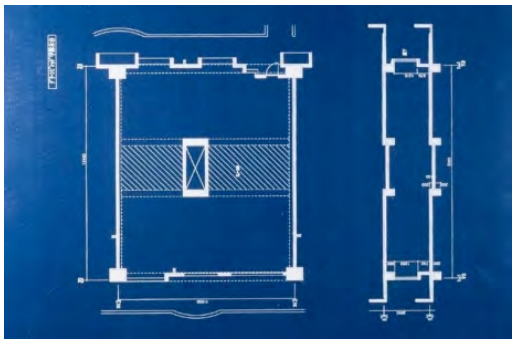


Figure 20 Green Village Utsukidai

5. Experimental Housing NEXT21

Construction of open buildings has thus been tried mostly for public apartments. In 1990, a major city gas supplier, Osaka Gas, planned to develop an experimental near-future-type apartment building, and asked Professors Yositika Utida and Kazuo Tatsumi to carry out the project. As a result, the well-known experimental housing NEXT21 was built. The author was a member of the developing group. NEXT21 is an eco-friendly open building apartment building constructed with the systems building method (Fig. 21).

Figure 21 NEXT21

Figure 22 conventional wooden house

The design of its characteristic external walls is the result of detailed studies. For NEXT21, dimensional coordination was used, with multiple integrated grids. The position of the external walls was determined according to the grid to realize a systematic configuration. The unique exterior of a muted rainbow color was made with the aim shown below.

Traditional Japanese wooden houses are designed based on a 900 mm grid, which allows residents to be involved easily to the determination of room layout. Japanese houses maintain a high level of customer satisfaction since carpenters can build the houses reflecting the requests of the residents. One of the reasons why there have been many open building projects in Japan is due to this characteristic of conventional Japanese wooden houses (Fig. 22). One aim of the open building projects is to enhance the customer satisfaction level and therefore it is easy for Japanese to understand the theory of open building.

However, in designing such traditional houses, owners, architects and carpenters do not closely examine the elevation of the houses, but just focus on the room layout. The elevation is determined as a result of making a floor plan. For this reason, the cityscapes of Japan began to lose their traditional beauty after the World War II.

For NEXT21, each dwelling unit was designed by a different architect, independently. Each architect designed the external walls and window layout of each apartment, resulting in a wide variety of apartments. However, this spoiled the overall design of the building. So, for NEXT21, an external wall system was developed to create a sense of unity in the elevation of the entire building irrespective of the random arrangement of the windows. In the system, stainless siding boards of five colors were put on the wall according to computer-generated random numbers to redirect people’s eyes from the randomly located windows to the stripe pattern of the boards. It was an experiment aiming to harmonize the degree of freedom of each apartment and the sense of unity of the entire building.

Another experiment was conducted for NEXT21 to move the position of the external walls (Figs. 23-25). By comparing the circumstances, before and after the wall was moved, the intention of the development, as noted before, is revealed.

Figure 23 NEXT21 before remodeling

Figure 24 NEXT21 after remodeling

Figure 25 NEXT21 cladding

Figure 26 dormitory of medical school Leuven

For the dormitory of a medical school at the University of Leuven, designed by Lucien Kroll and constructed in 1974, students were invited to decide on the façade from catalogues of window units (Fig. 26). The apparently random window layout was in fact the result of careful coordination by the architect Kroll
When architecture is divided into support and infill, it is not clear whether the external walls of an apartment building are classified as support or infill. Normally, the external walls are classified as part of the support. It is normally thought that when the building is considered as a social asset, the elevation of external walls should not depend on the decision-making of residents in the apartments. However these experiments were significant in indicating the possible diversity of the layout of external walls in Japanese residential buildings. The issue of the external walls of open buildings requires more discussion in the future.

5. Conclusion

NEXT21 has produced a substantial reaction in Japan, triggering widespread circulation of the idea of skeleton infill separation. The concept emphasizes physical separation of apartment building components by their duration years, rather than by the method of decision-making or by the form of ownership. The term “SI” has been frequently used in projects such as “House Japan” or “Next-Generation Vision of Town,” started in 1995 by the Ministry of Economy, Trade and Industry. This “I” stands for infill and “S” for skeleton, not for support.

In 2000, Takenaka Corporation and others constructed an experimental SI residential building Flexsus 22 in Aichi Prefecture in the House Japan Project (Fig. 34). They employed a seismic-isolated structure, eliminating beams, to realize the building frame with a high degree of freedom (Fig. 27). The shared pipe shafts were installed on the north side of the corridor and there was a horizontal plumbing zone above the slab of the corridor (Fig. 28).

Figure 27 Flexsus House 22

Figure 28 Flexsus House 22 (corridor)

In this situation, the Housing and Urban Development Corporation (Japan Housing Corporation) developed a concept of open building called KSI where the skeleton and infill are treated separately. In 1997, the Corporation built an experimental residential building in Hachioji City and conducted various experiments (Fig. 27). An electric wiring system that can be mounted directly onto the ceiling's concrete slab was developed and implemented (Fig. 28). Super high-rise apartment buildings developed by the Corporation have been constructed according to the principle of SI separation.

Figure 29 KSI experimental building

Figure 30 KSI electric wiring

The notion of SI separation has been employed not only for public apartment buildings but also for private condominiums. The name "SI house" is now familiar in Japan and more than one million sites are hit if browsed on the Internet using this keyword.

5. References

Kendall, S. and Teicher, J., 2000, Residential Open Building. E & FN SPON

Remote Teaching in Design Education

Rob Geraedts[1]
Spiro Pollalis[2]

[1]Graduate School of Design, Faculty of Architecture; Delft University of University, Delft, The Netherlands, r.p.geraedts@tudelft.nl
[2]Graduate School of Design, Harvard University, Cambridge, Massachusetts

ABSTRACT

The Department of Real Estate & Housing of the Faculty of Architecture at the Delft University of Technology has been working closely with a professor of the Harvard University, Graduate School of Design in Cambridge, USA since 1991. The case-based interactive seminars of this teacher about the management of the design & construction process are famous and have been highly appreciated by many generations of students. To extend the scope of his involvement he introduced a remote teaching component.

In the following experiment, the teacher would remain in his office at Harvard while the interactive work and discussion sessions with 130 students in a full lecture room would take place in Delft. The consequences this experiment has had for the course, for the techniques used, how these were experienced by both teachers and students, and which conclusions can be made, are the topics of this paper.

Based on this experience the possible problems of distance learning for Open Building or Open Architecture education will be expressed and finally some recommendations are phrased on the subject of how a similar approach would support Open Building studio education.

KEYWORDS

Interactive Remote Teaching, Open Building Design Education

1. INTRODUCTION

University education is changing fast. Influenced by the many possibilities offered by information and communication technology (ICT), traditional ways of giving lectures and passing on knowledge are enhanced by new options. In many places in the Netherlands, experiments are taking place to make an increasing use of new means of communication in education. The key question addressed in this research is how to use the Internet to improve the learning process. Among other aspects, this has to do with improving communication between teacher and students and among students. The Department of Real Estate and Housing of the Faculty of Architecture at Delft has been working closely with Professor Spiro N. Pollalis of Harvard University, Graduate School of Design in Cambridge, USA since 1991. Professor Pollalis's' case-based interactive seminars are famous and have been highly appreciated by many generations of students.

In Spring 2000, Pollalis suggested to extend the scope of his involvement by introducing a remote teaching component, the subject of his research in the last few years. As Information and Communication Technology in the Design and Construction Industry is part of the lectures of this teacher, it was appropriate to provide the students with a first hand experience on the subject. So, the decision was made to split the presence of Pollalis in two parts: in the first part he would be physically present at Delft. In the second part, the teacher would remain at Harvard while everything else would be the same as in the first part: the interactive work sessions with students in a full lecture room would take place in Delft as planned. The consequences this has

had for the course, for the techniques and facilities used and how these were experienced by both teachers and students, are the topics of this paper.

2. CASE STUDIES

Professor Pollalis's case studies constitute an important element of the course, and they cover the topic Management of the Design and Construction Process. He has developed a process for teaching management and technology to design students that has been used as part of his courses at Harvard as well as in Delft.

2.1 Management of Design and Construction Process

The 'Management of the Design and Construction Process' takes place during the first weeks of the course. The first three cases concentrate on the design process. In so doing, the architectural design consultants, those involved during the design process and the technical problems that arise are discussed. The following five cases are focused on design and implementation. Among other subjects discussed here are the role of the contractor and the complexity of international projects and large-scale building projects such as the Petronas Towers in Malaysia and the Bilbao Guggenheim Museum.

2.2 Communication

Communication before and especially during the course among the students themselves and with the teachers takes place largely via the Internet. The e-mail address of each student is available to others. In addition, the module also has its own Internet site on which all relevant data, such as the timetable, the reading material, literature overviews and the contact addresses of the teachers involved are brought up-to-date every day. In addition, all the students' questions and any remarks about the course before, during and after the module can be e-mailed to the teachers. The students' grading is posted daily, reflecting their class participation, as well as their submitted homework. The immediate communication allows for an intensive interaction and feedback.

Figure 1 All 130 students in the lecture hall with labels showing their first name and group number (left) and the screen in the lecture hall with the student presentations and the remote teacher in his office (right)

2.3 A new case every day

The program is the same every day, for three or four weeks. At the end of each morning, the teacher introduces a new case and a number of crucial questions that have to be answered. These include questions such as who is the most important party in this project, how was the team put together, what were the biggest problems encountered, how could they best be solved, and what role did computers play in this project. After that, the students start to work on these questions in groups and deliver their work as PowerPoint presentations by the end of the day, so that they can be discussed the following morning in class.

3. REMOTE TEACHING

The previous section described case-study education as it has developed in the course module in recent years. This was also the situation in the first two weeks of January 2000 — the professor involved was physically present in Delft. How, then, has remote teaching changed the course?

The research on web-based learning was initiated by Pollalis in an effort to improve the effectiveness of his teaching and constitutes a direct extension of teaching innovations that he had employed in the past. The objectives were:

- To bring to the classroom highly qualified people, both on the teacher and the student sides, who otherwise would not be possible to be part of the class.
- To improve the quality time in the classroom with interactive sessions and encapsulate the "content delivery" part of the lectures in the virtual space, in addition to live lectures.

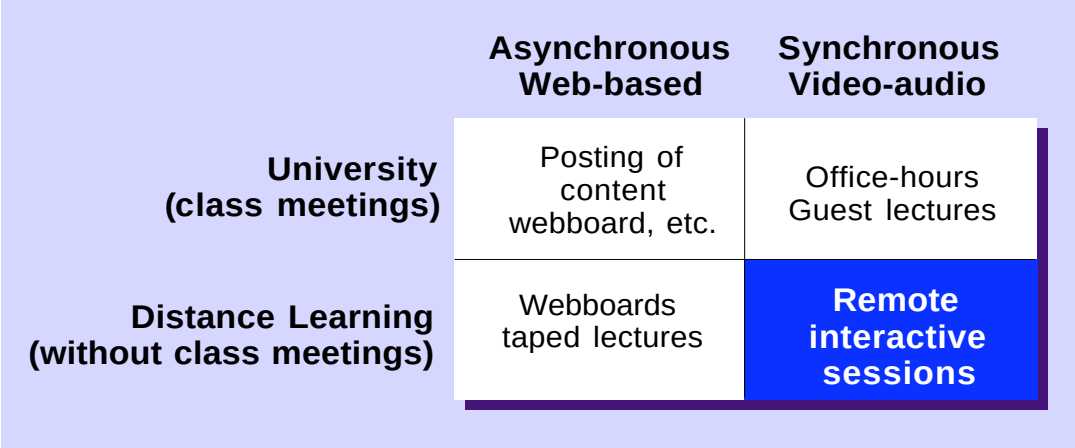


Figure 2 *The 2x2 grid that distinguishes between on-campus learning (the teacher can be in the classroom) versus distance learning, as well as between asynchronous and synchronous tools. The experiment was located on the lower right quadrant*

The framework of this research is presented in the 2x2 grid (figure 2) that distinguishes between on-campus learning (the teacher can be in the classroom) versus distance learning, as well as between asynchronous and synchronous tools.

With experience in fully implemented web-based learning for on-campus instruction at Harvard, using sophisticated asynchronous and synchronous tools, the objective in the course was to study the effectiveness of synchronous video-audio tools for distance learning. The asynchronous tools (course website, posting of content, posting of encrypted grades for immediate feedback, electronic submittal of homework, etc) had already been fully implemented.

3.1 Experiment

As with any scientific experiment, this experiment should measure only one variable. So, the design of the remote teaching experiment was set in such a way to keep everything else the same and only move the teacher a few thousand kilometres away. Furthermore, the teacher had contacted two weeks of live interactive sessions with the same group of students and the students were familiar with his approaches and his teaching method.

In the first place, due to the 6-hour time difference between Delft and Boston, another time schedule had to be operated. Instead of beginning as usual at 8.45 am, the plenary gatherings in the lecture hall began at 1 PM.

Compared with a normal course, many more technical facilities were present, such as: two computers for the students' PowerPoint presentations and the remote white board from Harvard, two powerful computer projectors for projecting the presentations and the video images of the remote teacher and the lecture hall in Delft, 50 microphones distributed on the student desks for use during the discussions, loose hand-microphones for the coordinators in Delft, a number of technical control panels and a monitor, two cameras, one at the front

and one at the back of the lecture hall, a small Web Cam focused on the projection wall for feedback to the remote teacher and a large number of cables.

Two technical assistants were responsible for the Audio and Video connection between Delft and Harvard. Two student assistants of whom one, in addition to taking notes of each student's participation, was responsible for synchronizing the speed of the PowerPoint presentations in both Delft and Harvard. The other student assistant acted as a camera operator and thereby, as became apparent afterwards, played an important role in guiding the discussions.

All 130 students, individually and per group, were given, in advance, a fixed place in the lecture hall. Each group was numbered with a number sign and all students were given a name label. The students were notified beforehand, via Internet, of the seating arrangements in the lecture hall. As soon as the session started, the lecture hall was closed. Late entrants were not allowed in

Figure 3 The remote teacher (left); attentive students (right)

When someone wanted to take part in the debate, they first had to put their hand up. When it was a person's turn to speak, they had to wait until the camera was focused on them. Before entering the discussion or answering a question, students first had to state their name and group number. When they had finished talking, they had to turn the microphone off again immediately. Restricting the time that the microphones were turned on was necessary to prevent an irritating echo at the Harvard end.

3.3 What stayed the same

In spite of the fact that, apparently, during the experiment there were quite a number of changes in how the course was given, there were also a number of things that remained the same.

To all intents and purposes, the teaching process both in the Delft and the Harvard situation remained the same, not only for the teacher but also for the students. Also remained the same Pollalis' introduction of the case and the most important questions that had to be answered, the requirement that the students should study the case and collect information via the Internet, the requirement that the student groups should produce PowerPoint presentations, sending the presentations via e-mail to the teaching team, giving grades for group and individual performances and making the results known each day on the website of the course and finally the interactive discussion and reaction during the contact hours in the lecture hall.

This last point was being substantiated by a survey that was carried out immediately afterwards among the students taking part. In spite of the new communication techniques, it seems that this very essential part of the course has not really been affected. By personally addressing the students through the remote teacher, their involvement was increased and the physical difference between them and the 'live' teacher was decreased. This is only possible when the teacher has worked previously with the students and when each student and group are allotted a fixed place in the lecture hall. For this, a plan with the names and photographs of the students was therefore made available in advance.

4. EVALUATION

In the practical experiment remote teaching, this same program was carried out, but then ‘at a distance’. Thus, the way of working was exactly the same, the only difference being that the main professor involved was not physically present. After an introductory lecture, which gave the 130 students the chance to get used to the new techniques, the week with the cases proved to be really successful, both technically and didactically. The evaluation of the experiment is based on the reaction of the teachers, assistants and students by a written questionnaire. Examples of questions were amongst others: how clear were the professors questions and interventions on video, how was the quality of the audio and video, how effective do you rate remote teaching and would you recommend to use this setup more often? Answers on those were based on a 60% student responses

All the teachers involved were very positive about the remote teaching experiment. The techniques used ensured that students felt confident with both the way of working and the environment. However, it was realized that this teaching method is hardly possible unless the remote teacher has been physically present at an earlier date. This enables the teacher to get to know a particular group of students, and vice versa. The students, for their part, have the opportunity to become familiar with the professor’s specific way of working.

The teachers also felt that the technology was quite transparent and the students could focus on content, a real achievement given the presence of technology in the auditorium. Furthermore, the teachers observed that the interaction between the students and the remote teacher was improving dramatically every day. Everybody felt that if another week would be devoted to remote teaching, there would be business as usual.

For good and efficient progress, it is vital that the part of the course during which the teacher concerned is present in person should precede the remote teaching. The students also considered it very important that Pollalis should be physically present. An ideal course scheme therefore would be one in which the first two weeks have physical presence, followed by one week remote and finally, to round the course off, one week of physical presence again.

Figure 4 More technical facilities, such as camera’s, microphones and technical control panels

The use of microphones during the presentations and debates in the lecture hall went so well that it will become standard practice to use them in both the normal course situation and in remote teaching in future. Microphones noticeably improve the understandability of the discussion between the students in the hall. Added advantages, are the learning opportunities offered by, for example, having to speak in public, in front of a microphone. The electronic remote whiteboard, used as a replacement for the traditional blackboard, on which the teacher makes notes during the discussions, offers even more possibilities. For example, the whiteboard can be used in parallel fashion, next to the presentations and the Web Cam.

The role of the cameraman during the discussions turned out to be more important than had been expected beforehand. When a number of students put their hands up to take part in the discussion, the cameraman zooms in on one of them. After that, the student concerned is free to speak. In concentrating on this activity, the cameraman often did not see the other raised hands. There was, therefore, too great a responsibility on the cameraman to facilitate the discussion.

The majority of students thought that in spite of the new technical facilities used, they could nevertheless concentrate well on the content of the material, the cases, and the questions.

Figure 5 Left: the important role of the cameraman and the co-ordinator facilitating the discussion; Right: A monitor and camera giving an overview of the hall from the back

In reply to the question about which aspects the students had missed most, the following remarks were made: the actual presence of the teacher and the lectures attached; the fast, focused discussions, interactions and interventions both from the remote teacher and the students: the need to follow agreed procedures makes this no longer possible; the short personal talks immediately after the class.

There were two serious technical breakdowns during the sessions. The first one had to do with the fixed microphones in the hall. By stepping on a cable and thereby loosening a single plug, the entire sound system collapsed. During the remote session, this was taken care of temporarily by the two portable interruption microphones present. For the discussion, these were brought to the students by two people. After the class meeting, the problem was then solved by taping all cables and connections firmly to the floor. A second breakdown caused a partial collapse of the video connection to the remote teacher. The students could still see the remote teacher, but he could see neither the hall, nor the individual students who took part in the discussion. For the teacher concerned, this was a rather serious breakdown. His only connection was sound. Eventually, the breakdown was repaired rather quickly by closing the connection off completely and starting it up again.

5. CONCLUSIONS AND RECOMMENDATIONS

One can put the Internet to good use for education by making information available. This can be in the form of general information on training (courses or teachers), practical information (module books, examination timetables, timetable changes or consultation times) and administrative facts (knowledge and skills assessment). Internet can also be used as a distribution channel for study material (syllabi, readers, PowerPoint presentations and video recordings of lectures).

Internet and e-mail can be used in the communication between teachers and students. In this area, three educationally interesting applications can be identified: computer (video) conferencing, homework and group-work. All three of the applications came to the fore during the Delft experiment.

Good progress with remote teaching on a classroom scale depends entirely on how familiar the teacher is with the students, and vice versa. That applies to the teacher's manner of working, the fixed daily program, the assignments that have to be carried out, the way of presenting and the method of assessing. The physical presence of the teacher responsible in a period prior to the remote teaching is a necessity.

The physical absence of a teacher, who can react immediately and quickly to what takes place in the hall, is experienced by the students as a great deprivation. Nevertheless, when the situation calls for it, remote teaching is seen as an excellent alternative for making use of the knowledge and expertise of an external teacher. In spite of the new communication techniques, the interactive meeting - an absolutely essential component of the course - was, in essence, not affected. Addressing the students personally by the remote teacher increased the students' participation and decreased the physical difference with the live teacher. Also this is only possible when the teacher has worked with the students at an earlier date and when each student and

group has a fixed place in the hall. The availability of a ground plan of the hall with the names and photographs of the students is essential.

There is an absolute dependency on technology for the remote teaching. When the sound installation in a normal course situation breaks down, the teacher can still make himself more or less understood. When projectors or computer projectors break down, then it is always possible to fall back on overhead projectors with sheets or use old-fashioned scratchy white chalk on a blackboard.

During remote teaching sessions, back-up teaching systems to replace techniques that break down are virtually non-existent. If the video connection fails, one can indeed still go further with the sound links, but if the teaching method is an interactive one, then this is far from ideal. Eye contact, the ability to see the teacher and vice versa, the students, both as group and individual, is essential if good results are to be obtained. If the sound connection fails, then remote teaching stops immediately.

6 SPECULATIONS ABOUT OPEN BUILDING EXERCISES

The Open Building design course is made up of various components. It begins with introductory lectures in which the lecturers can explain the background, methodologies and principles to students by means of theories and interesting practical examples. The remote teaching method described in this paper would be highly suited for this kind of knowledge transfer. It would also not only enable local lecturers to participate but could also include international Open Building experts physically located elsewhere in the world.

Another key component of the Open Building course is the group work on design assignments in which students translate and develop the principles previously explained into concrete designs. The results of this group work (probably done in groups of five to ten students) need to be explained, evaluated and assessed when lecturers are actually present. The remote teaching method described could also prove an excellent tool in this area, where instead of using a large communal lecture room, a small videoconferencing room is used and the design results sent in advance to the external Open Building experts. This would allow students to explain their design drawings or models live, as it were on location, while the results are discussed and evaluated by the remote experts. This would obviously involve group scheduling for the use of facilities in consultation with the external lecturer, but this is already the case in the present situation involving only local lecturers.

This way of working has the major benefit of enabling different experts or designers located elsewhere in the world to be used far more frequently than was previously the case. It actually brings the virtual design studio easily within reach, even for Open Building, resulting in genuine design collaboration on the web.

REFERENCES

Delta nr. 21, Delft University of Technology, Delft 24 June 1999
Pollalis S.N., *The Case Study Method in Architecture Teaching*, BMVB TU Delft, Januari 2000.
Geraedts R.P., *Reader Course M2*, BMVB Delft University of Technology, Delft Januari 2000.
Geraedts R.P., Remote Teaching; prof. S.N. Pollalis in M2, DUP, Delft February 2001.

Experience in Teaching Open Building

Li-Chu Lin

Dept. of Construction Engineering; 1, University Road, Yuanchau Kaohsiung, Taiwan 824, R.O.C.,
lsylvia@ccms.nkfust.edu.tw

ABSTRACT AND KEYWORDS

Education for an open architecture in the existing academic and professional environment is very difficult, especially when extraordinary formlessly architectures are prevalent today. Although the attention of sustainability has been widely spread and relevant methods have been adopted to a certain extent, the fundamental perspective and daily practice of architecture and the role of architect following modern architecture even looking back upon Palladio's time remain unchanged.

Based on five years experience in teaching students and the public about open building in Taiwan, especially to the students and academic fellows with construction engineering related background, failures and gains are examined in this paper. Barriers for promotion are analysed, strategies to deal with these barriers are proposed, and notices as well as pitfalls of implementation are discussed.

Barriers to promote open building are in five aspects. That are conflicts of values and ideology, inertia in professional practice, difficulties in differentiating and clarifying ideas, user demands are not strong and clear, and low motivation due to long payback period. Strategies to deal with these barriers are in three directions: establishing new paradigm carefully based on aesthetics of necessity, elaborating teaching methods for those of different backgrounds, and fully utilizing international platform. Besides, other factors such as regional differences, relevant movements have to be identified, impacts of promoting activities have to be evaluated by stages especially when a school of theory is formed and an aesthetic paradigm is generally recognized.

After more than ten years international team effort on open building implementation, comparing to Modern movement and Green/ sustainable movement, personal reflections are presented here so as to be a reference for continuous improvement.

Open Building, Paradigm Shift, Aesthetics, Pedagogy, Modernism

24.1 INTRODUCTION

Learning 'open building' needs the sensibility of living behaviours, the introspective ability of professional practice, and the consciousness of social equity as well as social change. It has been more than ten years to promote open building in Taiwan since the working commission of W104, CIB came into existence, the progress are still hardly seen. Instead, not to mention the extraordinary formless or curve architecture as a fashion, other movements such as green building, sustainable building are widely been aware by the public in a relatively short time due to their emergent and obvious environmental problems. Although open building ideas could help green movement and sustainable development in a fundamental manner, it is still not appreciated as deserves. Therefore, the reasons for such an overlook or silence worth further studying.

24.2 PROBLEMS ANALYSIS

It seems easier to accept open building ideas but more difficult to catch its points for engineering students than for architecture students. Although the former don't have the burden of architectural values, they still don't have the discipline to catch the issues raised from intervention of built environment. There are conflicts and

barriers observed in promoting open building. In a broad sense, the progress in educating or promoting it to the stakeholders of the construction industry is stagnated due to the following reasons.

24.2.1 Conflicts of Values

The differences and conflicts of thoughts between the contemporary architecture and open building are difficult to be clarified and shifted. Ideological comparison between them is shown as follows (Table 24.1).

Table 24.1 Ideological comparison

Factors \ Theorist	Palladio	Modernist	Habraken
Architectural values	Permanence, Classical aesthetics	Permanence, Extraordinary beauty, Simplicity beauty, International style	Transformation, Ordinary beauty, Complex beauty, Vernacular type
Designer's role	Master	Master	Coordinator
Economic features	Handmade, Sea trade	Industrialization, Capitalism	Capitalistic globalisation
Environmental attitude	Exploring nature	Conquering nature	Bio-symbiosis, Sustainability
Social concerns	Humanism	Family restructure, Urbanization	Social equity, Living autonomy

24.2.2 Inertia in Practice

Running business always needs to deal with financial, time and personnel constraints. Learning open building takes time, and open building approach needs more time and work to make a better design in practice. These may discourage its implementation without incentives or market pull.

24.2.3 Easy to Be Mislead Due to Its Low Entry Threshold

Open building is a matter of flexibility, user participation, renovation and industrialization, which look like old issues that had been discussed for decades since modern architecture launched. It is possible that the differences or arguments between modern architecture and open building are too sophisticated and profound to catch the points, especially for those who rush to go through it. Thus it may lead to paradoxical self-interpretation in a result if they are just looking for new marketing wording.

In countries poor in building industrialization like Taiwan, academic and professional people are not familiar with the ideas of open system and modular system. Therefore, open building ideas cannot be promoted effectively by event-type activities such as conferences or seminars. Teaching programs or workshops are probably the better ways.

24.2.4 Lack of the Sense of Environmental Rights

It is obvious that after industrial revolution the breakdown of profession and trade have diminished the sense of human nature in control of our living environment. Most of the people do not have the knowledge of modern building design as well as machinery tools operation for construction. In a result, all living demands seems being restricted by the existing technology, and the adjustments or adaptations have to yield to technology

instead of users' own will. There is no environmental autonomy. In a word, the building industry is not human enough to respect the lifetime needs of occupants, and users do not sense that they have the right to ask for. Therefore, it is lack of market pull.

In another word, building industry does not provide lifetime after-sales service or routine maintenance like car industry or other consumer products.

24.2.5 Low Motivation Due to Long Payback Period

Open building provides the freedom to make changes of occupant's living environment, but it is usually seen a few years later after construction. The time span of room adjustment at infill level varies from 5 to 25 years (Durmisevic, 2001). While other levels may take much longer. Even building itself usually costs the highest price in a consumer's life; his or her concerns about the values of the embedded functions for later adjustment may decrease due to the short memory of benefits or inconvenience. Users always have short memory, which is human nature. Thus a manual for maintenance and later adaptation may help.

Therefore, for young students, open building is not attractive enough. Although they have pure consciousness of social equity, due to their limited living experience, the deep insights of open building on the structure of built environment through physical intervention is not easy to catch. Especially for architectural students, under the pressure of intensive learning program and the intention of self-express to establish professional confidence, formal imitation is the easiest way to deal with such complicated issues and challenges. Therefore, iconic and fashionable forms are more attractive, and the conflicts of values and ideology are inevitably ignored. Students' demands and concerns vary at different stages; Constraints and missions on pedagogy can be described as Table 24.2.

Table 24.2 Discipline of students in stages

Bachelor degree	Master degree	Doctor degree or Ph.D.
• Incubation of interest • Sense of accomplishments • Self-confidence	• Exploring new areas • Re-orientation by values	• Deep reflection from practice or experiences

For the professional, there is no market pull. Without the clients' requests for the free control of their own living spaces, and without the legal requisites of design for reuse and recycle, the inertia of professional practice will keep them working towards the same direction, i.e. searching easy ideas for marketing and pursuing or creating extraordinary and fashionable form so as to obtain their personal fames.

For the architectural academic, himself or herself cannot easily learn open building theory like green building or modern architecture. It takes time to really catch up the ideas of the theory, especially in clarifying and differentiating ideas from flexibility, systemization, user participation, etc. Therefore, good instructors are the key persons. While for the construction related academic, they have no ideas about living behaviours and rarely concern about environmental social equity. Engineering accomplishments or innovations are their prides and the first priority. Therefore, construction of safety and quality by fixed forever are their golden rules.

For the officials, the effect of open building is not easy to be seen. Its vision is not easy to be appreciated by a few simple slogans as green building, intelligent building or sustainable construction do. Politically it is also not so emergent and visible like them. Open building deals with such a fundamental and complicated human structure that takes time to making transformation. Therefore, it proceeds relatively in a silent way and seems not cost effective.

24.3 STRATEGIES FOR IMPLEMENTATION

With a view to do the right thing for architecture in a right direction, efforts with effective strategies are necessary. Suggestions are proposed in the following:

24.3.1 Establishing New Paradigm Based on Aesthetics Carefully

Formal paradigm is always the symbol of contemporary architecture. Which should be easily recognized and distinguished from others. And the aesthetic presentation plays a key role to help the public recognition. This is the way that architectural history was made in general. Comparing with function, form can easily attract people's attention in nature (Table 24.3).

Table 24.3 Form vs. function

Form	⟷	Function
1. Aesthetics		1. Behaviour and technology
2. Sensing with intuition		2. Reasoning by experience
3. Access with ease		3. Access by instruction
4. Visible		4. Invisible

Although such a symbolic style is inevitable, the followers may misinterpret or misrepresent it widely. Therefore, deliberately developed form and aesthetic values are critical. Nonetheless creating simple and fashionable features in form is an indispensable approach. In this case, Next 21 is one of the good existing demonstrations in design. Which demonstrates a new model of aesthetics of complexity rather than simplicity, especially in a collective form and not just for low-income affordable housing. In another word, building unit or a single building may keep a simple form, but the whole building or group buildings should allow variations under a certain consensus or building type to cumulate a complex collective form.

Learning from the history, Modern architecture prevailed with simple and clear slogan: form follows function, less is more, etc. Aesthetics of simplicity was one of its core values. Which is still preferred today. Passively integrated solar energy design was promoted 30 years ago, but the prevalence was postponed until BIPV approach created new images by transparent curve forms which successfully accepted by the public. The glass dome atop of German Parliament building (Reichstag) in Berlin is the case.

24.3.2 Elaborating Pedagogy for Different Background Students

The promotion measures and pedagogy of open building have to be diversified, especially in Taiwan. Real cases demo and motion pictures presentation are most effective in general. Since the first step to persuade clients to invest on such a project is relatively difficult, motion pictures or video display may help greatly.

For different background students, effective teaching methods should take their specific professional discipline, mental structure and values into account; In Taiwan architecture students are taught architectural history, human behaviour and socio-cultural issues that engineering students are not. Construction management students concern engineering quality rather than living quality. Economic students learn socio-cultural factors but they do not have engineering knowledge. Therefore, architectural students may catch the issues raised in open building, but engineering and other background students are blind to them. Even so, the conflict of values, mentioned above, may level down the architectural students' social sense.

In Taiwan, students are under great pressure of advancement in education and obtaining diplomas, their knowledge is generally narrow and confined to academic fields. Therefore, the teaching focuses are concluded as shown in Table 24.4.

Table 24.4 Teaching strategies for open building

Background	Teaching focus
Architecture	Design (tissue, building, infill), Tectonic design, Building and Urban renovation
Civil engineering	Structural design, Building materials design
Construction management	Trade organization, Contracting,

	Legal regulations
Real estate	Marketing, After-sales service

24.3.3 Fully Utilizing International Platform

International organizations could play an important role nowadays. There are so many international organizations and committees related in professional field and even with the same goal such as sustainable construction. These resources could be effectively utilized in light of the following aspects.

(i) To broaden the scope of open building by not only holding joint conference with other active committees or international organizations but also linking other related issues such as mass customization, Lean construction, cradle to cradle, etc. and even international chain stores such as IKEA, B&Q. Other building types besides housing, such as hospital, laboratory, hotel, may be explored. Thus new blood can be injected and keep it refresh and progress.

(ii) To cohere with different ideas and to clarify the belief in the working group by enhancing communication in conference besides presenting papers. For people whose mother language is not English the effective communication inevitably takes time. The main barriers for international communications are the differences in language, cultural context, individual interest and personal commitment, which depends on one's busy schedule. Thus group reflection, cooperation, strategic planning (i.e. re-organization? re-name? stage-by-stage Implementation plans?), and so on may take place when getting together.

(iii) To support promotions in different countries as a mission by not only holding forum or workshop but also visiting government, trade union or academic associations. A strategic target chosen to start with for demonstration may be a critical step to success. Thus the government may be pushed to establish incentive programs, the trade union may pay more attention to search for new market, and the architects in practice may will to learn with care.

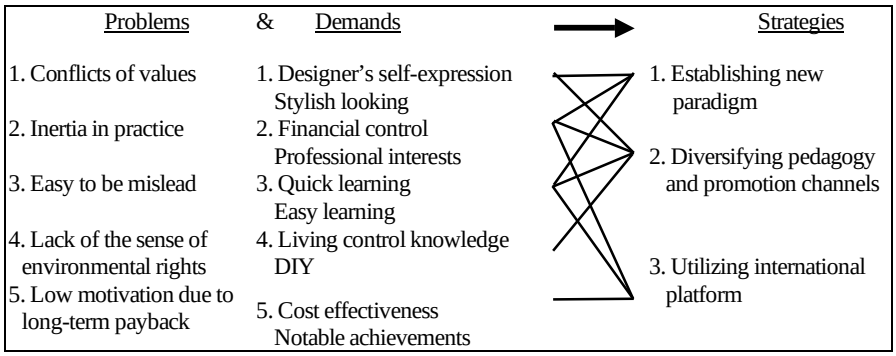
Referring to the historical experiences, Bauhaus provided an opportunity for a group of inter-disciplinary scholars and students closely work together; their ideas and products are extensively recognized in a result. In the meantime, concrete and steel materials as well as construction methods are advanced in a fast speed, which were adopted by modern architecture, thus the progress due to the cooperation of architecture and civil engineering fields was overpowering. SAR in Eindhoven was the cradle of open building, and OBOM in Delft was the base of implementation. Unfortunately they do not exist anymore.

To sum up the analyses of problems as well as demands with the proposal of strategies, the logic thinking is presented below (Table 24.5).

24.4 CONCLUSION AND DISCUSSION

Open building approach is believed as a silent revolutionary movement that can withstand time test. It can never become a fashion, but it should be paid attention and rooted in mind. As a latecomer, this paper tries to designate the barriers, clarifies the needs and intentions of stakeholders and proposes implementing strategies based on ten-year personal observations and five-year teaching experiences in Taiwan.

Table 24.5 Strategies developed process



Regional or countrywide differences, such as the living standards, the extent of building industrialization, the constraints of natural environment, have to be identified so that regional strategies and working models can be developed and better serve the followers. Relevance to other movements or the coming trends is worth interacting with. Thus the theory itself could be re-evaluated and upgraded.

In addition, one thing has to be kept in mind; any theory or movement might be distorted or mislead during education and promotion, even by media. Although the original books, papers and mission statements can convey the core thoughts of open building, in nature the ideas can never be interpreted specifically as the same along with time when spreading, even forming a school. The followers may misrepresent or over exaggerate the ideas so that the shortcomings arise. This is a pitfall that can draw lessons from the architectural history. Therefore, implementation through education and promotion or other measures should be carefully taken; Group periodical review and reflection may help in the long run.

24.5 REFERENCES

Durmisevic, E., 2001, Towards flexible infill systems, *Open House International*, vol.26 no.3, edited by Kendall, S. (Great Britain: The Urban International Press), 63-68.

Habraken, N.J., 2005, Palladio's Children, (London: Taylor & Francis).

Kendall S. 2001, Notes on Teaching open or agile architecture, *Agile Architecture Proceedings*, edited by Cuperus Y. (The Netherlands: OBOM, DelftUT), 123-132.

Extending the Mission of the Design Studio through Collaborative Engagement

K. Thomas McPeek[1]
Benjamin Dockter[2]

[1]M Arch, Assistant Professor of Architectural Studies, School of Architecture;
Southern Illinois University, Carbondale, ktmcpeek@siu.edu
[2]Graduate Student in Architectural Studies, School of Architecture;
Southern Illinois University, Carbondale

ABSTRACT AND KEYWORDS

The design and implementation of even the simplest architectural projects are almost exclusively collaborative endeavors requiring individuals of diverse expertise working together to achieve a singular goal. Each highly trained in their respective areas, yet few (if any) are formally trained authorities in the skills of collaboration.

This lack of preparation for working in a collaborative environment continues to happen despite the fact that architects, developers, builders and engineers commonly acknowledge that collaborative skills are a necessary foundation for successful architectural projects and a requirement under current NAAB accreditation guidelines.

Historically, the education of an architect has been a highly individualized pursuit, focused on the development of an individual skill set that seldom includes collaboration beyond that of student and professor. While this individualized hands on approach to education has been highly revered by many, it often falls short of its potential and fails to recognize that the greatest design accomplishments of humankind have been the undertaking of collaborative enterprise. Furthermore, architecture students are being prepared in a manner that is contrary to the highly collaborative nature of the architectural practice they will enter.

This paper highlights research conducted as part of a doctoral dissertation focused on collaborative design pedagogy in architecture. This research examines collaborative methodologies that have been and are currently being utilized in the design studio with particular emphasis on the use of the design studio as a vehicle for teambuilding and leadership development. The research will offer findings to include the facilitators and inhibitors to constructive collaborative engagement in the design studio and methods for equitable assessment of collaborative projects. Additionally, this research also shows how collaborative environments are conducive to the ideas of open architecture.

Keywords: **Design Studio, Pedagogy, Collaboration, Teamwork, Open Architecture**.

1.1 INTRODUCTION

The design and implementation of even the simplest architectural projects are almost exclusively collaborative endeavors requiring individuals of diverse expertise working together to achieve a singular goal. Each highly trained in their respective areas, yet few (if any) are formally trained authorities in the skills of collaboration. This includes architects, individuals who are often put at the lead of design projects which include people of varied backgrounds, working styles and areas of expertise.

Historically, the education of an architect has been a highly individualized pursuit, focused on the development of an individual skill set that seldom includes collaboration beyond that of student and professor. While this individualized hands on approach to education has been highly revered by many, it often falls short of its potential and fails to recognize that the greatest design accomplishments of humankind have been the undertaking of collaborative enterprise. Furthermore, architecture students are being prepared in a manner that is contrary to the highly collaborative nature of the architectural practice they will enter.

As Collaborative methods begin to see increased popularity in the design studios, the next generations of architects will have a greater capacity to work within the growing range of complexities of architectural

practice. It is no longer possible for an architect to build anything substantial without the help of multiple sources, whether it be within their own team or from outside contributors (McPeek 2008). This paper will discuss the strong relationship between the introduction of collaborative design methods into the design studios of our schools and its interrelated connectivity to the three main principals of open architecture.

1.2 OPEN ARCHITECTURE AND THE ROLE OF COLLABORATION

Open Architecture is concerned with three main principles: change, levels of intervention, and distributed design. These basically state that, first, architecture is in constant change. An architect's work has links to past present and future, and has to be able to traverse the time gap without loss of quality. Second, architects work on many levels of intervention; meaning, we routinely address issues in a range of scales from the broad scale of an urban design project to the much more modest scale of choosing tile for a small residential renovation. Third, and last, the built environment is created by a series of people over time and rarely, if ever, are all decisions made by a single individual.

The ideas of a collaborative teaching methodology in architectural education meld very well with these three key principles of Open Architecture. Collaborative design strives to deal with the problems of a constantly shifting practice by engaging the wealth of ideas and experiences that a small group can bring to any problem or project. It is discussed in the definition of Open Architecture that the "built field is never finished and changes part-by-part." When design is approached as a group endeavor, group members are likely to find themselves in a situation where they are required to take pieces of another group member's work and build upon them, or follow them through to completion.

The collaborative approach has multiple levels of intervention not only in the subject matter being taught, but the way in which it is being taught. One instance is the multiple levels of participation that are likely to be experienced in the design studio environment. In a collaborative context, the students engage their peers and teacher on a one to one basis. This is where the student gets much of their day to day interaction. They discuss the ins and outs of the project and are able to get constructive feedback in the form of in depth conversations and sketches. The next level of engagement involves peer to peer group situations, where the students present to their peers with the instructor as the mediator or moderator, allowing the students to interact with a larger number of individuals over a shorter period of time. This also allows the students to gain the benefit of the larger breadth of experience and a skill possessed by their fellow collaborators and allows the individual student to develop their own individual areas of weakness at a more rapid pace. The use of peer collaborators allows critiques from fellow students directly involved in the project who, because of their intimate knowledge of the project, may have ready access to knowledge not immediately available to the instructor on how to solve certain issues or problems (Bronet et al. 2003). The last form of interaction happens in the context of the design jury or review. The student presents in front of a jury with other students, the instructor and any passersby present (Anthony 1991). This is a much more open discussion of the project with many opinions being offered from many different sources. In context of the typical architectural design studio this is usually an intradisciplinary engagement limited to architectural students. In truly collaborative projects, the students would work in an interdisciplinary context with students and experts in other fields to give further insight and guidance to their project. Architects engage the services of consultants in practice, such as engineers and designers in other fields such as industrial, product, landscape, and urban design. Yet this form of collaboration is seldom seen in the university settings, even when these disciplines share the same roof. Another consideration is that architects tend to only value the outside consultants that have what we would call design decision making capacity – meaning that their input directly effects how a building will look and perform. To teach a more beneficial and holistic collaborative method other professions that tend to exist on the periphery of a design project should be considered such as: sociologists, ecologists, etc. These are the professions that deal with issues that are directly affected BY design (Bronet et al. 2003).

Collaborative design methods use groups to complete projects. This emphasizes the reality of architectural practice and the distributed design in Open Architecture. When students work together, they are forced to discuss their design ideas with other members of their group, in some case the ideas will evolve as the best solution and in other cases they will not, but often the ensuing discussion proves more important to their education than the resulting artifact. Just as in the practice of architecture, there are multiple decision makers and multiple individuals producing small pieces of a larger whole that eventually results in a unified project. In the end, this gives the project a much more realistic feel and increases the probability of quality project due to workload sharing and ability to force ideas through strict review with fellow group members.

1.3 COLLABORATION IN THE DESIGN STUDIO

Collaborative learning in design studios focuses on a student-centric model of learning, instead of the more common teacher-centric model. The main difference being that in teacher-centered approach, the teacher is at the center of the class and sole point of the class's knowledge and authority. The student-centric approach transfers some of the power to the students allowing them to engage more actively with the classroom exercises and reflect on the material being learned.

Collaboration is defined by Mattessich (2001, pp. 60) as

> *"bringing previously separated organizations into a new structure with full commitment to a common mission. Such relationships require comprehensive planning and well defined communication channels operating on many levels. Authority is determined by collaborative structure. Risk is much greater because each member of the collaboration contributes its own resources and reputation. Resources are pooled or jointly secured and the products are shared."*

This degree of shared interest is what makes collaboration different than other forms of teamwork. The joint ownership within the classroom between teacher and student is what defines collaboration and allows greater possibilities of learning.

Despite the potential difficulties associated with implementation of a collaborative model there is still strong interest in its potential and in Building communities Boyer went as far as to say that "making connections, both within the architecture curriculum and between architecture and other disciplines is, we believe, the single most important challenge confronting architectural programs" (Boyer 1996, pp. 89). Citing the many advantages of a collaborative model, Van Weert offers the following regarding collaboration, "collaboration intensifies the human aspects of learning. It increases our learning potential and empowers us with the knowledge of others." (2003, pp. 74)

For many, the transition to a collaborative model of learning can be quite challenging without adequate orientation to the process. Collaborative learning is a skill, and like any other skill, it must be learned (Straus 2002). In the early stages of a course that uses a collaborative model the instructor must help the students to develop the requisite teamwork skills to be successful to the course. This is often achieved by developing a series of group based exercises that help to transition authority and responsibility to the students (Barkley 2004) in a way that helps the learners to develop the five basic skills required for effective collaborative engagement as identified by Bosworth (1994): Interpersonal skills; Group management skills; Inquiry skills; Conflict resolution skills; Synthesis and presentation skills.

Research indicates that "Collaborative learning tasks will most likely be more compelling and effective if they are integrated into a course that has been designed to be learner centered." (Barkley 2004, pp. 59) it is this structure that underpins a collaborative learning based course and it is crucial to the success of collaborative coursework. As noted in the above quote, a student-centric model, as found in the architectural design studio, is ideally suited for collaborative learning.

Comparing Student Roles in the Traditional Versus Collaborative Classroom

Traditional Classroom (students shifting from)	Collaborative Classroom (students shifting to)
Listener, observer, and not taker	Active problem solver, contributor, and discussant
Low or moderate expectations of preparation for class	High expectations of preparation for class
Private presence in the class with few or no risks	Public presence with many risks
Attendance dictated by personal choice	Attendance dictated by community expectations
Competition with peers	Collaborative work with peers
Responsibilities and self-definition associated with learning independently	Responsibilities and self-definition associated with learning interdependently
Seeing teachers and texts as the sole sources of authority and knowledge	Seeing peers, self , and community as additional and important sources of authority and knowledge

Figure 1.1 Comparing Student Roles in the Classroom from Barkley (2004, pp. 30).

Boyer (1996) notes a long standing and distinct rift between architectural academics and the practitioners who practice architecture. Often academics note the lack of theory being incorporated into practice and the practitioners take the point to the lack of practice matters being taught in school. The collaborative approaches mentioned strive to narrow this gap, by allowing realistic interactions to take place within projects while allowing a variety of exercises to be attempted.

> *"Collaborative learning occurs when students and faculty work together to create knowledge…It's a pedagogy that has at its center the assumption that people make meaning together and that the process enriches and enlarges them." (Mathews 1996, pp. 101)*

1.4 MAKING COLLABORATION WORK

In considering how to develop a collaborative learning course it is useful to refer to the cognitive domain of Bloom's Taxonomy of Educational Objectives (1956) where he identifies three critical considerations for designing a course: identify the most important educational objectives for the course; develop learning exercises at an appropriate level for the learner; develop assessment methods that evaluate students at a correspondingly appropriate level. Barkley (2004) builds upon these ideas by offering four "considerations" that the instructor should be mindful of when developing a new course. The learning exercise needs to be fundamental to the learning objectives of the course as to not be considered "busy work". The learning exercise needs to meet the abilities of the students to insure that students don't get discouraged by it being too easy or too difficult. The learning exercise should promote interdependence in such a way that each student has a responsibility to contribute to the group while also being dependent on the other group members for their contribution and the group's overall success. In developing a collaborative course, there needs to be a method of instituting individual as well as group accountability for the work completed by the group.

It is critical that the instructor creates an environment that enables student collaboration by acting as a facilitator of collaboration (Bruffee 1999). This requires that the instructor relinquish much of the everyday control of the learning to the student groups while the instructor remains in charge of maintaining the structure of the course. Due to the fluid nature of a social learning environment like the collaborative classroom, the instructor needs to be prepared to make adjustments to the course on short notice to insure an optimal experience for the learners. Adequate preparation on the part of the instructor is also a key consideration and this is best achieved by "planning each phase of the collaborative activity, from how to form groups to how group work will be evaluated." (2004, pp. 56) It is worth noting that an appropriate environment for collaboration often depends on the physical resources of the classroom. Many of the resources on college and university campuses are situated in such a way to facilitate teacher-centric model of learning, with a lectern at the front of the room and all of the chairs and desks facing the lectern allowing each of the students to see the instructor and any visuals associated with the dissemination of knowledge. Since the nature of the collaborative classroom is to shift the general dissemination of knowledge from instructor to student, the class needs to be configured in such a way that it encourages discussion and ongoing interaction between learners. This is best achieved by positioning the students facing one another to encourage discussion and exchange.

1.4.1 Grouping

At the heart of a successful collaborative learning experience is the creation of an environment that will embrace and nurture the ideals of successful teamwork. The initial step to collaborative engagement in the classroom is the establishment of learner groups or teams. Barkley (2004) establishes three basic topic areas that must be considered when forming learner groups: group types, group size, and group membership.

It is important to understand the different types of learning group structure and in what settings they can be the most effective. Barkley establishes three typologies for groups: formal, informal, and base. In determining the format that is most appropriate the instructor must first consider the duration of the learning exercise since each type is tied to a specific duration. The format with the shortest duration is the informal group which can be formed quickly and is typically intended that the participants work together for a brief period of time. Often the informal group participants will be randomly assigned decreasing the odds of a homogenous group and thereby increasing the odds of a more diverse interaction for all group participants.

Formal groups are often utilized when the task being pursued are of greater complexity and/or longer duration. The formal group is assembled at the outset of task assignment and participants will continue to work together until the task is completed. Based on task complexity the typical duration for a formal group learning experience will range from a period of several classes to several weeks. The makeup of the group can be either heterogeneous or homogenous and there is research to support the use of both paradigms (Cranton 1998; Johnson et al. 1991; Sharan 1987, 1992). Heterogeneous groups bring an inherent diversity of background,

ideas, and experience and as a result will foster stimulating, even lively, discussions, though at the potential cost of performance and overall product outcome. As a counterpoint, a homogenous group brings the ability of a more refined product outcome and streamlined group performance due to the innate similarities in background, ideas and experience coupled with the greater probability of complimentary skill-sets of group participants. This too comes at a price in a lack of diversity. Typical sizing for a formal group is a minimum of two participants and a maximum of six with a group of five giving best results for both formal and informal groups (Bean 1996).

The final format is the base group. Johnson describes the base group as

> *"long-term, heterogeneous cooperative learning groups with stable membership whose primary responsibility is to provide each student the support, encouragement, and assistance needed to progress academically" (Johnson et al. 1991, pp. 4).*

The duration of a base group learning experience is the full length of the course. Johnson found that the optimal size for base groups was between three and four participants. In the case of a design studio the optimal group size seems to be three students. The odd number of students prevents any potential stalemates, encourages ongoing discussion and debate and the smaller size of the group facilitate a more even distribution of the workload.

1.4.2 Project Selection

Arguably one of the most critical components for successful collaboration is appropriate assignment selection with a particular focus on the complexity of the project being assigned. An adequately complex project will radically diminish the likelihood of what Levy calls the "free-rider" effect (2001). The increased project complexity forces an increased level of interaction between group members making it much harder for any member of the group to sit idle. Conversely, making the project too difficult will stifle communication and interaction resulting in an ineffective collaborative experience. The instructor can expect to make adjustment until this balance is found.

1.4.3 Assessment

Barkley notes that a difficulty that must be addressed in the part of the instructor is how to ensure individual accountability while at the same time maintaining positive group interdependence. Stating

> *"individual grades provide a mechanism to ensure individual accountability, but they may minimize the importance of the group effort…Group grades ensure that the group is held accountable and that all members support each other's learning, but if individuals are not held accountable, group grades create opportunities for 'easy riders' to avoid responsibility". (2004, pp. 83)*

As with all assessment, the struggle becomes how to fairly evaluate the contributions of each member of a group as well as the cumulative effort of all group members. The use of a collaborative model requires the development of alternative assessment tools since evaluation can no longer be conducted on strictly an individual basis. Assessment can include the use of alternative tools such as peer assessment, self assessment, group assessment, instructor assessment, and reflective journaling. *Peer assessment* typically involves the students grading the other members of their groups. This helps the instructor understand better who is working well with the team and who is perhaps not doing their work. *Self assessment* involves the students critically assessing themselves in a reflective manner. This is typically done in the form of a written document, either prose or a simple grading matrix. *Group assessment* is where the students grade the entire class. This would be based on a jury type situation where each student is able to give a grade based on the quality of work the other students show. Instructor assessment is when the instructor gives a grade based on his own observed knowledge of the student and quality of individual work. *Reflective journaling* is a daily journal written by each student in the course to chart their individual progress and discuss any issues that may have developed along the way either individually or in the context of the group. Journaling is perhaps the best way to track how well the students have worked together and the contributions made by the individual group members. It is important to understand the periodic frustrations can occur resulting in *spikes* in the individual journal for that week. However, when viewed in context of the overall project or grading period a clearer picture will emerge.

These techniques when combined, form a holistic approach to the process of grading that is tightly interwoven with the learning objectives of the course therefore becomes a critical element in the evaluating of collaboratively based courses (Barkley 2004). In addressing the topic of a holistic approach to grading Walvoord and Anderson (1998) conclude that,

> *"Grading…includes tailoring the test or assignment to the learning goals of the course, establishing criteria and standards, helping students acquire the skills and knowledge they need, assessing student learning over time, shaping student motivation, feeding back results so students can learn from their mistakes."*

1.5 CONCLUSION

> *"Without cooperation, almost no object of consumption we take for granted can ever come into existence."(Webster 2003).*

Current trends in architectural practice such as an increased focus on sustainable design, design-build project delivery, and the globalization of architectural practice will only serve to increase the need for practitioners that are skilled in collaboration. Creating a need that the academy will inevitably be forced to address. As we consider the role that Open Architecture will play in the coming decades we feel that it is of the utmost importance to also consider the increasing role that a collaborative pedagogy will also play.

1.6 REFERENCES

Anthony, Kathryn H. 1991. *Design Juries on Trial: The Renaissance of the Design Studio*. New York, NY: Van Nostrand Reinhold.

Barkley, Elizabeth; Cross, K. Patricia; Major, Claire Howell 2004. *Collaborative Learning Techniques: A Handbook for College Faculty*. San Francisco: Jossey-Bass.

Bean, John C. 1996. *Engaging Ideas: The Professor's Guide to Integrating Writing, Critical Thinking, and Active Learning in the Classroom*. San Francisco, CA: Jossey-Bass.

Bloom, Benjamin S., ed. 1956. *Taxonomy of Educational Objectives, Handbook 1: The Cognitive Domain*. New York, NY: Longmans.

Bosworth, Kris. 1994. Developing Collaborative Skills in College Students. *New Directions for Teaching and Learning* (59):25-31.

Boyer, Ernest L. & Mitgang, Lee. 1996. *Building Community: a new future for architecture education and practice*. Princeton: The Carnegie Foundation for the Advancement of Teaching.

Bronet, F., R. Eglash, G. Gabriele, D. Hess, and L. Kagan. 2003. Product design and innovation: Evolution of an interdisciplinary design curriculum. *International Journal of Engineering Education* 19 (1):305-18.

Bruffee, Kenneth A. 1999. *Collaborative Learning: Higher Education, Interdependence, and the Authority of Knowledge*. 2nd ed. Baltimore, MD: The Johns Hopkins University Press.

Cranton, Patricia. 1998. *No One Way: Teaching and Learning in Higher Education*. Toronto: Wall & Emerson, Inc.

Johnson, David W., Education Association for the Study of Higher, Washington D. C. Eric Clearinghouse on Higher Education, Washington D. C. School of Education George Washington Univ, Development Human, and et al. 1991. *Cooperative Learning: Increasing College Faculty Instructional Productivity. ASHE-ERIC Higher Education Report No. 4, 1991*.

Levy, James B. 2001. Can't we all just get along: Cooperative legal writing assignments. *The Second Draft* 15 (2):28.

Mathews, Roberta S. 1996. Collaborative learning: creating knowledge with students. In *Teaching on Solid Ground: Using Scholarship to Improve Practice*, edited by R. M. a. M. Weimer. San Francisco, Ca: Jossey-Bass.

Mattessich, Paul W.; Murray-Close, Marta; Monsey, Barbara R.; Amherst H. Wilder Foundation. 2001. *Collaboration: What Makes It Work*. 2nd ed. St. Paul, MN.: Amherst H. Wilder Foundation.

McPeek, Keith T. 2008. Collaborative Design Pedagogy: A Qualitative Study in Architectural Education. Dissertation, Architecture, Texas A&M University, College Station, TX.

Sharan, Yael and Sharan, Shlomo. 1987. Training Teachers for Cooperative Learning. *Educational Leadership* 45 (3):20-25.

———. 1992. *Expanding Cooperative Learning Through Group Investigation*. Colchester, VT: Teachers College Press.

van Weert, Tom J. & Munro, Robert K., ed. 2003. *Informatics and Digital Society: Social, Ethical and Cognitive Issues*: Kluwer Academic Publishers.

Walvoord, Barbara E. and Anderson, Virginia Johnson. 1998. *Effective Grading: A tool for Learning and Assessment*. San Francisco, CA: Jossey-Bass.

Webster, Chris. 2003. *Property Rights, Planning and Markets: Managing Spontaneous Cities*. Cheltenham, UK: Edward Elgar Publishing.

An education of the urban tissue design studio to reorganize the urban environments in downtown Tokyo –A case study of the Shimbashi areas of Tokyo –

Kazunobu MINAMI

Professor, Department or Architecture, Shibaura Institute of Technology, South-East 45-1 3-9-14, Shibaura Minato-ku, TOKYO 108-8548, Japan, k-minami@sic.shibaura-it.ac.jp

ABSTRACT AND KEYWORDS

The author has been teaching at the urban tissue design studio for the fourth grade of the undergraduate students for these three years. Each group of four students first surveyed and analyzed the existing theme of the areas along the new city planning road “Ring Route 2”, also known as MacArthur Road, in the Shimbashi - Toranomon district of Minato-ku, Tokyo and made design guidelines that embody aesthetic urban planning and environmental design. Each student design individually according to the design guidelines drafted by themselves and the effectiveness of the guidelines will be tested by using them in a schematic design. The students have learned the Open Building theory in their third grade, which means one year prior to this studio work. This studio gives them the opportunities to implement their knowledge in the field which they well know.

Keywords:

Urban tissue, Design method, Urban environment, Existing building stock, Public spaces

1.1 OUTLINE OF THE DESIGN STUDIO

The author has been teaching the urban tissue design studio for the fourth grade of the undergraduate students for these three years. The students first survey and analyze the existing theme of the areas along the city planning road “Ring Route 2”, also known as MacArthur Road, in the Shimbashi - Toranomon district of Minato-ku, Tokyo and make a district plan and design guidelines that embody aesthetic urban planning and environmental design. The aim of the studio is to learn a design method for reorganizing an existing urban environment by unifying the architecture, city planning, civil engineering and landscape design. Design guidelines for the area will be drafted and their effectiveness will be tested by using them in a schematic design.

During the course of this studio, students were encourage to interview local government representatives, university researchers and people who live and work in the area to obtain a variety of opinions for the urban redevelopment. Also the result of the students’ studies was presented to the landowners of the districts for the discussion among student and local people.

The Shimbashi - Toranomon district, which is located between the Kasumigaseki governmental district and the Shiodome business district in Tokyo, is expected to become a new business zone after the completion of a new city planning road. The students analyze the future potential of this area for business and residential functions by making the three-dimensional perspective views and models of the blocks that show the various alternatives for future city spaces.

The author has taught the students the Open Building theory in their third grade, which means one year prior to this studio work. This studio gives them the opportunities to implement their knowledge and to deepen their understanding of the Open Building theory.

1.1.1 Purpose and background of the studio

The economic growth that occurred in Japan after the end of World War II has led to the emergence of cityscapes dominated by huge high-rise buildings, but often without beautiful scenery and community spaces. This is because architecture, city planning, civil engineering and landscape design have become too specialized and there has been no integrated, holistic approach to the design of urban environments. The students were encouraged to study the areas along the city planning road “Ring Route 2”, also known as the MacArthur Road, in the Shimbashi - Toranomon district of Minato-ku, Tokyo, in an effort to draft a district plan and design guidelines that embody aesthetic urban planning and environmental design (Fig.1).

It has been common for the areas adjacent to a new city planning road to be developed haphazardly without any coordination between architectural design and civil engineering design, with the inevitable result of inferior public spaces and greenery. By reflecting on conventional environmental design, the students were required to establish a design method for reorganizing an existing urban environment by unifying the architecture, city planning, civil engineering and landscape design.

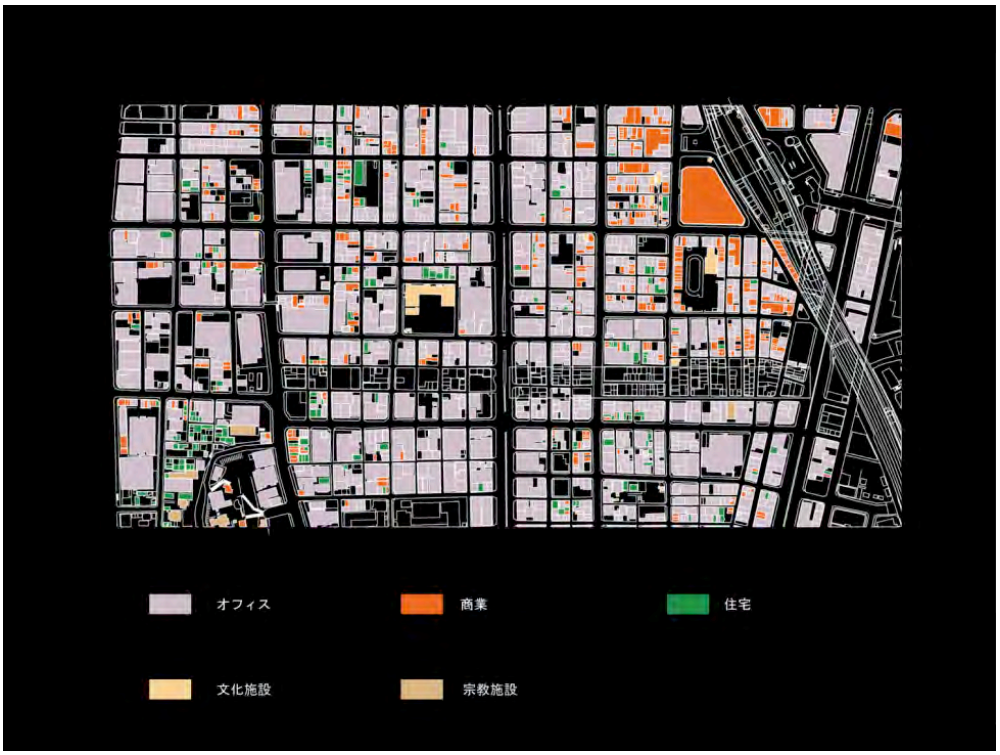


Figure 1.1 Present land use in Shimbashi

The aims of the studio are to obtain the knowledge and skills in the following areas:

(1) The design method based on the shared theme of the blocks.
(2) The design of long life buildings which will be a part of the social infrastructure.
(3) The reconstruction of the urban environment based on the local geography, ecology, history and culture to meet the future needs of the area.
(4) The renovation and activation of the existing building stocks and public spaces.
(5) The relationship between architectural design, city planning, civil engineering and landscape design.

Based on the knowledge and skills mentioned above, the students were expected to design sustainable buildings and city spaces which will be suitable for a carbon free society in the future.

1.1.2 Guidelines to be used for each building design

Each group of students first surveyed and analyzed the existing theme of the areas along the new city planning road “Ring Route 2”, also known as MacArthur Road, in the Shimbashi - Toranomon district of Minato-ku, Tokyo. They drafted design guidelines that embody aesthetic urban planning and environmental design for the two blocks which they selected for their design works. Each student individually designed a building according to the design guidelines drafted by themselves. The effectiveness of the guidelines was tested by using them in a schematic design. The students were required to decide by themselves the most suitable size and use of the building for each site.

The rules that could be set for the design guidelines are as follows:

1) Rules for buildings
A. Rules for external wall easements
Ex. Along MacArthur Road: Walls may be no more than 6.0m high and must be set at least 1.0m away from the roadside, or at least 3.0m away when the ground level is used as a pedestrian arcade.
B. Maximum building height:
Ex. The maximum height of buildings should be no more than 30m to maintain harmony with existing neighbouring buildings.
C. Building use:
Ex. Commercial uses are recommended for the lower floors of buildings facing MacArthur Road and offices and/or residential uses for the middle and upper floors.
D. Position of doorways of buildings:
Ex. The doorways of houses should be located away from the main street to secure privacy and security.
2) Rules for the street space
A. Create an active margin:
Ex. The spaces of the lower part of buildings along the pedestrian walkway will be used for creating turnout, such as with open air cafés.
B. Create a vibrant atmosphere for the pedestrian walkway
C. Plants and street furniture:
Ex. Arrange rows of plants within 5m of the roadside at each site. Install street furniture along the street.
3） Other Rules
A. Underground parking network:
Ex. Connect the underground parking areas in this area in order to facilitate the road traffic on the ground level and reduce on-street parking.
B. Restrictions on signboards:
Ex. Neither roof signboards nor overhanging signboards should be installed along MacArthur Road.
C. Walls, fences, gates and signboards which may obstruct traffic and block out the cityscape should be restricted.

1.2 STUDENT’S WORKS

In 2008, more than 70 students took this design studio. The author introduces some of the best examples of their works below.

1.2.1 Students’ Works-A: Pedestrian walkway covered by trees

The students established a design guideline that requires for each building to have a bridge to connect building and the pedestrian walkway in the middle of MacArthur Road. The Tokyo Metropolitan Government design of MacArthur Road on the other hand has wide traffic lanes in its centre. Students proposed to make the road into a pedestrian walkway covered by trees. The author will show the students’ proposal to the government in the near future.

Figure 1.2 and 1.3 Students' design (left) and
the design of the Tokyo Metropolitan Government (right)

1.2.2 Students' Works-B: The control to the facade

Most of the students established design guidelines for the buildings along MacArthur Road which control the building height and the dimension of the setback of each building from the road. They often suggested the ground floor and the first floor of the buildings should be used for commercial uses to make the street livelier, the middle part of them should be used for offices and the upper part should be used for residential use to allow people to live in the city. By giving a freedom of design within the shared design guideline, the students have learned how to design a rich built environment which has variety and uniformity at the same time. The author has been trying to teach the Open Building theory in a practical and easily comprehensible way in this studio, without using the technical terms of the Open Building theory. Students learned the theory through practice.

Figure 1.4 – 1.7 Examples of the façade design by the students

1.2.3 Students' Works-C: Acupuncture the existing building stocks to activate the city

Some students realized the importance of activating the existing building stocks in the back of the newly built MacArthur Road. A group of four students selected the four most important buildings around a square just behind MacArthur Road and rebuilt them into new buildings which make this area more active than present.

Figure 1.8 and 1.9 Proposal for the backs behind the MacArthur Road

1.3 CONCLUSIONS

The students studied the geographical and historical characteristics of the areas and analyzed the historical development process before they started their design works. They also investigated the present situation of building stocks through fieldwork to find suitable buildings for reuse and conversion. The design guidelines for the area were drafted and their effectiveness was tested by using them in the schematic design.

This design studio tried to remind the students the importance of the shared theme in the design of city architecture. The students drafted the guidelines by themselves and tested them in their individual design work. They were able to understand the relationship between the shared agreements for the urban design and the individual building design. Some students became frustrated because it was not easy to find agreeable guidelines between the team members or the design guideline which they drafted did not control the design of each building very well.

The Open Building theory has been questioning the relationship between the urban tissue design and building design. This theory has also been considering how architects can work together by sharing themes of the urban tissue. Professor Nicolas John Habraken investigated this topic through the "Grunsfeld Variation" workshop while he was teaching at MIT. The design studio in which the author was enrolled was for the under graduate students and the period of time for the students to work was only two months. While realizing this studio required many improvements, the author believes it offered a lot for the students to learn, especially for acquiring a better way of designing a contemporary built environment.

1.4 REFERENCES

Minami, K., 2007, A Study of the Urban Tissue Design for Reorganizing Urban Environments -A Case Study of the Shimbashi Areas of Tokyo, Building Stock Activation 2007,

The Architectural Institute of Japan, 2006-2007. The Development and Control of City Architecture Vol.1-3. Tokyo, The Architectural Institute of Japan.

The Open Building approach as an alternative to Brazilian social housing context[1]

Denise Morado Nascimento[i]
Thais Mariano
Nassif Salomão[ii]

[i] Department of Architecture, Universidade Federal de Minal Gerais; Rua Paraiba 697, Belo Horizonte, Minas Gerais, 30130-140, BRAZIL, dmorado@arq.ufmg.br
[ii] thaisnassif@gmail.com

ABSTRACT

Brazilian contemporary architecture (and, naturally, Brazilian schools of architecture) has not critically analyzed the mass housing production presently provided by the public power as *the solution* to the housing shortage in the Brazilian cities (around 7 millions of dwelling units, essentially in urban areas). The housing conditions in Brazil reflect the unequal income distribution – as excluded part of the formal market the poorest urban population is compelled to occupy residual areas of the formal city. The government approach towards *favelas* has slowly evolved, since the beginning of the last century, from expulsion or removal programmes to urbanization interventions, both strategies followed by mass housing production policies. Still, in contrast to such *answers*, the poorest urban population seems to live into the natural relationship between human beings and environment described by John Habraken. In spite of all the physical, environmental, economic and social problems, *favelas* are an example of coherent housing (auto) production processes where dwellers autonomously decide about the design, building and use of their dwellings. At the same time, they are usually linked to a strong sense of community no longer found elsewhere. Latest efforts to improve the *favelados*' quality of life have been taken place, all still based in the mass housing production models (which has been proved to be a serious misunderstanding of their *way of living*. This article intends to expose the negative impacts of the present mass housing production model. Then to analyze the possibilities of a coherent alternative to *favelas* based on the Open Building concepts and design methodology, which can consistently improve the dwellings and the built environment (considering their physical, environmental, economic and social dimensions). And, finally, to incorporate such possibilities as design strategies to be applied in the graduation course of Architecture.

Keywords: Housing, Brazil, *Favelas*.

1.1 HOUSING PRODUCTION IN BRAZIL

Brazilian cities welcome diverse *ways of living*, which are less determinated by social actions than by unequal economic conditions of their inhabitants. Despite this, since the beginning of the twentieth century, public institutions have interpreted the degradable reality of the housing conditions of the poor people merely as a *housing deficit.* In 2000, the families earning up to 3 minimum wages represented 83.2% of the urban housing shortage in Brazil, estimated around 5.3 million urban units (Ministério das Cidades, 2004).[2]

Statistical bodies' methodologies are still guided by the idea that housing shortage has been built upon "the sudden rush of population to the big towns". Such understanding is extremely criticised by some researchers who are mainly based in Engels' thoughts (1872): "to make an end of this housing shortage there is only one means: to abolish altogether the exploitation and oppression of the working class by the ruling class."

If it seems necessary to recognize that economic rules and socio-political structures (all imposed by the capitalist mode of production) define the housing production in Brazil we can't also deny the architects' subordination and alienation (or significant part of them) towards the issue. United Nations estimate that 90% of the buildings in Latin America are built without any orientation from any architect (Ghirardo, 2002).

Since the Modern Movement, the Brazilian social housing production has been guided by the minimum unit concept[3], created then, in order to fulfill the *dream of home ownership*. The architectural solution to the

chronic housing *crisis* refers to a hygienic, generic, repetitive, rationalized and reduced space (25 to 45 square meters), inserted into a lucrative logic mode of production derived from the private building investors, promoted by the real estate market and defended by the housing authorities. Nevertheless, the low priority given to social and political matters by the field of architecture also indicates that the architects' incapacities and restrictions are an indirect consequence of the action of those agents.

Such market-driven production has been possible only because of the home ownership strategy, which has actually served to relieve the State of regulating, producing and financing low-income housing and to empower the major building companies and the building industry. Besides, there is a wide (and mistaken) understanding by both building companies and State that financial resources and administrative procedures, which basically aim at the control of design and production processes, are sufficient to diminish the housing crisis.

Politically justified by the significant presence in the national economy (13% of the GDP – UNC, 2006) and the economic growing need (generation of profit, jobs and tributes), the Brazilian building sector has been committed to access project management models, information technology, and financial institutions' resources. Paradoxically, the sector seems to deny its scenario marked by:

- derisory wages of the building site workers;
- conflicts between the design and the production phases;
- reduced participation of architects and other designers who have complete understanding of site construction;
- technological delay and predominance of craft techniques;
- lack of collaborative maturity and of information patterns.

On the one hand, the efforts made by the building sector are simply centred in the cost reduction of the design and production processes and the increase of productivity on construction site, which guarantee the market survival. On the other hand, they exclude the possibilities of dwellers to participate in the decision-making processes, disable the architect participation as a mediator between designer, builder, dweller and public sector and reinforce the distance between the architect and the construction site.

Clear mistakes remain. Housing crisis gets worse in Brazil (at least from the deficit standpoint) because economic and political power of specific groups has been strong enough to prevail specific needs (and not the ones determined by poor families). The building sector's economic growing and the Brazilian industrialization have been mistakenly grounded by obsolete technologies, forced modernization and high-income concentration. Our point of view is that public actions and social housing programmes have been expectedly derived from the bargain power of privileged citizens and sectors (who determine the political actions) rather than dwellers' social structures and needs (and their social logic of the space). While private building investors, real estate market, housing authorities and architects promote hygiene, economy, rationality and standardization, the social, cultural and economic functioning of the Brazilian dwellers is completely despised. It seems that housing is a temporary and a statistic problem to be solved or a generic process to be controlled with no dialectic relation to the social and political order.

Due to all these, two housing production movements have been historically crystallized in Brazil: the housing *verticalization*, which is regulated by the State, and the housing *peripheryzation*, which is neglected by the State. The first one is connected to the private investors, real estate market, housing authorities and architects – the mass production; the second one is derived from the direct action of the user – the autoproduction. Mass production means to conceive (design and build) houses with few or any participation of people who occupy them. On the contrary, autoproduction arises when dwellers decide where, when and how to build their own houses (the design process may even not exist).

Taking the city of Belo Horizonte as an example, this paper seeks to show that mass housing production model is still the answer for the Brazilian housing shortage regardless its negative impacts to the dwellers and the built environment. Then, to analyze why we must learn lessons from autoproduction – here, *favelas*.[4] After all, to clear how Open Building can be a possibility to link the production capacity from the building sector, the administrative role of the housing authorities and the design strategies yet to be taught in the Brazilian architectural schools. The main aim is to view that the dwellers must (and can) be part of the whole decision-making process concerned to their homes.

1.2 HOUSING PRODUCTION IN BELO HORIZONTE

Belo Horizonte is situated in a hilly area, grew on the basis of a *grid scheme* of wide avenues crossed at right angles by streets. Although many macro-scale modifications are made since the 1940's, the original plan did not support the rapid urbanization process and, not surprisingly, informal dwellings spread by the risky hills.

Just in the beginning of the 1990's, *favelas* are recognized by the public power as an urban structure formed by citizens (not anymore as a *disease* of the formal city; such point of view sustained removal policies for decades). Since then, the local housing authority, *Urbel*, has faced the increasing community organization forcing some important improvements, such as land possession, paving, and drainage and sewage disposal.

However, self-built houses' production is not seen as a result of social and technical processes capable of not only teach how to consistently answer social, cultural and economic constraints of the poor families but also to reduce production costs. It must be recognized that around 50% of housing production in the Brazilian metropolis is carried by dwellers who take decisions about where and how to build their houses with no participation of architects, builders, engineers or designers (Motta, 2005). Besides, autoproduction consumes 55% of the national cement and more than 50% of the national building industry's products (Grassiotto, Grassiotto, 2003).

Dwellers build their houses, by themselves (usually during weekends with some help from neighbors, family or friends), assuming a never-ending process since they modify, enlarge or rearrange the houses according to their social and financial needs along time. Every decision, concerning design or construction methods, is taken based on feeling, tradition or previous experience; most solutions are improvised, a process considered eminently Brazilian, which naturally reflect an organic and harmonic shape but also spontaneous beauty.

Nevertheless, following a completely backwards direction, *Urbel*'s proposal to housing demands refers to an identical, repetitive and poorly designed minimal buildings, in which dwellers are expected to remain *frozen*. As Habraken (1999) said, it is an offense to human freedom, individuality and dignity.

1.3 CONCERNING PUBLIC POWER

Since the end of the dictatorship in the 1980's, the expression *popular participation* has become frequent in Brazilian public administrations as a synonym of an open and a democratic government. Nevertheless, rather than simply accepting the political discourse, it is important to distinguish if political action has actually interrupted the present housing market logic in order to increase individuals' autonomy towards the production of space.

In 1994, Belo Horizonte's City Hall implanted an agenda, named *Orçamento Participativo da Habitação* (OPH), aiming to essentially make the discussion around the municipal housing production democratic through an interlocution channel in which people have a say on where or how to distribute its local annual budget. The public discussion involves four parties: 160 homeless organizations representing 32.000 families, local housing authorities, homeless nucleus' delegates and the OPH's commission. The financial resources for OPH come mainly from the federal government (through the *Plano Nacional de Aceleração*) and the federal governmental bank (named *Caixa Econômica Federal)*. The resources are distributed following different criteria but mainly according to the communities' characteristics, their demands and income; all monitored by the local housing council and *Urbel*. The agenda is not only considered an important collective advance but also a national model.

However, a closer analysis reveals it is still far away from being capable of promoting people's autonomy to effectively interfere in the housing production processes. In the cases of houses for families living in risky areas, *Urbel* still insists on presenting models derived from an *unchangeable* design, resulted from the formal, constructive and technical determinations of the building sector or of the formal city. Or, in other words, it is not understood that social housing dwellers don't demand ready-made products with no possibilities to absorb social and physical changes through time.

The spatial dimension doesn't result of a "socio-spatial dialectic" relation meant by Soja (1993) in which "people make places and places make people" (Borden *et al*, 2002). Doing so, *Urbel* answers the mass production guidelines (structured walls, repetitive components and mass products, hierarchical spaces, low wages to site workers, craft techniques and, consequently, significant building material waste). Its housing strategies may turn to be an important path for consumption expansion. Tied up to the mass production, *Urbel* values the building industry capital through the demand of specific industrialized construction components and mechanized design and production processes, mostly defined (and controlled) by the building sector.

Figure 1.1 *Urbel*'s buildings are usually set in artificial plateaus in *favelas* revealing that the steep topography and geomorphology of each site are underestimated. The wide streets are designed as they are in the formal city. Photo credit: *Urbel.*

No doubts that not only *Urbel*'s but mainly the City Hall's major plan for *favelas* (named *Vila Viva* – Alive Village) allow significant achievements: land regularization, infra-structure-services, public equipments (health centers, schools, sports arena, parks), workforce training, all set by an important (even it is not wide) participative interaction between citizens and public power. The whole *Vila Viva* plan in Belo Horizonte, with 2.400.00 population, intends to benefit 125.000 people, which means 25% of the whole *favelas*' population.

But, mistakenly, other aspects are absolutely ignored in order to prevail the simply massive quantity of built houses: such as, the unacceptable conditions of the construction workers on site, the unthinkable use of light construction components, the effective promotion of users' autonomy, the possibility of housing design individualization and the financing desborucratization. Mainly, the present participation process doesn't allow people to actually interfere or alter the design and building processes but only to choose between a pre-defined typology (2 or 3 bedrooms) or a financial compensation (which would be probably used to move to another *favela*).

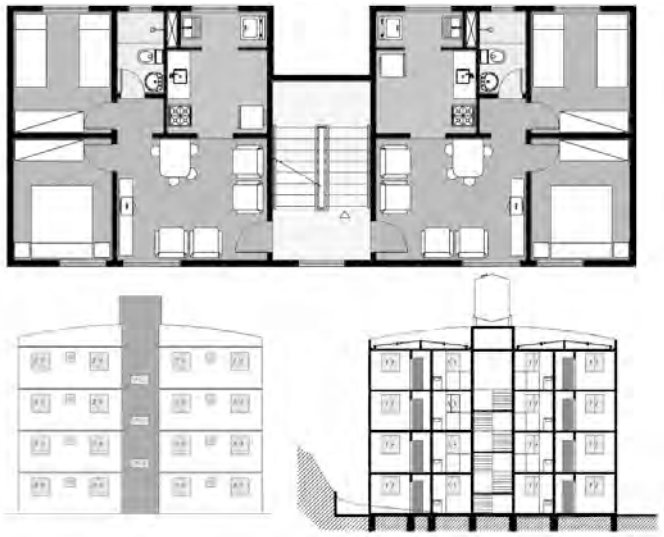


Figure 1.2 *Urbel*'s typology of 2 bedrooms: the buildings are four floors high, built with concrete blocks with no possibility of previous interference or posterior design changes. Each unit costs R$38.000,00 (around US$23.500,00). The dwellers do not pay for the flats since, in this case, the dwellers come from risky areas. Source: *Urbel*.

Along the entire participative process, the effective population participation is mostly indirect and remains around a deliberative (but not alterable) process, in which people are heard without real guarantee of being answered. The illusive participation and its result of limited concessions are evident compensatory and manipulative policies, which might be used to guarantee social stability and to sustain a democratic image of the State. The decisions continue to be taken not by the user but by the government and its technicians within a fake participative mask.

Our point of view is that gradual, continuous and adequate investment in the dwellers capacity of dealing with their needs must be reinforced. In order to do so, we believe Open Building methodology can be applied through the design and building processes organization but mainly through the possibility of a balanced intervention of the participants in the decision-making processes – first dwellers, then architects, builders, designers, building sector and public power.

Nowadays, the architect is hired to design a residential scheme, which is, most of all, determined by the building company's guidelines, the City Hall's legislation and the building sector's techniques. There is no need of (or pressure on) architects thinking about base building and fit-out since no capacity for individual choice at the infill or fit-out level are even considered. Nevertheless, we must, first of all, turn to the architectural education.

1.4 CONCERNING ARCHITECTURAL EDUCATION

The housing problem in Brazil, essentially the so-called social housing, has been an important target of many academics concerned about efficient and coherent design, production and occupation processes. However, the real contributions from architecture, as a knowledge field, has been extremely reduced when considering the dialogue between architects and all other housing processes participants – users and communities, local government, council housing, building industry.

The architects, while co-responsible for the task of building the city, distance themselves from the economic, social and political reality. The absence of that understanding explains the submission of the field to the rules of the real state market and the political institutions. In this context, the quality of production of those architects confirms their ties and submission to mass production. On the contrary, the architects able to articulate the language of rupture make the *drawings* more important than the construction of the buildings. Architecture (and naturally the architectural schools) constructs itself through individual attitudes, and it shows incapable of understanding the world collectively. The problem is also linked to the extreme utilization of intuition, imagination and guessing capacity instead of a conscientious and rational use of the architect intelligence and the technical knowledge.

In Brazil, architecture has been built upon the divorce between the design/proposal (theory) and the construction/realization (practice). But how this scenario could be changed? Our point of view is that the university is the potential space for changing architectural practices.

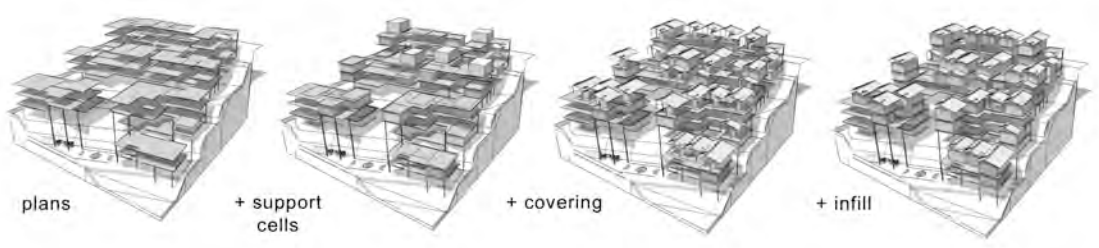


Figure 1.3 Social housing proposal to Belo Horizonte. Final Course Design developed by Luciana Pietra and supervised by Prof. Denise Morado (Architectural school of UFMG).

Perhaps what is most important is to direct the production of interdisciplinary knowledge by means of bringing architecture closer to other areas through an interaction approach with the social and political arena. Then, the architect should be formed as a mediator between not only the political and representative parties but also the technical ones, all involved in the decision-making process.

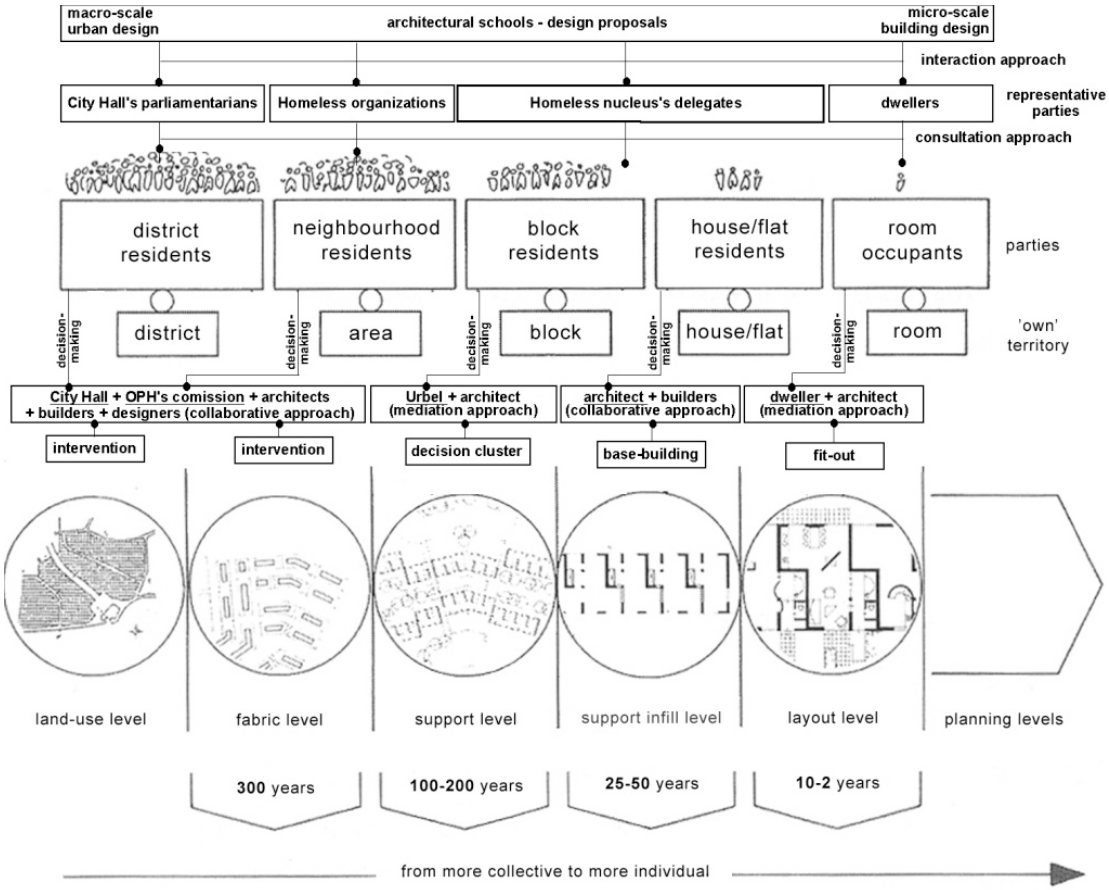


Figure 1.4 Adapted diagram of environmental levels – Open building approach to social housing context in Belo Horizonte.

Besides, any of the approachs above can't be accomplished if design-teaching methods and the disciplines' premises in the architectural schools don't converge towards the design and building processes to be developed in two different intervention phases (base-building and fit-out) and the following guidelines:

Table 1.1 Trends towards Open building versus architectural schools' understanding of social housing

Open Building (Source: Kendall, Teicher, 2000)	Social housing (defined as)
• the reemergence of a changeable and user-responsive infill (fit-out) level	• housing design individualization • flexible housing
• the infill may be determined or altered without affecting the support	• abandonment of waste culture • listening to workers on site
• design methods are based on new insights and supported by research	• a social space, which constantly changes and evolves
• OB projects are structured to subdivide technical, aesthetic, financial and social decisions into distinct levels of decision-making	• dwellers are part of the decision-making process • approximation to political and social sciences
• transformation may be occasioned by occupants' changing requirements or preferences	• autoproduction is a lesson to be learnt • different social arrangements
• minimize the interference and conflict between subsystems and the parties controlling them	• not a drawing but a product to be built • approximation to engineering
• enabling the substitution or replacement of each part during design, construction and long-term management	• modular coordinated answer • base-building: a collaborative design between architecture and engineering

• enables broad consumer choice in laying out, equipping and finishing spaces.	• base-building allows different physical arrangements
• households work with an infill architect	• complete understanding of site construction
• OB dwellings need not cost more than conventional units	• rational (but not repetitive) design
• new building technologies and materials are being produced to suit OB practice	• use of light construction components
• building standards, regulations, financing and management are adjusting in ways compatible with OB practice	• collective answer to dwellers, and not to the building sector demands or the political institutions' wishes and also the housing authorities rules

Considering the environmental levels proposed, we could affirm that Open Building practice could allow:

- architectural schools to guide students as enablers rather than drawing authors;
- the building sector to develop infill and support components;
- small building companies to be inserted into the present privileged real state market;
- housing authorities to meet other solutions to the housing crisis.

1.5 REFERENCES

Borden, I. *et al*. 2002. The Unknown city: contesting architecture and social space, (Massachusetts: MIT Press).

Engels, F. *The housing question*. Available at <http://www.marxists.org>

Ghirardo, D. 2002, *Arquitetura contemporânea: uma história concisa*, (São Paulo: Martins Fontes).

Grassiotto, J. de A., Grassiotto, M. L. F., 2003, Habitação social em São Paulo: alternativa em análise. In *Semina: Ciências Sociais e Humanas*, Vol. 24 (Londrina: Universidade Estadual de Londrina), 131-140.

Habraken, N. J. 1999, *Supports: an alternative to mass housing*, (London: The Urban International Press).

Kendall, S., Teicher, J. 2000, *Residential Open Building*, (New York: E & FN Spon).

Ministério das Cidades. 2004, *Política Nacional de Habitação*, (Brasília: IBGE).

Motta, D. M. da, 2005, Regularização de Áreas Urbanas Informais. In *Proceedings of 2ª Conferência das Cidades*. (Brasília: Ministério das Cidades).

Soja, E. W. 1993, *Geografias pós-modernas: a reafirmação do espaço na teoria social crítica*, (Rio de Janeiro: Jorge Zahar Editores).

UNC – União Nacional da Construção Civil. 2006, *A Construção do Desenvolvimento Sustentado*. (São Paulo: UNC). Available at <http://www.institutodeengenharia.org.br>

1.6 NOTES

[1] This article resulted from Open Building research, developed by the authors into the group *Morar de Outras Maneiras* – <http://www.arq.ufmg.br/mom> (Living in Other Ways), carried in the Architectural school of *Universidade Federal de Minas Gerais, Belo Horizonte, Brazil*, and financially supported by Fapemig.

[2] The rural deficit is around 1.2 million units (Ministério das Cidades, 2004). Brazilian minimum wage is R$415,00, which is around US$255,00 (US$1 = R$1,65 – cotation of June 2008).

[3] The Brazilian architects reproduced the 1929 CIAM (International Congress on Modern Architecture) guidelines about the use of the minimum space. The Latin American representative in the congress brought such strategies to Brazil, the Ukrainian (but living in Brazil) architect Gregori Warchavchik.

[4] There are 3.905 *favelas* in Brazil, which represent 1.650.548 families or units (28% of the Brazilian population). However, 10 million units lack adequate infrastructure services (Ministério das Cidades, 2004).

Dynamic Usage of Space in the Javanese Architecture Year 1921-2007

Mohamad MUQOFFA

Department of Architecture, University of Sebalas Maret, Surakarta, Indonesia, mmuqoffa@yahoo.com

ABSTRACT

The study tries to reveal the dynamic usage of space in the domestic Javanese Architecture in which the space of the house are able to cater for the ever changing activities of the inhabitants, to include the more dominant role of women.

The study area is a very old traditional settlement of the batik industry called Kampong Laweyan located in the city of Surakarta, Central Java, Indonesia which started during the 19th Century.

The method used in the research is explorative and qualitative method. The changing use of space observed in the Javanese houses also includes houses of the batik industry workers.

The result shows that during the period of 1921-2007 the house spaces remain constant, while the activities of the dwellers changed, from household activities to home based batik industry's activities. The study shows that the Javanese Architecture can be seen as open building and adaptable to dynamic changes of space usage.

KEYWORDS: **dynamic usage of space, houses, open building, the domestic Javanese Architecture.**

1.1 INTRODUCTION

Based on cultural history, Surakarta or Sala or Solo (Figure 1.1) was an aristocratic city separated into the inner city and outer district. A sociologist, Soemardjan (1981) and an archeologist, Adrisijanti (2000), suggested that segregation based on to cosmological concept divided Surakarta to some conceptual spatiality, i.e. *nagarigung* (centre, inner city) and *mancanegara* (outer district). There are some heritage areas in *nagarigung* district for example: Kampong Kauman, and Kampong Laweyan. Kampong Laweyan has grown into a settlement of batik industry in the early 20th century. Kampung Laweyan, an ancient district in Surakarta, is well known for its home based batik industry. It is a heritage area with vernacular Javanese architecture. As a heritage settlement, the vernacular architecture within the settlement should be preserved. However the development programmes and the increasing needs of the settlement's dweller may affect the design of the Javanese houses.

In order to keep the Kampung Laweyan as a heritage area, special attention must be given to the approach to sustain the vernacular Javanese architecture.

Figure 1.1 City of Surakarta in 1938 where Kampong Laweyan is located in South-Western
[Source: Library of Mangkunegaran]

1.2 THE JAVANESE HOUSE

Omah (house) is the most common of several Javanese words meaning house. The word *omah* symbolises a particular concept as well as the dwelling where, domestic practices mainly take place (Santosa, 2000). The *dalem* or noble's house is usually a complex of buildings which consists of two until four buildings and it is surrounded by a high wall. Each building has a different type of Javanese traditional architecture, i.e. *pendhapa*, *dalem*, *gandhok*, etc (Figure 1.2). Almost all of the *dalems* have a gate (or two gates), through which one passes to enter the *dalem*. The orientation of *dalem* is always north-south orientated. The users of *dalem* are usually the noble and his family, and also *abdi dalem* (servants) and his family. *Abdi dalem* usually lives in the *magersari*. The *magersari* is a symbiotic relationship of mutualism between the *abdi dalem* and the noble's family. The users of the *magersari* can be divided into two groups: the *abdi dalem* (noble's servants) families who live and work, and the noble's family whose members belong to the *priyayi* (the higher Javanese communities).

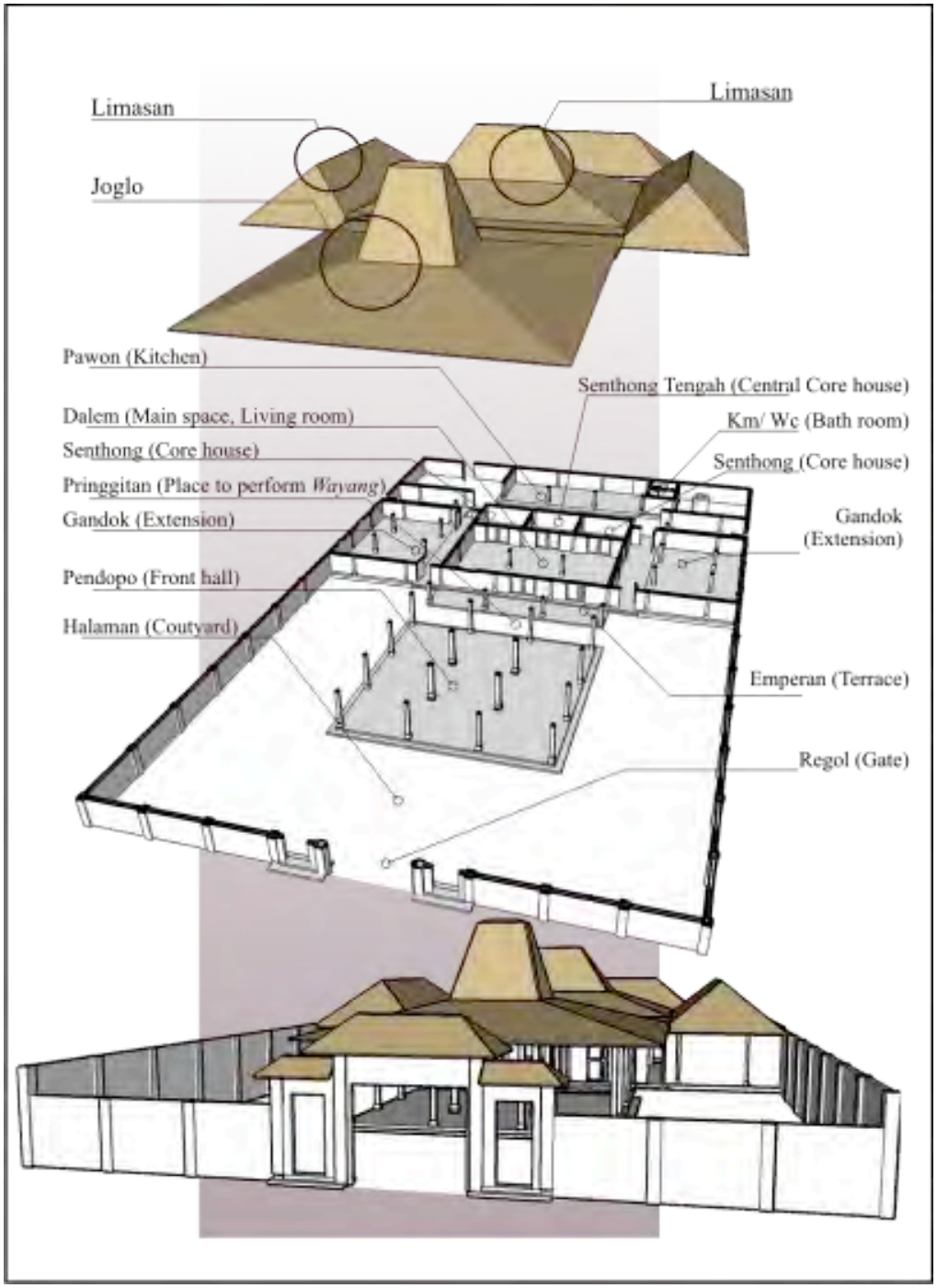


Figure 1.2 Basic Concept of Form and Spatial Pattern of the Javanese House

The Javanese houses as research samples are typological of Javanese house which refers to some of traditional manuscripts on the Javanese house (*Kawruh Griya, Kawruh Kalang*), i.e.: Javanese house is a house which consists of a specific expression or form, i.e.: *Joglo, Limasan, Kampung*, and *Mesjid* (Prawiro, 1969). The Javanese house is a large settlement and the houses are of wood's construction (Kridosasono, 1976). According to the Javanese house's theories mentioned above, it can be mentioned here that the Javanese house is a house (*omah*) which consists of *pendhapa* (front hall), *dalem* (main space, living room), and *gandhok* (extension building, attached/side pavilion). The Javanese house also has a specific roof typology such as *pelana* (*kampung*), *limasan*, *joglo*.

1.3 OPEN BUILDING AND LEVELS OF SPACE THEORIES

This study relate to analysis of open building context. Prof Kendall (http://www.open-building.org/ob/concepts.html, 2008) stated that Open Building is an approach to the design of buildings that is recognized internationally to represent a new wave in architecture, but a new wave with roots in the way ordinary built environment grows, regenerates and achieves wholeness. In the open building issue, architecture or built environment can be developed into dynamic ways: for both stability and spatial arrangement changes.

The theory of levels of space in relation of control of space by people indicated by Habraken (1976) can be used in the analysis of dynamic usage of space in the Javanese architecture.

1.4 RESEARCH METHOD

The method used in the research is explorative and qualitative method. Firstly, the survey was conducted to investigate the Javanese houses. The Javanese houses as samples are chosen by purposive sampling. Looking at the domestic practices and batik industry over a substantial periode of time from 1921-2007, samples chosen are at least seventy five years old and have been inhabited at least by three generations, thus these houses have accommodated their inhabitants' entire life cycle. It is also considered that the originality of the Javanese house embodies cultural sensitiveness.

Twelve Javanese houses were chosen for case-study. The method used was deep-observation, and data gathering from a variety of the inhabitants' entire daily-life activity. For data cross-check and information, physical-traces and interviews with informants i.e. a person who has authority, were done.

1.5 SURVEY RESULTS

Kampung Laweyan inhabited by the batik producers and built during the 17th (Rajiman, 1984) is one of the heritage places in Central Java. The settlement pattern is unique with the historic mosque and Javanese architecture. Figure 1.3 shows the settlement pattern of Kampung Laweyan. The Settlement is bordered by a river and the pattern is a combination between linear and grid patterns. Most of the houses were built on north – south orientations. The Settlement supports the inhabitants in their everyday lives and economic activities as batik producers through generations. Hence Kampong Laweyan is a living heritage, where the authentic Javanese houses still exist. The dwellers sustain their traditions and the vernacular houses, and obtain their incomes by using the houses as a place for the batik industry.

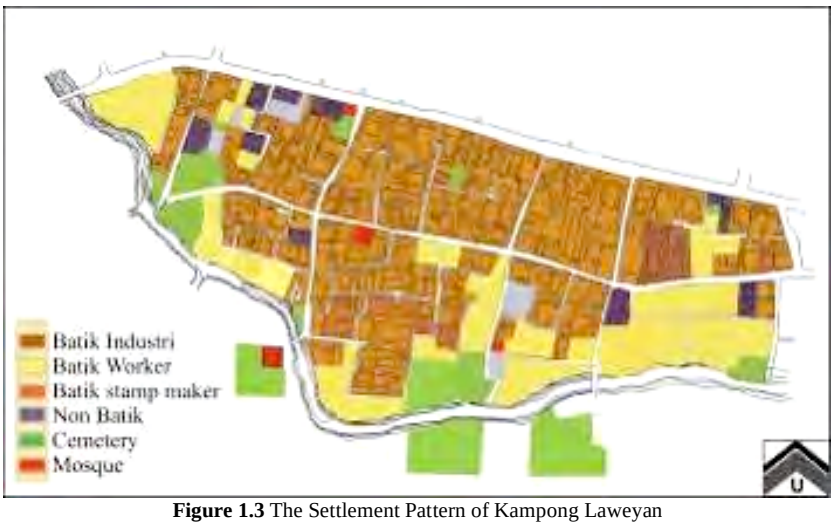


Figure 1.3 The Settlement Pattern of Kampong Laweyan

Figure 1.4 shows the original plan of the Javanese house and Figure 1.5 shows the continuity and plan changes of the Javanese house. According to the dweller, the house was built in the 19th century. Since then the house was used for batik processing. Due to facilitate the need of batik's industry, the dweller re-arranged this house i.e. covering the *pendhapa* (front hall) with walls, and changing it into the batik showroom. The usage of

dalem (main space, living room) is for batik packaging. The *gandhok* (extension building, attached/side pavilion) becomes the living room, bedroom, and office. Other building extensions at the right wing are for the garage, kitchen, dining room, and sleeping room.

Figure 1.6 and Figure 1.7 show the pictures of the house when the research was conducted from 2006-2008. From Figure 1.6 one can see that the house has a spacious front space, called "*pendhapa*" (front hall). This space and the front yard is usually used as a place for batik making activities done by the women. The inner of the house, called "*dalem*" can be used for the other batik craft activities and storing of the products. The everyday life activities are at the left wing of the house and have also been extended to the right wing of the house. The local wisdom such as the arrangement of the house spaces and the yards are still preserved, and proved to be very useful for home based industries and for everyday lives. This arrangement shows the changing of space at the dwelling level, but not at the block level.

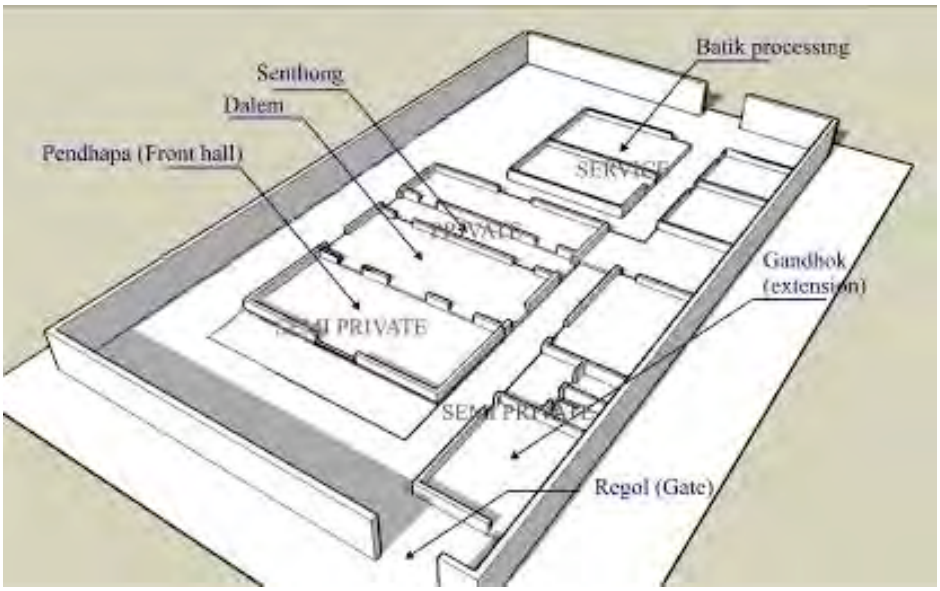


Figure 1.4 Sample [A] of the Javanese house: Original plan.
The figure shows that the semi private spaces are *regol* [gate], front yard, *pendhapa*. The private spaces are *dalem*, *senthong* and *gandhok*.

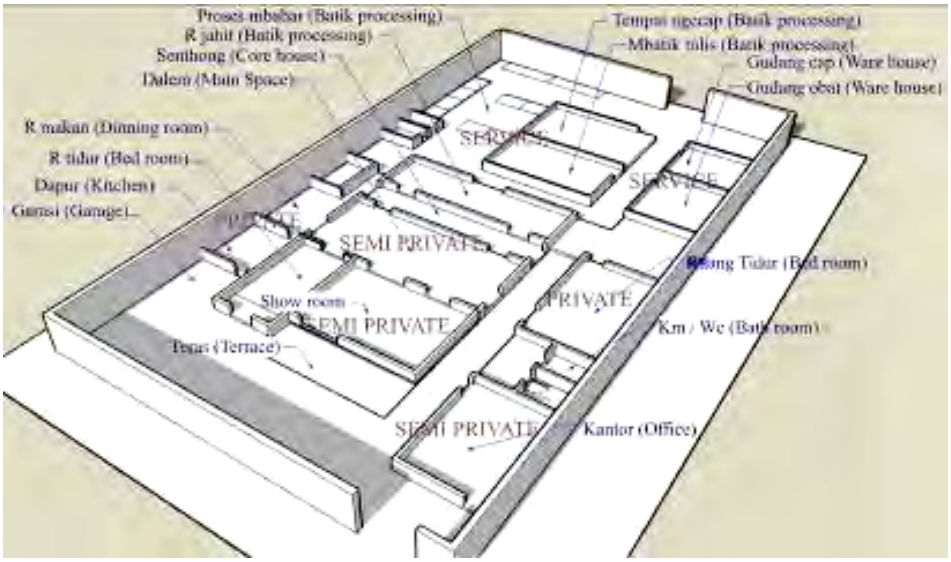


Figure 1.5 The Present Plan of sample [A] of the Javanese house.
The figure shows that the changes are *dalem* becomes semi private space because it is used as the showroom and batik packaging; and the *pendhapa*-the front hall for receiving guest now becomes the batik showroom. The stability is shown from the *senthong* as private space, and batik processing as the service area.

Figure 1.6 The picture of Javanese house showing the front yard and pendhapa (as batik showroom)

Figure 1.7 The *Dalem* (main space, living room) as batik packing place and showroom.

Figure 1.8 shows the original plan of sample B and the changes in space usage can be seen in Figure 1.9. Basically the house has no significant change even though it must be divided for two families, due to the increasing number of families settled in it. The house divided by semi-a permanent wall (block-wood). At the present time, the batiks activity is not continued. Nowadays the dwellers only sell the batik but not produce it. Based on the dwellers information most of the houses are not utilized. All of the dwellers live in the *gandhok* (extension building, attached/side pavilion). For temporary (semi-permanent) activities, they use *pendhapa* and *dalem* for example: for marriage ceremonies, religious activities (*pengajian*) etc. Figure 1.10 and Figure 1.11 shows the *pendhapa* and the *dalem*. The dynamic usages of the spaces in the houses prove the Habraken (1976)

theory that the Javanese house will be changed depending on how dwellers need to use it even though it has stable structure.

The "*pendhapa*" is usually open, without walls. However, due to some of the dwellers need places for storing, the "*pendhapa*" was then closed with a bamboo curtain. Most of the houses in Kampong Laweyan were built about 200 years ago, and were occupied by 3 or 4 generations. The houses can be seen as memories to the dwellers and also to the observers.

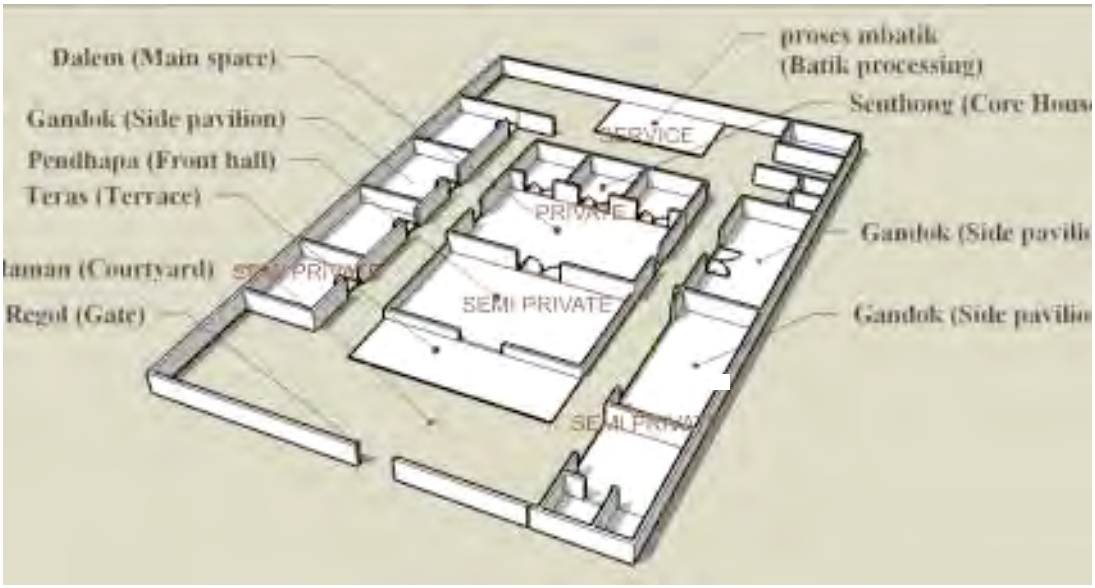


Figure 1.8 Sample [B] of the Javanese house: Original plan.
The figure shows that the semi private spaces are *regol* [gate], front yard, *gandhok* and *pendhapa*. The private spaces are *dalem*, and *senthong*.

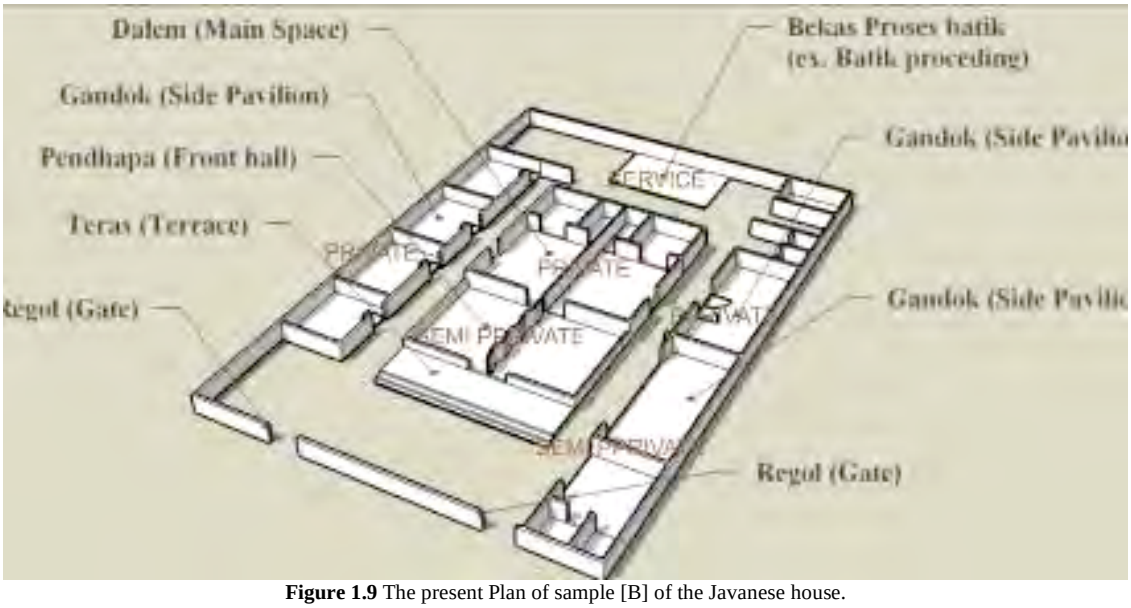


Figure 1.9 The present Plan of sample [B] of the Javanese house.
The figure shows that the changes are: the house is divided by two parts [see the wall in the middle]; regol [gate] become two gates; and batik processing [service area] unutilized. The stability is shown by *senthong* as private space, and *pendhapa* as semi private space.

Figure 1.10 The picture of Javanese house showing the front yard and *pendhapa* which is now covered with bamboo curtain.

Figure 1.11 The picture of Javanese house sample B showing the main space or living room (*dalem*)

1.5.1 The Changing of Space Usage

The survey shows that batik productions in this locality have experienced changes from a house as a processing-place to both a processing-place and market-place. This change greatly shaped the way the batik marketing itself was conducted. In the past batiks were sold in the "*Klewer*" market (city textile-market of Surakarta). Today batiks are sold in the Javanese houses, particularly in the *pendhapa*, hence the *pendhapa* becomes the 'showroom'. On the other hand, temporary activities have been conducted in the *pendhapa*, such as wedding parties, *pengajian* (religious activities), communal meetings etc. Due to its need to accommodate the batik industry, the main house and the *dalem* is also arranged as the showroom, even though this room is meaningful for the inhabitants as their transcendental domain. The extension of the Javanese house is the *gandhok*

(attached/side pavilion) which was used to facilitate daily activities in the past, is now changed as a place to print batiks. In contemporary usage, the Javanese house refers to a wide variety of modern life style.

As mentioned before, some of the Javanese houses in Kampong Laweyan have building extensions, called *gandhok* (attached/side pavilion), *lojen* (front attach pavilion), and *omah mburi* (back hall). Most of the extensions are used to facilitate the processing of batik.

1.5.2 Future Standards, Practises, and Regulations

In order to adapt the changing uses of space, the Javanese house needs future standards, practices and regulations. The Javanese house needs new regulations for building renovation, such as building coverage, building material, façade etc. The regulation should consist of detail arrangements for the interior such as doors, windows, tiles, and wall-colours. In exploring the spatial aspects of processing batik in the Javanese house, it can be concluded that future standards should consist of circulation (flow) standards, batik display arrangements, batik storage, and fitting-room.

1.6 EDUCATIONS FOR OPEN BUILDING IMPLEMENTATION

In the previous teaching programmes, the syllabus consists of conventional methods. The Javanese house was explained to the student with photographs as illustration and also by visiting the houses. From the research, the writer explored the changing of space usage in the Javanese house. Then, the problem is how to educate the implementation programme of the houses with the dynamic use of space. Concerning the open building theory, I decided to arrange a syllabus for a subject using open building practices in Javanese vernacular architecture. Firstly, the syllabus should consist of the concept from both the traditional Javanese house and the contemporary Javanese house. Secondly, a comparison of a previous spatially used and a contemporary spatially used in Javanese house. Thirdly, an explanation on the aspects of dynamic usage of space in Javanese house bearing in mind the Habraken theory of space usage. Fourthly, an excursion in Kampong Laweyan to observe the dynamic usage of space in the Javanese house, and lastly, a one-day workshop is held to summarize all of the subject material given above.

REFERENCES

Adrisijanti, Inajati, 2000, *Arkeologi Perkotaan Mataram Islam*, (Yogyakarta: Penerbit Jendela).

Brenner, Suzanne A., 1990, *Competing Hierarchies: Javanese Merchants and the Priyayi Elite in Solo, Central Java.*

Habraken, NJ, 1976, *Variations: The Systematic Design of Supports*, (Cambridge: the MIT Press).

Kridosasono, R.Slamet Soeparno, 1976, *Kawruh Kalang*, (Province of Central Jawa, Surakarta: Ministry of Public Work).

Prawiro, Soeto, 1920, *Kawruh Kambeng*, (Surakarta: Jajasan Pahaman Radya Pustaka).

Rajiman, 1984, *Sejarah Mataram Kartasura Sampai Surakarta Hadiningrat,* (Surakarta: Penerbit Krida).

Santosa, Revianto Budi, 2000, *Omah: Membaca Makna Rumah Jawa*, (Yogyakarta: Yayasan Bentang Budaya).

Soedarmono, 2006, *Mbok Mase: Pengusaha Batik di Laweyan Solo Awal Abad 20,* (Jakarta: Yayasan Warna Warni Indonesia).

Soemardjan, Selo, 1981, *Perubahan Sosial Yogyakarta*, (Yogyakarta: Gadjah Mada University Press).

Widayati, Naniek, 2004, *Settlement of Batik Entrepreneurs in Surakarta,* (Yogyakarta: Gadjah Mada University Press)

http://www.open-building.org/ob/concepts.html (accessed on May 20, 2008)

http://www.open-building.org/about/objectives.html (accessed on May 20, 2008)

Educating for flexibility: Housing and urban environments in South Africa

Dr. Amira O.S. Osman[1]
Raymund Königk[2]

[1]Senior Lecturer; Architecture, University of Pretoria, Pretoria, 0002, South Africa, amira.osman@up.ac.za
[2]Junior Lecturer; University of Pretoria, South Africa, raymund.konigk@up.ac.za

ABSTRACT AND KEYWORDS
This paper portrays the efforts of the Housing and Urban Environments (H-UE) research field at the Department of Architecture, University of Pretoria in aligning the focus of our teaching to the needs of emerging communities as well as the housing market in the context of South Africa.
The built environment is not static and provides an interesting context in which to study the relationship between stability and transformation. The quality of changeability is inherent in houses and cities throughout the world. This understanding of a house is not limited to low-cost housing but applies to all levels of housing across the economic spectrum. A house or residential unit is a changing organism; adapting throughout its lifetime to suit changing social status, economic status and lifestyles.
There are special considerations in South Africa that support the implementation of open building and the design of environments in a way to allow maximum accessibility and transformation.
This approach also makes sense in terms of affordability, where the urban support structure is robust and of high quality while the infill systems are of variable quality and cost to accommodate for a range of income groups. The aim is to allow for flexibility without subtracting from an effectual urban identity.
H-UE has been attempting to play a significant role in testing alternative approaches to the built environment. This has been successful in that we have recently been called upon to offer insight into real projects based on an OB approach. These projects acknowledge housing as a process or activity that precedes the planning and construction phase and extends beyond the owners taking up residence. This needs to be supported by a design process and tools for practice that can make it a reality.
This is presented to students in the honours level as a yearly housing elective. This paper shares these experiences (following on the Paris conference of 2004) and presents student project examples from the housing elective 2007.

Keywords: South Africa, Education, Flexibility, Housing, Urban Design

1. Introduction

In South Africa the wealth of knowledge in the field of housing has not always influenced implementation. As a result housing environments remain untransformed; landscapes evolved into sterile, regimented and inefficient settlement patterns. The massive machine of the state dominates housing delivery, in the process limiting interventions by other role-players. Architects have, understandably, distanced themselves from such ugliness (Osman and Lemmer 2002).

During Apartheid, South African cities developed in a pattern dictated by policies of racial segregation. White suburbs around the Central Business District (CBD) were buffered from black townships with 'gaps', which consist of large tracts of land used as major highways or industrial areas. The townships were isolated from the city but close enough to supply it with cheap labour. After Apartheid the CBD was largely abandoned by white owned businesses which moved into new centres in the suburbs. Yet, the structure of the city remains unchanged and fragmented; the result is difficult access to work and services, bland landscapes and environmental degradation. This fragmentation causes dislocated or missed market opportunities. The CBD, new commercial centres, transport routes, the 'gaps' of land and the townships should be connected to maximize the economic strength of the city.

Housing types that emerged from Apartheid policy were single-sex hostels for workers and the typical township house, which is a detached house in the middle of a small plot, an image that typifies the Apartheid period.

Housing reveals the social, cultural and political intentions of a people; in South Africa this is particularly evident. Housing policy is reflected in the built product and in the form of neighbourhoods. While the current government intended to remedy inherited fragmentation, it remained preoccupied with meeting quotas rather than developing quality environments. The country's housing programme has been one of the most successful internationally in terms of quantity: the number of housing units built between 1994 and March 2007 is 2 355 913 units (South Africa 2007). It is believed that housing delivery mechanisms will ultimately influence the spatial and physical characteristics of the resultant environment (Osman and Lemmer 2005).

New and enlightened policy directions, represented by the Breaking New Ground (BNG) plan for sustainable integrated human settlements, are currently being implemented by the National Department of Housing through a series of business plans, one of them focussing on medium and high density social housing. This is a major shift away from the one house, one plot typology.

Social housing in South Africa is medium-high density, subsidized rental housing in inner city areas close to amenities. It is seen as a main driver for integration and as a means to combat Apartheid spatial patterns. While this is accepted in principle, there are still many obstacles to implementation.

Dewar (1994) states that the organisation of the struggle during Apartheid has not successfully adapted to become a mechanism for development. In the optimism after 1994, legislative obstacles were removed but operative barriers to deliver sustainable housing still remain. Recent policy approaches could prove to be 'ground-breaking' only if partnerships are set in place for effective implementation.

Current debates in development favour pro-poor policies which mean that efforts regarding practice should be geared towards the percentage of the population that is marginalised. Current housing delivery sets a very poor standard for low-cost housing and unattainable and unaffordable standards otherwise. Some principles and approaches for professional involvement are identified such as learning from the vernacular and emergent systems, urban design, increased densities and change as a positive generator of form.

2. RELEVANCE OF OPEN BUILDING IN SOUTH AFRICA

It is believed that housing should be adaptable within a stable and robust support structure; this urban support structure gives an environment its character. The aim is to allow for flexibility while not subtracting from an effectual urban identity. A careful adaptation of open building systems to the South African context may be the means to introduce the potential for change without disrupting the stability and quality of the environment.

This concept has not been easy to promote as, for the housing practitioner, issues of quality may be lost against the more pressing reality to house large numbers of people quickly.

Dewar and Uytenbogaardt (1991) believe that a positive environment can be achieved regardless of the quality of the individual buildings; this puts emphasis on the importance of the individual house in contributing to the surrounding spaces, the quality of the streets and the potential of an area to be passively monitored by the community. Many of these factors can be achieved through site shape and size, positioning of and the relation of units to each other. The idea of urban design as an inseparable component of housing is reinforced.

Open building acknowledges the large number of participants in the development of the built environment, thus creating a richer, layered, sustainable environment rather than a sterile, repetitive, monotonous one. It empowers people when it involves them in the decision-making and implementation processes. Habraken (1998: 28) states that the built environment may be described solely in terms of live configurations operating on different levels. In so doing, it is described as a dynamic form controlled by people, fully taking into account that the built environment is a product of people acting. Dewar and Uytenbogaardt (1991: 35) refer to a process of 'negotiated reactions' whereby continuous transformation is achieved within a stable environment. This is perceived as a common characteristic of successful urban places.

According to Dekker (1998: 312) the aim of open building is to find principles of ordering and combining subsystems to give optimal freedom for design layout and installation. This allows for efficient building and makes possible the redesign of a subsystem or its replacement, allowing for alteration over time and higher possibility for user choice. It can be used at all levels of development and enables both stability and transformation in the environment. Parts of buildings constructed according to local building style and regulations can remain constant within an open building framework, while the building interiors change more rapidly (Habraken 1998: 7). Variety in the quality of infill/fit-out level can thus be achieved. This maintains the building level/support as the essential provision of space and shelter (Dekker 1998: 312, Habraken 1998: 72). The building becomes sustainable and able to undergo interior alteration to remain useful. In this way base buildings can be designed that have optimum capacity for diversity and efficiency at the fit-out level.

A systems approach to building includes modular and dimensional co-ordination, user-oriented design and construction, computational support of design, construction and manufacturing, industrialisation,

rehabilitation of existing buildings and development of the principles of sustainable design (Dietz and Cutler, 1971: 112). Open systems have been promoted by those who have pointed to the incapability of traditional building processes to cope with sophisticated production (Westra, 2002: 1667). Using modular systems may facilitate quicker construction and save costs (Martin 2001: 32). This is a concern because South Africa is a developing country without the technology or money to support a system which appears to depend on just that. A response may be to devise processes that adapt open building to the South African context and link up existing industries, such as combining indigenous knowledge and modular building systems as a means of providing low-income housing as experimented by Brewis (2003: 14). Modular systems are affordable, adaptable and their quality can be assured through manufacture under controlled conditions (Brewis, 2003: 17).

Houses have been adapted to inhabitants' changing needs in many contexts (Habraken, 1998: 7). Changes may mean the inclusion of income-generating activities, subdivision or extension. The more diversity is accommodated in a housing scheme, the more this diversity will become evident visually and spatially, and the more solutions will address longer-term needs, thus rendering these approaches sustainable (Osman and Gibberd, 2000: 6).

There are special considerations in the South African context that may support the implementation of open building. Osman and Gibberd (2000: 6) estimated the percentage of the population in South Africa most likely to be experiencing problems with the built environment, including their own homes, at 44%. This was based on statistics concerning the disabled, the elderly, children and HIV+ people (Statistics South Africa, 1999).

When addressing issues of housing quality, such as accessibility and appropriateness, affordability is argued to be a constraint. It must be emphasised that there is no single solution to cost efficiency; it needs to be addressed in creative ways with long-term vision. In rental housing, a unit houses different people through its lifetime, with different needs. Rather than having a standard quality of infill for all the tenants, a consumer-oriented rent policy may be implemented to offer a flexible response to clients' needs in terms of infill quality (Dekker, 1998). The aim is to allow for flexibility without subtracting from an effectual urban identity. As social housing in South Africa is mostly rental stock, this approach should not be dismissed.

By accommodating participation and change, it is possible to include poor people in the city on land traditionally thought of as being too expensive for social housing. Social housing stock being built now is generally three or four storey walk-ups with minimal space standards. This rental stock does not have the built in capacity for adaptation and change. Many times separating walls between the tiny units are structural walls that cannot be remove easily. If rental buildings are not designed to allow for change, they will soon become redundant and will have no market value.

Another aspect to consider is that the Department of Housing in South Africa is trying to encourage social integration by requesting that private developers include a portion of rental stock for lower income groups in any housing development. This so-called "inclusionary housing" can be problematic where the high cost market housing and the lower cost housing is included in the same development but is visibly very different. With an OB approach the base building which can be robust, high quality and more expensive then benefits all residents of the development while, within this structure, the infill can be of varying costs and qualities.

For this reason, the Housing and Urban Environments Research Field (H-UE) at the University of Pretoria has focused on this aspect of housing in its research endeavours and in its teaching.

3. ARCHITECTURAL EDUCATION AND HOUSING: THE HOUSING AND URBAN ENVIRONMENTS RESEARCH FIELD, UNIVERSITY OF PRETORIA

H-UE addresses issues of open building and distributed design during a Housing Elective offered to post-graduate students in the Department's Honours Programme. The course objectives include developing a deeper understanding for housing issues in South Africa, to explore alternative approaches to housing provision, to emphasise the potential of the design professions to facilitate change in the housing environment and to apply good design principles in an innovative way; this specifically includes open building principles.

The course aims to achieve a degree of specificity to the South African context while also building knowledge of housing issues worldwide. The physical and visual legacies of apartheid are addressed. Relevant skills are needed to deal with the transformation of township landscapes; the upgrading of hostel compounds and the creation of mixed use nodal and strip developments to connect the isolated townships and the CBD. Building conversions require attention as the inner city receives its new inhabitants with new economic

activities. Infill projects increase the density of fragmented, under-utilised inner city sites while bringing people closer to job opportunities and revitalising the locality in the process.

This project is based on an on-going research project of H-UE which looks at partnering with local, small scale industries in a township east of Pretoria, Mamelodi.

The honours students may be from any one of the 3 programmes that are delivered in the department: Architecture, Landscape Architecture and Interior Architecture. This adds an interesting dynamic to the elective and allows the group to focus on different aspects of the project related to their field. The project is comprised of three design components, two of which are focused on in this paper[1]:

1 The urban design framework

The students are required, as a group, to study the area of Mamelodi, understand its history, social and economic set-up, and its environmental and physical characteristics and based on this to select an area for intervention and inclusion of a mixed use development which would include social housing. The location needs to be strategic and should be seen as a catalytic development that would trigger further responses and developments in the area. The design challenge is to create a dynamic urban context based on the urban design principles of phasing, privacy, variety and integration as well as to achieve a visually dynamic context that is vibrant: places where people enjoy the daily experience of their surroundings and subsequently care for and further develop them.

The group then develops an urban design framework within which they select sites for individual social housing projects. The group framework includes a basic code for the designs in terms of building setbacks and heights and an agreement on general architectural principles. Landscape students propose projects for the area related to the environmental challenges unique to the area and Interior Architecture work in collaboration with architects to develop projects at the infill/fit-out level.

2 “Reinventing the everyday”

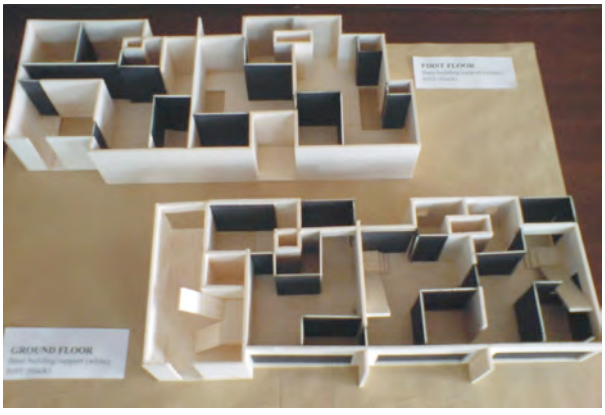
The second component of the project requires the students to work individually to develop their selected sites with respect to the group framework and the agreed urban design codes. While this part of the project is focussed on individual design, it requires continuous collaboration as the students also have to respond to each others designs within the framework. The students are asked to challenge the perception that limited funds means poor quality, to provide efficient living units in optimal space, which link well with outdoor spaces and to incorporate social amenities, services and income generating functions into the scheme.

They also need to create an enabling, inclusive, accessible context catering for the needs of all sectors of the target population. The students have to explore the concept of participation, not only as an initial component of a design project where communities are consulted and participate in the design decision-making process but also as an on-going process where the built environment allows for future adaptations. The capacity for change and on-going participation are thus built into the project from the outset.

4. STUDENT PROJECTS HOUSING ELECTIVE 2007

In this project (Figure 1) the design clearly differentiates between the base building and the in-fill/fit-out level through the use of a model.

Figure 1 Project by Hennie Muller (H-UE Housing Elective, 2007).



Here (Figure 2) the base building/support is designed in such a way that it groups the service zones in fixed clusters with intercepting spaces that are adaptable. The changeable zone can extend into the facade by the use of a light weight frame system on the peripheries that allows for floors to be put in and vertical circulation that can connect two levels. The student show a number of scenarios where the building use can be changed and the internal layouts and facades adjusted accordingly.

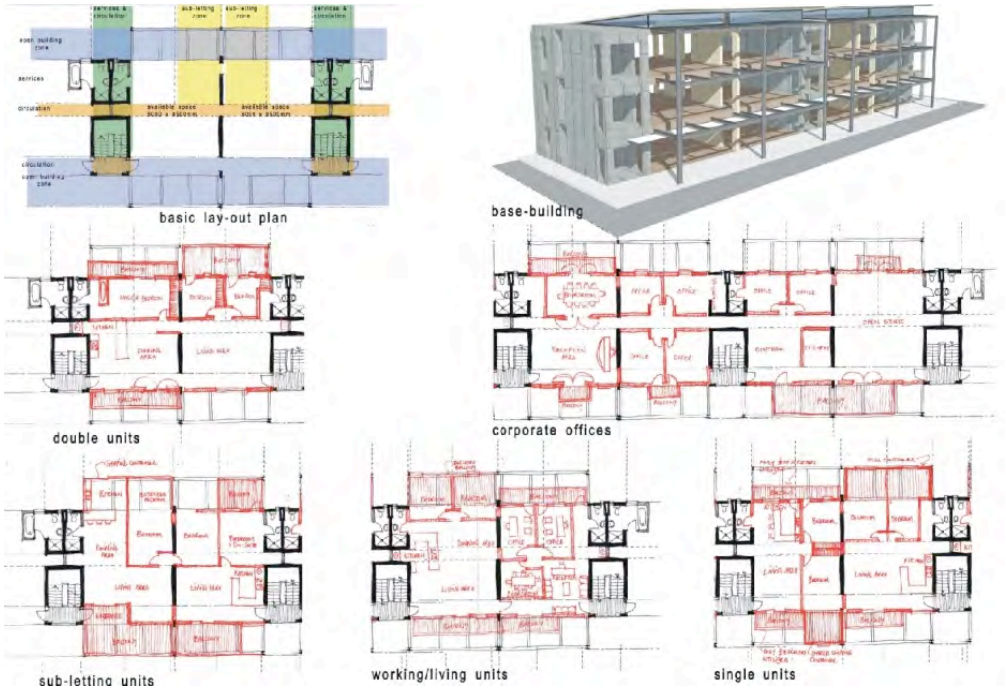
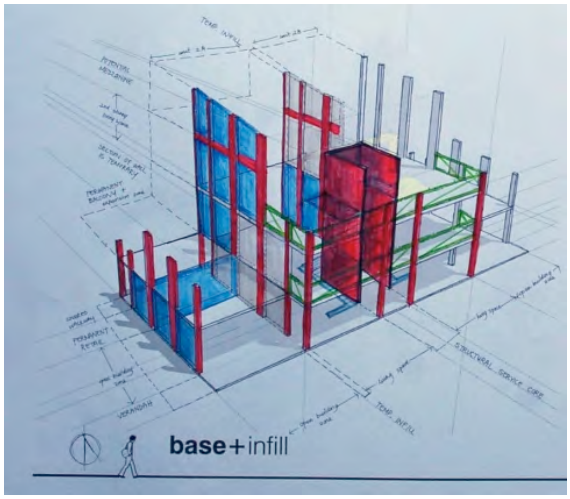


Figure 2 Project by Francois Malan (H-UE Housing Elective, 2007).

Figure 3 indicates how an Interior Architecture student investigates support and infill systems and allows for grouping of the vertical circulation and the service shafts which can be accessed from the stair landings.



Another student explores (Figure 4) the concept of vertical land where the building has the potential to be parcelled horizontally or vertically and can be permeable to allow for public or private outdoor space at higher levels.

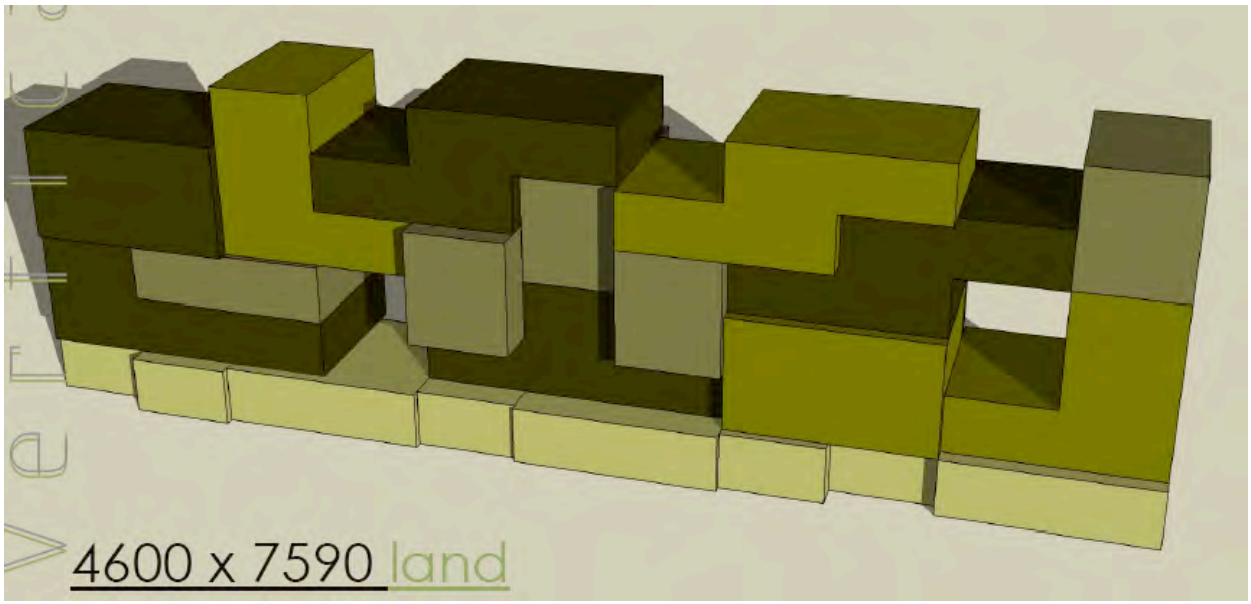


Figure 4 Project by Ryno Dreyer (H-UE Housing Elective, 2007).

This final project (Figure 5) shows how another student has used a support structure to construct space at an urban design level and has investigated how it allows for various interpretations in terms of private and public space as well as thresholds.

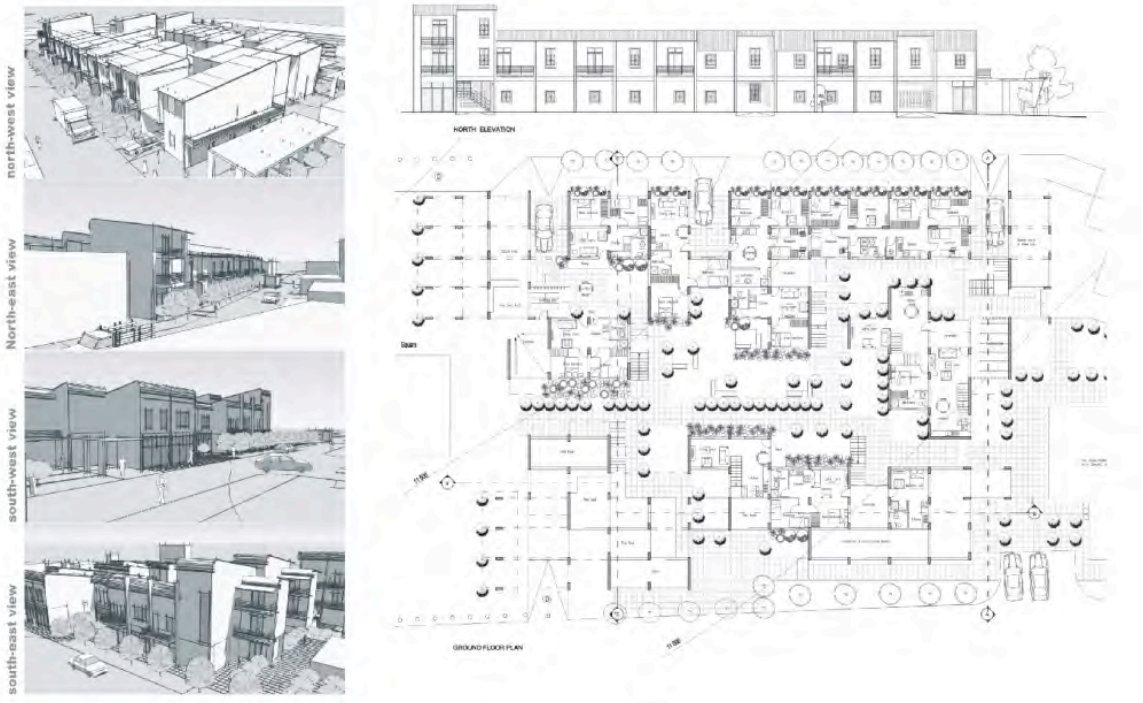


Figure 5 Project by Nompomelelo Nzuza (H-UE Housing Elective, 2007).

5. DISCUSSION AND RECOMMENDATIONS

While successful projects have been presented in this paper there are certain challenges in the teaching of an OB approach that will be addressed in future projects. Some weaker design students take refuge in the concept of OB as a way to design less. This produces extremely poor projects which literally become a bland structural frame. Students find difficulty in understanding they must demonstrate the potential of the base building to accommodate different scenarios and that this needs to be tested by thorough and rigorous design. One remedy to this in future is by asking students to exchange base buildings and to design for real life scenarios. The students also need to demonstrate the architectural quality of the base building and that it can allow for interesting design variations that relate to context that will add quality to the surrounding area.

Since this is a seven week project in total which comprises other exercises, the students only spend three weeks on this particular part of the project. This meant that we were not able to explore the technical resolution of the projects in any depth. It is hoped that as students become more aware and interested in OB, they will then explore it in the following year at Master's level.

6. CONCLUSION

The OB approach is believed to present immense potential to take the special needs of the South African population into consideration. The concept of participation, as an accepted paradigm in development, can be explored through methods that allow for user participation in design decision-making. Such design-aiding techniques optimise the contribution of role-players in housing through maximum transparency and effective communication.

Open building systems are perceived as a tool to achieve diversity. Liaison with existing industries in townships is believed to offer opportunities for relevance and flexibility in design as well as support for local entrepreneurship. The importance of academic connection with housing practitioners and involvement in real projects cannot be undermined. It is acknowledged that the construction industry is very conservative, especially in South Africa, but the importance of new approaches needs to be fully investigated and tested in real life.

There is a need for the development of sustainable housing systems relevant to the context. This paper shows, through students work, that housing can be adaptable within a stable and robust support structure.

Design for change is important in any context, but particularly in South Africa due to specific issues: examples are AIDS orphans who are left to fend for themselves and separate households that merge. Current rental stock does not allow for extended families and is very eurocentric in its design.

7. ACKNOWLEDGMENTS

The housing elective students of 2007 are acknowledged: Mirella Bandini, Phumalani Khuzwayo, Ryno Dreyer, Mpumie Nzuza, Cennette Swart, Hennie Moller, Francois Malan, Emmanuel Nkambule, Elana van der Watt, and Cara Terablanche.

8. REFERENCES

Brewis, D., 2003, Links between indigenous knowledge, low-income housing and modular building systems: a case study of sustainable wall building materials and technologies. *Technology and management for sustainable building 3rd conference in the series on sustainable development.* 26-30 May, CSIR, Pretoria.

Dekker, K., 1998, Open building systems: a case study. In *Building and research information*. Vol 26. No 5. pp 311-318.

Dewar, D., 1998, Settlements, change and planning in South Africa since 1994, in Judin, H., and Vladislavi, I (eds), *blank__ Architecture, Apartheid and after*., (Cape Town: David Philip Publishers).

Dewar, D. & Uytenbogaardt H., 1991, *South African cities: a manifesto for change*. (Cape Town: Urban Problems Research Unit University of Cape Town).

Dietz, A.G.H. & Cutler, L.S. (eds), 1971, *Industrialised building systems for housing*. (Massachusetts: MIT Press).

Habraken, J., 1998, *The structure of the ordinary form and control in the built environment.* (Massachusetts: MIT Press).

Martin, K (ed), 2001, *Guidelines for making social housing affordable*. (Johannesburg: Social Housing Foundation).

Osman, A. & Gibberd, A., 2000, Housing for special needs: physical interior design to accommodate special needs. *Social Housing Foundation Conference*, Johannesburg.

Osman, A., Lemmer, C., 2002, Architecture and housing: changing perceptions in the new South Africa. The case of Pretoria University. *Proceedings of XXX IAHS World Congress on Housing,* Coimbra, September.

Osman, A., Lemmer, C., 2005, Open building principles: An academic exploration in Soshanguve, South Africa. *Open House International*. Vol. 30, No. 1.

Osman, A., Karam, A., 2005, Report on themes, issues and recommendations of the seminar as well as integration with the intentions of IBSA, AMCHUD and BNG. *International Housing Research Seminar*, Cape Town, July.

South African Government, National Department of Housing., 2004, *Briefing Document: Breaking New Ground, A Comprehensive Plan for the Development of Sustainable Human Settlements*. Unpublished.

South African Government, National Department of Housing., 2007, *Housing delivery*. http://www.housing.gov.za (accessed 13 December 2007).Statistics South Africa (4th ed)., 1999, *The people of South Africa, population census 1996.* Published.

Westra, J., 2002., No point NL: national laboratory on housing. In *Housing construction an interdisciplinary task*. XXX IAHS World Congress on Housing, Vol3. Coimbra.

9. NOTES

[1] The third component of the project is presented in the paper “Informality as a legitimate energy in the city: Housing and urban environments in South Africa”

Implementation of the Open Building Theory in China's Residential Market: a Case Study of the Maya Project

REN Zhijie[1]
LI Haile[2]
JIA Beisi[3]

[1] Architecture Department; Rm217, Graduate House, The University of Hong Kong, Pokfulam Road, Hong Kong, CHINA, renzhijie@gmail.com
[2]ZCHS Architects, Chongqing, China, lhail@vip.sina.com
[3]Department of Architecture, The University of Hong Kong, Pokfulam Road, Hong Kong, jia@arch.hku.hk

ABSTRACT

The implementation of the Open Building theory varies with the circumstances and conditions of each country or area. Having experienced rapid development for years, China's residential real estate market has dominated the housing supply chain. Therefore, the feasibility of Open Building implementation under China's market mechanism should be studied. This paper initially assesses both the strengths and weaknesses of prevailing residential developments. The analysis is then followed by the case study of a recent high-rise residential project in China. It concludes that two strategies for high-rise residential buildings may benefit developer and dweller and obtain their supports. Finally, the paper discusses the architect's role in the development process, as well as the duties that should be expected from architectural education.

Keywords
Open Building, implementation, residential market, high-rise, China

1. INTRODUCTION

The Open Building approach has been carried out for decades. Although it has already been applied in office and commercial building developments, the theory has still been largely unconsidered in the realm of residential design. The related notion of "flexibility" is still "marginal to the profession at large". (Habraken, 2008) The embarrassment brought about by its marginalization motivates us to study the feasibility of this theory as it is applied in various circumstances.

China's real estate market has experienced rapid development since 1990. In recent years, it has taken a dominant role in the country's housing supply. (Meng, 2005; Niu, 2006) This fundamental change has resulted in a new background of Open Building implementation. Although some studies on China's implementation (Bao, 1984, Jia, 1998) have preceded this paper, they were not rooted in current circumstances. Implementing the Open Building theory in the existing commoditized housing market entails its adjustment to these current circumstances. This paper therefore concentrates on Open Building implementation in high-rise residential buildings under current market mechanisms.

2. THE CURRENT SITUATION

2.1 Dwelling Is a Commodity

The development of China's real estate market has experienced several stages, via which dwelling has changed from a housing industry product into a commodity in the residential market. As the market has come to dominate China's housing supply, commoditized private dwellings have begun to take on new characters and value.

In this context, "lovability" has become an important characteristic. Commoditized dwellings not only consider accommodating capacity, but emotional value as well. Many residential projects are designed and constructed with maximum 'lovability' to catch the attention of potential buyers, especially well-off ones.

Distinct location, magnificent façade, and dignified services are manipulated to indicate potential owners' distinctive social status. Anything that might frustrate this expression, such as allowing dwellers to control their façades by themselves individually, may reduce the dwellings' attraction to the dwellers and the developers.

Another characteristic of commoditized dwellings consists of diversified choices in the current residential market. Developers are now more conscious of the variety of clients, thus assigning functional and emotional identities to their dwellings and finding clients who will enjoy them. For instance, a developer may deal with several projects with different styles, such as modern-Chinese and Spanish. As customers choose the appropriate dwellings based on functional and/or emotional appeal, their personal preference is reflected in the process. Hence, "choice-making" is another word for "user participation" within this diversified market.

As another important consideration, cost-controlling is inevitable for developers. It is reasonable for non-government-run developers to reduce costs to remain competitive in the market or to enlarge their respective profit margins. They constantly try to tighten the schedule of both the design and construction process in order for them to commence unit selling at the earliest possible time. Nevertheless, although they can experiment on different styles in their projects, they need an efficient and repeatable production system in each development project. The design principle behind many high-rise projects is based on the repeatability of a "typical floor". In this manner, control-distribution turns out to be an obstacle in generating profits in the seller's market.

Instead of a neutral design, an optimized functional plan is another characteristic of commoditized dwellings. In spite of the fact that the average living area per capita in Chinese cities has increased to more than 20 square metres in recent years, this is still much less compared with that of developed countries. Residential buildings, especially those with small-sized flats, are composed of a tightly-fit functional plan, which demonstrates the principle of combining optimum living standards within a limited living area. This is an ideal which appeals to current buyers.

2.2 Government Is Not Enthusiastic

Scholars, architects, developers, government, contractors, and dwellers may focus on different aspects of the real estate issue. While scholars emphasize the sustainability of residential buildings for the future, the government may be concerned with another pivotal problem which must be resolved immediately. In the book *Reports on the Development of China's Real Estate*, published in 2006, the government and its researchers address the "over-speed partial and structural requirement" as the current key problem which threatens the healthy national economy.

Therefore, although the Chinese government has shown support for the principle of "sustainability", the local authorities' reaction has remained apathetic. Existing building regulations and approval procedures entail fixed designs and to them, the idea of "uncertainty" is a precarious notion. Consequently, a market mechanism, which fosters cooperation among developers, architects, and scholars, holds the key toward effective Open Building implementation.

2.3 Architect Is Employed By Developer

An architect is not an independent persona within the development process. In most residential projects, they are employed by developers, rather than the government and other public organizations. Prior to submitting drawings to authorities for approval, the architects' designs must initially meet the developers' requirements. As a result, the interests of the developer take precedence over those of any other involved parties. Thus, it is difficult for an architect to sell a concept involving long-term social value in the absence of clear and immediate economic profits.

2.4 Flexibility Exists Already

Common residential buildings are also given a modicum of flexibility. According to the book *Flexible Fixation: the Paradox of Dutch Housing Architecture* (1990), building flexibility falls into three categories: "spatial flexibility", "functional flexibility", and "character flexibility". The flexibility in prevailing Chinese high-rise residential buildings bears the first two.

The term "spatial flexibility" refers to the ability to "combine the adaptation to changing wishes with an alteration of spatial structure of the dwelling". A flat interior and furnishings in concrete structures are controlled by dwellers. They can rearrange partition walls and interior circulations according to their own

preferences. Although this spatial flexibility benefits the developer indirectly, it does provide freedom for the dwellers.

"Functional flexibility" means "the adaptation of changing housing wished does not entail an architectural invention". This flexibility is realized due to the redundant areas inside the flat. Moreover, the bigger the flat's size is, the more functionally flexible it is. Dwellers can assign new functions in redundant rooms or simply change the function layout inside the flats. In contrast with house-shortage days, functional flexibility in current residential buildings holds opportunities in dealing with functional changes.

3. NEW REQUIREMENTS FOR OPEN BUILDING IMPLEMENTATION

Changes and diversification in housing requirements are mentioned in an earlier study (Jia, 1998). Currently, as the real estate market has dominated the housing supply industry, Open Building implementation may be extended to a new range, which may be helpful in solving potential problems in the residential market.

3.1 Dynamic market

As a result of the combined effects of rapid urbanization, upgraded living standards, policy adjustments, and land price increase, residential requirements within China's market are constantly changing. Generally, in high-rise residential projects, the interval between decision-making and sales takes more than one year. Unpredictable and glaring changes in price and policy may cause a mismatch between the developer's decision and up-to-date requirement. Thus, developers find it difficult and risky to make decisions, especially when they also aim to maximize their profits at the same time.

3.2 Changeability for the Developer

Due to the dynamic market, developers may also need to adjust their decisions during the development process. However, in common developments, the proportion of flats in a project cannot be easily changed with the above mentioned interior flexibility. Some projects fail to accommodate changing market demands due to bad decisions, while some are not able to increase the number of hot-sale flats that feature a fixed design. Although some projects can be partially modified, it may be difficult and inefficient. Therefore, the ability to carry out short-term changeability to adjust decisions means a great deal to these developers.

3.3 Long-term Value

High-rise buildings can stand for many decades. For this reason, its long-term for the society and the dwellers, respectively, are significant concerns. Existing flexibility in common projects may provide a certain degree of interior functional capacity, but long-term value may require a larger functional capacity. For instance, a high-rise residential building could be converted into an office tower. Although it is challenging for architects or scholars to persuade developers to invest on a large functional capacity toward an unforeseeable long-term value, the paradox between limited functional capacity and an uncertain future requirement remains a question to all of us.

4. THE MAYA PROJECT

The Maya Project in Chongqing, China, demonstrates the Open Building theory in the real estate market. This project has a site area of 7014 square metres, and a total floor area of 50738 square metres, with two similar 28-storey residential towers over 2 stories of commercial podium and a sky lobby for residence. The residential towers consist of small flats, most of which have one or two rooms, and interior floor areas vary from 25 to 92 square metres. The staged design process of the Maya project began in January, 2006. Its construction began in August, 2006 and was completed in June, 2008. The second author of this paper is the architect of this project. The Maya project is actually a "vertical neighbourhood" rather than just a simple building as it employs the detached levels principle. Common high-rise residential building includes three levels: building, flat interior, and furnishing. In contrast, the Maya project has four levels: base building, flat, room level (flat interior), and furnishing. What is originally the building level in common projects is divided into the base building and infill

flat in the Maya project. The base building level is controlled by the architect and the developer, while the flat level is mainly controlled by the architect and the developer but guided by market information. Customers who are future dwellers reveal their preference for a specific flat type through their selections identified in the pre-sale. On the other hand, both the room level and furnishing levels are still under the dweller's control.

Figure 4.1 One Tower of the Maya Project

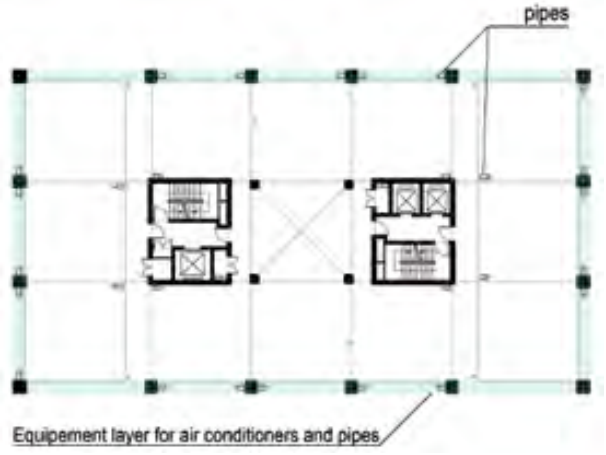


Figure 4.2 The Base Building Plan

Figure 4.3 Fifteen Typical Flats

As the main infrastructure of the vertical neighbourhood, the base building is designed generically and has a rectangular plan, the central area of which has two traffic cores. The habitable area is equally divided into 12 blocks following the 6.936.9 structural grid. A unit with a width of 3.45-metres and a depth of 6.9-metres occupies half a block. The sanitary system is located along the corridor and on the façade, which is a 700mm-depth equipment layer that houses pipes and air-conditioners. The second level, also known as the flat level, consists of flexible "infill": typical flats. Unlike common designs, the Maya project does not have a typical floor but 15 typical flats, which are located in any of the floors. A single-room flat occupies one unit, and the bigger flats are realized by merging units horizontally or vertically. In addition, partition walls are removable in the

flat's interior design and construction. The engineer permits dwellers to move partition walls within the maximum of 600mm away from the beam. This permit enables the dwellers to obtain an optimum flat layout within the limited interior floor area.

Aside from these design features, the Maya project also follows a unique process which spans approval, sale, construction, and usage.

Table 4.1 Differences between Common Projects and the Maya Project.

	Common projects	Maya
Design		
Plan	1. The flat plan and level plans are integrated. 2. Function goes first in the 'typical floor'; structure and services follows the functional layout.	1. The flat plan and level plans are independent. 2.'Typical flat' takes the place of 'typical floor' 3. Emphasizing compatibility within the structure, services, and various functional layouts.
Drawing	Based on a 'typical floor'	Based on a 'typical flat', if possible.
Changeability	1. Interior flexibility 2. Structure and services restrict the design adjustment of the flat's proportion. 3. Provides personalized residential layout.	1. Interior flexibility 2. The flat's proportion can be adjusted easily 3. Larger functional capacity for an entirely functional transfer
Approval		
Times	Usually, once for each authority	3 times for flat level due to adjustments.
Construction		
Standardization	Reproducing a "typical floor"	Reproducing a "typical flat"
Changeability	1. Almost unchangeable 2. Inefficient	1. Changeable in the uncompleted part 2. Efficient
Sale		
Changeability	Flats can not be sub-divided but can be merged.	Flats can be merged and sub-divided.
Feedback	Useful for next project	Important for current project
Process	Simple	Complex

5. BENEFITS FOR THE DEVELOPER AND DWELLER

Many parties, including developers, consultants, professionals, authorities, contractors, and dwellers, are involved in residential developments. The proponents behind the Open Building implementation should not only consider long-term value for society, but also the interest of involved parties. Otherwise, it will lose their support and make the implementation difficult.

5.1 Layered Decision-Making and Risk Reduction

Local regulations permit developers to pre-sale their properties prior to completion. It provides a potential opportunity for developers to collect up-to-date market information. In common projects, developers make decisions at the first stage of the projects, during which customers are not precisely visible and developers can only conceptually identify the future customers. Up-to-date market information collected from the pre-sale stage is not well utilized in ongoing projects. This could be a problem because developers cannot find buyers and consequently suffer financial setbacks.

An important strategy of the Maya project is that it employs a layered decision-making and design process. Due to detached levels, the Maya project is able to utilize first-hand information from the pre-sale. The process of decision–making and design are divided into two levels: base building and flat. When the developer pre-sold units from the Maya project, the base building was still under construction. It only had a generic frame with several floors. The detached levels made it possible for the developer and architect to modify the flat's design and proportion according to new information. In this case, the Maya developer adjusted the flat's proportion twice to increase the number of hot-sale flats. In this way, flats were decided, designed, sold and constructed synchronously. Investment risks are thereby reduced.

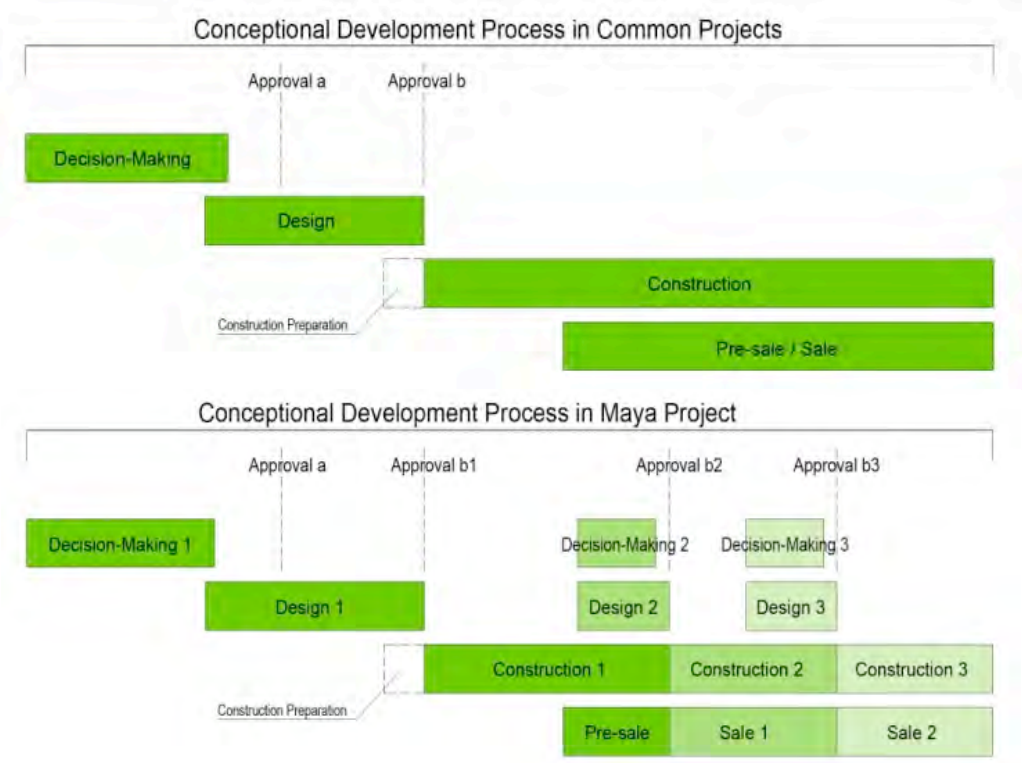


Figure 5.1 Different Processes of Common Projects and Maya

5.2 Imitative Control-Distribution and Fine-grained Fabric

As a level between the base building and the flat interior, the flat level is influenced by both the developer-architect team and the dweller. For economic reasons, high-rise buildings are designed to be highly compact. Without an interval space between flats, the architect has to spatially organize all flats and decide the boundaries between them. Nevertheless, although dwellers can show their "participation" by choosing a preferred flat type or by suggesting modifications to the developer, the flat level is mainly controlled by the architect and developer. This process can be identified as imitative control-distribution.

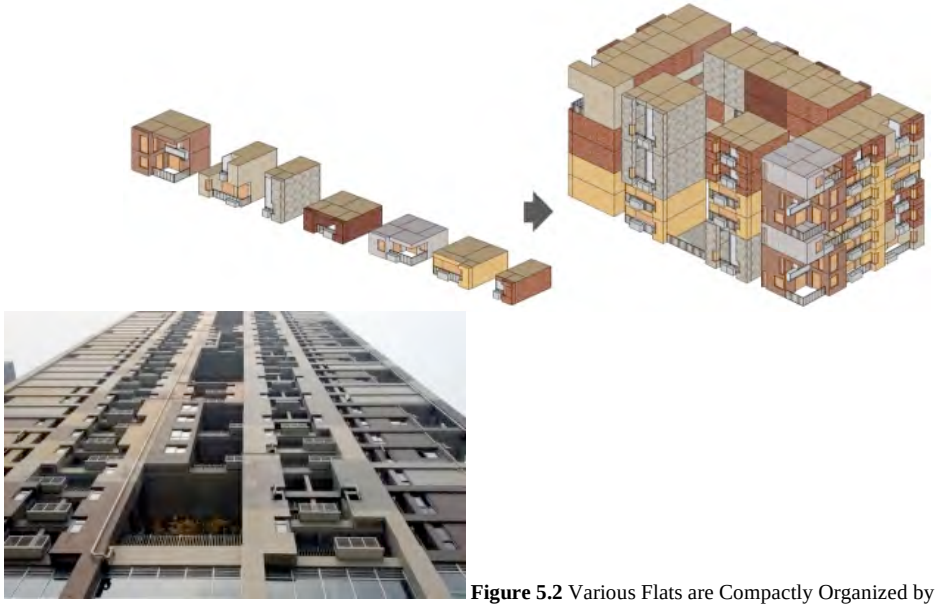


Figure 5.2 Various Flats are Compactly Organized by the Architect

Due to the fact that the Maya project's base building is generic, the architect and developer are free to fill in the flats. Each flat type has a uniquely coloured facade, and the architect filled in different flat types in consideration of various factors such as economy, efficiency, and façade variety. For the sake of constructional efficiency, the flats' spatial organization repeated every six floors in the first design stage. As the architect received feedback from the pre-sale, he then adjusted the flat's organization twice in the upper floors which had not been sold, in order to obtain a more marketable flat proportion. In this way, vertical variety on the Maya's façade reflected a real process of synchronized design and sale. It recalls the vivid sense of vernacular villages. Dwellers can easily find their flats from faraway. In addition, the communal sky courtyards filled with plants also added to its friendly atmosphere.

6. THE ARCHITECT'S ROLE AND NEW ARCHITECTURAL EDUCATION

If we divide the architects' role into two parts, that is, the rational and the emotional, the rational part may be modified corresponding to the notion of Open Building. First, due to the layered and synchronous development process, architects should possess more inter-disciplinary knowledge to ensure that their designs will be palatable to other involved parties. Second, architects should be responsible for the compatibility of the base building. For example, the Maya project's architect experimented on different structure grids from 6mX6m to 8.4mX8.4m, before identifying the 6.9 m X 6.9m grid as the one with the highest compatibility. Finally, architects should be sensitive and flexible in adjusting to possible changes. Yet, despite the importance of these factors, an architect's duty should not be undermined where the emotional and artistic part is involved. Architect should manage to preserve the building's "preciousness" through a layered and more complex design process.

When it comes to architectural education, students should likewise enlarge their knowledge of other inter-disciplinary areas. It is not difficult to acquaint students with the fundamentals of the Open Building concept; however, applying this concept in their designs implies a dynamic functional analysis, which requires plenty of information from other involved parties. In residential designs, students should learn basic knowledge of practical real estate. Unfortunately, this knowledge is not included in current architectural textbooks. Instead, it comes from developers, consultants, practice architects, and even dwellers. A comprehensive education system should provide students with easy access to such information, and help them evaluate their own designs in terms of the compatibility of their base buildings. If not, the student's design may fall into the trap of functional nihilism.

7. CONCLUSION

The implementation of the Open Building theory is valuable in Chinese urban context, where a large-scale real estate development is taking place. Implementation of this theory under current market mechanisms cannot ignore the local residential context. Objective recognition of the rationality of common developments is necessary to find suitable approaches towards Open Building implementation in China's residential market.

For the Maya project, benefits for the developer and dweller are emphasized. The short-term value (reducing risk) for developers is crucial in implementation under current market mechanism. Fine-grained fabric in high-rise residential buildings, through imitative control-distribution, is acceptable for dwellers. If Open Building promoters carefully consider these benefits for both the developer and dweller, its implementation may obtain more support from the residential market.

8. REFERENCES

Meng L, 2005, Review of real estate development in China. *China Economist*, **32**, 37–43.

Niu, F. *et al*., 2006, *Reports on the Development of China's Real Estate*, edited by Niu, F and etc. (Beijing: Social sciences academic press).

Bao, J., 1984, SAR in China, *Open Building International*, **9**, No.1.

Jia, B., 1998, Components strategies for adaptable housing in China, *Open Housing International*, **23**, 4-11.

Bijdendijk, F, 2005. Solids, *Time-Based Architecture*, edited by Leupon B. and etc., (Rotterdam : 010 Publishers), 42-51.

Habraken, J.2008. Design for flexibility, *Building Research & Inforamtion*, **36**, 290-296.

“Support” as Space Demarcation: A Theoretical Reflection on the Spatial Character of “Support” from an Architectonic Perspective

SHI Yong-gao

SCHOOL OF ARCHITECTURE; Room 0629, Shi-Dai-Hua-Fu, Jin-Xiang-He Road 33-2, Nanjing, P. R. China, 210008, archistone@163.com

ABSTRACT: The “Open Architecture” divides buildings into two parts of the stable and the changeable, the “support” and the “infill”, while each category suggests different human activity they usually correspond with different structural status. In the architectonic terms, such a division usually implies an assumption that the supporting elements fulfill structural necessities while the infill components delineate space. Although this assumption has its practical convenience, it lacks the academic coherency and intactness and subsequently impedes the implementation of the “Open Architecture” conception in architectural pedagogy. This paper argues against this simplistic assumption. Instead it intends to explore the space-creating function of “support” besides its load-bearing role, no matter the supports are planar components like walls and slabs, or linear ones of columns and beams. To arrive at this point, the paper starts with a brief theoretical speculation on the connotations of the support-infill division, and proceeds to differentiate between definition and demarcation of space, between the conceptions of structure and Gottfried Semper’s *Bekleidung*. Following this, the paper explores the spatial character of the “support” through case studies, taking frame as the main research object, and finally touches upon the pedagogical issues which focused on this theme.

Keywords: Open Architecture, Support-Infill, Space, Pedagogy

As commonly conceived and widely accepted, open architecture concerns several basic principles, like “change” which means the built field is never finished and changes part-by-part, and “levels” which suggests that as professionals, we work on multi-levels of intervention, and “cooperation” or “participation”, that the built environment comes into being and transforms by way of distributed design. With all these principles, “Support” is one of the most common factors each principle touches upon and it could be deemed as the most important keyword in the literature on open architecture because of its fundamental and complex implications. While it’s been much discussed, some critical aspects are still left unnoticed. This situation makes it imperative to reconsider different aspects of the concept “Support”, especially from an architectonic perspective, and probe into its spatial connotations.

1. SPECULATION ON THE CONCEPT OF “SUPPORT”

Support was a term first coined in John Habraken's book *Supports: An Alternative to Mass Housing*. It describes what might now alternatively be referred to as a residential base building, comprising the common part of a multi-tenant building, and thus lasting longer than the other parts. In the contemporary writings, open architecture is no longer confined to the housing projects and extended to a larger scope which varies from non-residential buildings to the urban infrastructure. “Support” therefore refers to different parts of a built system when applied in different scales and occasions. Surprisingly, none of these definitions involves architectonic on which the true architectural education is based upon. Partly because of this ignorance, the education of open architecture is often either degenerated to mere conceptual fantasy or is led to the finding of pragmatic solutions, but in neither case is architectonic taken into consideration. If we are going to establish a more substantial connection, the loose definition of the concept of “Support” should be made more specific, and this specificity has to be related to the organization of architectural components, and consequently the space-creating role could come into discussion.

As we have already noticed, in the above mentioned occasions, “Support” is not directly linked to a building’s architectonic consideration, nor to the structural ones. In fact, this has been intentionally avoided in

some authentic writing like Habraken's 1966 paper "Three R's for Housing". But when the need of alteration arises the structural components are inevitably the most stable ones, and more importantly, it is right this structural element that connects open architecture with architectonics. Understood in this way, "Support" not only sustains the common activities within a building, it also upholds the load of itself and other elements and passes them ultimately to the ground. Here, it is much like the notion of Structure which embodies double meanings of 1) relationship between different parts (like base building and infill parts) and, 2) the elements that uphold a building. Here, how we think of space in relation to the components could be a problematic issue: While understood in the first way, "Support" certainly defines space, but when understood in the second way, does it still fulfill such a function?

It now becomes clear that the spatial character of the structural support must be examined. Although the support could be planar elements like walls or slabs, as in most traditional buildings, it's been a skeletal system comprised of columns and beams that dominates in the modern time. What are the spatial characters of these two types of supporting elements? Particularly how does the skeletal system form a spatial field, and in what aspects are they differentiated from the space formed by the planar support? The columns and walls in Mies's Barcelona Pavilion typically represent these two types of spatial character: the space of slab (wall) and the space of column (frame).

2. SPACE OF WALL (SLAB) VERSUS SPACE OF COLUMN (FRAME)

There is a lasting debate over the actual structural system of Barcelona Pavilion as to it's a pure framework, or the frame structurally functions together with those seemingly floating walls. Contrasting to this heated debate, the spatial aspect of the columns and its particularity to that of the walls were rarely mentioned. A detailed study of these aspects is thus anticipated because of this ignorance and its close relation to the topic under discussion. But before that, we have to go back to a 19th century master, Gottfried Semper.

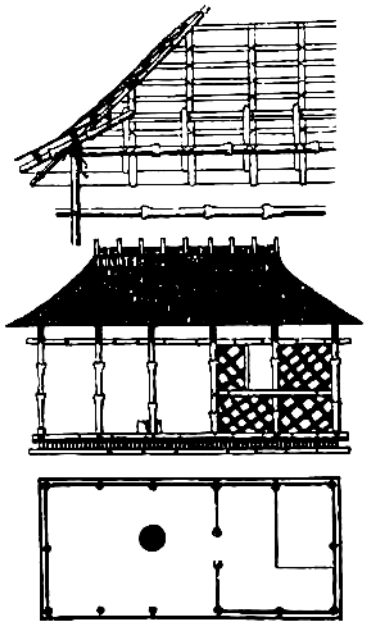


Figure 053.1 The Caribbean hut in the Great Exhibition of 1851 (Gottfried Semper, *Der Stil in den technischen und tektonischen Künsten*, 1860-1863)

As Adrian Forty pointed out: "… it was German architect and theorist Gottfried Semper who was responsible for the introduction of 'space' as the principal theme of modern architecture."[1] Although Semper's allusion to space was very brief, his concept of enclosure foreshadowed all the spatial theories afterwards. Semper never presented an explicit idea of space, but he expounded two critical questions of space, enclosure and dimension, in his "Four Elements of Architecture". Prior to this Four Elements, Semper began to develop

the idea of primordial forms (*Urform*). He identified two ideas generating the first adobes, the spatial elements of the enclosure (*Umfriedung*) and the roof. He later added the hearth to this list and defined the surrounding wall (*Einfassungmauer*) as the first element of antique architecture and the primordial seed for dwellings. (Figure 053.1)

For Semper, as evident in his Four Elements, architectural space was implied as an enclosed entity, a constituent of its boundary-defining elements. And for this reason, the columns never received their own independent status but are affiliated to the roof for purpose of enveloping a space. In fact, the only significance of these columns is to support the roof, is their structural capacity. In this way, the enclosure (wall) acquires its architectural value by defining a new spatiality. The inner world is separated and protected from the outer. On the other hand, the column plays nothing important in the space creation.

Because of their planimetric nature, walls enclose space no matter they are connected continuously or separated apart. These difference in the walls' compositional style exactly distant the modern architecture like Mies' from the classical one like Semper's. In the German pavilion, the freestanding walls on the one hand enclose and define certain space units, on the other hand these established spatial zones are also overlapped and interpenetrated because of the intermittent composition of these walls, therefore leading to the feeling of a flowing tendency. The other type of vertical elements, the eight columns, while they provide an ordered system or reference for the staggered and interlocked walls, they also complex the pavilion's spatial character, stimulating a multi-possibility of reading. (Figure 053.2)

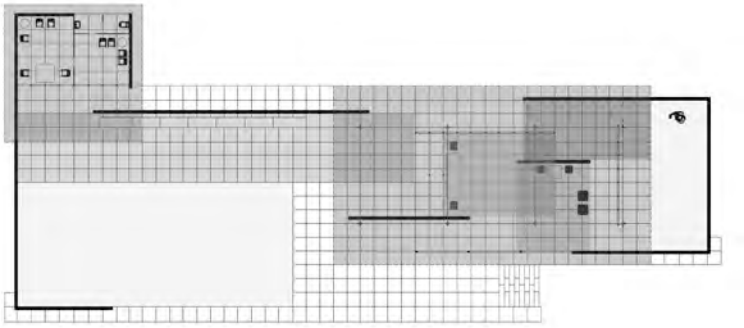


Figure 053.2 The overlapped and interpenetrated spaces of the German Pavilion in Barcelona (plan redrawn by the author)

Here, the nature of the column is quite different from the Renaissance. For the Renaissance master Alberti, the notions of column and wall are discrete and yet identical: One is recognized through the existence of the other. This is evident in his *Ten Books on Architecture*: "a row of columns... (is) indeed nothing else but a wall open and discontinued in several places.... a column is a certain strong continued part of the wall ..." [2] In the German Pavilion, Mies made an absolute difference between these two basic architectonic elements. Losing its ontological connection with earth, the wall in this building represents "the empty wall, ... the pure wall," or "the silent wall," citing Wassily Kandinsky as the last word in a chain of attributions. [3] Column, beyond its verticality and does not recall any stylistic metaphor, it has been pulled into a self-indulgent process of abstraction. It is right through this abstraction a column becomes the column itself and no longer is a part of the wall. The column acquires its own independent status and its own spatial character.

If the columns in the Barcelona Pavilion serve to complex the enclosed space and thus were degraded to be secondary to the walls, in other cases, it obtains the same significance as the wall in space creation. When isolated, a column strongly suggests a space around where the column stands. This character was explored in the Dutch structuralism and contributed in the resistance to the so-called flowing space. In the Orphanage by Aldo van Eyck in 1960, the column at the corner establishes its own sphere of influence, independent of any walls. Such a character helps to deviate from those commonly conceived modern flow space pattern, instead, the building was conceived as a configuration of intermediary places clearly defined. Here, the architect emphasizes: "This does not imply continual transition or endless postponement with respect to place and occasion. On the contrary, it implies a break away from the contemporary concept of spatial continuity and the tendency to erase every articulation between spaces, i.e., between outside and inside, between one space and another. Instead, I tried to articulate the transition by means of defined in-between places which induce simultaneous awareness of what is signified on either side." [4] (Figure 053.3) Because of column's loose and

weak definition of space, it plays an important role in creating such an in-between space, which is parallel to those spaces clearly defined by walls.

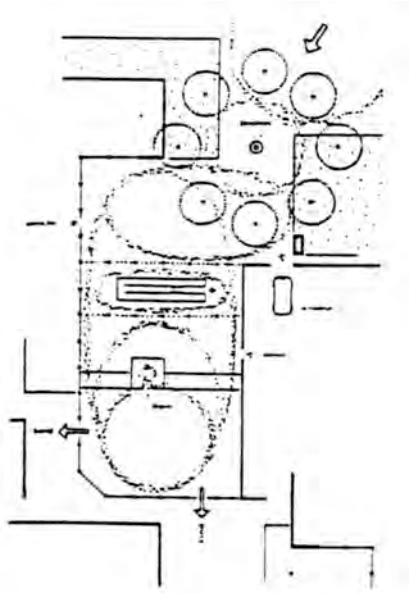


Figure 053.3 Scheme to illustrate the sequence of interlocking spaces and places between the entry and exit (Aldo van Eyck Works, 1999)

If conceptually, any column, especially when it's isolated from other elements, suggests a special domain, in the executed buildings, those speculative details often resonate with this and strengthen the spatial character. In Aldo van Eyck's Orphanage, the groove inscribed on the ground surrounding the column serves to stress on the sphere of influence by the corner column, and the circular-section of the column itself further enhances this round domain, attracting the kids playing around it. (Figure 053.4) In fact, the different sectional shapes of column have always been affecting its spatial character. While many architects have noticed this, no one has more profoundly experimented and explored this potentiality as Mies did.

In the Barcelona Pavilion, the cruciform stainless-steel columns seem to form a free-plan field. But unlike Le Corbusier's circular sectioned *pilotis*, which allow space to flow freely between them, Mies's

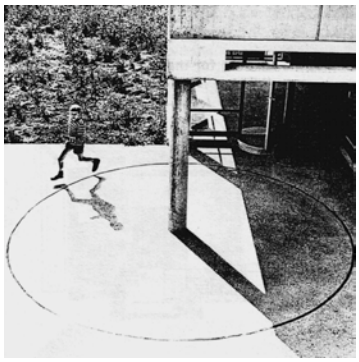


Figure 053.4 Space of the column in the Orphanage by Aldo van Eyck, 1960 (Vincent Ligtelijn, ed., *Aldo van Eyck Works*, 1999)

Barcelona Pavilion columns define a series of square bay volumes. Colin Rowe once observed this in a more systematical manner, discovering that Mies's characteristic German column was circular or cruciform, but his new column of the American period became H-shaped: "Typically, his German column had been clearly distinguished from walls and windows, isolated from them in space; and typically, his new column became an element integral with the envelope of the building where it came to function as a kind of mullion or residue of wall. Thus the column section was not without some drastic effects on the entire space of the buildings." Rowe further explains the effects they generate on the space character and excavates the perceptual reasons lying

behind, “The circular or cruciform section tended to push partitions away from the column. The new tectonic tended to drag them towards it. The old column had offered a minimum of obstruction to a horizontal movement of space; but the new column presents a distinctly more substantial stop. The old column had tended to cause space to gyrate around it, had been central to a rather tentatively defined volume; but the new column instead acts as the enclosure or the external definition of a major volume of space. The spatial functions of the two are thus completely differentiated.” [5] This differentiation in the sectional shape not only affects the interior space, but also the exterior ones, as Peter Eisenman has demonstrated in his article “Mies and the Figuring of Absence.” Here, he studied the evolution of Mies’ column in retrospection, starting from the German pavilion and discovered that at IIT campus, they entered a new phase: “they become implicated in the horizontal zone of layers, not only in the physical presence of the building blocks but also in the void spaces between the buildings.” [4]

In comparison with the wall, the spatial characteristic of column is highlighted not for its structural role, but for its linear geometrical feature. Such a character is not confined to the vertical columns, but also occurs to the horizontal beams, to the framework as a whole. When the horizontal beams are concealed in the ceiling like what Mies did in the Barcelona Pavilion, their spatial defining capability is weakened or even eliminated. When they are extruded and exposed from the slab as in the case of the Orphanage, this capability is strengthened. These two categories of linear architectural elements (usually also structural elements) act together in the suggestion of space definition.

3. DEFINITION AND DEMARCATION OF A SPACE

This difference between the spatial character of wall and column in fact reflects different concepts of space and the different manners of space creation.

In developing his theory of space, Semper introduced a German concept *Bekleidung* (means “dressing” or “cladding”) to refer to the enclosure and held the opinion that the essentiality of wall resides in its surface. His disciple in spirit, Adolf Loos, proceeded with this view and made the definition of architect’s general task as “to provide a warm and livable space.” According to Loos, it’s for this purpose that the architect decides to spread out one carpet on the floor and to hang up four to form the four walls because carpets are warm and livable. In the beginning was cladding. It is this cladding that envelops and defines space. “To invent the frame is the architect’s second task.” [7] This is the correct and logical path to be followed in architecture. With this declaration, Loos consequently degraded the importance of structure, no matter the structure is made of wall or frame. Because for Semper and Loos, architectural space is foremost ENCLOSED by the enclosure, and further by the surface of this enclosure.

The introduction of *Bekleidung* reflects and strengthens such a conception that space comes into being by being enclosed. Architects like Semper and the others, all perceive space as a void enveloped or even almost sealed by the verticality of matter. The result is the geometric volume of space apparent to our senses. But August Schmarsow, a theorist who neither ever built nor designed, considered space and spatial constructs in a different manner. Space for him was not necessarily an enclosed entity or a constituent of the boundary-defining elements, but an intuited form (*Anschauungsform*) that arises out of our senses as an extension in relation to all axes of our directionality and movement. As Tonkao Panin explained, “Space for Schmarsow is bounded, but not necessarily finite, by material enclosure.” [8] Schmarsow stated that the footprints in the sand and shallow grooves drawn with a stick are marks on the ground, is a demarcation of space. Marking or demarcating in this sense may not result in a geometrical volume of space, but they result in space as an intuited form just as a change of texture on the ground does.

Apparently, Schmarsow’s stress on the demarcation draws a line between the verticality and horizontality of elements, but what lies beneath this superfluous observation is the architectonic difference. Space could either be enclosed with planar elements or demarcated by non-enveloping elements although the later one is a space rather suggested or implied. In the context of open architecture, this is the difference between the in-fill and support as to their space-defining capacity. As already discussed above, while the framework often acts as the structural support in the modern buildings, it also establishes its own spatial character. Such a character is not achieved by the complete, seamless, vertical enclosure, rather it’s defined by the composition of linear components. The frame constituted by columns and beams may not seamlessly enclose a space, but it suggests a spatial field, it demarcates space.

Understood in this way, the spatial character of the linear elements is highlighted. In the pedagogical terms, this is explored in many ways, among which the nine-square problem is an exemplary case. With the help of the linear grids, spaces were not defined by complete and unambiguous enclosure, but rather implied by the correspondence of the edges of elements, permitting a simultaneous definition of several interpenetrating

spaces. Since the architectural elements that make up the nine-square grid exercise were meant to be abstract, compositional decisions were meant to focus on the spatial figures or implied spatial figures. The emphasis on the transformation of the plan diagram and the elaboration of space had the reciprocal effect of de-emphasizing the facts of construction, detail, and the quality of materials.

Having acknowledged what it achieved and what it lacked, in the recent years, we carried out an experiment in the Southeast University, underlining the different spatial characters of the wall and column, or more generally speaking, the planimetric and the linear elements. The exercise begins with a paper-folding to form a sort of space, and then transformed to a space of stick or volume. In this process, selection of specific (model) materials is emphasized and students are encouraged to discover design potential in the properties of material themselves. Meanwhile, abstraction in the nine-square problem is still maintained yet transformed into another form: it's no longer a given cage of linear elements, but some solids, planes, and sticks in accordance with the model material chosen by the students. (Figure 053.5) In this way, students are encouraged to mediate between space and construction, materiality is injected into the abstraction and the abstract space obtains its specificity. As this experiment has just commenced lately, it's more like a conception than a solid outcome, and for this reason, I can only describe what we want to do rather than what we have done.

Figure 053.5 Students' exercise works (Instructor: Shi Yong-gao, 2008)

4. CONCLUSION

If "Support" in Open Architecture refers to the part which is relatively stable when under the pressure of alteration, structural components are obviously the most important constituent. Concentration on this structural "Support" enables us to educate open architecture from an architectonic perspective, and subsequently avoiding the mere conceptual fantasy and the techno pragmatism. Given that the support system of modern architecture is primarily a skeletal frame of linear elements, when open architecture is sliced into "support" and "in-fill", it usually implies an assumption that the supporting elements fulfill structural necessities while the infill components delineate space. Although this assumption has its practical convenience, it lacks the academic coherency and intactness, because the skeletal support also defines space, but in another way and of another character. They don't enclose a definite space like those planimetric elements, but demarcates a spatial field. They result in space as an intuited form instead of creating a geometric volume of space apparent to our senses.

For the education of open architecture, distinction between these two characters of space formed by two types of components would help design pedagogical program which mediates between space character and architectonic elements. The anticipated pedagogy should not be a pure plan figuration like some previous ones, but take into consideration of material factors and probe into its spatial possibility and potentiality, in addition to its structural property. In such a way, the pedagogy could explore and find a more appropriate manner in dealing with the support-infill relationship. (I'm grateful to ZHU Lei, associate professor of the School of Architecture in SEU for his advice in the writing of this paper.)

References

[1] Adrian Forty, *Words and Buildings: A Vocabulary of Modern Architecture* **(**New York: Thames & Hudson, 2000), p. 257.
[2] Alberti, Leone Battista, *Ten Books on Architecture*, ed. by Rykwert, Joseph (London: Alec Tiranti, 1955), p. 14.
[3] Quoted by Hilberseimer, L., *Contemporary Architecture: Its Roots and Trends* (Chicago: Paul Theobald, 1964), p. 200

[4] Aldo van Eyck, quoted from Udo Kultermann, *Architecture in the 20th Century* (Cengage Learning, 1993), p. 138.
[5] Colin Rowe, "Neoclassicism and Modern Architecture," Part II, *Oppositions* 1 (September 1978), p. 18.
Rowe, Colin, *The Mathematics of the Ideal Villa and other Essays* (Cambridge: The MIT Press, 1982), p. 145.
[6] Peter Eisenman, "Mies anf the Figuring of Absence," in *Mies in America*, ed.,Phyllis Lambert (Montréal: Canadian Centre for Architecture; New York: Harry N. Abrams, 2001), 707-715, 712.
[7] Adolf Loos, "The Principle of Cladding", in Adolf Loos, *Spoken into the Void: Collected Essays 1897-1900*, trans. Jane O. Newman and John H. Smith (Cambridge: The MIT Press, 1982). 66-69, 66.
[8] Tonkao Panin, *Space-Art: The Dialectic between the Concepts of Raum and Bekleidung* (PhD diss., University of Pennsylvania, 2003), p.64.

Minka Reuse

Yoko Sone[1]
Makiko Taguchi[2]

[1] Professor, Department of Architecture and Architectural Engineering, College of Industrial Technology, Nihon University; 1-2-1, Izumi-cho Narashino-shi, Chiba 275-8575, Japan, sone@cit.nihon-u.ac.jp
[2]Graduate Student, Department of Architecture and Architectural Engineering, College of Industrial Technology, Nihon University; 1-2-1, Izumi-cho Narashino-shi, Chiba 275-8575, Japan

Abstract

This paper, related to a design exercise given in the second term for second year students under the direction of the author, is an attempt to effectively educate students on the Open Building concept. The content of the assignment is to select one of two specified traditional wooden folk houses, and to remodel the house to accommodate a modern-day family.
The folk houses of Japan represent a residential prototype that has been successively inhabited for hundreds of years with a deep connection to the climate and trade of various regions of the country. Collections of these houses forming a village are regarded as the spiritual home of the Japanese. While one of the specified folk houses is spatially closed to the outside and the other is opened, they both are beautiful wooden post-and-beam thatched roof structures with approximately the same floor area.
While the present era is completely different in every aspect -- lifestyle, materials, M/E equipment, etc. -- from the age in which these folk houses were built, the purpose of the assignment is to identify what is to be left inside these buildings as skeleton and to design an infill suitable for modern living. Through this exercise, while learning how to clearly distinguish between that which should remain and that which has been changed, the students will also learn how to integrate these two factors into a single residential structure. This paper reports on the instruction of such skills and the assignment results.

Keywords

Traditional Japanese folk houses, open building, residential architecture, wooden structures

Introduction

Housing design ranging from small residences to collective housing is the focus of a course taught by the key author of this paper for the Depart
ment of Architecture and Architectural Engineering at the College of Industrial Technology of Nihon University. As one of the design exercises in the first term, third year students are assigned a project on the reuse of *minka*, or traditional folk houses of rural Japan, for which the Open Building concept is introduced.

Since architectural design at Japanese universities is centered on the design of new buildings, such assignments involving the repair and reuse of existing structures are unusual. This paper describes the details of the course assignment, instruction methods, features of the resulting student works, and the educational effect of this project.

The assignment is to select one *minka* from a choice of two—the Kitamura Residence or the Hirose Residence—built approximately 300 years ago during the Edo Period (1615 to 1868) and renovate it as a residence suitable for contemporary life while maintaining its structural and spatial integrity.

Characteristics of *Minka*

Traditional *minka* in Japan are common dwellings that had been inhabited successively since hundreds of years ago up until the 1960s, with some dating as far back as the 17th century. deeply connected to the climate, natural features, industry and collective grouping of buildings of

the region in which they are found, their forms vary with respect to their location. Despite these regional differences, all *minka* built within a given area adhere to the same design regulations since they have been built using similar materials and common structural methods, creating a uniform townscape (Fig.1).

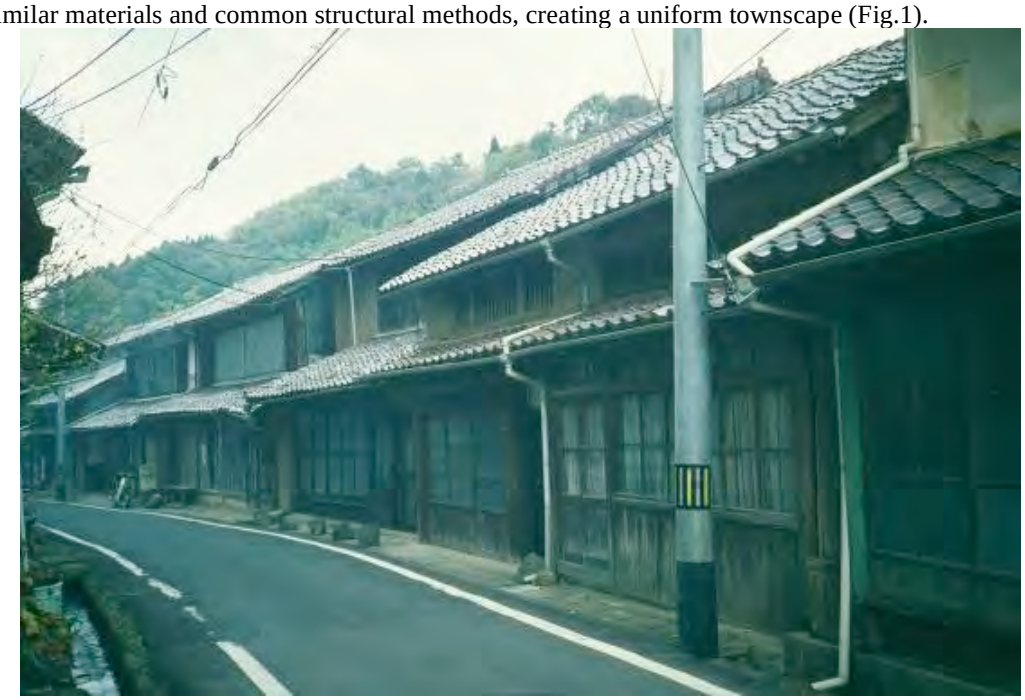


Figure 1 An old streetscape of Japan

In contrast to the folk houses of Europe in which apertures perforate the main wall structure of stacked bricks or stone, those of Japan are wooden post and beam structures, distinct in that their inter-columnar openings formed are fitted with windows, doorways and walls.

Due to improvements in carpentry and the widespread use of the modules of *sun*, *shaku* and *ma*[1] in the Edo period, construction materials that circulated in the marketplace also became standardized. Pillars were raised at intervals of 909mm, and unit dimensions of 1818mm by 909mm became the standard for *tatami* straw mat flooring and the inter-columnar elements of *fusuma* (opaque sliding doors) and *shoji* (translucent paper sliding doors). This is comparable to the construction methods used in industrialized housing today.

Although most Japanese people today have inhabited such spaces, with its extensive history, the space of the *minka* that had been intimately related to the daily habits and lifestyle of common people still inspires a sense of familiarity and comfort. Likewise, the appearance of a village formed by a group of *minka* represents the native scenery of Japan. Yet, many *minka* have been demolished and replaced because they are not suitable for modern lifestyles and are costly to maintain.

The two *minka* chosen as the objects for design, the Hirose Residence and the Kitamura Residence, are important cultural properties—the former is an important cultural property of Kanagawa Prefecture and the latter, a national important cultural property—and have been dismantled and reconstructed at the Japan Open Air Folk House Museum. Both houses have approximately the same floor area and are single-story wooden structures.

With a gabled roof enclosing an attic that was used to cultivate silkworms, the Hirose Residence has low eaves and a slightly closed feeling due to its abundance of walls (Fig. 2). The side elevations have a visually appealing Mondrian-like composition.

The Kitamura Residence is a hipped-roof *minka* and has a high degree of livability with its ceiling finish that covers all but the *doma*, or compacted earthen floor area (Fig. 3). The veranda along the central hall with bamboo flooring creates an open spaciousness that connects to the exterior.

[1] Units of measure used in traditional Japanese architecture based on the span of a bay (*ken*), in which 1 *sun*=30.3 mm, 1 *shaku*=303 mm, and 1 *ken*= 1.818m.

Figure 2 Hirose Residence

Figure 3 Kitamura Residence

Process of the Design Course

In the first phase of the project, the students go to the museum and examine the two houses in situ to understand the traditional Japanese space of the *minka*. Ample time is allocated to experience the spaces through various actions, such as standing and sitting inside and outside the buildings. It is also important for the students to appreciate intangible aspects of the *minka*, such as the smells, temperature, wind flow, and sounds, and to become familiar with the uniqueness of the spaces. Following this investigation, the students then document the buildings by measuring details and points of interest, while verifying the actual space against the building plans.

In the second phase, students construct models of the structural framework as the skeleton of the *minka* (Figs. 4 and 5).

Figure 4 Framework model of the Hirose Residence

Figure 5 Framework model of the Kitamura Residence

In the third phase, the students establish their concepts of *minka* reuse while considering aspects they found unique and those they would like to keep intact. They then make conceptual models and sketches based on those concepts.

In phase four, students present their individual concepts and sketches during class and receive advice from the instructors. Students then develop their concepts based on that advice.

During the fifth phase, each student gives a final presentation. In addition to their regular course instructors, architects invited as guest lecturers also attend these presentations, while students of other grade levels are also welcome to listen (Fig. 6).

From the project assignment to the final presentation, this seven-week program is broken down into the following timetable: one week is allotted for the first and second phases, five for the third and fourth phases, and one for the fifth phase.

Figure 6 Classroom presentation

Tendencies and Intentions of Student Works

The general tendencies of resulting student works vary slightly from year to year, such as interest in large-scale alterations of the existing *minka* by inserting new spaces, or focus on HVAC and other mechanical and electrical facilities suitable to modern lifestyles. The theme of the assignments also varies from year to year. For example, in some years there is an interest in the relationship between location and usage, or in others, the program calls for mixed-use housing that includes some other function in addition to residential use. However, alterations that retain the inherent features of the *minka* remain consistent every year.

The students make comparative studies between the *minka* and contemporary housing, and formulate their designs for *minka* reuse in consideration of the attributes they would like to keep of the former or those they should incorporate of the latter. They then divide the means of spatial usage in their actual designs into three categories: wall insertions, spatial insertions, and spatial divisions, as shown in Table 1

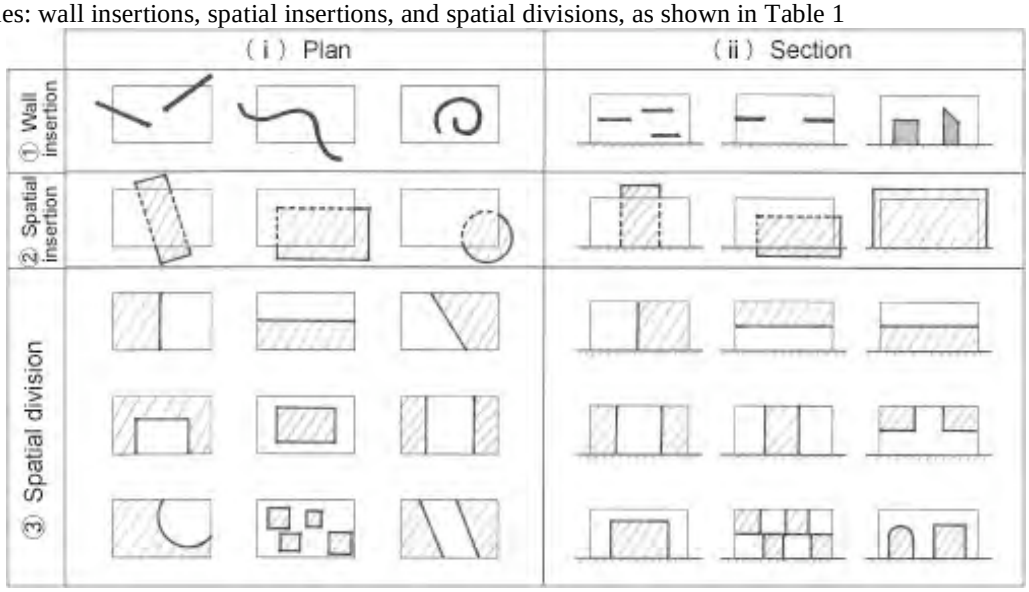


Table 1 Spatial usage

Table 2(i) shows what the students consider to be characteristic of the *minka*. For example, they possess "dark spaces as a result of their large roofs, or flexible spaces that can be divided by movable *fusuma* and *shoji* partitions. Among those items, the most distinctive features of the *minka* are listed as being their large spaces greater than 100m^2 in floor area with over 5m ceilings, and their post and beam structures with large, organic-

shaped cross sections. The characteristics of present-day housing are shown in Table 2(ii), in which they are described as possessing bright spaces with natural and artificial lighting, or comfortable indoor livability with air conditioning systems.

		(ⅰ) Characteristics of *minka*	(ⅱ) Characteristics of contemporary housing
Shell	①	**Post and beam structure**	
	②	Natural materials (clay walls, tiled roofing, wood board/bamboo/earthen flooring)	Modern materials (steel, glass, concrete, etc.)
	③	Beautiful proportions	
	④	Utilities (firewood, river water)	Utilities (electricity, gas, plumbing)
Furnishings	⑤	**Large interior space**	
	⑥	Dark interior with large roof	Bright spaces from natural and artificial lighting
	⑦	Flexible space afforded by movable partitions (*fusuma*, *shoji*)	Spaces with individual functions (master bedroom, nursery room, etc.)
	⑧	Japanese-style floor-based space for daily living (*tatami* mats, *futon*)	Western-style space for daily living (chairs, beds)
	⑨	Function as a place of production (ex. Silkworm cultivation)	Function other than residential use (SOHO, etc.)
	⑩	Intermediary spaces between exterior and interior (*engawa*, or veranda, space under	
	⑪		Indoor residential performance (M/E kitchen equipment, A/C, privacy)

Table 2 Features of *minka* and contemporary housing

Examples of Student Works

A number of the students' *minka* reuse projects have been selected from among the results and are introduced as follows.

Figure 7 shows a project in which skylights are created through perforations in the roof to bring sunlight down into the space, turning the dark *minka* space formed from the large roof into a bright, modern space. Conversely, the project shown in Figure 8 optimized the dark space of the *minka*, locating the AV room for movie viewing in the center of the house, while placing other rooms around the perimeter walls, providing natural lighting.

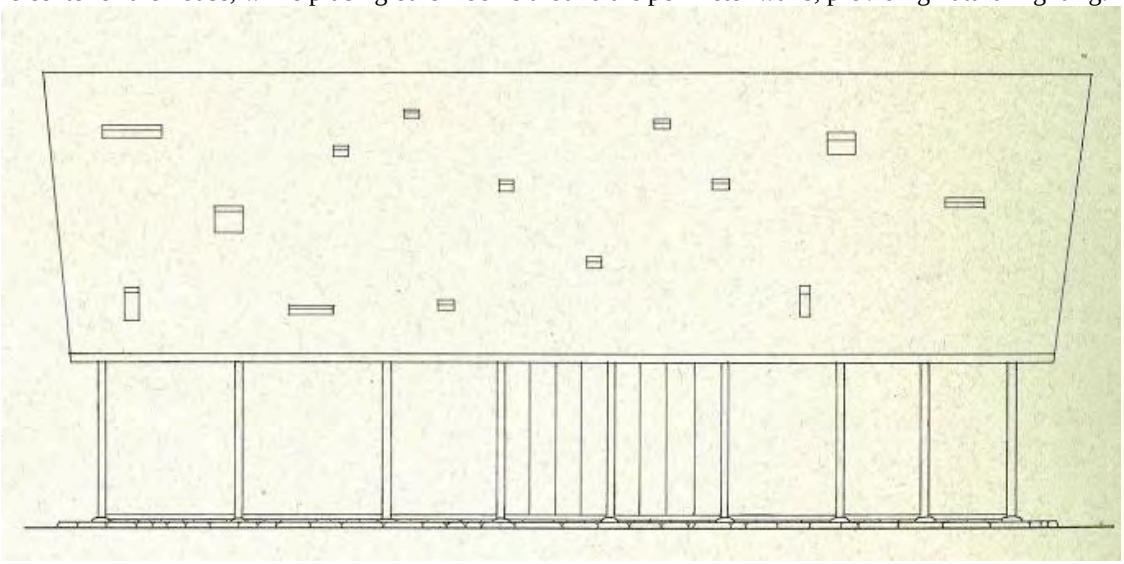


Figure 7 Transformation of interior from dark to light

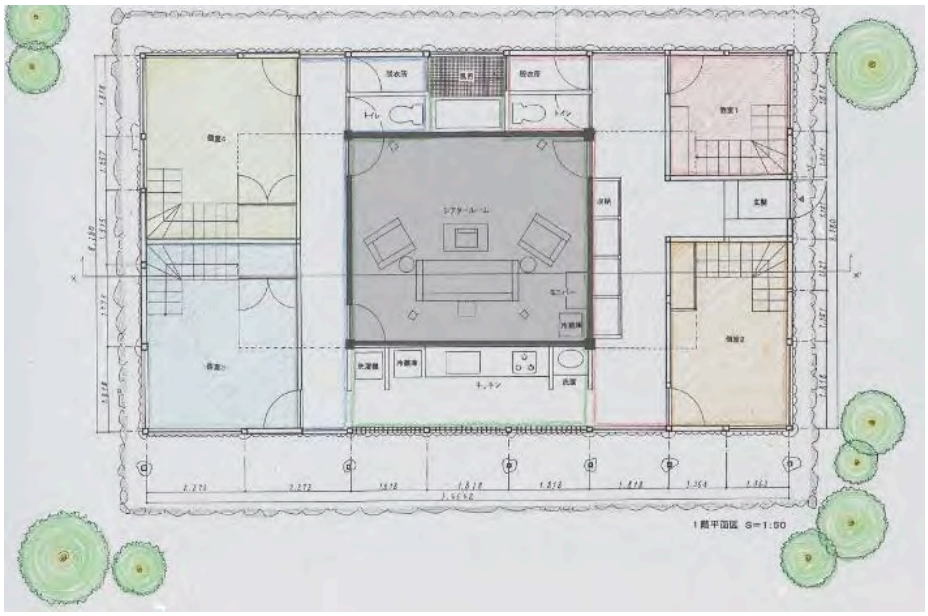


Figure 8 Optimization of the dark interior

While the arrangement of rooms in *minka* is flexible due to the use of partitions, in the scheme shown in Figure 9, a large multi-use space that functions as a living room, dining room and kitchen was situated in the center of the main space, with a layout of separate individual rooms, such as bedrooms for each member of a family of four and bath/toilet/laundry rooms. The mechanical and electrical equipment was enhanced in each room, providing comfortable indoor livability.

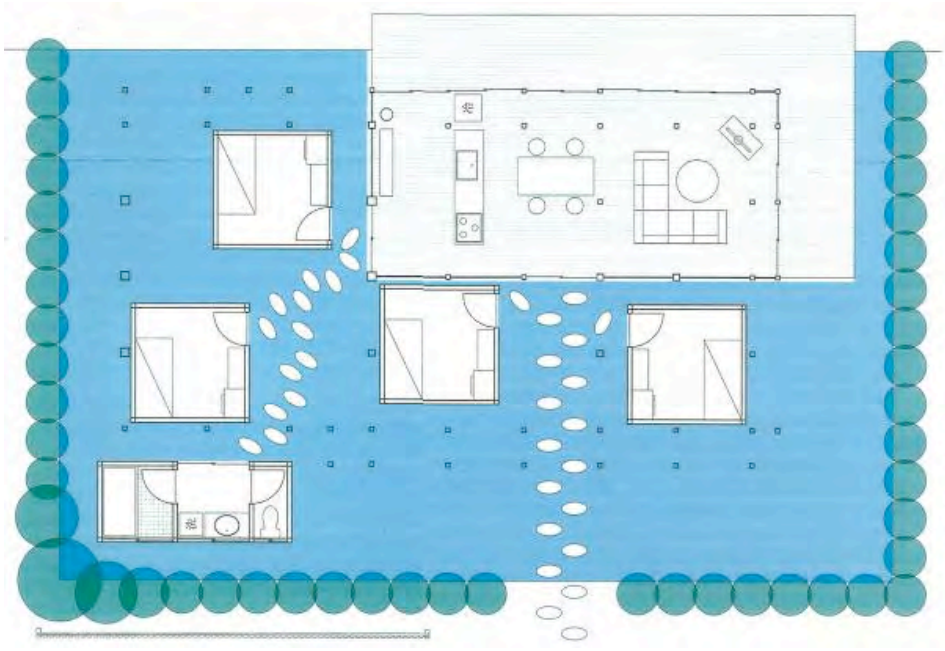


Figure 9 Layout of rooms

The scheme shown in Figure 10 focused on the interest of materiality over the improvement of residential performance. Concrete, glass, and aluminum walls were introduced as a method of spatial division in contrast to the natural materials of the *minka*, such as clay walls and wooden columns.

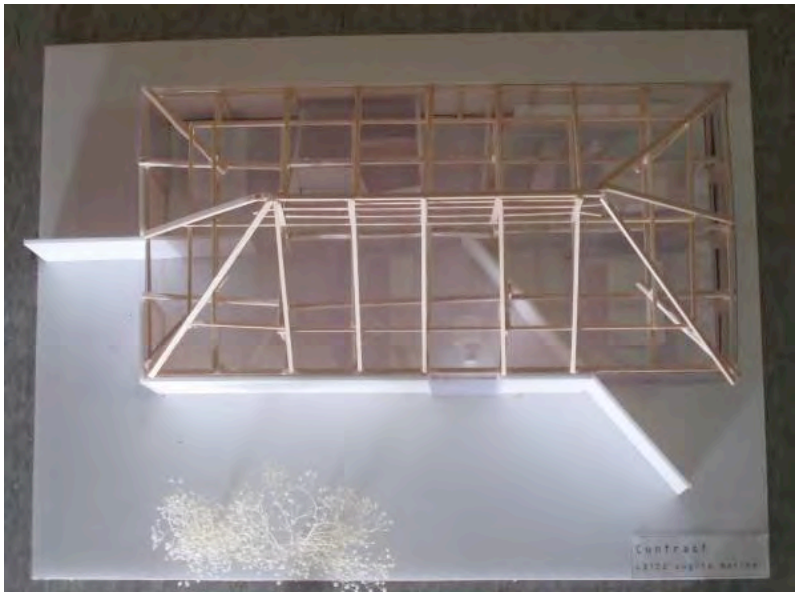


Figure 10 Wall insertion

In the scheme shown in Figure 11, in order to improve the residential livability of the *minka* to suit a contemporary lifestyle, a section of the roof was removed and a box-like space with a second story was inserted; but aspects characteristic to *minka*, such as the flexible layout afforded by movable partitions and the Japanese-style living room, were kept intact. By contrast, the scheme in Figure 12 located the minimal amount of water-based utilities necessary for modern living inside an oval space, while the rest of the house incorporated elements of traditional *minka*, such as the use of an *irori*, or sunken hearth, for heat.

Figure 11 Spatial insertion

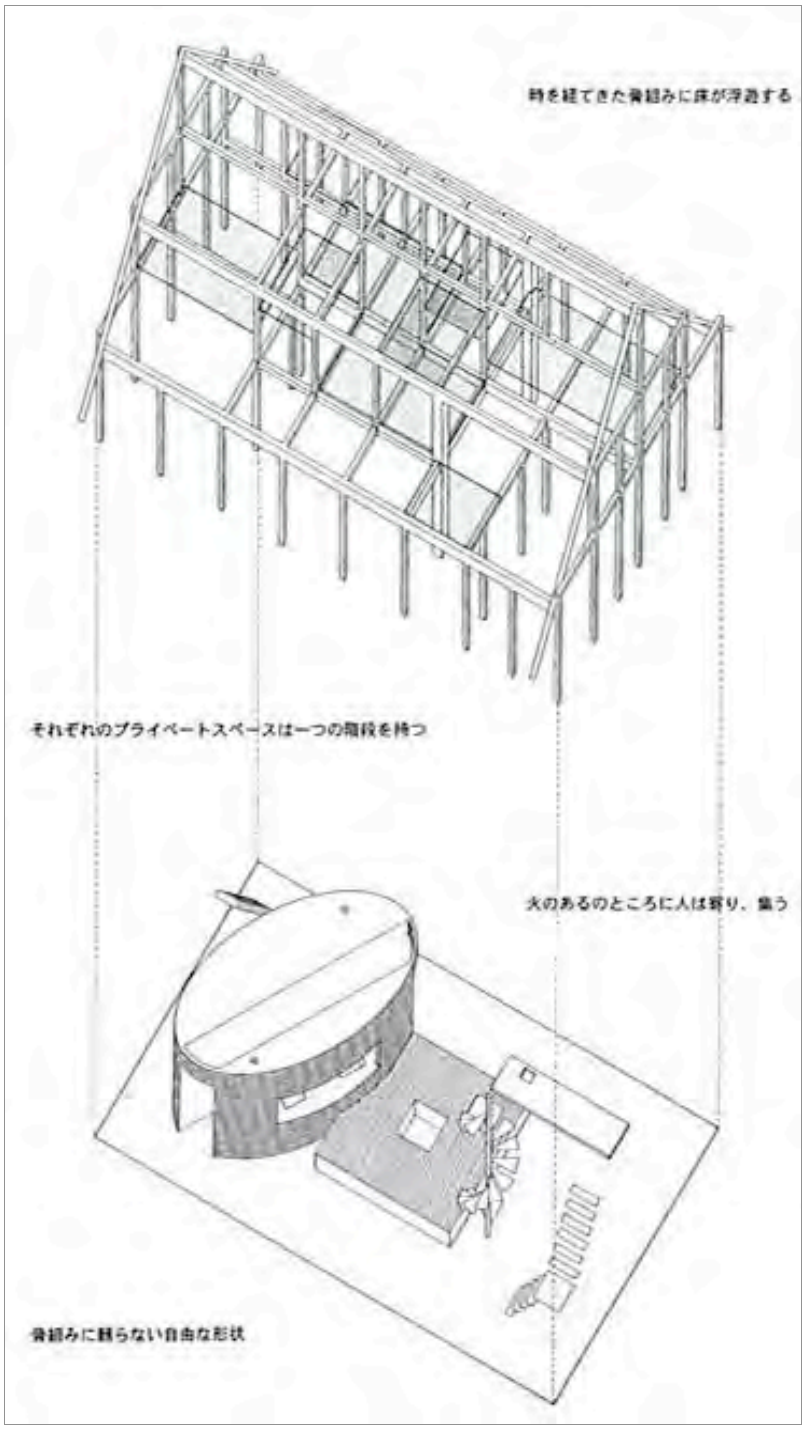


Figure 12 Compact integration of modern-day M/E facilities

Typically, when a second level is created in a *minka*, there are limitations on the use of the space due to the organic form of the wood beams of the upper structure. For this reason, the amount of small beams is generally reduced when installing a second floor level. However, in the scheme shown in Figure 13, all beams were kept intact and floors were inserted at various heights, where low-height spaces between the floors and beams that are hard to access by adults became interesting spaces for children. The project shown in Figure 14 is a unique scheme for a mixed-use dry cleaning shop-cum-residence, where the clothing moves on rails hung among the beams to call attention to the distinctive forms of the beams.

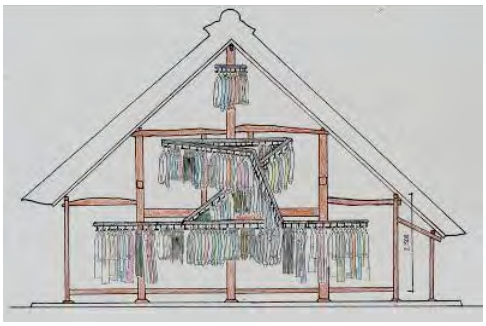


Figure 13 Daycare center with various scaled spaces

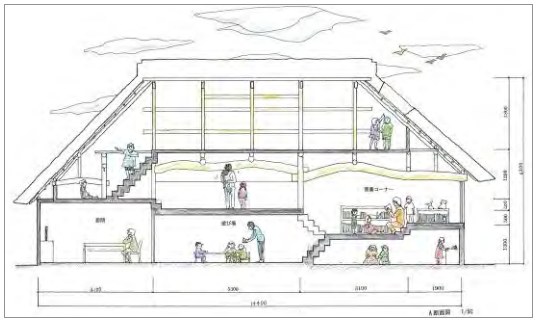


Figure 14 Dry cleaning shop using space between beams

Significance of the Project Assignment

While valuable as a means for the students to acquire an understanding of traditional Japanese space, the assignment of *minka* reuse is also an effective means of learning about the Open Building concept. In considering the usage of the large space of the *minka* unsuitable to modern living, students determine which columns and beams are structurally required and optimize them in their designs. The Open Building concept can be learned through this process.

The results of their investigations can be seen in the skeleton/infill housing (SI housing) projects that follow the *minka* reuse assignment. Designs for SI housing are conducted in groups of five or six, with each group proposing a concept for the skeleton of a collective housing project. Each student then develops their own infill design for these skeleton designs. The students who succeed in their assignments for *minka* reuse propose skeletons that have rich originality—not simple rigid frame structures that are the norm in SI housing design—and in the process, they produce many interesting infill solutions that optimize those skeletons. In closing, we introduce two of the students' SI housing schemes.

The scheme in Figure 15 shows an equilaterally triangular structural cross section as a continuous skeleton through applying an incline to a simple rigid-frame structure. From such a skeleton emerges an infill with rich spatial variety. The scheme in Figure 16 shows a rectangular tower skeleton with a regular octagonal core, where partitions radiate from the core and protrude from the tower, creating an infill of glass boxes. Although both of these projects present simple skeletons, they are flexible and allow numerous infill possibilities.

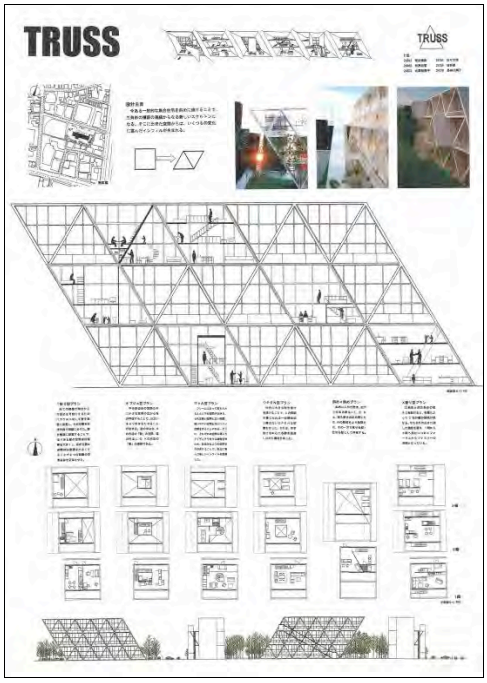


Figure 15 Truss-like skeleton

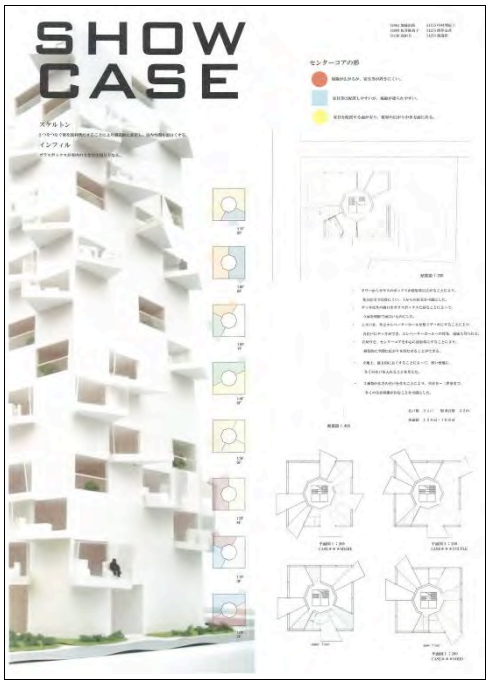


Figure 16 Showcase-like infill

A Studio of Technologies for an Open Architecture and Environment: The Experience of the Course of Master of Science in Architecture of the University of Florence (Italy)

Maria Chiara Torricelli[1]
Nicoletta Setola

[1]Department of Technologies for Architecture and Design "P. Spadolini"; Via San Niccolo' 89/A, Florence, 50125, ITALY; mariachiara.torricelli@taed.unifi.it

ABSTRACT

This paper is focused on the experience led in the Studio of Technologies for an Open Architecture and Environment of the Master of Science in Architecture, University of Florence.
Today we are in front of a new technological paradigm, sustainability, which introduces an innovative process in changing the built environment. This new process finds applicable and developable knowledge in the Open Architecture theories.
Innovation and sustainability put every project inside a holistic and systemic vision characterized by inter-disciplinary, research, professional and tacit knowledge and skills, and by multiscalar and cyclic dimensions.
In our curricula the studios at the top level of teaching (2nd and 3rd level according to the European model) should ultimately become the place where knowledge develops through design and should configure more as laboratories of experimental research favouring team creativity development.
In particularly our studio experience concerns the project of housing in a delimited area at north of Florence taking into account sustainability and flexibility principles. The project approach is based on: the performance approach; the idea of project as multi levels process; the idea of built environment as an open system.
The work has been developed in two phases. We started defining a DPP (Preliminary Project Document) thanks to the contribution of different parties. Each group of students has represented a part: the designer, the authority, the user,…. Each part was supposed to study the problem from its own point of view and to communicate with the others by briefings (meetings) where the discussion was enhanced from the different visions.
The second phase of project was held in 3 levels: urban project (assuming the G. De Carlo master plan for the area), support project, and infill project. The students have the possibility to pass through the different levels as designers, whereas the professor assumed the project manager part.

Keywords: learning studios, sustainability, open building technology

1.1 themes

The studio program aimed to tackle the designing process experience through two main themes, which affect the classic approach to design: the idea of sustainability and of open architecture.

These two fields demand good technology knowledge to be developed. So the students were encouraged to take advantage of the information acquired in the past years of university and to enhance their own background with new experimentation.

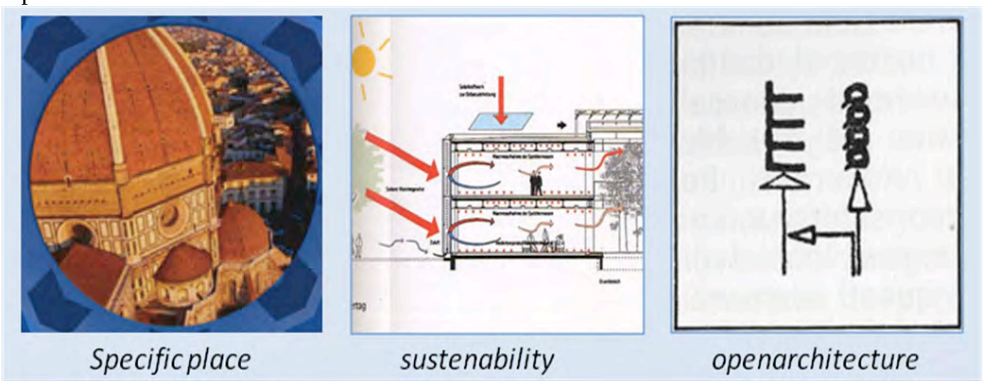


Figure 1.1 the three issues tackled on the studio

1.2 METHODOLOGY

The implied method was a simulation of a real process design. The process was divided into 2 phases where people (students, professors, and assistants) played different role.

We choose a specific area in the suburb of Florence called *Le Piaggie* where the Council foresees to build new housing.

1.2.1 Phase 1

The first concerns the making up of a base document (DPP) useful for the designers that are going to apply the area project. The project preliminary document (DPP) contains information about the project requirements, the project space, the project consistence and the concepts sketches. In other words it defines the general goals and the strategies to reach them with special regard to the environmental problems and the adaptation over time. Moreover it comprises the users' demands, the housing functions program, and the technological requirements for structures, envelope, and services. In addition it sets the main law constraints about the context and the financial top limit to respect.
The DPP was made up by the students divided in 2-3 persons groups, under the coordination of the professor. Each group embodied a part, which contributed to the DPP draft.
Each part analysed the problem from its own point of view and afterwards shared its knowledge and suggestions with the other parts. These moments developed as briefing and have turned out to be very meaningful for a real exchange of information thus obtaining a good final DPP.

Figure 1.2 The different part contributions to the DPP draft

For example a group represented the City authority and it dealt with the urban tools regulating the development of city. A different group was the landscape architect who studied the area from a natural point of view. The third group played the private investor role. And so on until the future users.
As a result the briefings generated an A3 book with rules, constraints and needs of the project.
At this point we were ready to tackle the project.

1.2.2 Phase 2

The second phase concerns the project process. It was organized by 3 design level corresponding to different scale and different level of decision.
This time, each student had the possibility to pass through the different levels as designers, whereas the professor assumed the project manager part leading them along the process.

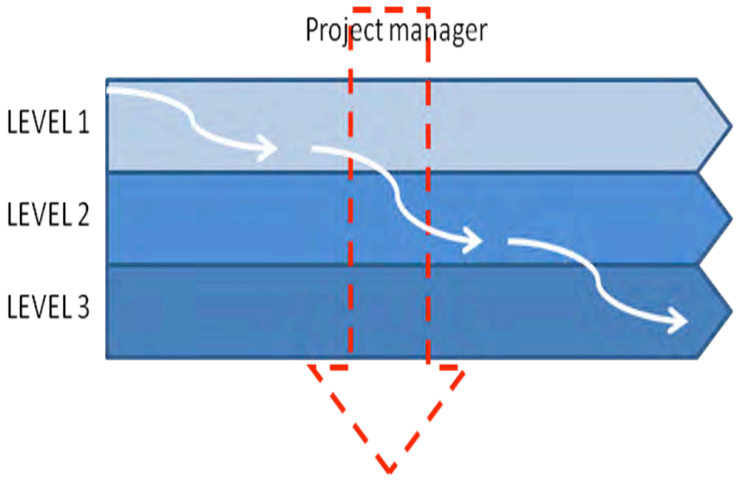


Figure 1.3 The levels diagram with the student path

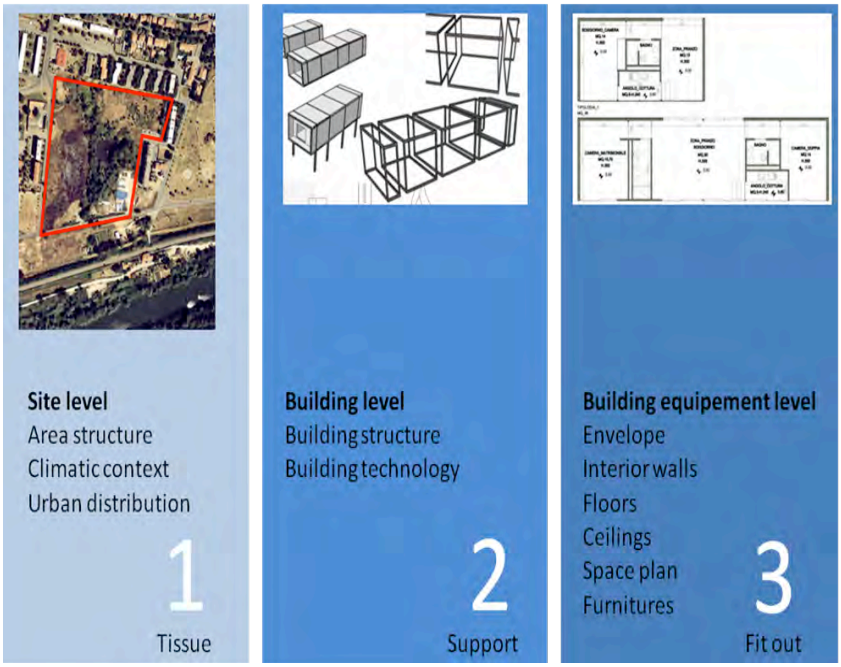


Figure 1.4 The levels organization

The first level is the urban system. Because the council of Florence refers on it, we assumed the master plan done by the architect Giancarlo De Carlo on 2005 concerning the big area our site is included in. The master plan consists of a tissue of relationships where there are neither quantitative standards nor typological instructions.

Figure 1.5 The Giancarlo De Carlo master plan with our project area

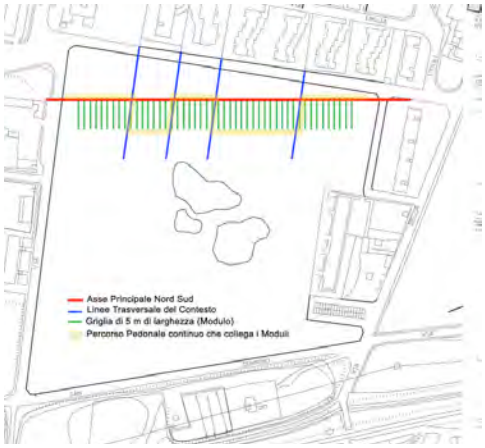
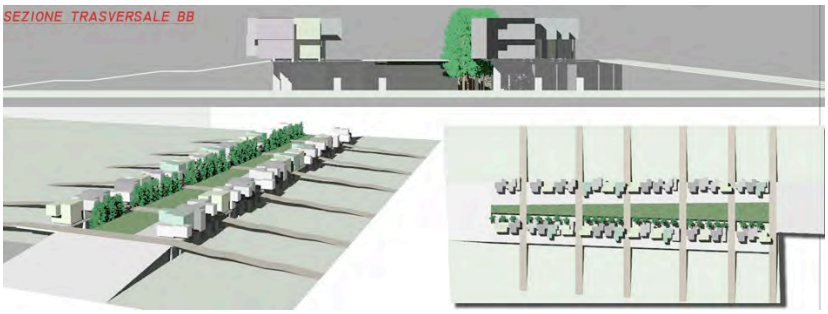


Figure 1.6-1.7 Some students' works of level 1: a grape and a comb shape

Thanks to the input of DPP the site designing started with the aggregation of houses, layout of streets localization, the accesses to them and the relation of the built environment with the natural one. Subsequently we passed to the second level to study of how the tissue can adapt to different functional organizations of housing cell and to different aggregation possibilities ensuing from needs growth and flexibility. Each building was supposed to have a fix part, which will be the support for the successive components of building. In some students' projects the fix part (unchanged) represented the infrastructure to support the cells with different combinatorial possibilities, in others the fix part corresponded to the structure system and allowed a possibility of distributive solutions and the integration of pipes system thanks to a modular rule.



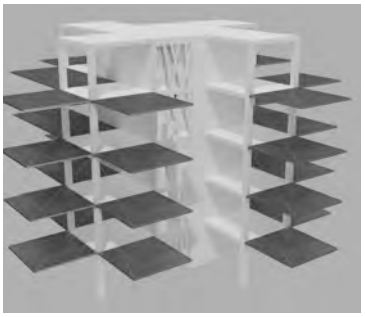


Figure 1.8-1.9 Some students' works of level 2: the infrastructure and the skeleton

Study the relationship between infrastructure or structure and the earth contact was also very interesting because of the different variety of solutions found.

In the third level the students tackled the building equipment designing. The equipment ranged from the skin of building to interiors walls, from the floors and ceilings to the furniture. The spatial layout was created according to flexibility criteria in a way that the inhabitant could change the disposition or add new space by his own. Sometimes in each apartment a service space with bathroom and kitchen keeps the same location and the other spaces move around it, but sometime ceiling and floor allow a more flexible integration among structure, systems and equipments.

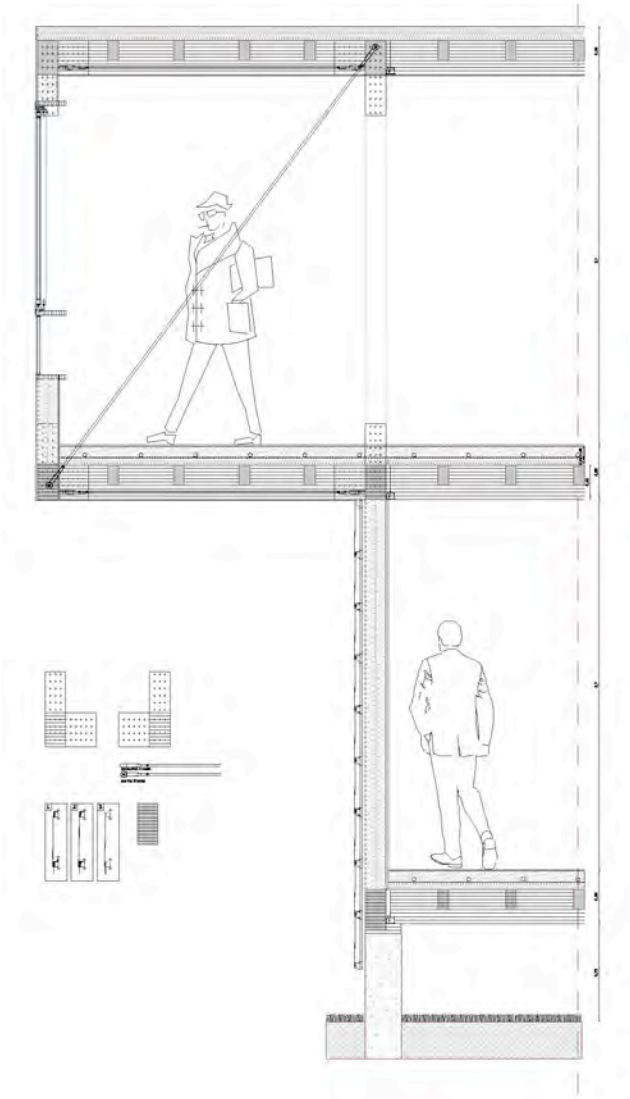


Figure 1.10 A final detail of the building structure

1.3 RESULTS

Each student made up a complete project: urban system, building system, infill, and details. The role of building technology was very important while facing these design levels, because it gave the opportunity to create the flexibility and the real possibility for the user to participate at the process.
In terms of proposed solutions the students' works results mainly spotlight two options concerning the support project (level 2):

- the support urban infrastructure (level 1);
- the support as housing skeleton (level 3).

In the first case the support became the built urban infrastructure the housing cells grow on, according to the programs (the tree and the fruits).
In the second case the support is the skeleton the components of the infill subsystem insert in to set up the skin, according to the programs (in-fill, lug wrench, overlapping…).

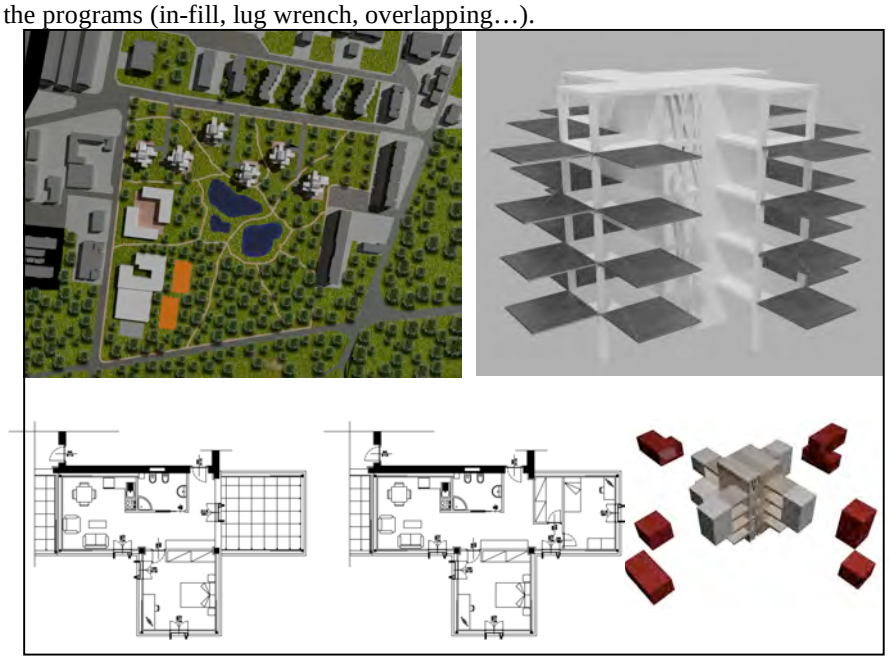


Figure 1.11 The all process steps

On the whole the experience stimulated an interesting group work, even if in individual project experience. This is the reason that allows us to think about the results and the possible outcome in the theory and tools field of project.

1.4 OPPORTUNITY, DIFFICULTIES AND FUTURE DEVELOPMENTS OF PEDAGOGY EXPERIENCE

We conclude with some general comments about the innovations that an open building approach brings to the sustainable project in a studio. We agree with Kendall's idea that the open building approach transforms the studio in a workshop or more likely in a "experimentation laboratory" of designing tools. The experimentation consists of using in an integrated way tools of designing (spatial, environmental, technological) that usually are used in sequence (urban, architectural, executive project). The students generate in levels of successive control the "form" of building system: space textures and materials in relation with the built context, the climate, the nature, the neighbourhood, the men and family life.

At each level the set of tools allows to establish some growth rules according to indeterminacy. This approach modifies the common meaning of project scales, briefing and preliminary designing document.

The studio as laboratory needs to integrate with thematic courses (System and component designing, Assisted designing) and it aims to define new tools more than to achieve an architectural result. This is the first problem we deal with because the students are used to a linear process consisting of designing an architectural form starting from a functional program and afterwards giving a technical solution to this form. In our case instead the design process generates at every single level the organizational models, the spatial shapes and the technologies. This seems to us more pertaining to the actual conditions of the project.

The open building approach experimentation with the students allows an innovative remark about the sustainability topic highlighting the priority of social and cultural aspects. At the same time it allows to develop the performance based building approach introducing the control of the performances level by level.

This is a new idea of "rationality" that subverts the traditional analytical approach into a synthetic one.

1.8 REFERENCES

Dierna, S. and Orlandi, F., 2005, *Buone pratiche per il quartiere ecologico. Linee guida di progettazione sostenibile nella città delle trasformazioni*, (Firenze: Alinea).

Gangemi, V., 2001, *Emergenza ambiente: teorie e sperimentazioni della progettazione ambientale*, (Napoli: Clean edizioni).

Habraken, J., 2000, *Housing for the millions*, (Rotterdam: NAI).

Kendall, S., *Notes on teaching open or agile architecture*, in http://www.bsu.edu/web/capweb/bfi/, download on July, the 2nd 2008.

Torricelli, M.C., 2004, Centralità e complessità della produzione di progetto, in *Tecnologia, progetto, manutenzione Scritti sulla Produzione Edilizia in ricordo di Giovanni Ferracuti*, edited by Andrea Missori, (Milano: FrancoAngeli), 111-121.

Torricelli, M.C., Del Nord, R. and Felli, P., 2001, *Materiali e Tecnologie per l'architettura*, (Roma-Bari: Laterza), 1-311.

Torricelli, M.C., 2001, La dignità dell'abitare, imperativo di uno sviluppo urbano sostenibile, in *Costruire sostenibile: il Mediterraneo*, edited by AA.VV., (Bologna: Fiere Internazionali di Bologna), 214-221.

Zambelli, E., 1982, *Il sistema edilizio aperto*, (Milano: Franco Angeli).

Architecture in Dynamic Form
-A Design Exercise in Changing Waterfront in Taipei-

Wu, Li-Ying

Project Description

This is a studio project setting out a framework for handling changes caused by natural force and their long-term negative social and environmental consequences. The resolution calls for architects and design professionals to go beyond mere designing a static construction and instead establishing active agents in the physical environment to cope with the changes.

In the process of taking a close observation on the site, the studio developed six issues to manage physical environmental changes and tried to engage programs as an experimental agenda to create different point of views on design capacity. The students were asked to develop a dynamic mechanism toward programs which were planned not only to control the changes but also yield a design space that response to its urban inhabitation.

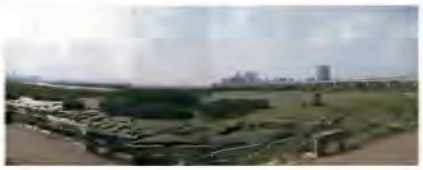
In dealing with the complexity of the natural phenomena, we understand it cannot be adequately modeled by a single pattern or systemic logic. Our approach therefore based on the architectural application on haptic technology, which constitutes an inter-force relationship between an adaptive organization and its internal and external environment. Our built environment is transformed by natural forces through times and the transformation gets to continuous cycles. These cycles re-form both the organization itself and the context of which it is a part. The iterative process generates a project which is grown rather than designed, and which continuously evolves over time.

The process of design exercise is followed:
Observation of the site
Description of the observed changes
Dynamic mechanism
Programs for the adaptation
Design scenario

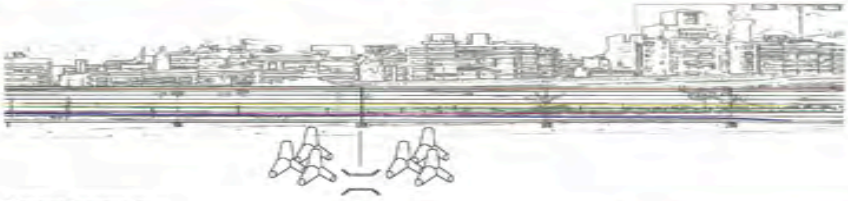
OB1 DIVIDING LINE BETWEEN RIVER AND LAND

Observation of the site

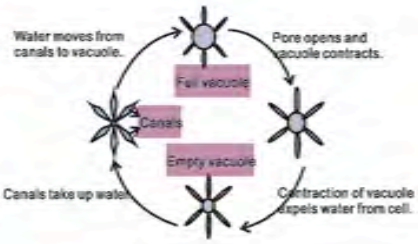
Danshui River has been under a clean-up and protection process for many years due to its pollution caused by wastewater. However, we can find its bio-ecological environment is in a great deal of diversities. The changing tide creates various site conditions for people to be engaged with.
The river level recedes during the ebb tide and the hidden wetland reveals to its appearance.
During the low water level period, birding becomes a popular activity and a section line of the riverbank pops up along with the various aquatic plants to be observed. While when the river rises to the high water level, we see boats cruising on the river. Wetland islands are eliminated in sight.
By dealing with different water levels and the exposure of wetland on the river,
a series of floating mat is placed over on the river as a device that manipulated river-bank topology and typology of the local aquatic plants, and re-describes the river landscape in templates that configure a new regulatory texture for the wetland.

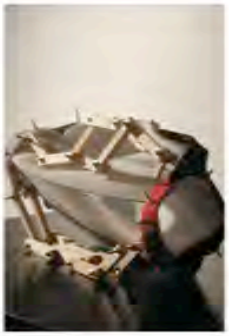


Description of changes

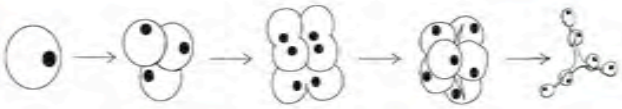


Contractile vacuole



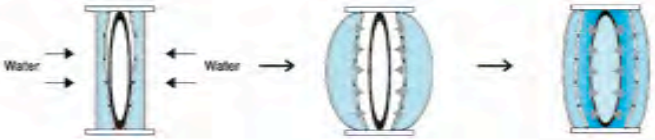


Spicule

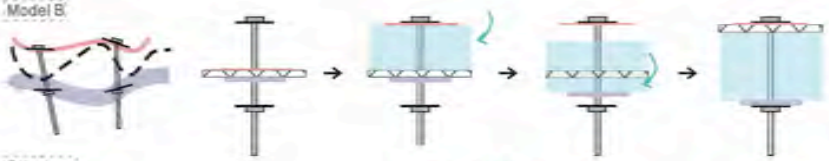


Dynamic mechanism

Model A

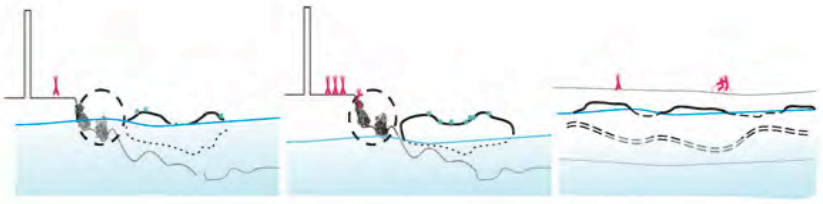


Model B

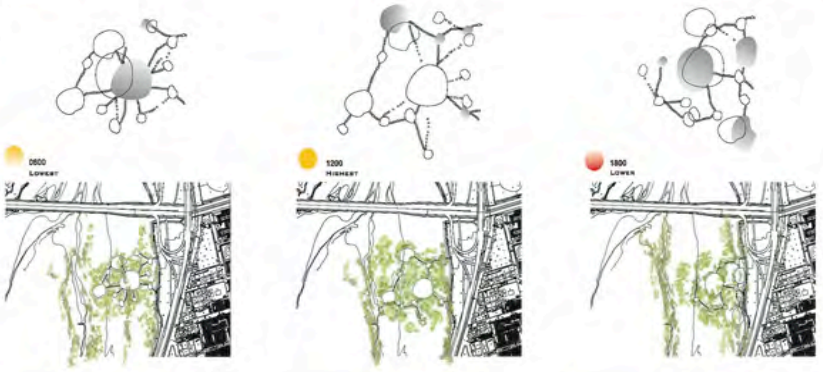


Structure member

Programs for adaptation



Design scenario



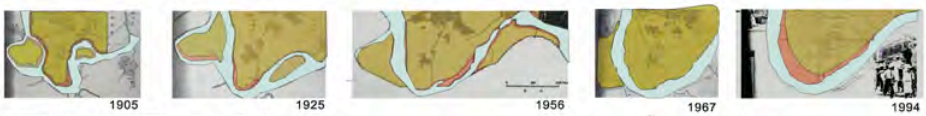
OB2 THE POWER OF WATER FLOW

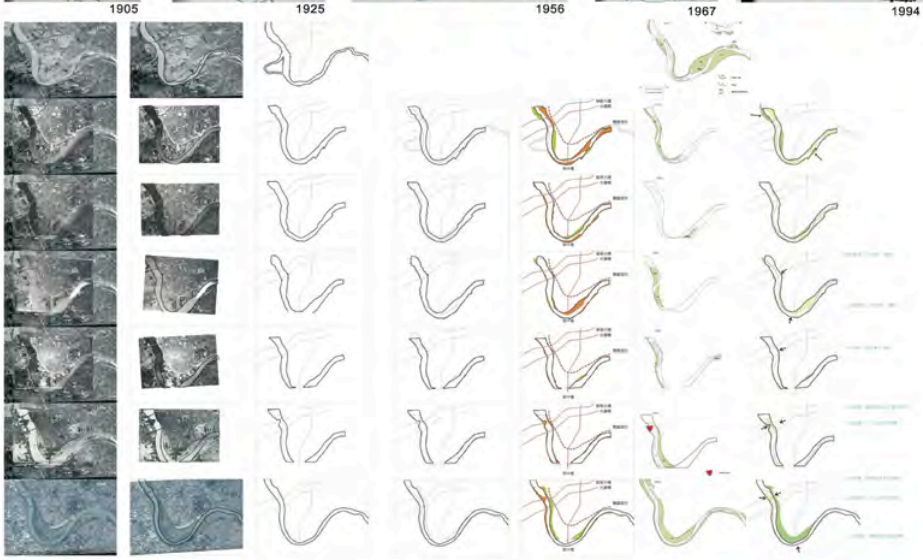
Observation of the site

The source of Danshui River is from Pintien Mountain and run through several counties in the northern Taiwan, it lastly empties into the Taiwan Strait. Looking at the river in a birds' eye view, we can see the Danshiu River is a meandering watercourse, meaning the shape of the river in general is a bend in sinuous form. This character of an irregular waveform can be described in a scientific way. A meander is the result of a snaking pattern alternatively eroding sediments from the outside of a bend and depositing them on the inside. Therefore, by studying the meander formation we can try to predict how the changes of the river affecting the form of the land. The alternative formation of the sediments is the dynamic system of how water flow becomes active agent in the changing landform. The system goes a cycle in every four-year which is the design issue to be dealt with and the program will be targeted on adapting the changes in a round.

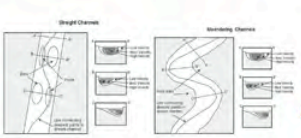
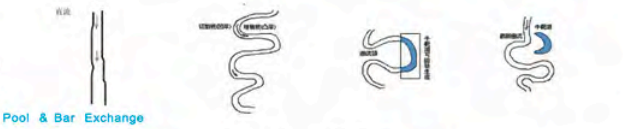


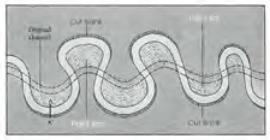
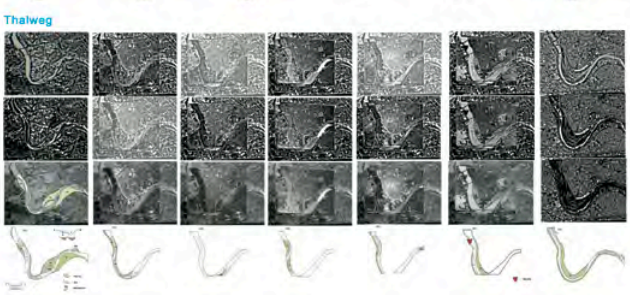
Description of changes

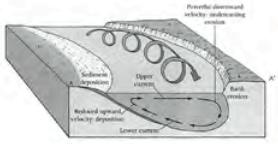


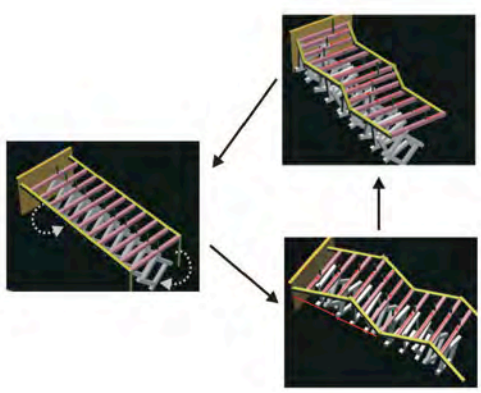


Dynamic mechanism

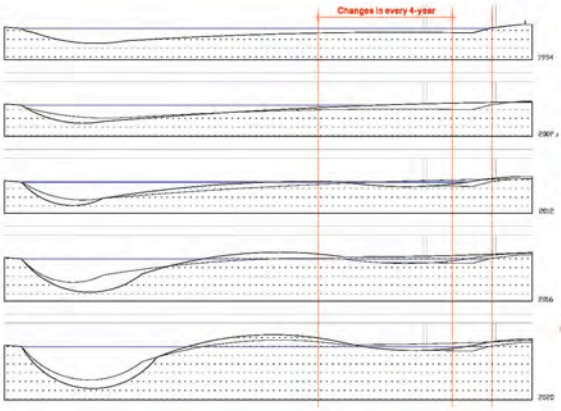



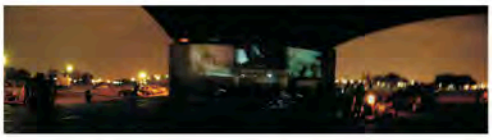


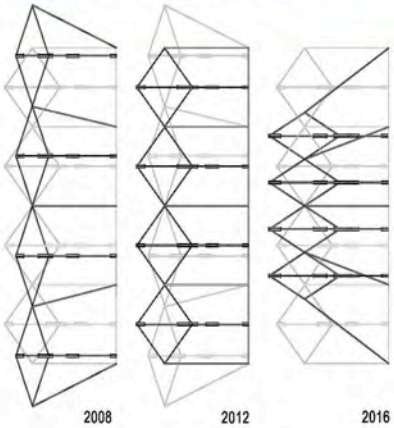


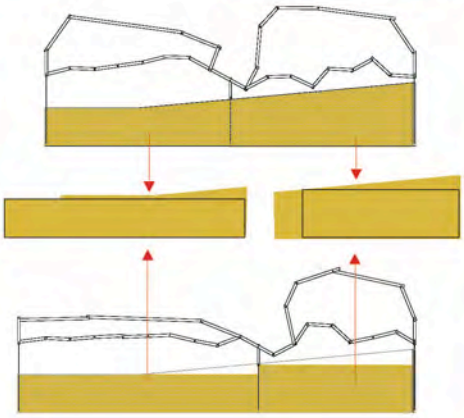
Programs for adaptation



Design scenario





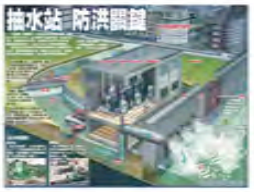


OB3 PUMPING AND DRAINING THE WATER

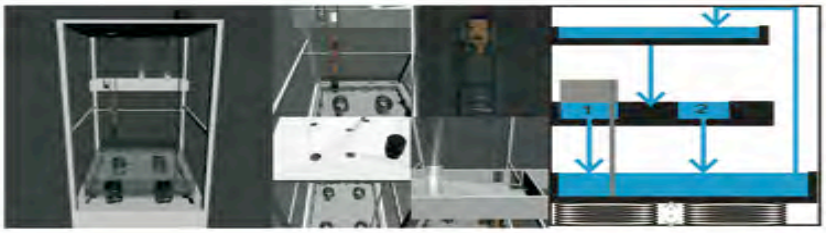
Observation of the site

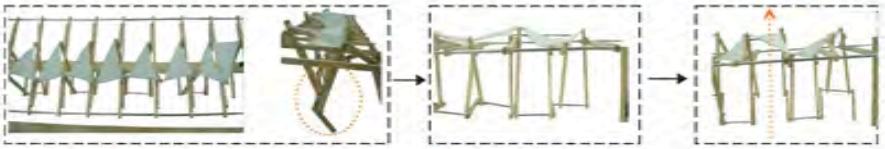
There are sporadic pumping stations along the riverbank. The purpose of this facility is to pump out rainwater when the capacity of water drainage system in the city is overloaded. River is a component of the water cycle. In Danshui River, the water within the river mostly collected from precipitation through surface runoff and groundwater recharge. Therefore, when it comes to raining season, the rise of the water level needs to be paid attention. To see if the capacity of sewage system within the city can drain the rain water to the river and flow into the ocean, pumping station plays the role to control water capacity in the city and take actions to balance the cumulative rain water between two sides of the river bank.

This pumping station deals with extremes in where water flow goes. It indicates changing level on river water. The changing points of water level were used to transfer a registration of the force within a system through different orders of movement. The proposal for a pumping station focuses on its indication of water level changes when it rains and at the same time, integrating spaces into the contextual site for educational purpose of use.

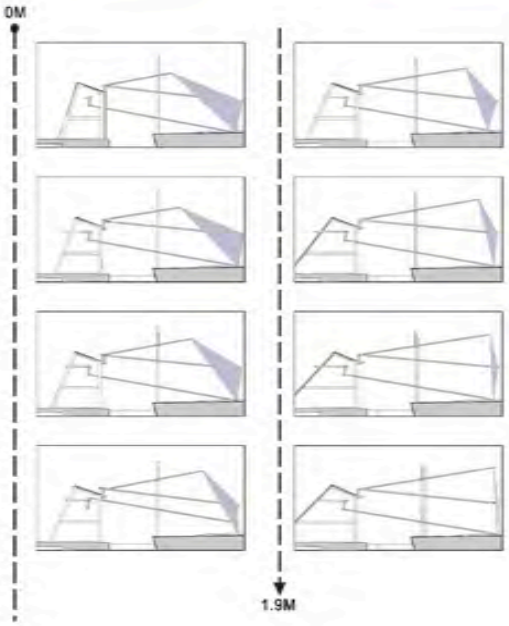


Description of changes

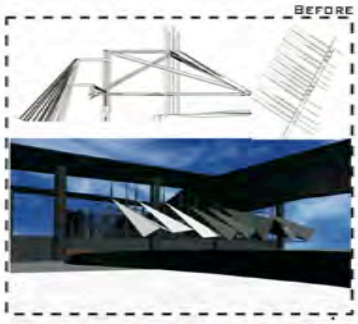


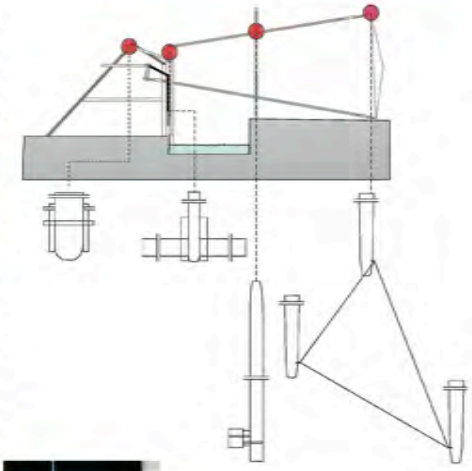


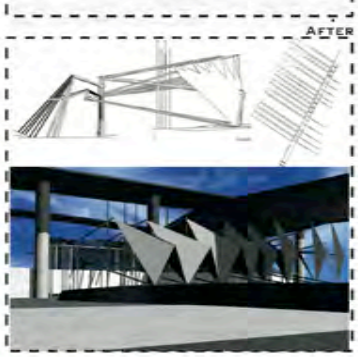
Dynamic mechanism



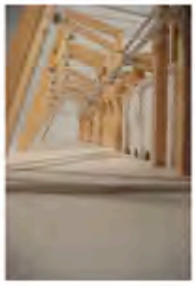
Programs for adaptation

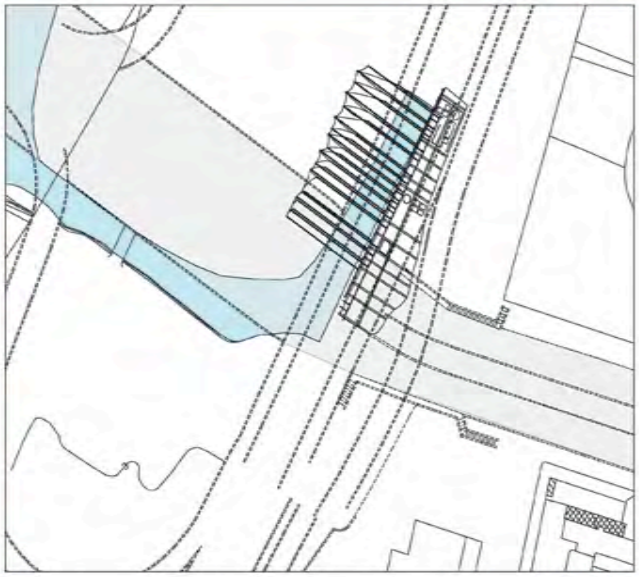


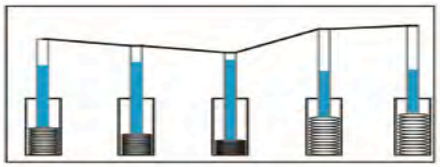




Design scenario





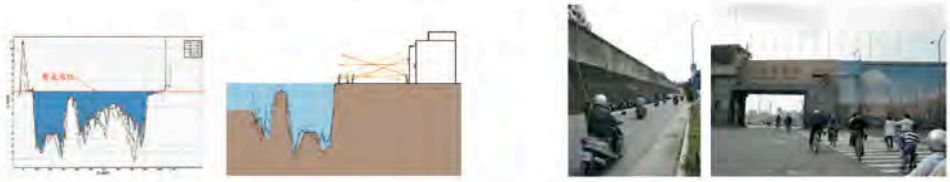


OB4 THE SYSTEM OF A FLOOD BUILDING

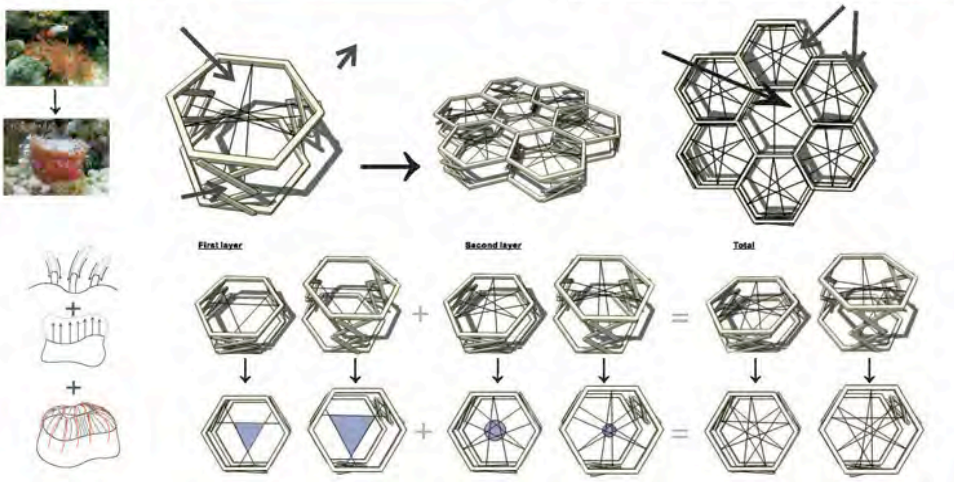
Observation of the site

There are kilometers of a flood building erected along the river to prevent flooding of the adjoining city. This flood building was constructed as a vertical wall made out of reinforced concrete. The wall located between the edge of the city and the river park. Several sluice gates were deployed to connect the traffic either run through the wall bypassing to other traffic route or to hook up onto the overpass express highway which attached aside to the structure of the concrete wall. Up till now, this flood building divided the people from accessing to the river and becomes the edge of eastern Taipei city. The deployment of the \flood building lies in the water level of the river for preventing the flood in 200-year period. When water level rises up above the riverbank, sluices will shut down and vehicles parked inside the riverside of the wall will evacuate. The situation will occur when it comes the rainy season or typhoon, usually a couple of times per year. In order to eliminated the existing flood building, a unitized device to collect rising water as landscaping elements on the site is established. These construction elements can be iterative and placed as needed to create spatial scenario for the site.

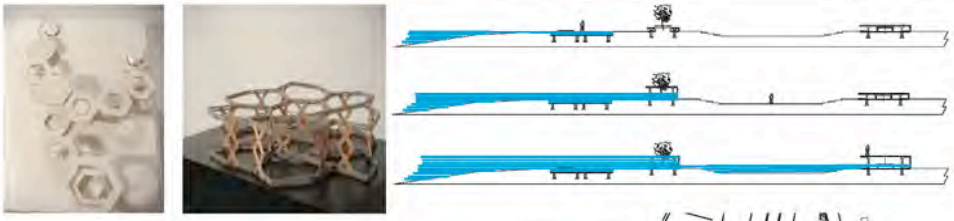
Description of changes



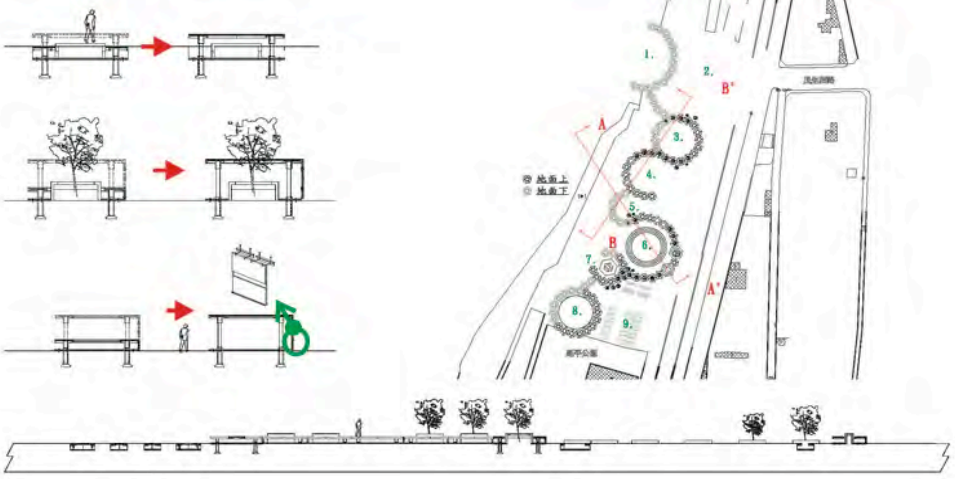
Dynamic mechanism



Programs for adaptation



Design scenario



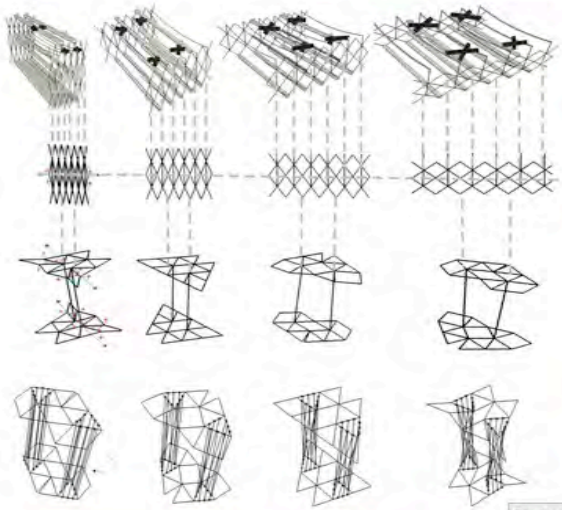
OB5 THE START-UP OF AN EMERGENCY MEASURE

Observation of the site

When going around this edge city area, we found the indication of signage system reflects situations relating to water level of the river. For instance, during the typhoon season, evacuation of the parked cars around this area is indicated by a signboard showing the safe district as an emergency measure for temporary parking. Or on the wall of the embankment, measured dimensions were indicated telling people in what height that water has achieved. A warning system along the Danshui River needs to be established in order to cope with different weather condition to prevent damages from flooding. This warning system was shown by signs for people to take action when emergency occurs. While the emergency is released all the taken actions will be returned to their original places.
The idea of infrastructure within the city as a multi-use device to cope with emergent situation is to adapt the temporary changes when it needs. The purpose for the design scenario is to create an intelligent system for the public facilities to make provision for the risk of severe weather condition.

Description of changes

Dynamic mechanism

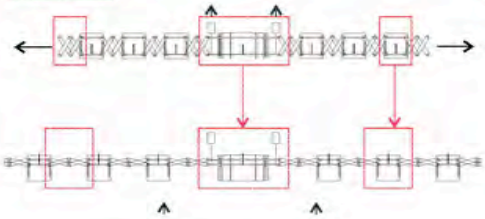


Programs for adaptation

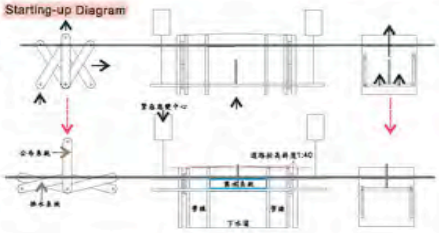
Status		Space	Emergency
Before Typhoon	Parking	Underground	Parking
	Drainage	Collection	Re-use
After Typhoon	Clean-up	Underground	Circulation
	Moving	Underground	Embarkment
Activity	Event	Aboveground	Re-direction
	Jam	Groundlevel	Re-direction

Design scenario

Adaptive phasing



Starting-up Diagram

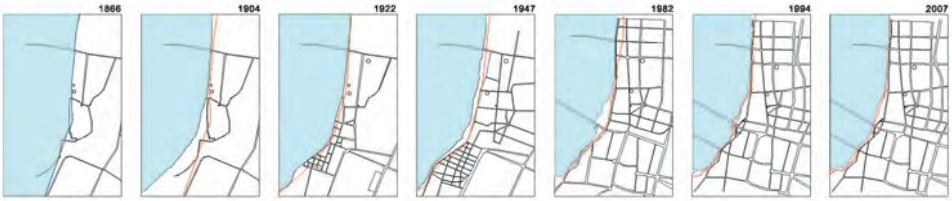


OB6 THE MARKS OF URBAN MEMORY

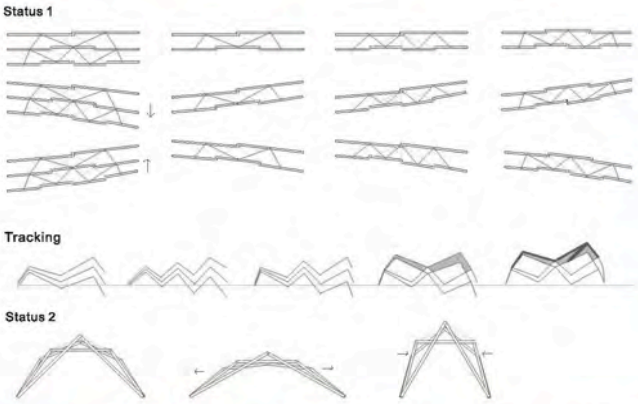
Observation of the site

Through over times, the waterfront of the Danshui River has been changing. River water flows and brings over with sands and gravels. Consequently, land grows and waterfront recedes. By looking up the typological map tracked back to 100 years ago, we found coastlines changed every four years. Not until the wall of embankment was built around in 1940s, the waterfront kept receding due to the cause of sediment deposition. With the change of river landscape over 100 years, man-made environment adapted to its form through generations. There are some traces left that tell stories about what has happened and changed. In particular, an old street where used to be prosperous with its tealeaf business but now obsolete is the main feature to be fixated on.
A used-to prosperous street is uncontrolled in decay over times. However, we observed its elegant architectural elements left after years been abandoned. These are the marks that tell stories about the urban memories. The design scenario is to revive the old street by giving a new identity within its context and control its changes by developing a design system for adaptation.

Description of changes

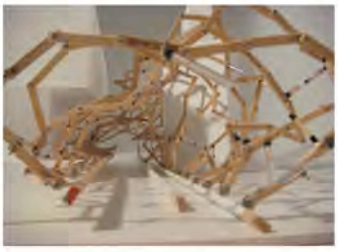


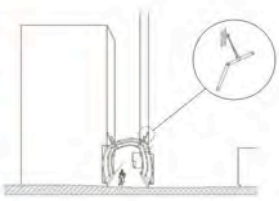
Dynamic mechanism



Programs for adaptation

Design scenario





Conclusion

Building flexibility into our environment will be one of the key challenges of this century. The character of our built environment is shifting, as manufacturing yields to the rising service sector, and as computers and advanced communication technologies revolutionize the production, consumption, and distribution of goods and services. It is difficult to foresee exactly what kind of built environment will be needed to provide people to live in decently. Only a flexible system that responds to changing environment can effectively provide for this new era.

A flexible system can be directed into many aspects. In this exercise, we tried to enter a design research of living things on creating a smart built environment to deal with various conditions. Taking the selected site as an objective to observe is the step to understand its pace of growing or aging and establish the mechanism for representing its development. A design scenario is aimed to bridge a dialogue structure among the changing environment and suggest the solutions for the problem of the site.

Our focus of the exercise is on the changing relationships between people, nature, and places caused by shifts in the structure of power and context. Through a process of observation and realization creates opportunities for students to be able to use new means as design tools for approaching a dynamic form in architecure.

A Case Study of Open Architecture Concept on Urban Renewal Design in Harbin

ZHOU Li-jun[1]
SHAO Yu[2]
CONG Ning[3]

[1]Harbin Institute of Technology, Architecture Dept.; Number66, West Dazhi Street, Nangang District, Harbin, Heilongjiang Province, China 150001, mailto:ccc82281438@163.com
[2]Harbin Institute of Technology, Harbin, Heilongjiang Province, China, shaoyuu@163.com
[3]congningjiaojiao@163.com

ABSTRACT:

Several typical courtyards in downtown Harbin were selected as the case for students. The idea of open architecture was introduced into the teaching process with two steps of site investigation and the renewal design, aiming to enable the students to understand and apply this design idea. It is important for future architects to incorporate the sustainable development concept and the open architecture idea in their designs. Through the design process, the authors tried to introduce a newly, facing the practice and the open style educational model into the students' teaching system.

At the beginning, the students studied the original behaviors in service, buildings' historical situation and function, and the viewpoints of native residents, outside tourists, and other interested parties. This area in Harbin is well preserved with fine scales and deep cultural connotations. It is a traditional pedestrian street with commercial establishments on both sides. The study area contains street spaces and courtyard spaces which were surrounded by roadside buildings. Due to the overexploitation of local establishments, the original street space facilities can no longer meet the present functional needs. Facing with the protections of the historical culture blocks, the call of the development and the renewal are becoming stronger.

After careful analysis, the students proposed renewal plans based on existing structural systems. The process gave students an opportunity to understand the open architecture concept. Ultimately, the idea of open architecture can enhance architectural teaching and the creative process, manifest the construction's variability and the sustainability.

Professors of the senior class proposed to combine the theory of "open architecture education" with "open architecture" and established a new mechanism of design course teaching. Design of open architecture not only depends on solving spatial relationship, function and structural organization, but also needs to embody open, free and cultural "place spirit." This architectural theory can cultivate a new thinking mode among students and improve their creativities and pioneering spirits.

Keywords: Open Architecture, Teaching Practice, Field Investigation, Urban Renewal.

1 SUBJECT SETTING

Design Subject: District Courtyard Renewal and Transformation Design of Harbin Zhongyang Street.

Teaching Task

The intersections between the main street and auxiliary streets of the Zhongyang Street area form a multi-level public space system, and main street—auxiliary streets—courtyards—families constituted hierarchical and the traditional courtyard space. However, it had become more and more difficult for these traditional courtyards to satisfy the requirements of

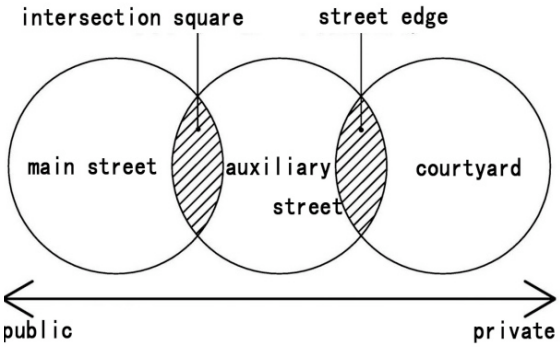


Figure 1.1.1 Schematic Diagram of Block

modern life with the passage of time. . The original residential function, disruption of these houses, aging of building structures and lack of facilities no longer meet these requirements. Based on above thoughts, the professors planned to provide a design course involving selecting spaces and redesigning spaces in the Zhongyang Street area a unique urban resource of Harbin. The buildings were mostly commissioned and designed by Russian immigrants in the 1920s.

Teaching Purpose

Starting from “field”, “function”, “space” and other problems of the courtyards, this course was designed to enable the students to discover, study and solve problems, expand cognition for open architecture conception and deepen the knowledge for rational methods of architectural design via renewing the courtyard buildings.

Design Content

The subject the spatial scope of three streets and two adjacent housing blocks has been selected as the site for open building design. Our professors investigated the study area before selecting the subject courtyards and found 3 to 4 courtyards from which students themselves can select 1–2 courtyards and propose modification plans. The overall design requirements were to replace the residence function of the original courtyards and create open multi-functional spaces that may be used for leisure, entertainment, commerce and so on. The continuity of modified courtyard spaces as well as smooth traffic flow can be ensured. By creating breezeways at the ground level of the buildings, the traditional courtyards can become a continuous district. Pedestrians will be able to access the modified courtyards of every housing block and the courtyards are expected to be revitalized.

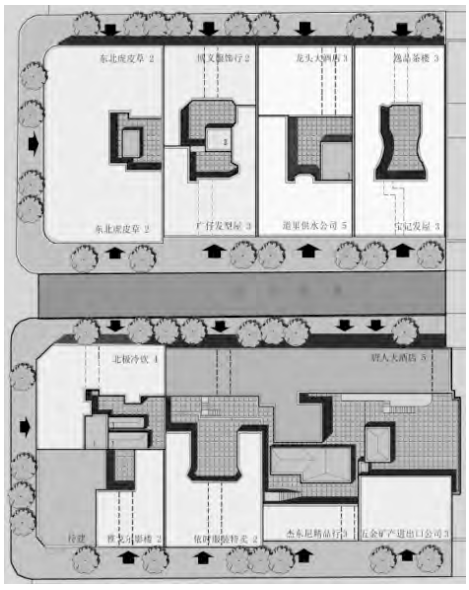


Figure 2 Courtyard Plan

2 Teaching Procedures

Recollection of Courtyards——Research on Existing Condition

Field investigation was introduced into the architectural design course. We first provided a topographic map representing streets and existing building layout to give the students a general idea before field investigations. Based on the topography map, we explained the development status of commerce, tourism, culture, sanitation and other kinds of facilities in the district. We also gave investigation guides to students by further combining analysis on urban texture, historical context, block function, street space, courtyard space and other concerned status and factors.

Students carried out field investigation of courtyard spaces. With 3–5 persons as a working group, the students randomly selected 1 or 2 courtyards out of 4. They went through the social scenes of the modern courtyard spaces and illustrated findings in hand drawings, photos, cartography and other writings. Students will find problems and record their investigations, which should be taken as design basis for modification.

Common conclusions for courtyard status were drawn: The courtyards adopted the pattern of "upper-floor housing /ground floor shops" as well as "street facade and backyard" arrangement. There were public tap water faucet, sewage pool, public toilet in each courtyard, which became the semi-public and semi-private space for social and outdoor activities of residents; the building space arrangement was not confined to a fixed format, and exhibiting high flexibility; the house structure and municipal facilities in courtyards were damaged seriously due to natural aging; mottled building façade indicated that many houses had exceeded service life and became old and unsafe. Being short of necessary sewage discharge facilities and winter heating facilities, the living quality was very poor; due to historical reasons, the phenomenon of serious illegal add-ons. Most of these illegal structures were wood structures which were fire hazards.

Figure 3-6 Courtyards A, B, C, D

Although these courtyards had similar problems, each courtyard had its uniqueness.

Courtyard A: Transition junction of facades and key decoration composed of cornice, mutual and parapet.

Courtyard B: Most buildings are not connected at the façade turning points and the openings created allowed a imaginary extention of the courtyard.

Courtyard C: The courtyard's scale was very comfortable and had room for exertion.

Courtyard D: Courtyard space was not as irregular as the others, and the function replacement was comparatively easy.

.Summary of investigation results: Each group had put forward unique thoughts for their courtyard modification; moreover, students in each group had different cognition and different explanation for the same issue. In view of open building education, such results accorded with cognitive law. During this process, teachers guided the students and discussed problem solving methods with them.

Continuity of Courtyard——Creative Design Scheme

This stage was to study design methods of open architecture. In order to help students to collect subject information, We had planned several class lectures joined by several experienced architects to introduce their practices to students. These academic lectures are more like a design firm discussion than a formal lecture. We hope the "open" discussion would also help their understanding of "open" concept in all aspects of life.

During this stage, students had their own idea for design from all aspects. The following are the suggestions put forward by students for the courtyard renewal.

Courtyard A:

- Roof: Remove debris on roof, repair cornices and dormers on the roof and add cornice design.
- Door and Window Openings: Repair door and window frames and add European-type architrave, replace broken glasses and repair door openings.
- Wall: Clear advertisements on wall, repaint according to colour theme.
- Outdoor Stair: Add one stair.

Courtyard B:

- Roof: Remove debris on roof, set European-type for cornice, and parapet.
- Door and Window Openings: Based on existing openings, add European-type architrave to the windows and doors. Create breezeways with the same architectural style.
- Wall: remove advertisements on walls, repaint according to colour theme, treat walls with the same architectural details.

Courtyard C:

- Roof: Remove debris on roof, repair cornices and dormer on the roof and add cornice design.
- Door and Window Opening: Repair door and window frames and add European-type architrave, replace broken glasses and repair door openings.
- Balcony: Add joint railings for the second floor balcony.
- Wall: Repaint according to color theme, demolish wood-structure add-ons and restore brick walls.
- Outdoor Stair: Repair outside stair and add one stair.

Courtyard D:

- Roof: Remove debris on roof, set European-type for cornice, and parapet.
- Door and Window Opening: Re-paint frames of doors and windows, replace broken glasses and repair door openings.
- Balcony: Remove debris on balcony, repair underside of the balcony as well as railing Repaint.
- Wall: Clear advertisements on walls, repaint according to colour theme. Treat walls with the same architectural style.

Renewal of Courtyard——Scheme Design

Students had proposed modification design for courtyard space after field investigation and scheme conceiving. The following are the design schemes for the four courtyards.

Courtyard A: Part of original building façade should be preserved, repaired or modified. Indoor and outdoor space openings can be realized with covered courtyard. Outdoor stairs, breezeways and other components can be preserved without changing original appearance, structural system and basic plane layout to promote circulation and communication of pedestrians within the courtyard and between courtyards.

Courtyard B: Illegal buildings should be removed first to rescue the courtyard from a shabby state and restore the courtyard to its original space temperament and texture; the courtyard design should maintain the original spatial form, temperament and historic features; and emphasize on cultural characteristics of this courtyard.

Courtyard C: This scheme aimed at the modification design of functionality decline due to structure decline of this traditional courtyard to form new strategy of stimulating courtyard functionality regeneration. The courtyard originally was residential space, with comparatively single function. Additional usages like leisure, restaurant, pub, characteristic hotel, historic expo and so on which are relatively quiet in nature can be introduced into this courtyard.

Courtyard D: It was considered unfavourable for extroversive and close spatial form in the traditional courtyard to organize commercial people flow and difficult to form scale effect, the emphasis of courtyard renewal and transformation should be placed on remodelling structural relationship of courtyard space to lead commercial people flow on pedestrian street into this courtyard and provide a variety of commercial services and comfort.

Figure 7 scheme 1 of Courtyard A

Figure 8 scheme 2 of Courtyard A

Figure 9 scheme 1 of Courtyard B

Figure 10 scheme 2 of Courtyard B

Figure 11 scheme of Courtyard C

Figure 12 scheme of Courtyard D

CONCLUSION

To summarize this reform attempt of design course teaching, the evaluation on the course effectiveness was based on:

The teaching mechanism emphasized on combining open architecture education with open architecture. Through the design modification of typical open spaces of courtyard, the students mastered a new design technique and design concept after completing enlightenment stage of architectural education.

From uncertainty to certainty, the open design theme and the research process played an important role in cultivating students' capability to connect with society, finding problems, analyzing and solving the problems. Students have gained more sense of rationality and responsibility. Their individuality, imagination and

creativity were fully reflected in the process. Through field investigation, the students gained first hand knowledge of buildings, spaces and functions. Through secondary research, they had a better understanding of the architecture major. The designing process further enhanced their appreciation of the profession.

REFERENCES

WANG Jian-Guo. 2005,The explore of Chinese Architecture Education Development . Architectural Journal, 2, 5~7.

WU Gui-Ning, BAO Ge-Ping, LUO Wei-Xing .1997, The new model of architecture education . New Architecture, 3, 49~51.

DING Wo-Wo. 2001, Pursuving Verity and Innovating —The Education Explore of The Department of NanJing University . City Architecture, 5, 33~36.

Loon, P.P.van. 1998, Interorganisational Design— A new approach to team design in architecture and urban planning , Publikatiebuteau Bouwkunde Delft, ISBN 90 5269 2521.

The Enlightenment Education Based on the Idea of Open Building

Shao, yu[1]
Zhou, lijun

[1]Shao Yu, Harbin Institute of Technology, Harbin, Heilongjiang Province, China
shaoyuu@163.com

ABSTRACT It is important to give some enlightenment to the student about the idea of Open Building during the Basic Course of Architecture Design. Based on a school assignment in the Course, this thesis discusses how to cultivate students' abilities on making the environment design according to the changing functions in the built environment without changing its structure.

In the assignment, a room of a college dormitory--less than 16 square meter--is selected. Built in the 1990's, the room which was designed for 6~8people at that time seems crowded and cannot satisfy modern requests. Students are asked to rebuild the environment of the room while maintaining the built structure. During the Assignment, students will do their research by surveying the room and drawing its plan, communicating with the user and then analyzing the disadvantages at present. It is concluded that 2 people, not more or less, living in this room is the best. Then they rebuild the environment of the room according to the new functional requests such as space of living, sleeping, communicating, amusing and storing, etc. At last, they express the result of their design with model.

By this issue, we conclude that it is necessary and available to enlighten the students the idea of Open Building. By the small assignment, the students can realize how to make the built environment ongoing and how to make the old building creative without changing the construction.

Keywords: enlightenment education, Open Building, structure, changing function, teaching

1 BACKGROUND

The Basic Course of Architecture Design is an enlightenment lesson for the Architecture Major, which is the first special lesson for the freshmen who have just graduated from senior high schools. It's objective is to make the students have some basic cognitions about architecture and master some necessary skills in architecture design. We need to make the students realize that architecture have their characteristics tightly connected with ages, national economy, humanism, social phenomena, etc (Liu-Yudong, 1999). Architecture should satisfy its basic function, and should possess fairness and connotation according with the times. By the learning of this lesson, the students should have understood some ideas and grasped a certain methods of architecture design. With the global economy, there have been great changes, either materially or mentally, about the social and human environment, which forces the pedagogues of architecture to think about that through what a kind of didacticism the students can comprehend the concept of architecture with changing eyes, can self-study and self-realize to acclimatize themselves to the knowlegement society , and can exceed society restrict(Andy Hargreaves, 2007) to make out creative architecture-design-products.

It is concerned in the research of Open Building that how the social changes influence the architecture design and how to adapt the increasingly changed and developed functions without change the structure of the architecture. As for social interventions on architecture design, architect should take their social responsibilities on emphasizing architectures' continual development, which has been paid much attention more and more. The idea of "flexible design" about architecture design has been given in the paper *Characteristics of The Methodology of Architecture Design: Influenced by Science and Technology*, by Liu-Xiangfeng & Shen-Tianxing. It is defined that "flexible design" can be

adapted to the uncertain propose because flexible product has its flexibility and therefore can be acclimatized to the uncertain changing function requirements. At the same time because such products have their opening ports, they can run effectively in a long time with continuously technique reforming and thus resources are used reasonably. (Liu-xiangfeng & Shen-Tianxing, 2006) Such an idea has an important enlightenment during the courses of architecture education. It can teach the students how to meet the contemporary social requirements as well as to be adapted to intending challenges. In the view, we try to introduce the concept of Open Building into part exercises of the Basic Course of Architecture Design. Take the case of the course Study of Transformable Projects, This thesis is to describe the application of the concept of Open Building in learning and teaching.

2 "STUDY OF TRANSFORMABLE PROJECT" EXERCISE

2.1 Project Requirement

In this exercise, a room of a college dormitory is selected, which was constructed in 1990's and is less than 16 square meter. At that time, colleges are all national and the guideline to the construction of college dormitories is *Economical, Practical: function first, outward appearance second.* One room of the dormitory is designed to accommodate 6-8 students. With the rapid economic development and more and more private colleges appearing, the freshmen are becoming richer than before. Old dormitory cannot meet their new demands. At the same time, the developing social culture and changing of aesthetic value call for new interior. During this exercise, the students are asked to re-do the inside-room design according to the new request that only 2 people living in a room .In the design the structure of the dormitory is requested to remain, i.e., the structure and location of basic parts of the room such as walls, doors and windows are forbidden changing. It demands the designer, according to the new cultural and economic background and by the way of re-designing the inside components and facilities of the room, create a characteristic, various and flexible environment.

2.2 Study

The study of this Project includes several periods:

2.2.1 Surveying and Drawing

Method :

1. The students are divided into groups and each group has 3-4 members. Each group will survey one dormitory room and draw the plan and the sections of the room (Fig. 1 & Fig.2), include the interior furnishings, thus they can fully know the present condition of the rooms, including each room's basic measurement and structure.

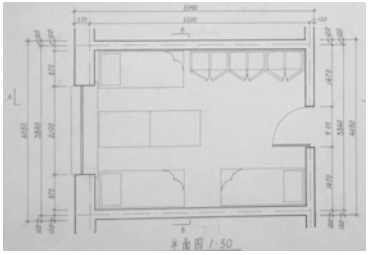


Figure 1 Plan of a Room by

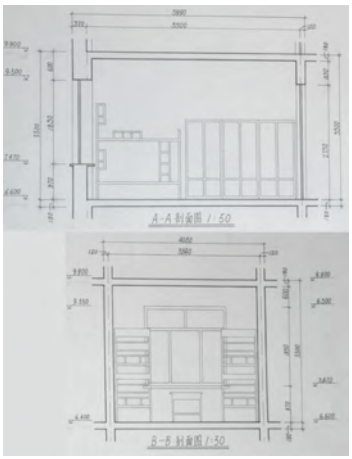


Figure 2 Sections of a Room by Surveying

2. Communicating with past and current dwellers of the dormitory rooms and consulting their comments, the designers can understand what is not satisfied to the user (Fig. 3)and what is their new requirement of the rooms, which is due to the social changing and the dwellers replacing, and thus can make a reasonable judgement that what are the new dwellers' expectation of the room.

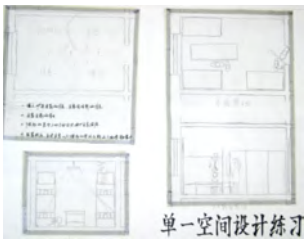


Figure 3 Existing State

Teaching Objective:

In this phase, there are two objects: first, through personally survey, the designers experience what is space measurement and can establish their cognitions of architecture space from a very small environment; second, through communicating with dwellers, they will realize that social changings bring on new changes on architecture space and establish the tentative ideas that function changing must be paid attention while making architecture designs.

2.2.2 Thinking & Designing

Method:

Firstly, according the new function requirement concluded from the above surving, make drawings on expressing the interior functions of the room. They found that they can rebuild the environment of the room according to the new functional requests such as space of living, sleeping, communicating, amusing and storing, etc.

Secondly, through the *Nine-square Grid Problem* (Zhu Lei,2007) and *Wall House* (Hu Heng, 2004), we will introduce the method of architectonics(Gu-Daqing,2006) and thus new and effective closure of space is encouraged to satisfy the new function. Such ways expressing their thoughts of design as sketch, rough model, two-dimension and three-dimension modes are welcome and so direct experience on degree of closure and space fluidity is got; breakthrough and audacious research on spatial form is largely applauded (Fig.4, Fig.5 &Fig.6).

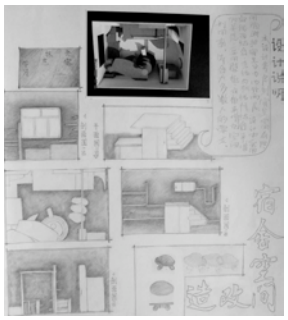


Figure 4 Design of the Student

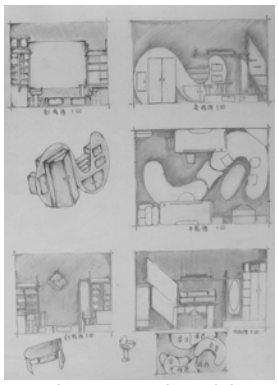


Figure 5 Design of the Student

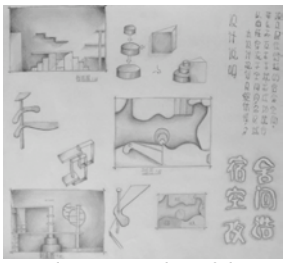


Figure 6 Design of the Student

Teaching Objective:

Help the designers realize the existence of space corresponding to its function and then discover the possibility of creating flexible space according to a determinative structure; research how to express a special space by way of simple architectonics language; and make the designers know that the characteristics of the properties of enclosure as shape, surface and edges, as well as experience the properties of space as proportion, scale, form, enclosure and light sensation, etc(Ja-Beisi,2003).

2.2.3 Model Expression

Method:
All the design concepts got from the above two phases are expressed by models scaled 1:20-30. During producing the models, the function requirements on the space of the room above are transformed into the abstract design elements as spots, lines, surfaces and objects. Fine change of the elements will bring on the dwellers different psychological influence. From the models the designer can further experience the function permissibility of the room and fully know the relationship between the space structure and the architecture function(Fig.7 Fig.8 & Fig.9).

Figure 7 Design of the Student (Model)

Figure 8 Design of the Student (Model)

Figure 9 Design of the Student (Model)

Objective:

Express the space by model, pay more attention to function and space, reinforce the abstract cognition

3 CONCLUSION

We can get the below from this taught case:

1. Via the modern education theory of experience cognition, it is not the only way that acquiring the knowledge of architecture from textbooks. To the college students, recruiting by the nowaday system and majoring architecture, the better way is to experience themselves in practical environment. From surving, drawing and communicating they can understand the relationship between the function and the space.
2. The room of the dormitory selected in this case is special to the designers. Perhaps their teacher, worshiped by them, lived in this room years ago, so they may have special feeling to it; on the other hand the restrict limit of the space causes them much more inconvenience. “Study of Transformable Project” exercise is a new probe on keeping the humanism emotion of an old architecture while open out its new function. It brings the students to think about what are the intensions about architecture and space, and lets them pay more attention to the new requirement between the social changes and the space functions.
3. Because the Project in this case is tightly related to the students and the abstract aesthetic theory is expressed through a practical way, the students take part in actively and have acquired new experience different from before. The pattern of teaching starting from researching is suitable for cultivating students in colleges.
4. In the Study of Transformable Projects, from a room of a dormitory, the students have a certain cognition on how the function of a space unit changing with the social changes. In succession, we introduce the cognition into outer space environment and another exercise “Pleasure: Study of Traditional Block” will be got. In this study we choose a traditional block in a city and organize the students to make their investigation. During the investigation the students get a certain sensuous knowledge about the architecture language of the traditional block and give their active thought about the conflict between tradition and modern. Trough observing the whole block and talking with its users, they give their investigation report. This will be discussed in another thesis.

Summing up, introducing the concept of Open Building in the enlightenment education, such as Basic Course of Architecture Design, has got better effect. The students should get to think the meaning of the architecture with the time. It can cultivate students’ abilities on making the environment design according to the changing functions in the built environment without changing its structure.

Reference

Andy Hargreaves, 2007, *Teaching in the Knowledge Society*, (Shanghai: East China Normal University Press).

Gu-Daqing,2006, Space, Architectonics,and Design –Tectonics as a method of work, *The Architect* , **1**, 13-21.

Hu Heng, 2004, The Index of Architect John Hejduk, *The Architect* , **5**,79-89.

Jia-Beisi, 2003, *Architectonics of Modernism*, (Beijing:China Architecture & Builing Press).

Liu-xiangdong , 1999, *Meaning of architecture*, (Beijing:China Architecture & Builing Press).

Liu-xiangfeng & Shen-Tianxing, 2006, Characteristics of The Methodology of Achitecture Design: Influenced by Science andTechnology, *Journal of Architecture*, **1**, 74.

Zhu Lei, 2007, Texas Rangers and Nine-square problem, *The Architect*, **4**, 40-49.

W110 Informal Settlements and Low Income Housing

Progressive Dwelling
ANDRADE, Jorge, Universidad Autonoma Metropolitana, Unidad Xochimilco, Mexico, D. F., jandrade@correo.xoc.uam.mxjandrade@correo.xoc.uam.mx

Informal:Informing:Exformal
JANZ, Wes, Department of Architecture, Ball State University, Muncie, Indiana, 47306, wjanz@bsu.edu

Housing by People, Adaptive to Flood and Economic Activities
NAING, Naidah, University of Moeslim Indonesia, South of Sulawesi, Indonesia, naidahnaing@yahoo.com

Informality as a legitimate energy in the city: Housing and urban environments in South Africa
Osman, Dr. Amira O.S., Senior Lecturer; Architecture, University of Pretoria, Pretoria, 0002, SOUTH AFRICA amira.osman@up.ac.za, and Raymund Königk, Junior Lecturer; University of Pretoria, South Africa, raymund.konigk@up.ac.za

Linking Open Building and Sustainable Livelihoods in the Kampung – Informal Settlement
SANTOSA, Happy Ratna, Department of Architecture, Institute of Technology Sepuluh Nopember (ITS), Surabaya, Indonesia, happyratna@yahoo.com

Guerrilla Design in the Maximum City
SHALL, S. Gerald, Department of Architecture, Temple University, Philadelphia, Pa 19004, sgshall@temple.edu

Informal Settlement in Iran
ZOUQI, Ali, Administrative, Urban And Regional Planning, Building and Housing Research Center & Tehran, Central Azad University, Iran, azouqi@gmail.com

Progressive Dwelling

Jorge ANDRADE

Universidad Autonoma Metropolitana, Unidad Xochimilco, Mexico, D. F.
jandrade@correo.xoc.uam.mx

ABSTRACT

The concept of dwelling has been continually evolving since the Industrial Revolution. Radical changes in society along with the accelerated urbanization processes in many countries have stimulated a great demand for places to live in the cities.

Currently more than 40% of dwellings in Mexico are still built by their occupants. The situation where an occupant simultaneously builds and lives in the dwelling leads to a completely different concept of dwelling than the traditional one or even that held by professionals and institutions.

The legacy of the twentieth century has left the professionals in the area of urban growth a great challenge. We must deepen our commitment to in-depth study and actions that will truly help improve the quality of life and housing for the poor majority.

In the early 1960s., N.J. Habraken introduced the "support and infill " ideas in Europe with the intention of finding an equilibrium in the relationship institution-individuals in a time where mass housing was the predominant way of building dwellings.

Nowadays in the third world countries and particularly in Mexico, the informal settlement is the dominant way of dwelling. Now, after thirty years of emergent experiences, some of which used "support" ideas, we turn back to the concept of support, trying to find an equilibrium between institutions and individuals, in a context where individuals have controlled their own dwelling process. We will call this approach "Progressive Dwelling". What is "support" and what do we mean by "infill" on this approach?

KEYWORDS: support, infill, time, space, progressive dwelling.

1.1 INTRODUCTION

This paper is about low income housing production and particularly low income housing design. We focus on the idea of *dwelling* as a process; as the result of a dynamic relationship between the dwellers and their dwellings.

We first speak about different ways of understanding the concept of dwelling. Each one of these ways, mainly from the view of their producers. We also present here the conceptual approach to the housing production process.

Secondly, we describe four different kinds of dwellings by using the concept of housing production process. Two of them were born in Europe and the other two, in third world countries.

Finally, we introduce the concept of *progressive dwelling* where we present three representative examples, all of which were built in Mexico City. These are Cohuatlán (1975), Apatlaco (1989) and Xacalli (1997) collective houses.

We also present the study on regional housing typology :Tabasco (1985) and a collective housing project which in 1991 won the second place in a national competition on housing design in Mexico.

We finish by making the final remarks and we make some reflections on support and detachable units in relationship with the social production of housing.

1.2 THE CONCEPT OF DWELLING

The concept of dwelling has been continually evolving since the industrial revolution. Radical changes in society, along with the accelerated urbanization processes in many countries have stimulated a great demand for places to live in, in their cities.

Those housing and urban problems have been seen from different angles. We could enumerate some of them.

The urban and housing problems were viewed as a health problem in England in the XIX century. Engels defined it as a socio economical problem. It has also been taken as a political and planning issue and due to its complexity, it has had to be studied within a multidisciplinary approach.

One of its faces, and maybe the most important, is that in order to tackle and find its solution we have to include the dweller's knowledge and participation since he is the main actor in the housing production process.

The housing problem studies are mainly produced by specialized researchers, politicians and technicians. However, they tend to neglect the dweller's opinions and way of life. It's a fact that, in order to study and understand the social processes of low income housing production, jus few studies have been carried out. What is more, even less studies have been done to systematize those processes and so the chance to improve the different ways of housing production, have also been diminished.

On this part we introduce the concepts developed by the Habitat International Coalition (HIC) which since the late seventies has been working on the recognition and improvement of different ways of habitat and dwelling production. The importance of this habitat and dwelling production is that the inhabitants are the main actors: both as the producers as well as the users of their dwellings.

HIC integrates those different ways of habitat and dwelling production into the concept of social production of habitat. We can conceptualize the dwelling ideas, from a HIC point of view as follows:

a. Dwelling is a high-rated cost product because of its inputs, building materials, land costs, technology, etc.
b. Dwelling is a basic need and a human right because it dignifies the human being lives.
c. Dwelling is a process in which we can optimize both individual and social materials as well as economical resources through the ideas of incremental growth.
d. Dwelling could be seen as a potentially abundant social good, in contrast with the idea of its high cost. The control and participation of dwellers in their dwellings production, is stressed here.
e. Dwelling is mostly a self- produced good because most of the population take part in their own dwelling production.
f. Dwelling is a verb which relates the human being with its natural environment. In this, he can then settle his cultural environments. The human being, as a sensible and alive subject, prints on this environment, his particular mark.

All those features are mainly related to dwellings and self-produced human environments. However, Institutions and Professionals have traditionally considered and conceptualized them as minimal and informal dwellings.

Finally, we can speak about three kinds of housing production: the dwelling produced by third persons, as a merchandise to be introduced in the market. The one produced to be rented, and finally, the self-produced housing.

1.3 THE HOUSING PRODUCTION PROCESS

The housing production process is made up of four stages or phases clearly differentiated. These are:
1) Planning and Management; 2) Building; 3) Distribution; 4) Use.

Figure 1.1 Production process of housing (Drawing: Leonardo Páez 1998).

The phase of Planning and Management on dwelling production includes the following activities:

- Definition of future dwellers.
- Land (acquisition).
- Urban and architectural projects.
- Legal and administrative requirements.
- Financial feasibility.

The phase of Building includes:

- Urban development.
- Dwellings construction.
- Financial support.
- Technical advisory.

The phase of Distribution involves:

- Dwellings marketing.
- Dwellings assignment.
- Financial contracts.

And finally, the phase of Use comprehends the following activities:

- Credit payments.
- Dwellings maintenance and use.
- Dwellings improvement.
- Management of dwellings and or housing complexes.

1.4 MASS HOUSING

The mass housing production has its peak after the Second World War when many cities were impacted and destroyed. As thousands of new dwellings had to be built as a result of this, it was necessary to introduce the concepts of industrialization, rationalization and mass production. This is how the *mass housing* concept appeared. The mass housing approach is mainly based on projecting a highly efficient dwelling unit and then, develop housing complexes by repeating this unit as many times as necessary. This dwelling unit project is called *Prototype*. As we can see, the main goal was both, to simplify the building process in order to build more dwelling units in a lesser period of time, as well as reducing the building costs.

Analyzing this approach from the view of the housing production process, we can find that the private builder of public dwelling, is in control of the three first phases: Planning, Building, and Distribution. The dweller appears just at the final phase: Use. He is just a mere consumer of a final product which most of the time results highly difficult to adapt to his or her particular needs and aspirations. This concept has spread all over the world. The mass housing concept has prevailed in Mexico since 1952 when the Architect Mario Pani designed and built the Miguel Aleman housing complex. In this project, Mario Pani used many concepts of mass housing previously developed by Le Corbusier.

Nowadays, big private building companies in Mexico continue building mass housing complexes on the outskirts of the main cities. Moreover, not only has the Le Corbusier approach been reduced to producing housing prototypes but it has also scattered them on big pieces of land, mostly on reticular street patterns and with a minimum of equipment. The reaction to this simplification has been the same as in many other countries of the world. The lack of understanding, the local culture, ways of life, local technologies, climate, etc. have produced in most of them a rejection to living in them.

Figure 1.2 Mass housing in México City (Photo: Isadora Hastings 2004).

1.5 THE SUPPORTS

In the early sixties, a renovated Europe required a higher quality of housing. The mass housing produced after the Second World War, had not turned out to be good enough to satisfy their standards of life. The mass housing production had been efficient in terms of producing thousands of dwellings in short periods of time and reducing production costs. However, the final actor of the housing production process had been forgotten. He had been taken just as a statistical evidence to define minimal dimension of spaces. It so happened that the individual needs, as well as the different and particular ways of life, had been sacrificed in order to design dwelling prototypes to be repeated as many times as possible. This could be the main reason for the appearance of participatory design methods.

The young generation of architects like Jan Carlo di Carlo, (Italy); Ralph Erkine, (England); and John Habraken,(Holland) amongst others, began to generate options to introduce the dweller again, as an actor in the housing production process.

The concept of *support* developed by John Habraken could be taken as the most innovative. Habraken analyzed the production process of housing and found that there was a need to divide it into two different levels or spheres. The first one had to be done and controlled by the institutions. He named it *Supports.* The second level could be produced by different institutions or by individuals but, as far as the selection and use of their dwellings was concerned, it had to be controlled always by the users.

Habraken ideas had been so meaningful that some years later, (middle of the seventies), he became Head of the Architecture Department of Massachusetts Institute of Technology.

The input of housing design problems brought to MIT by students from all over the world, had a strong impact on Habraken ideas. We could say that those new inputs can be found in his book “The structure of the ordinary” published by MIT Press.

We could particularly say that this essay could not have been done as it is, without Habraken’s approach.

1.6 SELF-HELP HOUSING

Most of the cities in the third world, in the middle of the last century, began to grow along their periphery through thousands of self-produced dwellings. These, were built by low income people who needless to say, were outside the housing market and had to build their dwellings by themselves.

Nowadays, more than 40% of dwellings in Mexico City are produced within a self-helped housing production process. This kind of process could be characterized by two basic aspects: On the one hand, it is a process controlled mainly by the individuals. However, their lack of economical, technical, legal and institutional resources has had a strong impact on the quality of their dwelling. On the other hand, it is derived from the lack of economical resources. Due to this fact, they have had to build their dwellings step by step and in long periods of time. This could take from 15 to 30 years. It goes without saying that all this time, they have had to live in their dwellings at the same time they have been building them.

Figure 1.3 Progressive housing (Photos J. Andrade 1977).

In Mexico City cases, we have found that the dwellings have changed through time not just as the quality of their materials, the increase of rooms or the legal tenancies is nuclear family to become a group of dwelling units sharing open and built spaces conformed by an extended family.

In some way, the spatial structure with all the mentioned limitations has been adapting through time to changes into the social structure needs and spatial requirements. The understanding of this process is in our view, the key to approach our work in order to have an impact and improvement on this processes.

1.7 ALTERNATIVE HOUSING

In the early seventies, another approach to the housing production sprang in third world cities. Groups of low income people got legally organized into housing cooperatives, housing social societies, and other legal and recognized forms of organizations. New housing complexes were developed and located in third world cities. The main features of those processes were:

- First, the social organization controlled the building process of their housing complexes. They planned, managed and hired their architects and builders to build their dwellings. They also distributed them and finally, they became users of their own self-produced dwellings.
- Second, this approach opened up a new option for low income people outside the dwelling market, to get themselves, dwelling units. This could be achieved, through their organized and active participation in the housing production.
- Third, they could now take part in very important decisions such as the location of their future dwelling, as well as its design and building process.
- Four, through participation, they again managed to reduce the final cost of their dwellings production.

Unfortunately, this new approach along with its advantages, has not been well accepted neither by politicians, nor by private dwelling producers. The first ones, see the social organizations as a danger and the second ones, look at them as competitors in the dwelling market.

However, from our point of view, none of them is right. The fact remains that, instead of being a danger, social organizations generate more responsible and participative citizens. On the other hand, their participation as producers of their housing complexes, doesn't even affect the private market of dwelling since they were out of it anyway. Even more, we could say that they are opening up a new approach for private builders to participate in the low income housing production.

Figure 1.4 Alternative housing (Photos: J. Andrade 1981-1985).

1.8 PROGRESSIVE HOUSING

By the mid-seventies, the INFONAVIT, (the biggest financial institute for housing for employees in Mexico) invited COPEVI, (a non-governmental organization on housing) to present a pilot project to them. This project allows the users to get organized and participate actively, in their own housing complex production. This pilot project also introduced experiences on social organization, (housing cooperative); participatory design, (supports and patterns) in order to develop the new housing complex. This pilot project was called in Spanish *Viviendas en Proceso*, (Progressive Dwellings).

The *Progressive Dwellings* approach is a way to integrate concepts of three different kinds of housing production: The self-help one, the alternative one, and the supports one. The self-help housing production considers the needs, resources and the view in which users transform and adapt their dwelling units through time.

The alternative one involves the social organization to be taken as an option for a socially and legally recognized group of people. This group is capable of getting financial resources and technical advisory to develop their own dwellings. The support approach allows both individuals as well as institutions, to interact in the housing production process. Now we will present four cases related to progressive dwelling.

The first one Cohuatlan Housing complex was as, we said before, the first time this concept was applied in a real project. The second and third, are both of them case studies related to the understanding and systematization of self produced low income housing. The first one related to the so called informal settlements and the second one to the vernacular housing architecture. Finally the fourth example is a real project developed with a social organization. In this case we introduced both dwelling units incremental growth as well as urban design incremental growth.

1.8.1 The Cohuatlan Housing Complex

This housing complex was built in downtown Mexico City between 1975 and 1978. It was a pilot project which was developed in a low income neighborhood named Colonia Guerrero. In order to design the supports, the architects first carried out a detailed study of design patterns of the typical dwellings named *vecindades*.

The idea was to design a support capable of admitting the traditional design patterns found in the vecindades.

The social organization got legally recognized as *Colonia Guerrero Housing Cooperative*. The 70 members were the inhabitants and their families living, all of them, in the vecindades under extremely poor conditions.

The support buildings were designed through participatory design techniques. After that, the cooperative members together with their advisors, defined 7 different size options for their apartments. These varied from 35m2. to 70m2. Each kind of apartment had internally different options of spatial organization. This housing complex was finally built and inhabited in 1978.

Figure 1.5 Cohuatlán housing complex (Photos J. Andrade 1976 – 1978).

1.8.2 Santa Ursula Case Study (1981)

This study, was a master's degree thesis developed in MIT by the author, under the advisory of John Habraken.

The field information was a well documented study, based on architectural plans, urban maps, aerial photographs, urban and dwelling units photographs, interviews and surveys.

All this documentation was focused on the description of urban morphology and the dwelling transformations which took place in Santa Ursula neighborhood since its beginning in 1954, until 1978. The documentation was collected with the help of students and teachers at our university. This important material was the basic data to develop a method to analyze the relationship of social structure, (families) and spatial structures (dwelling unit) through time.

Twenty-five years later, I completed the second part of Santa Ursula study. This means we have now a 50-year history of urban morphology and dwellings typology transformations as well as their relationship with social changes, (Andrade, 2007).

In both cases; thesis and Santa Ursula study case, 25 years later, the dynamic relationship between social structures and spatial structures, prevails.

After that, three other experiences of progressive dwellings were designed and built: the *Union de Colonias Populares*, (1982); the *Palo Alto II*, (1983) and *Tepito* II,(1984) housing complexes.

1.8.3 Tabasco Housing Typology (1984)

This research study of housing typology in the Tabasco State, was done using support ideas. This experience was helpful to describe systematical process to detect traditional housing patterns and develop regional and locally adapted supports. The study was divided in three parts:

1. Analysis of existent conditions.
2. Developing of housing and urban design criteria.
3. Design examples.

The first one, included studies of natural environment conditions, housing typology, urban morphology and finally, local building materials. The second one, was a catalogue of design criteria for supports and urban tissue based on the regional housing typology and urban morphology. The last one, included examples of urban and housing designs, in which the support and urban tissue rules developed before had been applied.

Despite the fact that this study was done for a governmental agency in low income housing and without the direct participation of people, the approach was helpful for the next experiences on progressive dwellings. This is, as far as a method to design patterns and supports is concerned.

Other experiences in progressive dwelling were: *Apatlaco* housing complex, (Mexico City,1991); *Aries I* housing complex, (Cosoleacaque, Veracruz.,1993); *Xacalli* housing complex, (Mexico City,1997); and Sebastian de Aparicio housing complex,(Mexico City, 1988).

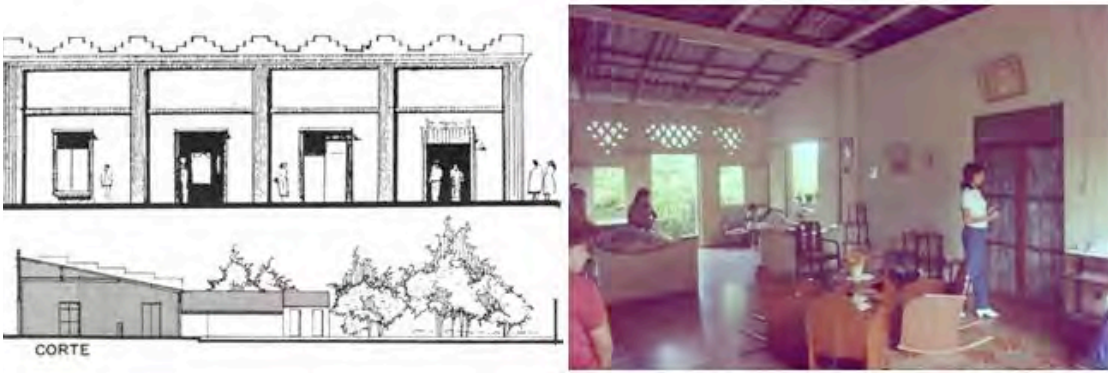


Figure 1.6 Tabasco, housing typology (Photos: J. Andrade 1985).

1.8.4 Xacalli Housing Complex (1977)

This project is located in the south part of Mexico City at the border of a natural reserve area. It is a 1Ha land, approximately, and 50 dwelling units were built on it.

The production process of this project was controlled by Xacalli's civil association. They contracted their designer, they selected and bought the site for their dwellings and they searched for and found the financial institution for housing. They also supervised their dwelling units building and even the urbanization of the place.

Dwelling units and land urbanization had not been finished by the time the inhabitants occupied their dwellings.

The changes at dwelling unit level which have been taking place during the last ten years, have been under the control of each family. The changes which have occurred at urban level, have been controlled by their social organization.

Both, the improvement of quality and size of dwelling units, as well as the urban space quality, show us that this approach is highly positive in order to develop new hosing complexes for low income people.

Figure 1.7 Xacalli housing complex (Photos: J. Andrade 1998 – 2006).

1.9 FINAL COMMENTS

After more than 30 years of teaching and working in the progressive dwellings approach, we could say that supports concepts have been essential in order to define the base building, (the fixed up part) of new housing complexes. In this base building, changes occur according to the place and the people. However, it becomes the initial building element to be used , transformed and adapted through time to fulfill different needs and requirements.

The concept of detachable units could be considered in this approach, not jus as components of the building, but as new additions and divisions of open and built spaces, (yards and rooms).

In our view, Habraken´s support approach has been successful because instead of considering just the design, he incorporates the users participation in the building process through detachable unit elements. The main problem in housing in Europe in the sixties, was the lack of flexibility and adaptability of dwellings built under mass housing processes.

Nowadays, the main problems in self-help housing production are time, technology, and lack of financial resources. However and from our own point of view, the main problem is the lack of knowledge of a housing production process, where to live and to build, go together through time.

The social organization participation as the main actor under housing complexes production has a direct impact on reducing costs.

The use of a systematical approach to design progressive dwellings (supports and patterns) makes it easy to improve technological solutions and to have adaptable and flexible dwelling designs to change through time.

Besides that, this approach makes it possible to begin with a minimal cost at urban and dwelling unit levels and allows for a step by step growth, in accordance with the social organizations needs, (urban designs) and the individual needs, (dwelling units).

1.10 REFERENCES

Andrade, Jorge, 1981, *Dwelling transformations,* Masters Degree MIT Thesis.

Andrade, Jorge et.al., 1982, *Análisis de la transformación físico espacial de las colonias populares en la ciudad de México*. VI. D.D.F.

Andrade, Jorge, 1992, *Tabasco estudio de tipología de vivienda*, UAM-X México D.F.

Andrade, Jorge, 2000, *Reflexiones sobre el diseño habitacional y la autoconstrucción* in Experiencias de autoconstrucción de Vivienda en México, Cuaderno FICA México City.

Andrade, Jorge, 2007, *El concepto de vivienda popular* En anuario del posgrado de ciencias y artes para el diseño, UAM-X, México D.F.

Andrade, Jorge, 2007, *Space and time to build,* CIB congress South Africa.

Cuperus, Y., 2000, Past present and future of infill systems. *Open House International,* **26 No. 3**, (UK: New Castle).

Habraken, J., 1972, *Supports in alternative to Mass Housing,* (London: The Architectural Press).

Habraken, J., 1980, Alternativas professional and users in pots, Design for adaptability change and user participation. OpenHouse, **5 No. 4**, (Holland: Eindhoven).

Habraken, J., 1994, *The structure of the ordinary*, (Cambridge Ma.: MIT press).

Ortiz, Enrique, 1998, *La conceptualización de la vivienda popular* casa y ciudad México D.F.

Informal:Informing:Exformal

Wes JANZ

Department of Architecture, Ball State University, Muncie, Indiana, 47306, wjanz@bsu.edu

ABSTRACT

A small but growing number of architects understand that the built environments of the world's poorest people evidence not only fundamental lessons about the ways in which locals conceive of and construct cities, neighborhoods, and structures, but also lessons that can inform our efforts as design professionals.

With this paper, several of these voices will be aligned in an attempt to study these new practices in relation to each other. The architects to be considered: Cengiz Bektas (Turkey), David Adjaye (Tanzania and England), Carin Smuts (South Africa), and Anirudh Paul (India). As will be shown, the lessons learned are wide-ranging and related to a number of concerns including building technology and material assembly, design with climate, built-in flexibility, participatory processes, sensitivity to local specificity, and more.

Simultaneous to this effort to "make known" the informal, an exformal perspective is offered that seeks to rethink "how little we know" about the difficult lives lived by many of the world's people. It is suggested that these lessons—including locals vandalizing a building they helped design and build—evidence how an apparent understanding can be another form of misunderstanding.

KEYWORDS: Informal Settlements, Architects, Local Knowledge, Local Resistance.

1.1 INTRODUCTION

Believing that it is possible, and then looking closely, one can see that many not-so-obvious people are busy designing our cities.

People . . . maybe you arrive at Chhatrapati Shivaji International Airport in Mumbai, March 2008, taxicab to a Malad hotel at 4 AM, and people are laying in the street, asleep. Later, Sheela Patel, the co-founder of SPARC (Society for the Promotion of Area Resource Centres), tells you that 28,000 Mumbai households are pavement dwellers, 53,000 households live within 50' of railroad lines.

People . . . maybe you visited the Cervantes National Theater in downtown Buenos Aires in 2006 following Argentina's economic collapse of 2001. If so, you know: a woman cocooned there in her lean-to, in an oversized theater doorway. Or maybe it should be called an "all-out house" or "human hellwhole" or "citizen's a-rest." We need some new terminology to describe her house. "Self-built" and "squatter" and "informal" don't do justice. Here, there is no justice.

People . . . maybe you know Keith Austin of Flint, Michigan. When I met him in 2006, Austin was being evicted from the front porch of the abandoned house where he'd lived for three days. "I know where to get food and water. I know how to hunt," he said to us. As one person said to me, "perhaps being an urban squatter is like living in the wild." When we departed, Austin said, "You can get as much as you want out of life. I believe in being positive."

1.2 INFORMAL

Looking into the lives lived by many of the world's poorest city dwellers, you can find whatever you want to find: crime, desperation, disease, early death, "off the book" jobs, illegal occupation, utilities pirating, poverty, relief workers, votes.

There is truth in all these interpretations.

There are, of course, other truths.

If you want to be positive–like Keith Austin--you can see that a pavement dweller in Mumbai, the theater woman in Buenos Aires, Austin himself, and a billion more living similar lives are the most determined of

urban settlers, predictors of long-term increased land values, forward-thinking people seeking opportunities better than those available elsewhere, and builders as passionate, if not more passionate, about building as are most contractors and architects.

With that said, it's important to acknowledge how little we know about the building cultures, construction processes, and architectures of our poorest people, whether in India or Indiana. Architects, in particular, are comfortable practicing within an exclusionary bubble. We readily accept our place within the economic constructs of clientage and patronage. We are delusional about an imagined professional status alongside lawyers and doctors. Most of us are drawn to the material aspects of building; concerns for the social, cultural, or political realms—for humans—are, at best, secondary. And each of us is the product of an enculturating and professionalizing set of conventions that dominate curriculum, accreditation, and licensure conversations worldwide. What it means to offer another perspective is considered, but within norms that are both widely accepted and infrequently discussed.

I have worked with teams of students, faculty members, or citizens on projects in Delhi, Mumbai, Colombo, southern Sri Lanka, Buenos Aires, and Rosario. It is extremely difficult to transfer knowledge gained regarding real, challenged lives into meaningful design initiatives. There is a kind of "fall away" from what was learned about the disadvantaged or disenfranchised person and the existing material conditions of his, her, or their life and a "fall back" to known problems and solutions, to conventional thinking and ideas taught in the classroom. This is, in many ways, understandable. We know little of lives that are simultaneously extraordinary and commonplace. We have few or no precedents to consider. We have little reason to be concerned about forgotten lives, no interest in using the spaces in city that have been long abandoned, and no reason to repurpose building elements or materials that can be found among the broken down architectures of our cities. We often don't recognize poor people when we see them and most of us can live our lives separate from theirs if we want to. And such design settings almost always come with minimal or nonexistent budgets.

This, too, is true.

1.3 INFORMING

A growing number of persons are interested in such perspectives and lives. This paper is one early effort to "see" and "seed" these initiatives in order to more effectively leverage this good work.

Such an effort is part of a larger argument that a professional "we" has much to learn from a local "them." This shift challenges the fundamental beliefs that planning and design professionals can "save" the poorest people (by imposing our standards on them) or "know best" what is needed. There is great benefit in the dominant group becoming aware of and engaged in the planning, design, and constructional processes of the groups that are typically seen as being subordinate and in need, in disrepair, and in chaos. At the same time, it must (and will) be acknowledged that such involvements bring their own complications.

By displacing the privileged position of the trained designer, this work challenges conventional 1-2-3 sensibilities (which assume that knowledge flows primarily if not exclusively from the First World to the Third World) and instead offers insights into a 3-2-1 view that suggests that there is a great deal to learn about planning, design, and architecture from regular people making their way in a difficult world. It can be the case that once the favored position of the designer is shifted along with the way we typically understand the subordinate group, we might begin to see the ways and degrees in which the locals "push back against" what ethnographers term "the shove of domination."

It must be said: engaged architects are trying.

I've experienced this energy directly. In teaching, recent graduate theses (all completed under my direction) include: "At Home with the Unhoused: Conversations with Men and Women Living on the Streets of Berlin" (Kathrin Löer); "Street-Side Parallels in Bombay: Contestation of Everyday Life with Order" (Siddhant Sinha); and "Imagining the Alchemy of Shrinkage between the Real and Ideal: A Resilient Design in Evolution in Flint, Michigan" (Marwa el-Ashmouni). And while traveling: fly roofs in the Kowloon Tong district of Hong Kong, self-built of corrugated tin sheets and welded metal frames, intercept both sun and rain while capturing cooling winds. In Kalametiya, Sri Lanka, residents of houses constructed post-tsunami, almost without exception, built new kitchen buildings, so dysfunctional were the facilities designed by Sri Lankan architects. In a drivers' village outside Abu Dhabi, residents make streetside modifications to standard low-cost housing.

I know some things. I'm confident with some of the knowledge I have about the informal and its potential to inform our work as architects.

1.4 EXFORMATION

Still, I try not to fool myself. I've had some experiences, I've read some books, I've talked with some smart

people, I've listened to three of the four architects featured below explain their world views and approach to the built works they directed. But what kind of "knowing" is this?

Kenya Hara, in the 2007 book "Designing Design," suggests that because the amount of information available is far beyond our capacity to process it, it is no longer the case that information can be transformed into knowledge: "piles of information, like seeds not germinated, [are] reduced to an ambiguous condition; we can't tell whether they're dead or alive." "So then," Hara offers, "shouldn't we make the world unknown?"

I coined the term "exformation" as half of a conceptual pair, the other half being "information." Exformation doesn't mean "making known," but "understanding how little we know." . . . Is it possible to communicate not by "making known," but by "making understood how little we know"? If we can recognize that we know so little, a method for finding out how little we know will become clear as well.

We have some information.

According to UN-Habitat, Mumbai, Calcutta and Bangkok "have over 10 million people and between one-third and one-half of them live in slums." The Urban Age Project, in the book *The Endless City* (2007) estimates the number of people who will be added to major cities every hour by 2015: Lagos (+58), Dhaka (+50), Karachi and Mumbai (+42), and Kinshasa, Delhi, and Jakarta (+39). The Internal Displacement Monitoring Centre estimates there are 26,000,000 internally displaced persons worldwide.

We know these things.

But many of us have little awareness of how little we know about the plans, designs, and architectures created, built, and lived in by the world's poorest and displaced persons. It is the author's hope that this paper begins to address this gap, and this potential.

So . . . these are the threads that flow through this paper: the pavement dwellers asleep in Mumbai, the doorway dweller in Buenos Aires, the porch dweller packing up and out in Flint, four architects, and the broader lessons available if we believe we have much to learn in informal settlements and from informal settlers.

To begin this journey, it might be most appropriate and beneficial to not say what we already know or think we know, but instead, to understand how little we know, and to begin from there.

1.5 LESSONS

A small and growing number of architects are moved to action. They understand that the built environments of the world's poorest people evidence fundamental lessons about the ways in which local people conceive of and construct cities, neighborhoods, structures, and lives. And these architects, to their credit, are involved. In so doing, they find both societal and professional space for their architectural knowledge (head), willingness to work hard often under difficult circumstances (back), and belief that we have much to learn from and offer to the world's most at-risk populations (heart).

However, the sorts of lessons they offer are not always what might be expected, and as will be revealed in their comments, at times are certainly not what was expected or what he or she wanted to know.

Admittedly, the alignment of this non-aligned group is based on the author's interest in their works, either through conversations or lectures. As there is not time or space to give full coverage of the perspectives or work of any one member of this gathering (that is not the purpose of this paper) and as there is not much published or available regarding these or other such activist-practitioners (some don't have websites or aren't seeking publicity), a decision was made to select quotes that reflect both ideas important to the individuals as well as the somewhat unique perspectives expressed in their words and work, informed as they are by the informal.

The first two architects—Cengiz Bektas and David Adjaye—share international acclaim and an awareness of what might be learned from informal settlements and settlers from perspectives that are in keeping with more conventional architectural sensibilities, even as the more senior Bektas and the younger Adjaye leverage their own life experiences and world views. The third architect—Carin Smuts—had experiences that challenged her understandings of what it means to organize a group of local people to design and construct buildings. Finally, Anirudh Paul's comments frame another set of issues related to the difficulties of knowing the distinct qualities of another's place, as well as the need, if we are to become more informed participants, of a new language that can grow from, and possibly guide, local engagement.

1.5.1 Cengiz Bektas

I was introduced to Bektas when the student Amal Cavender arranged an interview with him as part of a "World Architects and the Working Poor" graduate seminar I offered in late 2004. Bektas has built numerous works throughout Turkey, as well as in Egypt and Japan. Among his many honors was the Aga Khan Award in 2001 for the Olbia Social Cultural Center at Akdeniz University in Antalya, Turkey. Such international

recognitions are complemented by local activities. For example, in 1979, with a group of architects, he created the Bektas Participatory Workshop, an attempt to engage in community work without causing gentrification to occur while reinforcing harmony and tolerance among local residents. Their first and main project was in Kuzguncuk, one of Istanbul's oldest neighborhoods with between 5,000 and 10,000 residents from at least four different ethnicities (Jews, Armenians, Greeks, and Turks). In the midst of sculpture workshops, choir singing, wall painting, and flower planting, the architect opened his house, then under repair, for everyone who needed help and advice in order to repair and improve their house. All this was offered at no charge in the attempt to show people that with some effort they could have the home they wanted without leaving their neighborhood.

Unique among the conversations we had that semester (Adli Qudsi of Syria, Iranian Nader Khalili, Australian Sean Godsell, and Santiago Cirugeda Parejo of Spain among them), Bektas was definite in his belief that architects have much to learn from informal settlements and settlers:

> I believe we can learn many things from them. First, they know how to choose the best material for their needs and they not only build with it but also they find the appropriate method to use and build with that material. So, we can say it is a vernacular and sustainable way of building. Also, these people follow Vitruvius's rules in architecture; they know houses need to face the sun and avoid the hard wind, and maintain close social relationships without invading the privacy of others. The planning is so flexible; it can be changed with time and need. The first generation is not forcing the second generation to live in square blocks. The second generation has the choice to live in it, add to it, modify it and add another dimension if they want. These are important elements for contemporary architects to think about. For example, we create great forms but do we know if the next generation will prefer to live in them? Can these forms be modified with time? What will happen after two, three, or five generations? How good is it to build with such permanent materials? I believe, as architects and cultural presenters, we need to offer different solutions so we don't force our beliefs on the next generations. In Anatolia, every family works in the design or building process of their home. Architects need to engage people and encourage them to participate in the design process. This participation will make the design product parallel to their expectations and needs. An architect needs to work with the individual to create the community he or she wants.

Our interview with the architect covered a range of subjects: the banking and mortgage systems, gaps in the legal system, land speculation, the devastating impacts of earthquakes for most informal settlement houses. He then introduced one additional topic: empathy. Here is what Bektas said, in response to a question about architects' preoccupation with form:

> I don't agree with the "magazine architects" or "tailor architects" who feel the need to create new trends and the obligation of presenting new forms and lines every year without thinking about how people will feel about the space when they live in it. I don't feel this obligation because my approach is not to be so concerned about form. Even when we say "form follows function" we miss here the human element, such as how his happiness relates to the form and function. I don't think we need to be acrobatic in our designs to bring forth humane spaces. I should not worry about creating my own temple. I am not against the forms created by many architects and I don't criticize them: if the forms work for people then it is fine. Isn't poetry the same?
>
> I think here I am contrasting egoism to empathy, and I choose empathy. What makes people happy will make me happy.

1.5.2 David Adjaye

Adjaye was born in Tanzania and educated in England. While he is best known for a series of elegant buildings for prestigious clients—Nobel Peace Center (Oslo), Idea Stores (London), and the Thyssen-Bornemisza Limited Edition Art Pavilion (Venice) among them--in a recent interview he said that after finishing his formal education:

> I refocused my intention to re-look with a new set of eyes at conditions that I already knew [such as those in a northern Ethiopian town]. I reprogrammed myself to no longer look at these things as conditions of crises. Once it happened, it opened up a whole new way of working.

In discussing the illegal settlements of Delhi, Sao Paolo, and Lagos, and the many settlers living in such informal conditions, Adjaye says:

> They don't want to wait. They have to live their lives. They have to build, formulate habitable conditions which will make their lives work. But these are not desperate measures. A shantytown developed by a city planner becomes a linear prison. Yet a shantytown developed by people, is an agglomeration of networks and connections that interweave into each other and form bigger or small kinds of localities. Not in the way we understand localities, in terms of squares and plazas. I think this is fascinating because we are talking about a co-dependency which allows survival to be much more easy. This is not insignificant, because the idea that somehow you will one day catch up to the West is a complete fallacy. I think conviviality is the underplayed agent in this. Visiting most of these places, what became clear to me was that they required a different kind of looking. If you focus on the poverty and directly compare it with the situation here, you will be horrified. But if your eyes adjust from looking at comparisons to considering adaptation, then you see an urbanism that could be learned from. It doesn't occur top down, but sustains an entire community who would otherwise have fallen by the wayside as they waited for government to do something. . .
>
> The model should no longer be an image of the world as a kind of singular project; it should be a series of equivalent systems, each with their own advantages and disadvantages. As an architect, or as an urbanist or a social thinker, one can work within all these paradigms. .
>
> I am trying to produce a non-hierarchical visioning of the urban environment. So that one no longer accepts an evolutionist idea of development, but instead explores a much more expansive and horizontal set of evolved states, working within those to really understand what is happening. Only then can one escape the tyranny of an architecture obsessed with aesthetics that are still derived from a Greek tradition.

In discussing the "poetics of informal habitation" specific to Ndebele villages in Soweto, Adjaye continues:

> You can have an agglomeration of different systems which form yet another system, one that is very specifically related to its own context. . . The homes are laced by this network of lines and walls that turn spaces into very defined thresholds and courtyards. The suburban model hinges on the singular house but with the Nbebele, the singular house is in relationship to the next house. Its connectivity arises from a network of walls that somehow stitches all the huts together to form a community.

To add one more specific case, Adjaye says the following about the process of making hillside favelas above Rio de Janeiro:

> I'm struck by this notion of hill towns and cliff towns as a mat of civilisation, a network that sits on a landscape. . . You've got this house that has been built by construction workers, who are building creatively because they cannot afford to dig out the landscape and place boxes within it. So they are just naturally adapting to the flow and contour of the landscape, which gives rise to a very unique kind of pattern. When you go up into favelas, their very specific identity is striking. They are very responsive to context, as opposed to the way that downtown buildings are built in the applied grid of an abstracted cityscape.

Bektas and Adjaye make the case that there are important lessons, to be culled from the self-planners and self-builders who reside in informal settlements. Each of these respected architects is a student of the slum and the slum dweller. The next architect has worked with economically disadvantaged persons as well. She has had experiences that put into question the limits of what we can actually come to know about another person and another architectural setting.

1.5.3 Carin Smuts

Smuts was born in Pretoria, South Africa and founded CS Studio in 1989. An acknowledged specialist in low cost housing, Smuts and the Studio have completed over 100 projects, often with limited budgets. Among her notable public projects are the Gugulethu Meat Market, Guga S'thebe Art Center, Laingsburg Multi Purpose Center, and the House Bester Community Center, all in South Africa. In a recent article (Marschall, 1998),

Smuts talks of the benefits that involvement in a building project can mean for local people within an Apartheid system:

> In order to get a public facility [in the township] you're dealing with people who've had Apartheid education, dealing with people who haven't finished school, you're dealing with people who've been locked up for three or four years . . . So, it's more the process and the changes in people's lives than the buildings themselves. And you will often find that a lot of people we've worked with never did anything, or they were just sitting on the street. And now, all of a sudden, they are running building projects or young people decide to go to university or to go and work somewhere because they now realise (sp) that there is more to life.

For her 1998 article, "Architecture as Empowerment: The Participatory Approach in Contemporary Architecture in South Africa," Sabine Marschall talked with several architects and all spoke of the "ongoing problem of vandalism and the general lack of maintenance . . . [which] cast doubt on the efficacy of community participation for fostering public responsibility." Among those making such comments was Smuts, who has personally watched somebody equipped with a hammer going on a rampage through Uthango, a recently completed cultural centre in Nyanga, where the community was involved every step of the way. Other people made a fire in the ballet room, smashed the piano, stole the security fence, broke virtually every window, damaged the lights and the toilets.

Marschall's "Participatory Approach" article includes a section titled "Long Delays and Emotional Drainage" in which she writes: "Abuse or non-use of a building shortly after completion understandably leads to personal frustration, disappointment, and emotional drainage on the part of the architect, given the enormous effort, time investment, close interaction with the community and the witnessing of initial positive results. Community participation is a process of involvement that works both ways: the architect, too, establishes a sense of connection with the building and the people. 'One gets so emotional about a building; when you then see the vandalism: it is devastating,' says Carin Smuts."

Smuts reveals the limitations of what she knew, or understood, about the local people alongside whom she worked. Although well intentioned and obviously committed to such local initiatives, it is just as apparent that some aspects of her design processes and design thinking are in need of reconsideration. Smuts came to know how little she knew of the preferences of the locals. The fourth architect of the four studied raises his own challenges to those who work alongside local people, specific to uniqueness and language.

1.5.4 Anirudh Paul

Paul is the director of Kamla Raheja Vidyanidhi Institute for Architecture in Mumbai. In 2008, when discussing the future of the 600,000-person slum district of Dharavi, he began with five questions:

> Where and how much do designers and architects intervene?
> How should we map such communities?
> How might we engage "extralegal" settings?
> How does someone, who is knowledgeable and "outside," trigger such interventions?
> And, what is our role as architects in the world of self-builders?

After establishing some of the unique local qualities--for example, Mumbai occupies $1/10^{th}$ the land of other global cities, and the people of Dharavi have, for the most part, supplied their own housing--Paul stated that such distinct aspects, issues, and potentials require us "to counter the body of knowledge that exists--the conventional knowledge regarding global cities and economies." "We need a language," he said, "that articulates the local." While urging our group to consider that "a slum is a credible place to live," he said that we must

> displace the duality of [the approaches and languages of] "resistance"
> and "development" with a third mode, one that might reconceptualize architecture.

Paul sets out what we don't know, or maybe what we don't have: general knowledge, specific knowledge, or even a place and language from which to consider the uniqueness of the lives lived by 1,000,000,000 squatters worldwide.

1.6 NEXT STEPS

If architects are to become more informed by the informal, one exformal "next step" is suggested.

Architects should dedicate time to knowing one person over time, as he or she ages, matures, and moves through his or her own challenging and hopefully rewarding life. Visit that person repeatedly, not only to help him or her, but to come closer to understanding the human side of the profession, his or her work, and his or her self. The benefits might be a better understanding of the person's material world, early insights into a more appropriate "third language" (as Anirudh Paul might term it), the role architecture plays in the person's day-to-day life, and a better awareness of why one should continue to be an architect. Bektas works, for years, in his neighborhood; Paul has worked in Dharavi for ten years. Smuts needs to go back as she goes forward with the next project. Adjaye must find his first client in the places he so admires.

People . . . let's begin with them, with getting to know them.

People . . . believe that the best way to change the world is to be changed yourself.

People . . . we can find our way within the constraints of others living lives we can't imagine.

1.7 WIKI

To close, I offer my most recent project. Wikis, of which Wikipedia is the best known, are collaborative websites where a collection of web pages specific to a particular kind of content can be accessed, modified, or contributed to by on-line visitors.

"OneSmallProjectWiki: An Informal Design Exchange" is the collaborative website this is being built. It takes the OneSmallProject website I created in 2005 one step further—no longer a one-way internet site (like all websites and blogs), OSPW seeks out others interested in the informal worlds and brings together a range of projects done by a diverse group of persons.

To view the wiki, see: http://onesmallprojectwiki.pbwiki.com/

To contribute, send your work to: wesjanz@gmail.com

Thank you.

1.8 REFERENCES

Adjaye, D. in conversation with Kodwo Eshun, 2006, Learning from Lagos: A Dialogue on the Poetics of Informal Habitation. In *David Adjaye: Making Public Buildings: Specificity Customization Imbrication*, edited by Allison, P., (London: Thames & Hudson).

Bektas, C. in conversation with "World Architects and the Working Poor" seminar participants at Ball State University, November 16, 2004.

Burdet, R. and Sudjic, D., editors, 2007, *The Endless City*, (London: Phaidon).

Hara, K., 2007, *Designing Design*, (Baden, Switzerland: Lars Müller).

Marschall, S., 1998, Architecture as Empowerment: The Participatory Approach in Contemporary Architecture in South Africa. *Transformation*, 35, 103-123.

Paul, A. in conversation with Ball State University CapAsia field study group, March 2008.

Housing by People, Adaptive to Flood and Economic Activities

Naidah NAING

University of Moeslim Indonesia, South of Sulawesi, Indonesia, naidahnaing@yahoo.com

ABSTRACT

People always create houses and environment which can provide their everyday activities and needs. They also strive for their lives in a safe environment, where they can earn their living with reliable economic activities. The discussions in this paper cover the people's creations of their houses to adapt to its environment at the *Tempe Lake* in Sulawesi Island. Houses were built floating on the lake. When the floods came, the houses were moved to the edge of the lake, close to the land. On the other hand, when the floods decreased, the people, then moved their houses back to the centre of the lake.

The floating system of the house was to provide for the needs of the inhabitants to catch fishes from the lake. The houses were always moved by the dwellers to spaces in the lake where many fishes can be caught. At a certain time the houses will be moved back to the edge of the lake. The discussions also include how people construct and move their houses, the open building implementation of the houses for living, the production process of the fish and the place for selling the products.

The research was conducted using qualitative method and explorative survey of the lake area. The result of the study shows that the informal houses built by the people are able to adapt to the floods and suitable for the economic activities of its dwellers.

KEYWORDS: Adaptation, houses, open building.

1.1 INTRODUCTION

The dwelling floating system on the water with fixed-raised-house is an interesting case in Indonesia because of its geographical condition mostly covered by water (the lake, the river, the swamp, and the sea). Basically, the dwelling on the water have already begun for centuries due to its geographical and/or its historical factors. At the moment, dwellings on the water is an alternative place for living. The floating house system on *Tempe Lake* in Wajo Regency, South Sulawesi, Indonesia implements an open building concept. The application of the open building system is useful to anticipate the floods that always happens, and to accommodate daily activities as well. Besides household activities, the floating houses is also be used for economic activities such as fishing and/or being rent to the tourists who spend their visit for a long day. One advantage of open building systems is that activities can take place in one location; it means that it has multifunction room for the guest's room, living room, bed room, place for fishing activity, place for processing the fish, place for selling the fish, daily needs, and can also be used for a rent room for the tourists.

There are approximately one hundred floating houses on the *Tempe Lake* that has 100 mm rainfall in a month. This place is relatively dry. The lake has a transitional climate in South Sulawesi. The dry season happens twice that is from January to February and from August to October, while the rainy season occurs from March to July. The water elevation varies from 3 meters high in dry season until 10 meters high when the flood occurs. Due to the location and climate, floating houses will be moved anytime in accordance with low-high-tide of the lake's water and the macro climate around it.

1.2 THE HISTORY OF THE FLOATING HOUSE

The history of the dwellings on the water was begun when the groups of a certain ethnic arrived on the water area. This group, then lived there from generation to generation and then became a big clan. The existence of

the ethnic community on the water tends to be homogeneous and they improved a tradition and certain value in their lives. This condition has a great influence on the characteristic of this peculiar house. The characteristic of this house is inclined to improve spontaneous and organic dwelling (Suprijanto, 2000). This theory is in line with the history of the dwelling on the *Tempe Lake* in Wajo Regency in South Sulawesi where a group of fishermen who live on this lake came from the land around the lake. They called their community as *Salotengnga Buginese*.

Nomad dwellings in floating house system on *Tempe Lake* have begun for several years ago. At the beginning, there were only several houses, but recently the number is increasing to a hundred of floating house. At first living on the water was just for fishing activity on the lake by the fisherman who lived around the lake. Besides fishing on the lake for free, they can also do a fish breeding in the so-called *Belle* (cut-plaited-bamboo). This *Belle* was embedded in the water. In the *Belle*, the fish can be breed very well. Very often after using the *Belle*, the fish will be stored on the raft that made from bamboo. This raft was originally designed by the ancestor of floating house on *Tempe Lake*. In the dry season, water level will decrease especially in the lake side. Therefore, the fishermen began to find a way to protect themselves from the heat of the sun and took a rest during the daylight. The fisherman usually took a rest on the raft beside their *Belle*. Furthermore they made columns on the four corners of the raft and then joined them with beams (bamboos). After that they put a roof on the beam for protecting them from the sun heat and the rain like a shelter. The roof materials were made from textile or plastic. Further development showed that they started to re-design the roof to a sloping roof (saddle roof) and substituted its material from textile or plastic to dried- large- palm (*nipa frutescents*) leaves or dried- coarse- grass that was easily be found around the lake.

Every inhabitant lived on this lake has another house on the land, their floating house was their second home. The location of their first home is approximately 2-5 km far from the lake. Due to the economic activities on the lake, they usually spent their time all day long, so that their first home will be unoccupied since all of the family moved to their floating house. In order to protect their fishing tools from the pirates, fishermen, then began to think of living on the raft for the whole day so they began to make a house on the raft as the place for doing household activities (such as sleeping, eating, taking a bath, etc), at the same time they do some economic activities (such as catching the fish, sunbathing, and selling the fish). Every year in the rainy season, this area is flooded. The water level goes up to the top roof of the houses. The dwellers had no choice for living except on their floating houses. Finally, the fishermen community has done both household cores and economic activities inside the houses. The floating house is a product that has undergo a morphological process for several years ago up to now, It started from the raft, just to store the *Belle*, and added four columns to support the roof for protecting them from the weather (sun and rain). The next step of morphological process of floating house is to add walls at the sides of the raft in order to make it more comfortable to live in and to protect them from the weather and wild animals like crocodiles and the like.

The process of Nomad Dwellings on the floating houses has existed since the society who lived around *Tempe Lake* realized that it is very important to place the houses closed to their workplace, because it will reduce the cost of transportation and can store the fishing tools on the lake. Besides, they will not be disturbed when the floods happens every year. Living on the floating house on *Tempe Lake* now become a living concept that provides more secure dwelling houses from the floods that happens every year for several months. Now the existing of the floating houses on *Tempe Lake* with all of their characteristics such as dwellings and architecture models, lay out of the space, the social culture of the community, the economic activities, etc, has caused this place to be one of tourist's destinations place in the South Sulawesi besides Toraja. The domestic and international tourists visitors are an extra value to increase the income for Wajo Regency.

1.3 THE DESCRIPTION OF THE FLOATING HOUSE

According to Koestoer (1997), generally, the characteristics of traditional dwellings in the urban area can be identified easily because it does not have similar shape (irregular facade), the lay-out of the houses tends to gather in a group and the community lived near the water looks like the river or the lake. The special characteristic of the floating house on *Tempe Lake* is always moving from one place to another, adapting to low-high tide of the lake's water level. The houses were designed to use stand-alone concept. The position of the floating houses on *Tempe Lake* do not have a regular pattern, for its position and direction were much depending on the water level and the wind. The distance between the houses are quite far to each other. This condition allows the wind to blow easily so that the weather in the floating house is cool. Since the floating houses always move continuously, the pattern of the house-position changes every time. In order to put the

floating house permanently, the dwellers make a pole, embedded in the bottom of the lake in front of the house and a rope was used to tie it, so that the house could not be moved far away by the wind or the water current.

Figure 1.1 Floating house with the Open Building System

Figure 1.2 Lay out of the space in the floating house that is open for various activities.

The position of floating houses spread out on the whole *Tempe Lake's* water, where they can float very well. When the water level decreases in the dry season, the floating house will be moved to the center of the lake (far from the land), on the contrary, when the water level is high, it will be moved to the side of the lake (close to the land).

Dwelling on the water using raised-house on the raft (see figure 1), is a traditional architecture of the Buginese, without high column. Floating house on the *Tempe Lake* is a raised-fixed-house on the raft that floats on the water. The house were made of wood and bamboo for the columns and the walls, and used nipa frutescents leaf for its roof. Nowadays, the material of the roof has been changed by using zinc plates because of its simplicity and lighter. The raft is made by a chained-bamboo. This house has two entrances, one is placed in the front house (main entrance) and the other is placed in the side of the house (side entrance). Windows were put at the side of the house and beside the main entrance. Ventilation were set to the walls of the house consisting of space between the wall's materials. The house is not a temporary one. Most floating house is an inheritance from the dweller's parents who occupied the house for several years ago. The foundation of the house is made by a chained-bamboo, however, its foundation must be changed periodically.

The floating house of *Bugisese* on *Tempe Lake* are environmental-kindly houses. The uniformity of rectangular plan with the terrace in front of the house *(lego-lego)* is one of the proofs. This kind of plan has applied to the open building concept. The fresh air can blow freely into the house. The open building concept enables the dweller to develop the space function (Naing, 2007) The concept refers to a cosmologic sight of the *Buginese*, who believed that the universe is a diamond shape which called *Sulapa Eppa Bola Suji* (rectangular shaped). It is strongly believed that the sight means that everything will be accomplished if it has four sides (qudrilateral). This philosophy refers to the human creation that consists of four elements: soil, water, fire, and wind. The shape of *Sulapa Eppa* is a basic of *lontarak alphabet* of the *Buginese*, which is very much influenced to the characteristics of *Buginese's* house (Yamin Data,1977 : 32-33).

1.4 THE MOVEMENT OF THE HOUSES DURING THE DRY AND THE RAINY SEASON

When the *Tempe Lake's* water overflows (floods) and the level of its water increases to the land around the lake, the community of floating houses will be moved to the side of the lake (close to the land), if the water level is only one meter high, it will be moved to the center of the lake (far from the land), because on the center of the lake, the water level is still higher than in the side of the lake, so that it is possible for the floating house to float. During the dry season, the community were far from the land. The water level in *Tempe Lake* is always in low-high tide, due to the condition of biophysics environment that always change continually so that it influences the inhabitants of *Tempe Lake*. The position of the floating house is not permanent. It moves everyday, every week, and every month. It means that this house and its inhabitants can adapt to their environment.

The moving process of the floating house is pulled by some traditional boats when the water level is high, or can be pulled by some people if water the level is not so high. All of the floating houses can be safely moved at anytime.

The traditional boat which is used to pull the floating house is operated by a single-machine. To pull a house, it needs approximately 5 to10 boats depending on the size of the house. The moving process of the floating house takes place during the year as long as the existing of floating house is still there.

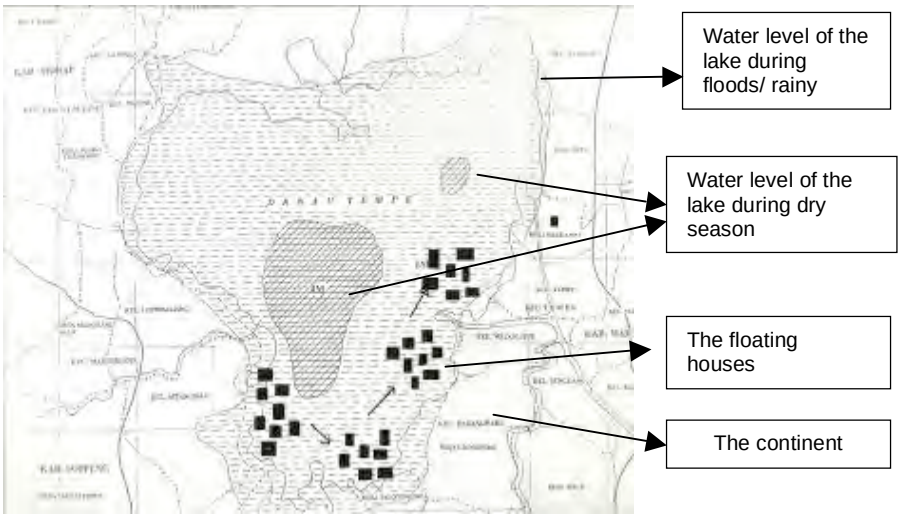


Figure 1.3 Situation of the floating house in *Tempe Lake* during the floods, the water cover the land around the lake. The floating houses moved to the side of lake close to the land.

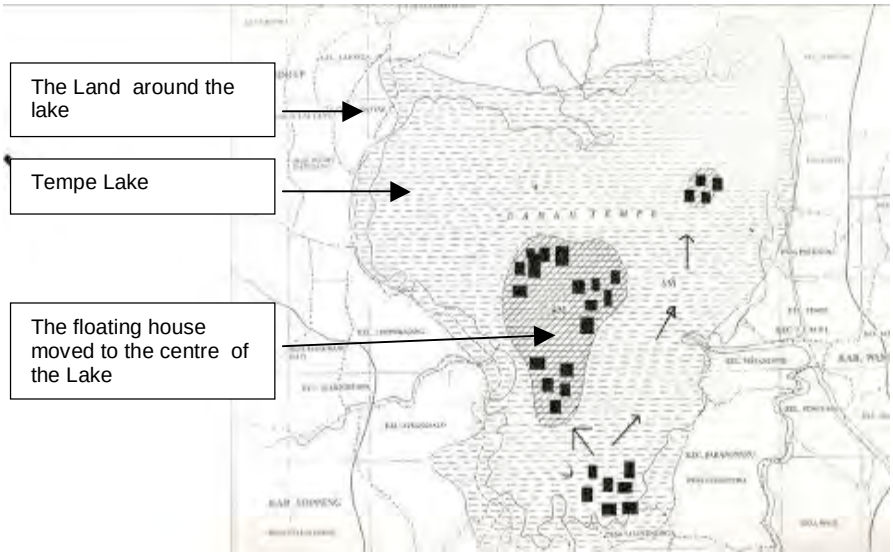


Figure 1.4 Situation of the floating house at *Tempe Lake* during dry season, The floating houses moved far away from the land.

Figure 1.5 Condition of dwelling on the water in *Tempe Lake*, South Sulawesi.

Figure 1.6 Process of moving the floating house in *Tempe Lake*, South Sulawesi.

1.5 THE ECONOMIC AND THE LIVING ACTIVITY

1.5.1 The Economic Activity

The economic activities which are conducted by the community at floating house are mostly informal activities in the economic sector, such as fishing, fish breeding, fish processing, and fish selling. In the afternoon or the evening, the fishermen will do their activities (fishing) on the lake using the boat with or without a machine. The equipments used to catch fishes are casting-nets and *Jabba* (iron made snare fish) which is to be put down to the bottom of the lake during the night and will be taken up the next morning. For the catcher-fishermen, they can do fishing on the lake freely to fulfill their daily needs and part of the fish can be sold to the so-called collect fisherman. For the fish-breeding-fisherman, they breed the fish in the *Kerambah* and encircle it with a *Belle.* The fish can be harvested five months later. The fish production from *Tempe Lake*, were not for the local consumption (Wajo Regency) only, but it also be sold to the other regency around Wajo as well.

To fulfill household-basic-needs, There is a role that the householder who catches the fish on lake at noon and or at evening, and then sort it for selling the fish to the fish collector, to the traditional-market, or sort it for making a dried-fish. The housewife will assist the householder to process the fish such as cleaning the fish, conserving the fish, drying the fish, and selling them to the fish-collector, or selling it to traditional market. All of the activities mentioned above were done in the floating house. Activities for cleaning the fish and keeping the dried fish is done in the floating house, while the drying process is done in back of the floating house, on the raft without the roof for getting maximum sun light. The dried-fish for the consumption or for the sale were place at a circular container made of matting of pine leaf. The production of the fish was useful to fulfill the inhabitants daily needs and also for paying their children's educational fees.

Figure 1.7 Activity of drying the fish at back of the floating house.

Figure 1. 8 Activity of processing the fish in the floating house

Besides being a fisherman, the inhabitants also earn the money by opening a small shop in their house that sell various daily-needs to the community who lived there, they also rent the house to the visiting tourists there. The traditional Architecture of the *Buginese* who built their house on the raft was an interest to the foreign or domestic tourists. The other advantages of *Tempe Lake* are the beautiful panorama and various kinds of flora and fresh-water fish. In the evening, people can see the sunset that reflect its ray on the water, while the fishermen go up and down with their single-boat-machine, and also the unique house that can not be found in another place. One can go to the area of floating house by using boat for about half an hour from the center of Sengkang downtown of Wajo Regency.

1.5.2 Living (daily activity)

The open building concept with open lay-out which is applied to floating house has no massive partition. It will facilitate the dweller to do a variety of activities everyday. In the morning the householder leaves their house for going fishing by using his single-boat-machine completed with its equipment, while the housewife are taking care of their children and cleaning the house. Taking a bath or washing clothes and cleaning the household equipment is done on the raft by using the lake water. While the excretion is done in a small rectangular water-closet (about 1 m) at the backside of the raft separated from the house. This water-closet is made by wood or zinc. There is no other way to throw the rubbish or the disposal except through the lake. This way, however, will contaminate the lake's water despite exploiting the water vegetation to grow up and function as a natural-sanitation system to neutralize the lake's water. Although the lake's water is not good for cooking and drinking, but it is sufficient enough to use it for washing and cleaning. While the drinking-water or water for cooking is delivered from the land around the lake.

The activity to receive the guest is done in the frontage or in the center of the house that has a half to ¾ part of the wide of house. In general, the houses that apply an open concept, there is no furniture at all, only mattress were laid down as a place for sitting or taking a rest for the guest. From the outside, this living room is reachable through the main entrance and the side entrance which exist in every house. The Inhabitants were friendly enough to give a warm welcome to the foreign and domestic visitors who visit *Tempe Lake*. Usually the tourists will leave this floating house in the afternoon when the sunset appears or spent their night on the floating house and go back to *Sengkang* city next morning.

Cooking activity is done by the housewife and will be assisted by their son or other family such as their grandmother or aunts. The kitchen are located behind the house in the back side. Their kitchen equipments are consist of a wood stove, oil stove or a gas stove.

In the night, some of the fishermen catch the fish and watch the catching equipments that tied around the lake. And take it when the morning comes, while the housewife and the children are sleeping in the house using mattress. The bedroom in the floating house is only consists of a single room which partition is using a cloth or a thick paper as a private area and also be used to protect them from the cold-weather. To protect them from mosquito bites, the dweller used a mosquito net (kind of cloth which has big pores) that have four corner to drape it at the wall so that it form a tent within the doors. The situation becomes calmer at night.

1.6 THE OPEN BUILDING IMPLEMENTATION

The open building concept which is applied to this floating house makes the possibility of changing the space function according to the inhabitants' needs. The open building theory explains new approach in the building and the dwellings which combine the design, finance, construction, fit-out, and long-term management processes of residential buildings, including mixed-use structures. The open building concept could make a simplified construction, reduce conflict, afford individual choice, and promote overall environmental coherence (Kendall, S. and Teicher, J. 1999). The application of this concept in the floating house can be seen from the lay out of the plan and its flexible partition, so that the floating house can be used for many kinds of activities. As mentioned above, floating house has many functions for the household and the economic activities on the water, for family or people gathering, and it can be rented for the foreign or domestic tourists. It can be used also for fishing, and special event on *Tempe Lake* festival to be held on every August 23 as well.

1.6.1 Meeting hall

Floating house with its open building concept has many advantages. One of its advantages is can used for fishermen-community-organization meeting. Normally the kind of the meeting there is an informal meeting without regulations. There is no furniture there. All of the attendants just sit on the wood-floor with a *tikar* (a plaited mat made from leaves) or a carpet spread. Common time for the gathering is in the afternoon or in the evening after the fishing time. In the informal meeting, people usually talk about the process and the production of the fishing, the improvement of it, and the usual constraints faced by them during their stay in the lake.

1.6.2 Boarding house for tourists

Tempe Lake is one of the tour destinations in South Sulawesi. Many foreign and domestic tourists went there because of the characteristics of the floating house with its *Buginese* traditional architecture and its beautiful sight where many kinds of bird fly over it. Normally, the activities of the tourists is just taking a rest and enjoying the panorama around the *Tempe Lake*.

1.6.3 Fishing house

Besides as a dwelling place, the floating house also has a function for the fishing activity. Usually it is on the side of the raft, in front of the floating house or in the back of the floating house. The raft that used for fishing activity is the enlargement of the raft (foundation) that has no roof. Sometimes the width of this open raft is more than the houses that built on it. To the tourists, fishing at this place is a satisfied activity, that is sitting on the side of raft while enjoying the panorama around the lake. They can also doing fishing on the terrace without leaving the house.

1.6.4 The *Tempe Lake* Festival

According to the history, *Tempe Lake* is located between two stratums of Asia and Australia, that is why this lake has food reservations for fresh-water fish that breed in it. The presence of the abundant fresh-water fish there, will not be found in another lake or river. As a consideration to thank God, the inhabitants that rely on their living on this lake, make a ritual ceremony to be held annually on every August 23 ceremony. The ritual ceremony is called *Maccera Tappareng* (a sacred ceremony for *Tempe Lake*). The familiar name of this ceremony is called *Tempe Lake Festival.*

In this ceremony, the inhabitants form a fraternity to each other and with the community around *Tempe Lake* as well. There are many programs in *Tempe Lake* festival such as slaughter a cow, cultural festival such as traditional boat racing , traditional kite competition, *anak dara dan kallolona tanah Wajo* (the election of a beautiful girl and a handsome boy from Wajo), *padendang* (competition of drumming the rice-mortar), traditional music to accompany a dance called *Bissu* dance (a dance which done by transvestites), and another special exhibition from this regency, to make this festival glorious one. The *Tempe Lake* Festival is done at the lake side until the centre of the lake (around the floating house). When the festival is going on, the community who wants to watch the various festival activities can gather at the floating house.

The Implementation of the open building concept at the floating house can give contribution to knowledge development especially about the alternative of the living concept on the water where the household and the economic activities is combined by the inhabitants in one place, and contribute the knowledge the human being relation, their environment and adaptation process of living on the water.

1.7 CONCLUSION

Based on the descriptions above, it can be summarized that dwellings on the water in *Tempe Lake* were designed with the open building concept and now become one of alternative living locations for the *Buginese* in Wajo Regency to anticipate the floods that always occur every year and also to adapt it with the tropical climate. By applying the open building system, the fisherman community can do many activities in their house. Household and economic activities can be done on the water as well. Low-high tide of *Tempe Lake's* water in

the rainy and dry season causes floating house always moves from one place to another place and adapt with physical condition of the lake. The application of the open building system can be seen from the plan and at the facade of the building. Besides household activities, The inhabitants can do many activities at the houses such as using the house for a meeting room, boarding the house for the tourists, processing the fish, and for conducting during the festival of *Tempe Lake*s. Due to the application of the open building concept in this house, it is recommended and very useful for the architecture students to do a study in this place so that they will know how to implement an open building concept in the floating house and it's advantages.

1.8 REFERENCE

BPS Wajo (2007), *Wajo Regency in Figure*, Statistical Centre on Duty of Wajo Regency.

Irrigating on Duty of Wajo Regency (2006), *Development Design of Tempe Lake of Wajo Regency year 2006*, Final report of Irrigating on Duty of Wajo Regency in assosiation with Institute of research and community services (LPPM) Hasanuddin University, Makassar.

Kendall, S. and Teicher,J (1999) *Residential Open Building.* (London: Spon).

Naing, Naidah dkk, (2007), *Wajo In Architecture Perspective*, (Surabaya: Publisher Quality).

Naing, Naidah (2006), *Stock Taking Data of Slum and Floods Disturbed Area in Districts of Tempe, Sabbangparu, Tanasitolo, and Belawa in Wajo Regency*, South of Celebes, Final report Bappeda Wajo Regency, 2006.

Koestoer, Raldi H. (1997), *Environmental Perspective Urban-Rural*, (Jakarta: Publisher IU-PRESS).

Yamin Data (1977), *House Forms of Buginese and Makassarnese*, Publisher of Development Project Media of Culture Departmental Culture Directorate General Education and Culture RI.

Informality as a legitimate energy in the city: Housing and urban environments in South Africa

Dr. Amira O.S. Osman[1]
Raymund Königk[2]

[1]Senior Lecturer; Architecture, University of Pretoria, Pretoria, 0002, SOUTH AFRICA amira.osman@up.ac.za
[2]Junior Lecturer, University of Pretoria, South Africa, raymund.konigk@up.ac.za

ABSTRACT

While South Africa has success in the rapid delivery of houses, it is acknowledged that there are still many challenges faced in terms of generating functioning neighbourhoods as opposed to housing-units.

Housing reveals the social, cultural and political intentions of a people and housing policy is reflected in the built product and in the form of neighbourhoods. The current government intended to remedy inherited fragmentation, but remained preoccupied with meeting quotas rather than developing quality environments. New and enlightened policy directions are challenging this: the Breaking New Ground (BNG) plan, which is being implemented by the National Department of Housing. Yet even the enlightened BNG plan will still need to review its approach to informality which it is attempting to eradicate by 2014 – an already futile activity.

The concept of *open building* studies this inherent characteristic of the built environment and distinguishes between fixed and flexible elements. By accommodating participation and change, it is possible, with innovative design, to successfully include the poor within the city on land traditionally thought of as too expensive for social housing.

The Housing and Urban Environments Research Field (H-UE) at the University of Pretoria attempts to research an appropriate approach to issues of informality by proposing that a well structured and serviced public realm becomes the focus of interventions in informal settlements and that practice be guided by a slower, yet ultimately more effective, process of participation.

H-UE hopes to play a more significant role in testing alternative approaches to the built environment, in particular housing, by developing interaction between the university and its context. The aim is to allow the architectural studio to move beyond the confines of the university campus and by collaborating with formal and informal local enterprises in exploring materials and technologies that may prove to be more relevant to the contexts in which they are generated.

These approaches acknowledge informality as a legitimate energy within cities, with a particular focus on the City of Tshwane.

Keywords: South Africa, Education, Informality, Housing, Urban Environment

1. INTRODUCTION

While South Africa has had success in the rapid delivery of houses, it is acknowledged that there are still many challenges faced in terms of generating functioning neighborhoods as opposed to housing-units.

It is now acknowledged, and this is reflected in policy, that housing is not just the construction of individual living units but encompasses all aspects in the macro- and micro- environment, including communal facilities, job creation and entrepreneurship. However political pressure to produce numbers still dominates housing practice.

The area of study is restricted to the township of Mamelodi situated east of Pretoria. This locality is interesting in terms of being positioned in an area removed from the city – being not easily visible or accessible in the manner of typical Apartheid planning—yet it is in close physical proximity to it. It is in the east of the city, not far from some very affluent suburbs. Integrating this township into the city structure promises to be an interesting challenge, difficult yet inevitable.

Mamelodi, similar to other townships on the peripheries of South African cities, is mostly comprised of mono-functional residential areas, isolated from the CBD and job opportunities, with poor quality housing and a large component of informal settlements. Being a typical dormitory town, it is dependent on the city of Pretoria and does not have a viable economic core and sufficient job opportunities yet it houses a large proportion of the population of the city.

Housing reveals the social, cultural and political intentions of a people and housing policy is reflected in the built product and in the form of neighborhoods. The current government intended to remedy inherited fragmentation, but remained preoccupied with meeting quotas rather than developing quality environments. This is being challenged by new and enlightened policy directions: the Breaking New Ground (BNG) plan for sustainable, integrated human settlements, which is currently being implemented by the National Department of Housing through a series of business plans one of them dealing with upgrading informal settlements.

2. BREAKING NEW GROUND: CURRENT POLICY DIRECTIONS IN SOUTH AFRICA

Current development and housing policy claims to be “pro-poor” and with a focus on “in-situ” up-grading of informal settlements. While a world-renowned housing programme is in full swing in South Africa, the housing backlog is not decreasing. Informality, emergence and the so-called “2nd economy” are aspects of the South African social/economic scene that will probably remain for many years to come. Designed and emergent systems (Hamdi 2004), are equally important and it is strongly believed that any approach that does not acknowledge the presence of the ‘informal’ as a force that cannot be eradicated and as a legitimate power, energy and form of expression is doomed to fail.

Current debates regarding development, in general, and housing, in particular, attempt to position the issues in the broader perspective of the ‘south’, the African continent and new policy directions in South Africa. While the approach to informality portrayed in this paper may not coincide with global intentions, there is already agreement that the ‘south’ needs to re-structure itself to become a stronger partner internationally upgrading evident from re-alignments and partnerships such as India, Brazil, South Africa (IBSA) and the African Ministerial Conference on Housing and Urban Development (AMCHUD) initiatives.

Yet, even the enlightened BNG plan will still need to review its approach to informality which it is attempting to eradicate by 2014 – an already futile activity. It is acknowledged that emergent systems could become catalysts for future development interventions. More research needs to be done to investigate how BNG may address the issue of informality.

2.1 Approach to informality

When urbanized poor people need homes they either acquire them through land invasions or they wait for government provided housing. Alternative solutions involve capacity building, saving schemes and job provision in a holistic approach which needs collaboration between diverse government agencies and more participation by various stakeholders. This would generate a complexity that needs alternative systems of governance. Formalising housing and markets does not guarantee poverty alleviation and neglects the skills and knowledge that the poor may contribute to development.

The reality is that informality appears to be faster and more efficient when it comes to providing for the needs of the poor. Formal mechanisms of housing delivery are too slow and unaffordable. Professional architects and housing practitioners need to position themselves in terms of various interpretations of development—this is critical in order to guarantee their effectiveness.

Patterns of emergent systems in cities are indicators of real need and the imposition of pre-determined plans should be avoided as professionals become more sensitive to context. Hamdi (2004) explains how 'small' interventions grow and guide development and how the role of the professional becomes one of creating conditions for emergence and in this respect searching for catalysts. These catalysts then generate a process of 'negotiated reactions' (Dewar & Uitenbogaardt, 1991), whereby continuous transformation is achieved within a stable environment. The built environment is not static: it is a complex relationship between stability and transformation (Habraken 1998). These notions, however, take on a different meaning when speaking of informal settlements. In squatter settlements transformations happen at an enormous rate compared to formal (more static) designed environments. Furthermore, the relationship between structural supports and detachable units is unclear. There is a degree of permanency in a squatter settlement—such as the layout of the site, but the overall set up is experienced as short term. Any design intervention will need to support a process which will evolve quickly. Transformations will not only apply to structural elements but also to location and function.

Because there is no security of tenure, shack owners are reluctant to invest substantially to convert an informal dwelling into something more permanent. This often results in people living in structurally compromised buildings for years. This volatile nature of squatter settlements inhibits long-term development, thus professional interventions are essential. Harber (2006) explains how a squatter settlement develops in a process that is the exact opposite of a formal settlement: the land is occupied, buildings put up and services finally installed. He believes this usually generates an environment that is layered, develops gradually and is less disruptive to the existing site. This gradual, organic process is perceived as a common characteristic of successful urban places and is a quality found in vernacular settings.

A heightened sensitivity to various forces of urbanisation needs to be developed among practitioners and policy makers in order to strike a balance between stability and transformation: multiple levels of the environment where multiple agents may intervene in transforming their areas of control through complex decision-making, modification, adaptation and appropriation. This will contribute towards the generation of a layered and complex environment which fosters a sense of belonging, ownership and pride. This is direct opposition to conventional approaches to decision-making in the built environment which is a top-down process, strictly planned and rigid. This strict planning results in monotonous, fragmented, mono-functional environments and disempowers people (professionals and communities alike).

Within urban structures, the house is seen as a flexible/adaptable product rather than a fixed final product. Urban design is an inseparable component of housing and this acknowledges the various levels of the environment differing in the degree of permanence and changeability thus allowing for more involvement and affordability. This challenges our understanding of informal economies, settlements and structures and our role as professionals in interacting with these alternative systems and "ways of doing/living".

In testing out the above, housing issues very pertinent to South Africa may be analysed and current approaches re-assessed. This line of inquiry is very meaningful at this particular time. Alternative housing delivery mechanisms are extremely important since, despite a very successful programme of government subsidized housing, the housing backlog is not being reduced.

Figures 1-3 Township technologies and artistic expression: a shack and a window detail in an informal settlement and innovative shack construction by a local carpenter, Sam Mpila, in Mamelodi.

While recognising some of the negative impact of slums on cities and their inhabitants, for example the health and safety problems they may create, a pro-removal approach to slums neglects the fact that every shack is in reality a home. Squatter settlements are not undifferentiated areas of squalor but dynamic environments with unique characteristics that need to be properly researched before any intervention is made. Slum upgrades are complex processes requiring the combined efforts of a number of disciplines.

2.2 Concepts of participation and Open Building

The concept of open building studies the inherent characteristic of the built environment to adapt and transform and distinguishes between fixed and flexible elements. By accommodating participation and change, it is possible, with innovative design, to successfully include the poor within the city. The suitability of the concept to the context of South Africa is tackled in research at the Department of Architecture, University of Pretoria in terms of existing industries, the need for sustainable and labour intensive technologies, participation and changing ideas regarding professionalism.

Modular coordination may facilitate quicker construction and save costs. A rudimentary form of modularisation is already being used in the townships: it is proposed that collaboration between academics and these simple construction industries be initiated in the search for affordable and acceptable solutions for housing systems. These solutions would use local technologies for infill/fit-out systems. Partnering with existing industries could possibly increase the chances of acceptance and affordability.

While permanent and fixed components of the environment are crucial in achieving structure, robustness and identity the adaptable, changeable and transitory is just as crucial in achieving more complex decision-making processes and democratic environments. The balance/interface between the planned and unplanned needs a degree of disentanglement of physical and administrative systems at various levels of the environment, where change in one system does not disrupt the others.

This “Open Way” of building is being studied in terms of implementation in this particular context. It is believed to be very relevant to addressing accessibility and affordability issues in South Africa as well as ensuring more participation and acceptance from the various role players in the process of developing sustainable human settlements.

3. HOUSING AND URBAN ENVIRONMENTS RESEARCH FIELD (H-UE), UNIVERSITY OF PRETORIA

The Housing and Urban Environments Research Field (H-UE) at the University of Pretoria attempts to research an appropriate approach to issues of informality by proposing that a well structured and serviced public realm becomes the formal framework: a permanent, long-term structure that allows for informal activity and interventions to occur within its parameters. In other words, allowing for the unexpected. This process would distribute the levels of decision making in the environment and separate them so as to reduce conflict and allow for the organic processes of human intervention to occur.

A main research question being addressed is the need to re-direct professional efforts towards the needs of the poor rather than the ideals of the middle class. Traditional “expert”-driven design approaches are questioned in terms of their relevance. Taking locally available skills as a starting point for a design process needs to be tested, in a sense reinforcing the idea that technological innovation has to adapt to local capacities and not vice-versa.

As the research progresses, it is quickly becoming apparent that the idea of catalysts is key in terms of the intimate understanding of the setting and the identification of potential collaborators and projects.

Hamdi (2005) explains the complexities of working with communities. He questions whether we are ever certain that we are interacting with the REAL community representatives and portrays the problems of communicating through “gatekeepers”. Some NGOs may not necessarily have enough community backing to make them truly representative.

Some individuals are perceived as “institutions” and champions within their communities: in the sense that they are known, respected, accepted and many activities seem to either be initiated by them, supported by them or revolve around them. Identifying these individuals is paramount to the success of this project. Collaborating with a variety of people within a given community may mean more possibility for detecting where and how interventions could ultimately have significance.

This approach has more to do with process than product. Throughout the process teaching methods are enhanced and made more relevant, meaningful partnerships and networks are established and people are being educated and empowered through participation, skills-sharing and cultural and technological transfer. It needs to be recognised that this is a 2-way process and implies the creation of a mutual learning ground: from students/researchers/lecturers to local workers (skilled and unskilled), local entrepreneurs and the general community and vice versa.

3.1 Participatory action research: Teaching practice and participation

It is believed that practice should be guided by a slower, yet ultimately more effective, process of participation. In this slower process, alternative approaches to the built environment can be tested. To explore this concept, we are establishing more interaction between the university and its context.

The architectural studio has been moved beyond the confines of the university campus by collaborating with formal and informal local enterprises in exploring materials and technologies that may prove to be more relevant to the contexts in which they are generated. This has resulted in students exploring partnerships and materials through small, yet strategically positioned, built projects.

Examples of local industry from the area of Mamelodi were initially investigated. A plan for meaningful partnerships and intervention was proposed. The value of this approach is that local technology and "what exists on the ground" is taken as a point of departure for research and intervention, and not some obscure and possibly irrelevant theory far removed from reality.

As a research field, we have built good relationships with community members – this has added value to our teaching and has assisted us in bringing an aspect of realism to our student projects. It has proved to be a process of mutual learning. Partners are identified through a sampling technique where leads, obtained during interactions with the community, are followed (Cohen, Manion & Morrison, 2000). Community members have contributed in project criticisms and our students have made presentations to government subsidy beneficiaries, local councillors and various government officials where we hope we have managed to portray a more enlightened approach to housing issues and design. Our partners in the townships have assisted us in identifying student projects; they have been our guides and have helped us gain more insight and understanding into a context that we ourselves and many of our students are far removed from.

An adaptive research strategy is adopted; proclaimed the most intelligent strategy (Jones, 1976) relevant in this case as the way forward is always determined by the latest available information as new partnerships are established and new energies identified. This entails a continuous appraisal of process. It is complex as strict pre-planning is not possible. This approach needs to be reconciled with the administrative settings of university and various funders.

Participatory Action Research (PAR) is used – in an attempt to explore development assistance that is responsive to the needs and opinions of local people. This is an alternative approach to development projects which are usually implemented through a technocratic process. The researcher is viewed as a change agent, who is required to be independent of macro-social organizations. In this process, research is transformed into interactive communal enterprise.

PAR is cyclical and reflective: the communication of results implies, not only communication to an academic audience, but also returning the knowledge to the participants. It is hoped that this approach will produce more socially meaningful research results and that it would democratize the research relationship (Babbie & Mouton, 1998).

A workshop approach is followed based on the principle of "knowing by doing" and by using the builder's yards and the building sites as locations for technological and cultural exchange. A research programme of the University of Pretoria (RDP) and the National Research Foundation (NRF) funds this project, with the ultimate aim of achieving long-term collaboration between the university, local industries and communities in the region. This is providing for excellent learning opportunities for our students and us.

4. PROJECT EXAMPLES: LEARNING BY DOING

Identifying where interventions could take place, what kind of intervention and anticipating the kind of influence it would have on the surroundings is critical. Mapping existing energies and forces provides indicators as to where input may have the most potential for triggering a variety of responses. That is after all the ultimate aim: to intervene where it will generate a response thus allowing more agents to become involved in the formulation of the built environment.

Small projects are seen as vehicles for collaboration, development and learning. While these projects may be spatial in character, some proposed are not. Operating from a design department that comprises the three fields of architecture, landscape architecture and interior architecture (including product design) the interventions are anticipated to cross through the various scales and levels of the built environment. The two projects built in 2007 and 2008 are portrayed below.

4.1 2007

A Centre for Research and Applied Technology, CRea(A)Te, has been proposed to be implemented through the Department of Architecture with the intention of sharing knowledge and transferring technical know-how to small, medium and micro construction enterprises. Knowledge gaps in the construction sector will be identified and services will be offered to existing enterprises in the sector as well as assistance in the development of new enterprises where there is a market need. CRea(A)Te will aim to support these businesses in the process of becoming efficient, competent, competitive and financially viable.

As a modest start to this larger project, students were asked to build a small workshop and meeting space that would become a temporary base for our efforts in Mamelodi Township. They had to work within the constraints of an existing shed. They explored the idea of separate systems of a building through a very simple steel structure and infill panels that they commissioned three local artists to implement, using very different materials and methods. The work of the local artists mostly using used recycled materials.

Figures 4-6 A workshop space built by the honours housing elective students of 2007 in collaboration with local artists and builders. The students are photographed in the picture in the middle with Sam Mphili the artist who assisted them in the project.

The landscape students also collaborated with locals and designed and built a garden, using minimal resources in the centre. In this process the students explored local ways of doing and where recycled materials are sourced (mostly from the surrounding industries); they also learnt how to establish meaningful partnerships and how to work creatively within a very limited budget.

Figures 7-9 Local “pre-fabricated” panels made from recycled material. A student working in the garden and two of the local people assisting in the third image.

4.2 2008

At the end of 2007 a local school, the Berakah Institute approached us, which is located in an informal area of Mamelodi East known as Lusaka. The school is located in a formal plot that was granted by the local authority with the condition that they build permanent buildings within a certain period of time. Due to lack of funds the school activities were housed in a large military tent (which at the time of our work there had been blown down by wind during a storm) as well as a few shacks. The students proceeded to build a classroom using a gum-pole structure, a simple roof with timber beams and corrugated sheeting. Canvas was used as screens and some of the walls used an experimental technique of sand bags where a sand/cement mix was used in netted plastic bags (used to sell oranges locally) with barbed wire in between each layer to offer more stability.
This again offered an excellent opportunity to explore local energies, possible partnerships and local expertise and materials. It also gave the school its only formal building and will hopefully add leverage to the schools claim on the land as set out in the condition by the local authority.

Figures 10-12 Students and local people working together. A student working on the sandbag wall. The finished structure

5 CONCLUSION

These approaches acknowledge informality as a legitimate energy within cities. This will potentially create more understanding between academic institutes and emergent township enterprises. Appropriate solutions to housing systems may be identified from the everyday realities of a specific context. Taking locally available skills as a starting point for a design process is being tested, in a sense reinforcing the idea that technological innovation has to adapt to local capacities and not vice-versa.
The fact that many people live in shacks, be they on legally-owned land or not and be they a part of the formal rental market or not, means that there is a potential for academic involvement in meaningful ways. Firsty, in learning from what is happening on the ground, thus changing our mindset and ridding ourselves of professional arrogance. Secondly, in being able to work with students on location in developing the quality of the buildings that in any case house so many people and community functions. Thirdly, in investigating the possibility of these informal industries in having a role in achieving adaptability and affordability in the local residential market. It is also hoped that small industries may play a role in formal, government-subsidised housing projects planned in the vicinity.

The possibilities are endless and through this on-going project we hope to investigate to what extent academics can play a role in making these possibilities a reality. The intention at this stage is to propose an approach to the problem rather than to suggest a conclusive resolution. The proposals need to be tested through actual application and a response from the community needs to be obtained. This study believes that enterprises emerging from informal settlements are more suitable for low-income groups and that support of the informal sector better addresses the urgent need for poverty eradication.

The interesting aspect of the project could prove to be the skills sharing and cultural/social transfer that happens between historically-disadvantaged, black, emerging entrepreneurs and white students from historically-

advantaged settings with the main interaction happening on site rather than on campus. The students appear to be overwhelmed by the context of Mamelodi and they perceive it as an alien setting that does not seem to be functioning according to their understanding of how they believe cities should operate. The concept of mutual learning is not easy to grasp and the idea that the township is a worthwhile setting to implement projects of architectural merit is being promoted through the research project. We are challenged as professionals to investigate beauty and efficiency in informality as an antithesis to a middle-class interpretation of how life should be lived.

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7. REFERENCES:

Babbie, E. & Mouton, J., 1998, *The practice of social research*. (Oxford: Oxford University Press).

Boyarsky, N., 1998, *Action Research: Architecture and Urbanism 1*. (Black Dog Publishing Ltd).

Coghlan, D. & Brannick, T., 2005, *Doing action research in your own organization*. (London: Sage publications).

Cohen, L., Manion, L. & Morrison, K., 2000, *Research methods in education*. 5th Ed. (London: Routledge Falmer Press).

Dewar, D. & Uytenbogaardt H., 1991, *South African cities: a manifesto for change*. (Cape Town: Urban Problems Research Unit, University of Cape Town).

Greenwood, D. J., 1993, *Participatory Action Research as a Process and as a Goal*. (New York: The Tavistock Institute).

Habraken, J., 1998, *The structure of the ordinary, form and control in the built environment*. (Massachusetts: MIT Press).

Hamdi, N., 2004, *Small Change, about the art of practice and the limits of planning in cities*. (London: Earthscan).

Jones, C., 1976, *Design Methodology: seeds of the future*. (John Wiley & Sons Ltd).

Osman, A., 2006, Adaptable residential architecture in South Africa: exploring the possibilities of technological and cultural transfer in partnership with small-scale, local industries in Mamelodi, Pretoria, *Adaptables2006, TU/e, International Conference on Adaptable Building Structures*, Eindhoven The Netherlands 3-5 July.

Osman, A. & Karam, A., 2005, Report on themes, issues and recommendations of the seminar as well as integration with the intentions of IBSA, AMCHUD and BNG. *International Housing Research Seminar*, Cape Town, July. Unpublished.

Osman, A & Peeters, N., 2005, Generating an Improved Quality of Informal Housing, Mamelodi, South Africa. With Nele Peeters. *CIB Conference and Meeting on Informal Settlements and Affordable Housing*, Surabaya, Indonesia, November.

South African Government, National Department of Housing., 2004, *Briefing Document: Breaking New Ground, A Comprehensive Plan for the Development of Sustainable Human Settlements.* Unpublished.

Linking Open Building and Sustainable Livelihoods in the Kampung – Informal Settlement

Happy Ratna SANTOSA

Department of Architecture, Institute of Technology Sepuluh Nopember (ITS), Surabaya, Indonesia,
happyratna@yahoo.com

ABSTRACT

Kampungs have been recognised as traditional housing settlements in South East Asia for many centuries and the inhabitants are primarily from the lower income groups. In the inner city of Surabaya, kampungs serve as informal settlements whereby about 50% of the city population live in (Municipal Government of Surabaya, 1992). The inhabitants of the kampungs have limited resources to build or improve their houses and neighbourhood.

Kampungs in Surabaya cover about 7% of the city area (Municipal Government of Surabaya, 1992). These contain mixed socio-economic groups of low and middle income households living alongside each other, although the majorities are low-income. The livelihoods of the community in the kampungs i.e., how people can sustain their lives and how they use the spaces in the kampungs and in their houses, are discussed in this paper. Further discussion will be concerned with the implementation of open building in the kampungs, including the change of spatial uses at the neighbourhoods, on the streets and in the houses. The study indicates that the open building concept can support the livelihoods of the kampung inhabitants.

KEYWORDS: kampung, open building, sustainable livelihoods.

1.1 INTRODUCTION

Surabaya has been developed for about seven hundred years, and kampungs have been established since the 19s through a self built process. Some kampungs were formed by transformation of existing villages through densification and expansion processes. The agglomeration process of kampungs forms towns and cities (Municipal Government of Surabaya, 1992). Kampung is not a squatter nor slum, but it is an informal settlement built by the dwellers, although with little urban services and facilities. Gradual improvements of houses and environmental qualities by the inhabitants is a sustained process of development in the kampung.

Since 1979 many kampungs have been supported by the Kampung Improvement Programme (KIP) for the improvement of infrastructure, and the local residents have improved their houses to meet the accepted standard (local Government of Surabaya, 1991). The kampungs housed many home industries as an option of employment for the inhabitants. Then the KIP comprehensive programme which started in the year 2000 helped the dwellers to improve their income, as well as the infrastructure (Dewi Septanti, 2004).

The open building concept, where built environment can support the community interest and change, is applied in the kampungs. Thus, kampungs are long lasting settlements, where people can adopt and adapt the function of their houses and the environment whenever there are new possibilities in the future.

1.2 OPEN BUILDING CONCEPTS

The open building concepts are stated here to understand how such concepts can support the livelihoods in the kampung. As mentioned by Kendall (2008), buildings and neighbourhoods are not static artefacts, they need adjustments in some measure to remain attractive, safe and useful. Open building approach also recognises that designing and constructing buildings involves many people and no party makes all decisions. Hence organising decision making and construction is important to reduce excessive dependencies among the parties involved (Kendall, 2008).

Kampung is a neighbourhood which is not static. The inhabitants can adjust it to their new needs to keep it a sustainable place for living for generations. How can the open building concepts be applied in the kampung is interesting for discussion.

The particular characteristic of the open building concepts lies on the environmental levels, comprising the district level, neighbourhood level, block level, dwelling level and room level. Each of the levels relates to the one below and above it according to certain rules (Kendall, 2008). For instance, the street alignment on a higher public level (district level) remains constant, while the lots divide and aggregate, and buildings are changed on a lower level (the neighbourhood level). At the block level the setting of houses can be stable, but the individual house form at the dwelling level might be changed; depending on the need of the house dweller. At the dwelling level, the form of the house many remain constant, but the wall placement in the room can be modified (the room level). These environmental levels in the kampung and how the kampung accommodates large or small changes for the sustainable livelihood of the inhabitants will be discussed in the following sections.

1.3 KAMPUNGS–SURABAYA, INFORMAL SETTLEMENTS DEVELOPED BY THE INHABITANTS

Kampungs of Surabaya have been built and developed incrementally by their inhabitants. Their growth occurred through a transformation of rural villages into urban kampungs with minimum services and through gradual expansion and consolidation of urban villages into a major urban agglomeration. The traditional and informal housing process of “housing by people” provides 85% of the housing needs. Where land has been limited against the high, densities in the kampung have grown rapidly. Some have densities of about 1000 people per hectare (Municipal Government of Surabaya, 1992).

Most kampung dwellers are of the lower and lowest income groups. The government’s funds to support the informal settlements have been very limited. Gradually some improvements are made to the housing units and the infrastructure, as neighbourhoods consolidate and the living standard is improved.

The unique mix of socio-economic classes in traditional kampungs – the poor live next door to the urban middle class households – can help the improvement of the kampung through mutual helps and cross subsidies. However, since the density of the kampung increases, the gradual improvement is left behind the population increase and there is a lack of space for on-plot and neighbourhood development. With poor sanitary conditions the risk of health hazards increases. For this reason, the Kampung Improvement Programme was implemented and 70% of the kampungs received this programme, starting from 1979 (Building and Social Housing Foundation, 1993).

The program also stimulates the gradual improvement of most dwellings from non permanent to semi permanent and permanent structures. The on-plot facilities: toilets, garbage bins, water supply, etc. have grown substantially. The dwellings and facilities improvement follow the dwellers and community interests and needs.

1.4 SUSTAINABLE LIVELIHOOD IN THE KAMPUNG

Kampungs are strategically located in all parts of the city, providing easy access to different employment opportunities. They also generate home industries ranging from manufacturing of leather, cloth, metal goods to various ready made foods and services. The activities of the kampung inhabitants help to mould the actual morphology of the kampungs and houses where they live in. The location of the kampungs also has an effect on the strategies of the inhabitants. Hence the location of the kampungs is a vital asset in the livelihood strategies of the urban poor.

The DFID (2000) framework identifies five main forms of capital: human capital, social capital, natural capital, physical capital and financial capital. The human capital comprises the kampung inhabitants that posses the intangible strengths, for example: skills, knowledge, good health and ability. The skills and knowledge of the kampung inhabitants are mixed, however most of them are elementary school graduates. This allows the kampung inhabitants to pursue their livelihood strategies. Therefore, it is very important to maintain kampungs as healthy informal settlements, and improve the ability and skills of the inhabitants. The KIP comprehensive programmes include community empowerment to strengthen the initiative, creativity and independency in the implementation of development in the kampung (Dewi Septanti, 2004).

The social capital expresses the quality of the relationship that household has with the greater community in the kampung. The more inter-connected the family is with the community or society, the stronger their informal safety net and support system is. The social relationships in the kampung are particularly high, where neighbours are used to help each other in most of their activities. This condition also helps kampungs exist from generation to generation for almost 700 years in Surabaya.

The natural capital refers to natural resources of the poor’s disposal from which certain service and resource exchanges are derived. The land of the kampungs, water and air quality are all natural capital. This natural capital is very important to support the livelihoods in the kampung. Limitation in land for housing lots in the kampung,

shortage of water and the poor air condition due to emission from city transportation can affect the kampung inhabitants' livelihoods.

The physical capital includes basic infrastructure and producer goods. Basic infrastructure refers to the ways that the physical environment in the kampung can be modified in order to help the poor meet their needs and improve their modes of production. Housing, services and location of the kampungs all become assets, used as physical capital. Producer goods are the tools and equipments that people in the kampung use to meet their needs and improve production. The KIP programme helps the kampung inhabitants in modifying the kampung environment, in the provision of foot paths, gutters and water supply. To improve the production of goods, the Department of Small Industry and the Department of Social Affair provide tools and equipment for the kampung dwellers who posses home industries.

The financial capital refers to the economic resources the kampung inhabitants use in order to pursue their livelihood strategies. These can be in the form of savings or invested capitals. The financial capital can be liquidated in times of need. Such a financial capital is usually limited in the kampung.

All the capitals indicated above are utilized in the livelihood strategies in the kampung. Apparently the social capital in the kampung is high, while other capitals are less. The livelihood strategies are developed to find a way of continuing to survive with the same level of assets. The aim is not just for survival, but also improvement in the quality of life. This can be achieved by increasing capital and reducing vulnerability.

The livelihood strategies shape the kampungs, in the sense that the inhabitants activities reshape the kampung environment. The changing functions of the houses and environment, which can be accommodated by the kampung, create stability and long lasting kampungs in Surabaya.

1.5 OPEN BUILDING IMPLEMENTATION IN THE KAMPUNG

1.5.1 Long Lasting Location and Accessibility at the District Level

Kampungs in the inner city of Surabaya are located in cluster in the district of Tunjungan, the old district developed since 1930 (East Java Province Development Planning Board, 1990). The street patterns are centuries old, bordering the kampung areas. The kampung location remains the same, surrounded by big buildings. The street grid in the Tunjungan area remains stable, with the infrastructure found along the street (Figure 1.1).

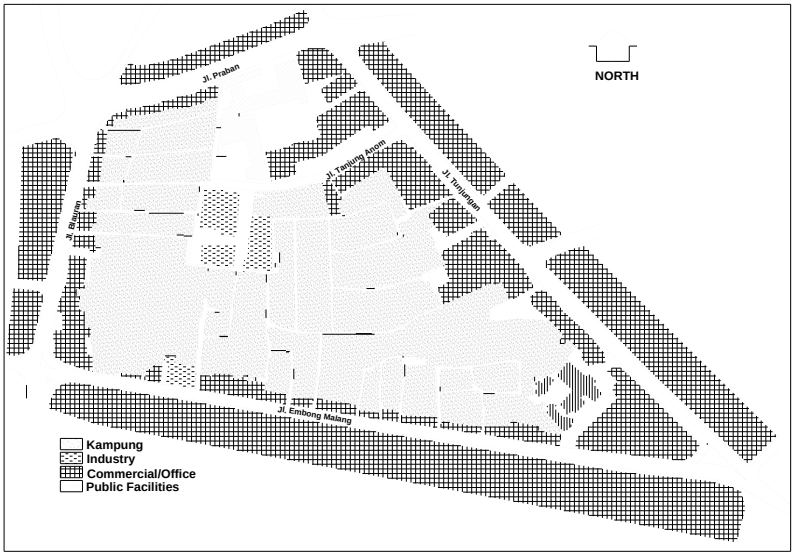


Figure 1.1 Kampung-Tunjungan in the Inner-City Surabaya.

Accessibility at the district level is good and the kampungs are accessible from all directions of Tunjungan area. The central area of Tunjungan, where the kampungs are situated, form the shape of a trapezium. Big offices and shops along the main roads border the kampung houses. Hence the kampungs can not be seen from the roads. To approach the kampungs there are lanes connecting the main roads to the kampungs' streets. Activities in the kampungs include home-based industries, and service activities such as printing, barber-shop, beauty saloon, laundry, boarding house and children school. Since the Tunjungan district is a commercial area, the kampung dwellers have the opportunities to participate in the commercial activities for generations.

1.5.2 Changing Building Function at Neighbourhood Level

At the neighbourhood level, the neighbourhood has a neighbourhood head office, mosque, school, market, open space, and shops. With the ever- increasing population in the kampungs some changing functions of the buildings occur. Small shops have changed into big buildings such as department stores, meeting halls, offices. These have replaced the old buildings. However, many old buildings are currently still usable, even though the function has changed. Old restaurants have become office buildings, shops have turned into offices, and international hotels. Large and small changes have happened, balancing the neighbourhoods in Tunjungan area. Usually the small change occurs in parts of the building while the whole building still functions as a market, even though parts of the market has changed into shops.

1.5.3 Changing Functions at Kampung Blocks and Dwelling

In the kampung blocks and dwellings, more changes can be observed. For example the open spaces has become smaller and several have been disappeared. As the kampung becomes crowded, the open space usage gets more frequent. Common activities using the open space are festivals, children's play, gymnastics, soccer, etc. Very often the street function changes. Since the social capital in the kampung is high, the streets can become a place for wedding party, music, children's play, bazaar, street vendor area, clothes drying area and guard spot. Hence the streets in the kampung blocks are very active areas. They can accommodate the changing functions, depending on the inhabitants' preferences. People and children are found on the streets almost all day long. The street picture indicates how life in the kampung is. The kampung streets serve as one built environment which supports the people activities and stability in the kampung blocks. At the street level, the kampung dwellers can directly notice strangers who are not members of the kampung society, since the street is a place for mixed activities and functions as a semi private area. Kampung can be seen as a community architecture, where people develop their settlements in their own accords and with participation among dwellers.

Some functions that have changed at the house level include home industries, warehouses, shops, catering places, offices, boarding houses, playgroups or clinics and doctor practices. The division of rooms in the houses can be modified or remain as before. People have cleverly designed their houses to adapt to the new activities therein.

1.6 CONCLUSION

Kampungs in Surabaya are one example of a sustainable low-income, informal settlement in the heart of the city, which has existed from generation to generation. They can be seen as a community architecture, since they are planned and developed by the inhabitants.

The livelihoods of the inhabitants are particularly supported by the high social capital in the kampung. The kampung families are interconnected with the society and this has formed an informal safety net and support system.

Even though the kampungs are not formally developed, they can house 50% of the city population. The livelihoods in the kampungs support the inhabitants' living activities and needs, and people can improve and change their living environment through generations, in a regenerative built one. The open building concept is applied in the kampungs and supports the livelihoods of the inhabitants at the district level, the neighbourhood level, the block level, and the dwelling and room levels.

1.7 REFERENCE

Building and Social Housing Foundation, 1993, *Cities of the Future*, (United Kingdom: Building and Social Housing Foundation).

DFID (Department for International Development), 2000 (cited June 2005), *Framework and Introduction, Sustainable Livelihoods Guidance Sheets*. http://www.livelihoods.org/info/guidance_sheets.pdf

East Java Province Development Board, 1990, *Integrated City Development*, (East Java Province: Bappeda).

Kendall, S., 2008, *Open Building Concepts*. http://open-building.org/ob/concepts.html.

Local Government Surabaya, 1994, *Surabaya, Passage and Steps*, (Surabaya: Pemda Tk. II).

Municipal Government of Surabaya, 1992, *Surabaya, City of Partnership*, (Surabaya: Pemda Tk. II).

Septanti, D., 2004. Micro Credit System for Housing Finance in Comprehensive KIP and Social Rehabilitation on Slum Area Program in Surabaya. *Journal of Architecture & Environment*, Vol 3 No 2, 1-20.

Guerrilla Design in the Maximum City

S. Gerald SHALL

Department of Architecture, Temple University, Philadelphia, Pa 19004, sgshall@temple.edu

ABSTRACT

In the summer of 2008, a team of art, architecture, and design students representing seven universities and six disciplines travelled to India where they redesigned school and health centers for children living on construction sites of Mumbai. Working side-by-side with people who speak a different language, have different customs, and carry different values, our students used their creative talents to uncover new techniques of design and construction based upon undervalued materials and indigenous methods of working. Their work was neither a replication of existing local methods nor an imposition of foreign solutions. Rather, it was a synthesis of both traditions – a hybrid address that empowered those served to possess and evolve the given strategy in a meaningful way.

Our team then worked closely with members of our host community to develop these techniques into a new vision of education that could address all scales of this work, including curricular development, furniture design, architecture, landscape and architecture. Over the next few years, our international non-profit partners will use this work to redesign all of their health and education centers, potentially allowing the efforts of our team to directly impact the lives of the 10,000 children living in the informal settlements who are served by this group.

To be successful, participating students had to supplement the gaze offered by traditional studio practices with more heuristic approaches. They had to find ways to bring their technologically advanced and highly sophisticated understanding to bear upon a paradigm of reclaimed material, mud, and trash. In the process, they not only unearthed the indigenous tectonic approaches required by the project, but a new professional methodology as well – one capable of helping our field to articulate a much more sensitive, humane, and sustainable response to the world around us.

KEYWORDS: Guerrilla, Bricollage, radical, reconstruction, India.

1.1 CONTEXT

"I don't think that the earth needs me at all. But I do need it. To just go off into the woods and make a piece of work roots me again. And if I don't work for a period of time I feel rootless ... I don't know myself ... If I don't work for two, three weeks and I give a lecture, I feel like I am talking about someone else."
Andy Goldsworthy, from *Rivers and Tides*.[i]

The International Design Clinic (IDC) started in 2006 to provide students with the chance to use their unique creative talents to help those in need around the world. Since that time, students and volunteers from the IDC have designed and constructed five projects, ranging from an urban tent for the homeless made of trash to a communal playspace for Romanian orphans using primarily dirt, rock and broken bits of concrete. In the summer of 2008, the IDC (in partnership with the Study Abroad Program at Temple University) took 16 US students to India, where they worked with professionals and students from around the US and India to redesign the schools run by Mumbai Mobile Crèches – an Indian non-profit that provides schooling and health programs for children living on the construction sites of Mumbai.

During this five week project, our team, consisting of three faculty members, seven professionals and 32 students from two countries, eight universities and six disciplines, would be asked to forge a collaborative effort with people they had never met, for a client they knew little about in a country most members had never seen. In addition, this team would also have to address a parallel series of challenges as they attempted to address the complex and fluid nature of the programs, sites, and communities served by their work.[ii] In terms of program, our client, Mumbai Mobile Crèches did not want, or need, a beautifully-designed school; they needed a beautifully-crafted vision that could inform interventions at a range of scales, including furniture, curriculum and interior design to architecture and urban planning, for years to come. Correspondingly, the site for this project also varied widely,

as did the nature of the communities served. To be useful, our work had to thus function well within the city and the suburbs, as an infill within the buildings under construction and on the construction sites outside of them, and within communities ranging in size from a few dozen families to several hundred. Moreover, as these facilities would, on average, only remain in existence for two to three years before they would give way to the condos and offices under construction, our work also had to be flexible enough to move beyond these known conditions and address the unknown sites, programs and clients offered by future projects. Only then could our team hope to address the demands of this program and create a work capable of informing not only the dozens of schools currently operated by this group, but the dozens more they would open over the next two years in order to double their capacity and provide services to over 10,000 children.

1.2 [SEE CLEARER]

"It is hard, hard going, and it is cold sometimes on the hand and I do get up very early ... And all that effort is, ultimately, going to make something that is effortless."
Andy Goldsworthy, from *Rivers and Tides*,.[iii]

Fortunately, these pressures were not unknown. Before setting foot in Mumbai, our team knew that they were going to confront conditions that were strange to them as travellers, students and professionals. As this anticipated strangeness became palpable over the first few days of our experience, the members of our team could not feign ignorance; they had to make a decision. They could either rigorously engage this strangeness, deal with leanings that create it, and allow their unique perspective to become an asset to the project or they could attempt to ignore this strangeness, in which case it would invariably become an assumed condition of the work. In this scenario, these pressures would eventually compel our team to retreat into the perceived comfort of more 'normative' conditions, as provided by either the memorized givens of professional convention, the sharply defined and clearly delineated edges offered by isolated classroom activities or the carefully edited perspective found within an air conditioned bus. On the other hand, if the members of our team elected to confront this strangeness, they would give up the opportunity to construct a more palatable version of their experience: as travellers, they would inevitably be confronted with offensive sights, abrasive sounds, and unsavory smells; as students they would have face the uncertainty offered by an unscripted and improvisational educational experience; as professionals they would have to face the fact that that value of their work lies not within the well-defined internal parameters imposed by employer, faculty member, or other established authority figure, but within a complex and changing matrix of conditions.

Due in large part to these discomforts, the experience of travellers, students and professionals often veers to more protected and edited confines. Reflecting upon this tendency within his own academic experience, artist Andy Goldsworthy, remarks:

> *"I was at art college in Lancaster and all the students were in their cubicles as they are and in that cramped space. And everyday I'd catch the train to Marcum where I was staying and you'd get off the train and see this big expanse, this space. Such stark contrast to the art college. One day I went off and worked on the beach. What struck me was that sense of energy when you were outside the art college... It was very secure in the college ... As soon as you made something that was outside there was this breathlessness and an uncertainty. Total control can be the death of the work."*[iv]

Whether or not one can relate to Goldsworthy's experience, it is nevertheless easy to see that the pursuit of total control can, and has, compromise the work offered by many service-based initiatives, which are often criticized as being too isolated, imposed or paternalistic to be useful. After all, assuming that these works are indeed inspired by an act of good will, it is reasonable to deduce that such ill-founded work can only exist within isolated design processes that either eliminate or carefully choreograph the influence of unsavoury, complex or paradigmatic concerns. Remove these works from these controls and the thinking professional will quickly see their faults. It stands to reason then that if one is to avoid imposing large-scale acts of paternalism in the name of service, those engaged in this type of work must remove artificial controls from the work, place themselves in a more inclusive situation and allow their work to face the conditions imposed by this unflinching environment throughout the design process. They must relinquish some measure of control. In such a scenario, any observations and proposals based upon prejudicial judgments or assumed normative conditions will naturally atrophy, while those anchored upon a more inclusive vision will continue to grow and evolve.[v] Then strangeness can become an ally.

Bearing this in mind, during the summer of 2008, the IDC asked all parties, including students from the US, students from India and the various professionals interning with the IDC, to engage the context of the work through

a lens largely unfamiliar to all participants. Specifically, we asked our team to engage the community through the theories, activities and understanding proposed by the Situationists.[vi] Ranging from fairly straightforward acts of foraging (i.e. scavenger hunt) to much more complicated activities based upon the principals of the derive (i.e. a psychogeographic cab ride), we asked our team to simultaneously engage different mediums, including photography, collage, mapping, sketching, modelling, and building (virtual and actual**)** and see the site for our work strangely. Our team's near universal lack of experience with these methods provided an ideal platform for our work, one that would eventually enable all participants, regardless of their background, to more sensitively engage the context of the work without eliminating or prioritizing their previous experience.

Naturally, the inverted priorities and strange stance assumed by these views also posed certain difficulties for the team. First the members of our team, most of whom were used to operating within much more controlled environments, had to confront the relatively uncontrolled nature of the assignments, which called for all participants to continually question and reinvent their ideas, methods, and opinions in reaction to what they saw. This effectively removed their ability to choreograph their experience – an intimidating reality that caused many team members to retreat into convention and habit. For example, when we asked our students to document their movements during the first derive exercise, most participants attempted to do so by sketching the outlines of the subjects they passed – a posture that completely ignored the psychogeographic context that was the stated focus of the exercise. Fortunately, once this shortcoming was pointed out, most of the team was able to quickly shift focus, take control of their presuppositions, and produce sketches that effectively used the selected medium to interrogated the given context and assignment. However, other participants had more difficulty with this work. For some, the deep-seeded tendency toward convention remained a persistent companion for the duration of their experience; one which had to be confronted by operating within the uncontrolled confines of a more inclusive and, therefore, complex, context and allowing the unwavering conditions imposed by this to naturally frustrate unfounded assertions or weak patterns of thinking. Although no one was ever completely comfortable working within these conditions, by the end of our time abroad, our team had learned to capably use the indeterminate nature of their context to cultivate a more fitting methodological response. In so doing, our team effectively formed a cycle of inquiry that developed both the understanding of the context and the methodology used to unearth this understanding. This allowed the complex amalgam of social and geographic factors offered by our project in Mumbai to inspire much more than our design response.

1.3 [THINK HARDER]

"*The moment when something collapses ... it is intensely disappointing. And this is the fourth time it has fallen. And each time I got to know the stone a little bit more. And it got higher each time ... so it grew in proportion to my understanding of the stone**.** And that is really what ... one of the things that my art is trying to do ... trying to understand the stone. I obviously don't understand the stone well enough ... yet**.***
Andy Goldsworthy, from *Rivers and Tides* [emphasis mine].[vii]

It is important to note that the biases and presumptions outlined above are not only held by members of the foreign community, as is often posited by detractors of community-based learning experiences; those within the community are just as susceptible to acting upon assumed normative conditions and creating work that presumes to know more than it does. These presumptions are incredibly harmful, potentially causing the insider to over-prioritize immediate needs and circumstance at the expense of long-term opportunities. Aside from undermining the longevity of the work, the overt acceptance of immediate circumstance is also antithetical to innovative thinking. Those operating in this manner thus often miss the opportunity to create alternative methodologies, materials and programs - pitfalls not generally encountered by the outsider, who is predisposed to finding new uses of inherently strange rituals and materials. Thus, despite the fact that the work created through the biases of the insider often responds quite well to its context (which is likely why it does not receive the same scathing criticism as does work created under the prejudice of the outsider), it is nevertheless just as dangerous.

Bearing this in mind, the community-based designer must either seek to eliminate the biases carried by everyone involved in the work or provide a working method that would allow all parties involved to bring their inherent leanings to bear upon each other. Given the obvious paradox posed by the former approach, which must welcome the potential offered by experience, talents, passions and expertise without admitting the obvious role played by personal experience in their acquisition, evolution, and use, it seems reasonable to assume that success within this realm is once again less a matter of editing than inclusion. To function well as a community-based designer, one must cultivate a dialogue wherein the perspective of the outsider is immediately challenged the intimate understanding of the insider and the assumptions of the insider are immediately challenged by the provoking influence of the outsider. Or, to use the terminology offered by Claude Levi-Strauss, the key to this type

of work is to create an equal exchange between the magical thought of the bricoleur which attempts to draw useful conclusions through sensory experience and intuition, and the scientific thought of the engineer, which offers a more detached and sustained look in order to create "knowledge for its own sake." [viii]

To find an example of an approach that welcomes both the ordered, scientific approach of the scientist and the less-controlled, more improvisational methodology of the mystic, in practice, one can turn to the world of art. To once again quote Claude Levi-Strauss:

> *"The painter is always mid-way between design and anecdote, and his genius consists in uniting internal and external knowledge, a 'being' and a 'becoming', in producing with his brush an object which does not exist as such and which he is nevertheless able to create on his canvas. This is a nicely balanced synthesis of one or more artificial and natural structures and one or more natural and social events. The aesthetic emotion is the result of this union between the structural order and the order of events, which is brought about within a thing created by man and so also in effect by the observer who discovers the possibility of such a union through a work of art."* [ix]

Or stated more concisely: "By his [the artist's] craftsmanship, he constructs a material object which is also an object of knowledge."[x] Taking these observations as a point of departure, our team sought inspiration from artist Andy Goldsworthy, whose work speaks eloquently to the immediate context of the project at hand without losing sight of the links of the macro-relationships between all these individual works and their shared physical and intellectual terrain. This allows Goldsworthy to remain rooted upon the opportunities immediately presented, while simultaneously seeing his work as a series of events that will eventually change the world in which he operates. Speaking to the former point, Goldsworthy, after completing an icicle installation in .... admitted that "I never had any idea that [the light highlighting that would happen. So that potential here is fantastic."[xi] Speaking to the latter, Goldsworthy confesses that **"**The moment when something collapses ... it is intensely disappointing. And this is the fourth time it has fallen. And each time I got to know the stone a little bit more. And it got higher each time ... so it grew in proportion to my understanding of the stone**.** And that is really what ... one of the things that my art is trying to do ... trying to understand the stone. I obviously don't understand the stone well enough ... yet**."**[xii] This drive to understand creates an often prompts Goldsworthy to push his work to failure, creating an intensely risk-centered design process that allows him to become much more attuned to the structures that inspire his work.[xiii] For Goldsworthy, there is little difference between failure and success, as each is capable of refining his approach to the work and lending insight to his stated long-term goal of understanding the hidden spirit of place.

In order to bring this perspective to bear upon the project in India, our team engaged in a concerted effort to cultivate an equal platform for exchange between engineer, artist and bricoleur within our approach. Our efforts to this end were helped considerably by the fact that this approach was actually incredibly relevant to the parties chiefly involved in the project. On one hand, our work was centered upon the informal settlements of India – communities which have a deep experience with making do with whatever is at hand in a manner very similar to Levi-Strauss' 'bricoleur'. Not only was the physical structure of the community made of scraps from the construction site (and thus were constantly shifting as new materials became available), but the entire infrastructure was based upon similar strategies: if the community lacked electricity, they would pirate it from a local source; if they lacked sewage, they would commandeer a nearby river or ditch; if they lacked police, they would pay local strongmen. On the other hand, our client and many members of our team were just as predisposed to viewing their work through the lens of the scientist. Years of isolated study and research had created students and professionals who, in general, felt less comfortable working within the unpredictable and complex nature of our site than they did operating with more predictable materials and methods in the library and studio.

In response, our team attempted to operate in a manner that would move seamlessly between these perspectives and create a response that is hard-wired to the natural inclinations of both parties, as each would play an important role in the evolution of our work after our departure. For example, during the second week overseas, one of our team members, using a fairly scientific approach based upon traditional research mechanisms, discovered that children living in Mumbai have alarmingly high rates of illnesses brought about by various contaminants in the air. Seeking a solution, she expanded her researched to discover which indigenous plants could remove these contaminants. From this base of research, this team member then hypothesized that is might be possible to create a green wall that would help clean the air. Just as importantly to the project, once the school was no longer needed, the wall could be theoretically drained from the wall, placed back into the site and retrained with a different set of plants. Although quite interesting as a hypothetical, we had no idea if the idea was actually workable using the means and materials available to the project. To answer these questions, another student proposed building several versions of the wall so as to uncover an economical way to construct the wall. For the next several days, this student worked with other students and local laborers, who would largely be responsible for building versions of this wall should it prove useful, to construct several versions of this wall. In the end, these efforts, when combined with the

insight gained through more traditional research models, created a wall that spoke to issues of commodity (i.e. how the proposal spoke to the site, program and budget), firmness (i.e. how much deflection could be accommodated before the wall would crumble), and delight (i.e. how the unique deflection offered by this proposal animated the wall both immediately through the play of shadows and over time as the wall moved to accommodate different forces).

1.4 [MAKE BETTER]

"The first wall that I had made with a waller ... my idea was that I work with him ... But he kept taking my stones off the wall. And he was right to do that. I have learned that you have to respect their work, their life...They bring their lives to it. They don't want me to touch the walls, playing at being a waller, just like I don't want them to play at being an artist ... Their dialogue with the stone is what makes the wall. The stones are laid on and on and on and the work makes itself to some extent. And it is that fluidity of working that gives the sculpture a sense of movement and energy."
Andy Goldsworthy, from *Rivers and Tides.*[xiv]

Given the long-term aspirations of our work and the complex and ever-shifting nature of its eventual home, our team realized that this methodology, and the proposals borne of it, had to function as the first step in a much longer process. The value of the products created through our work, in terms of our understanding, the physical proposal and the methodology that served to clarify both, lay not in their quality as isolated acts, but in their promise as progenitors of future evolution. Thus, the stuff we produced had to cultivate an evolving sensitivity to both immediate circumstance and long-term potential through an ongoing dialogue between acts of intellectual inquiry, physical construction and methodological understanding.[xv]

Of course, our team could not hope to fully develop this dialogue during our five weeks abroad. Therefore, we focused our efforts upon creating several clear, concise and compelling acts of instigation that would prompt future evolution in a manner not dissimilar from the works of "radical reconstruction" proposed by author Lebbeus Woods. Prompted in large part by the observation that the homogenous vision offered by many works of architecture were too deterministic to function well with the densely-layered, urban construct, Woods believes that, "the complexities of buildings, streets, and cities, built up over time and across the span of innumerable lives, can never be replaced" and that any attempt to do so invariably props up " the interests of the decrepit hierarchies, struggling to legitimize themselves finally through sentimentality and nostalgia."[xvi] Within such an environment, Woods reasons, single-layered, cause-and-effect conceptions of process or place have limited viability, as do the self-assured, monumental architecture such conceptions generally provoke.[xvii] As an alternative, Woods proposes that the processes and products of the architect draw their "sinews from webbings of shifting forces, from patterns of unpredictable movement, from changes of mind, alterations of positions, spontaneous disintegrations and syntheses" to produce an "architecture resisting change, even as its flows from it, struggling to crystallize and be eternal even as it is broken and scattered – architecture seeking nobility of presence, yet possessed of the knowledge that only the incomplete can claim nobility in a world of the gratuitous, the packaged, the promoted and the already sold – architecture seeking nobility of persistence in a world of the eternally perishing, itself giving was to the necessity of its moment ... architecture drawn as though it were already built – architecture built as thought it had never been drawn."[xviii] Wood's theories bore obvious relevance to our work in India. Not only did his theories respond very clearly to the ever-shifting collage offered by the informal communities that served as the site for our work, it also provided a fitting articulation of our work – one which would allow us to create specific proposals for our client without sacrificing the long-term potency of our work.[xix] Thus, we, like Woods, endeavored to create work that functioned as "visual evocations that however precise and detailed, are intended only as heuristic aids, guides that will stimulate transformations by others."[xx]

To do this, our team had to resist the urge to become fixated on immediate needs, no matter how pressing, and instead focus upon those conditions that would remain in place for long enough to stimulate evolution. Locating these moments within the project thus became the chief goal of the team. To point, during our first conversation with the director of Mumbai Mobile Crèches, our team learned that, in order to get permission to construct a crèche, our client had to first convince a developer to support the project through funding and land allocations. So that this arrangement might be as palatable as possible to the developer, our client generally limited their requests related to the built environment to the absolute minimum. Thus, our client had very little control over these variables – a situation that placed great importance upon any points that are either consistent between projects or have variation within the influence of our client. Correspondingly, these points of constancy or influence furnished the foundation for our work.[xxi] Every act undertaken, from the first acts of observation to the ongoing development of our proposals was designed specifically to help us understand the logic behind these moments. We, like artist Andy Goldsworthy, dedicated ourselves and our work to "understand that state and that energy" within the project and to touch "the heart of the place."[xxii]

In this way, our proposals became a coalescing activity capable of bringing together many systems and flows, creating knowledge and generating the "unpredictable regenerations" described by Woods.[xxiii] Though this mindset is evident in all of the work produced, it is perhaps most eloquently demonstrated through the manner in which we organized our efforts to create an "ideal crèche" (the client's stated goal for the project). Instead of operating from the top down and attempting to immediately form a complete vision for the project, we asked each member of our team to find a point of great influence within the project and propose a single act of radical reconstruction at this moment. The resulting proposals varied widely, from small-scale furniture prototypes or curricular strategies to large-scale urban interventions and autonomous mobile schools. Yet, despite this diversity, there remained persistent gaps within our work; areas that one would think to be incredibly important to the idea of the ideal crèche, but somehow were missed. For example, out of over thirty proposals, only a handful addressed the project at the scale of building. The reason: this issue, although important, was not a key pressure point within the project. Mobile Crèches, due in large part to their historic lack of influence at the scale of building (and the fact that over 66% of their facilities were interior environments that temporarily occupied a small portion of the building under construction), had spent great energy developing a vision based upon matters of curriculum and the interior environment. The architecture, on the rare occasion it fell within their jurisdiction, correspondingly held negligible influence.

Yet, despite the fact that our work would inevitably have to address this scale within the few days remaining, we resisted the urge to address these gaps directly. Instead, we asked participants to test the assertions of their initial address and allow these moments of clarity to gradually expand. A Darwinian approach emerged: those ideas that were anchored upon core principles relative to long-term conditions (as offered by the ethos of the client, program, site, etc) naturally superseded those anchored upon short-term conditions (as offered by the specific needs of current sites or facilities). Those ideas anchored enough on key principles of the project received great attention, while those that needed additional tenacity sought out strategic unions through either a symbiotic merger or a complete consumption. Through this process, the team began to judge the value of their work not as a static product, but as an open, evolving movement. Gradually, our work coalesced around several key ideas, each of which occupied a key zone of the project. By the end of our time abroad, these points expanded, filling in many of the gaps within the work.[xxiv]

1.5 [DO MORE]

"My contact with the stone was still very, very strong. So I was with it down there. But I still couldn't see it ... I haven't simply made the piece to be destroyed by the sea. ***The work has been given to the sea as a gift and the sea has taken the work and made more of it than I could have ever hoped for.*** *And I think that if I can see in that ways of understanding those things that happen to us in life, changes in life, that causes upheavals and shock ... can't explain that."*
Andy Goldsworthy, from *Rivers and Tides*.[xxv]

Yet some gaps remain. To pretend otherwise would be a blatant oversimplification of the conditions posed by the project, a gross exaggeration of our role within this context and an affront to the methodology unearthed through our efforts. Such unfounded heroism would also completely undermine the value of our work. Our work exists in and through the gap, functioning as self-contained acts of instigation that highlight, augment and, at times, exaggerate, these missed synapses within the project so as to provoke others to construct a more fitting response.[xxvi] Within this work, the key to success is not only determining which gaps to occupy, but which gaps to highlight or leave provokingly open. For it is through this choice that our work becomes able to speak to varying levels of conviction within the project: key points can be matched with proposals of equal conviction, while points of lesser importance are greeted with proposals that are less resolute. Issues pertaining to the longevity, constancy, mutability and conviction held by the various conditions of the project are thus given voice in the final proposal. It is hoped that in so doing, our work will effectively capitalize upon the naturally-occurring priorities of the project and allow these streams of influence to remain active and vital for years to come.

Yet, it is important to remember that this vitality is not immutable; our work, like most acts of design, will eventually atrophy and die. Far from compromising our work, this admission of powerlessness empowers our work, becoming the ultimate point behind our efforts. That is, by constructing our work as an act of provocation, intended to inspire unpredictable regenerations, we are effectively speeding our proposal to obsolescence. With every proposal we either inspire or execute, we are systematically seeking out ways to compromise the integrity of what we offer.[xxvii] A similar mind can be found within the work of Goldsworthy, prompting him to feel like his work "has been taken off into another plane ... taken off into another world or into another work. It doesn't feel at all like destruction. That moment is really part of that cycle of turning."[xxviii] It is hoped that by assuming a similar stance

our work in India will also gracefully fold back into context that inspired it, creating something far more fitting and beautiful than we could have created during our brief time there.

"I cannot then explain beyond that, but I know that there is more than a simple collapsing and arrival of material. I struggle to say these things and I know that I can just get them out but there is a world beyond what words can define for me. Words can do their job, but what I am doing here says a lot more."
Andy Goldsworthy, from *Rivers and Tides*.[xxix]

[I] Goldsworthy, A. and Riedelsheimer, T. 2001, *Andy Goldsworthy's Rivers and Tides* (New Video Group), Chapter 9.
[ii] Suketu Mehta's *Maximum City* and Gregory David Roberts' *Shantaram* provide compelling accounts of this dynamic urban environment. Mehta, S., *Maximum City*, 2004, (New York: Vintage Books); Roberts, G.R., *Shantaram*, 2003, (New York: St. Martin's Press).
[iii] Goldsworthy, A. and Riedelsheimer, T. 2001, *Andy Goldsworthy's Rivers and Tides* (New Video Group), Chapter 2.
[Iv] Goldsworthy, A. and Riedelsheimer, T. 2001, *Andy Goldsworthy's Rivers and Tides* (New Video Group), Chapter 4.
[v]" I have to work with my bare hands 'cause my gloves stick and I don't have the sensitivity to do it with gloves. I always like to touch. You never shake someone's hand with a glove on." Goldsworthy, A. and Riedelsheimer, T. 2001, *Andy Goldsworthy's Rivers and Tides* (New Video Group), Chapter 3.
[vi] The Theory of the Derive by ... proved to be especially helpful in this regard, as did Two Accounts of the Derive ...
[vii] Goldsworthy, A. and Riedelsheimer, T. 2001, *Andy Goldsworthy's Rivers and Tides* (New Video Group), Chapter 4.
[viii] The only difference between the engineer and the bricoleur, according to Levis-Strauss, is the "inverse functions which they assign to events and structures as ends and means, the scientist creating events (changing the world) by means of structures and the 'bricoleur' creating structures by means of events."

"Mythical thought, that 'bricoleur', builds up structures fitting together events, or rather the remains of events, while science, 'in operation' simply by virtue of coming into being, creates its means and results in the form of events, thanks to the structures which it is constantly elaborating and which are its hypotheses and theories. But it is important not to make the mistake of thinking that these are two stages or phases in the evolution of knowledge. Both approaches are equally valid." Levi-Strauss, C., The Savage Mind (La Pensee Sauvage), 1966, (London: Weidenfeld and Nicolson), **13-14,** 22, also 1-33.
[Ix] Levi-Strauss, C., *The Savage Mind (La Pensee Sauvage)*, 1966, (London: Weidenfeld and Nicolson), 25.
[X] Levi-Strauss, C., *The Savage Mind (La Pensee Sauvage)*, 1966, (London: Weidenfeld and Nicolson), 22.
[Xi] Goldsworthy, A. and Riedelsheimer, T. 2001, *Andy Goldsworthy's Rivers and Tides* (New Video Group), Chapter 2.
[Xii] Goldsworthy, A. and Riedelsheimer, T. 2001, *Andy Goldsworthy's Rivers and Tides* (New Video Group), Chapter 4.
[xiii] "When I make a work, I often take it to the very edge of its collapse. And that's a very beautiful balance." Goldsworthy, A. and Riedelsheimer, T. 2001, *Andy Goldsworthy's Rivers and Tides* (New Video Group), Chapter 9.
[xiv] Goldsworthy, A. and Riedelsheimer, T. 2001, *Andy Goldsworthy's Rivers and Tides* (New Video Group), Chapter 10.
[Xv] Author Colin Rowe acknowledges the importance of this continued dialogue when he asserts that, through a relationship between the "civilized mind (with its presumptions of logical seriality) and the 'savage' mind (with its analogical leaps) ... it might even be possible to suppose that the way for a truly useful future dialectic could be prepared." Rowe, C., 1984, *Collage City* (Boston: MIT Press), 105.
[xvi] who wrote extensively about how to engage the unique opportunities offered by "the critical edge of urban life and culture." According to Woods great potential exists at this "critical edge of urban life and culture," where the dominant system is constantly confronted by the "refugees of the mind" (criminals, adventurers, opportunists, those who would inhabit an edge condition and .the guileless passivity that pervades the popular culture is confronted (and in some cases compromised) The unique opportunities offered by the edge condition (defined as those places within our social construct where the guise propagated by the dominant social power has weakened, thereby allowing the crisis that underlies the whole of existence to become exposed) is outlined by Woods, L.,1997, *Radical Reconstruction*, (New York: Princeton Architectural Press), 15, 11-17.

Also refer to author Michael Sorkin who writes, "Urban friction is the signal of a boundary and a

symptomatic condition of urban social gradients. Such friction – by signaling difference – locates the internal edges of the city as well as potential sources of conflict." Sorkin, M., Introduction, *Giving Ground: The Politics of Propinquity*, 1999, eds. Joan Copjec and Michael Sorkin, (New York: Verso) 7

Although the exact nature of the edge existent in our work is not the same as the dualities and edges described by Woods and Sorkin, the opportunities inherent within these points of friction are quite similar. More importantly, so is the methodology proposed.

[xvii] "... architecture must forsake the monumental, because there is no hierarchy to valorize anymore, no fixed authority or its body of knowledge external to human experience to codify." Woods, L., 1997, *Radical Reconstruction*, (New York: Princeton Architectural Press),*14.*

[xviii] Woods, L.,1997, *Radical Reconstruction*, (New York: Princeton Architectural Press),17.

[xix] Additional relevance was drawn from the fact that our work had to exist between two constructs: the shifting, informal settlements of the construction sites and the more rigidly defined work of the surrounding buildings. We quite literally occupied a gap between formal and informal, planned and improvisational, "architecture drawn as it already built" and "built as though it had never been drawn." Woods, L.,1997, *Radical Reconstruction*, (New York: Princeton Architectural Press).

[xx] "Accordingly, the architects of the spaces within walls do not make predictive designs. Rather, they produce visual evocations that, however precise and detailed, are intended only as heuristic aids, guides that will stimulate transformations by others." Woods, L.,1997, *Radical Reconstruction*, (New York: Princeton Architectural Press),13.

[xxi] To once again quote Woods, "To inhabit the spaces of wall, edges, peripheries, border and the 'in-between' – the spaces of the extreme conditions brought about by radical transformations – is not a matter of creating entirely new knowledge, even less of discarding existing ideas or systems of knowing, but rather a matter of expanding them, precisely at their former, or present, limits." Woods, L.,1997, *Radical Reconstruction*, (New York: Princeton Architectural Press), 13.

[Xxii] "Art for me is a form of nourishment... I want to understand that state and that energy that I have in me that I also feel in plants and in the land. The energy and life that is running through ... that is flowing through the landscape. It is that intangible thing that is here and then gone ... growth ... time ... change ... and the idea of flow in nature." 1 "You feel as if you have touched the heart of the place. That's a way of understanding ... seeing something that you have never saw before. It was always there but you were blind to it." Goldsworthy, A. and Riedelsheimer, T. 2001, *Andy Goldsworthy's Rivers and Tides* (New Video Group), Chapter 3.

[xxiii] Woods, L.,1997, *Radical Reconstruction*, (New York: Princeton Architectural Press), 14-16.

[xxiv] Woods, L.,1997, *Radical Reconstruction*, (New York: Princeton Architectural Press), 16.

[xxv] Goldsworthy, A. and Riedelsheimer, T. 2001, *Andy Goldsworthy's Rivers and Tides* (New Video Group), Chapter 5.

[Xxvi] To quote author Lebbeus Woods "In the spaces voided by destruction, new structures can be injected. Complete in themselves, they do not fit exactly into the voids, but exist as spaces within spaces, making no attempt to reconcile the gaps between what is new and old, between two radically different systems of spatial order and of thought. <u>These gaps can only be filled in time</u>." Woods, L.,1997, *Radical Reconstruction*, (New York: Princeton Architectural Press), 16 (emphasis mine).

[xxvii] Artist Andy Goldsworthy, in an exchange with an local man regarding his work in ... demonstrates a similar mindset:

> Gentleman on beach: "What's going to happen ... what do you expect is going to happen when that tide hits that?"
>
> AG: "It is going to float away...it will move away into the pool there...no it won't stay in tact. No ... Absolutely not." [on driftwood dome]...

Goldsworthy, A. and Riedelsheimer, T. 2001, *Andy Goldsworthy's Rivers and Tides* (New Video Group), Chapter 3.

[xxviii] Goldsworthy, A. and Riedelsheimer, T. 2001, *Andy Goldsworthy's Rivers and Tides* (New Video Group), Chapter 3.

[xxix] Goldsworthy, A. and Riedelsheimer, T. 2001, *Andy Goldsworthy's Rivers and Tides* (New Video Group), Chapter 10.

Informal Settlement in Iran

Ali ZOUQI

Administrative, Urban And Regional Planning, Building and Housing Research Center & Tehran, Central Azad University, Iran, azouqi@gmail.com

ABSTRACT

Informal settlement is the most problematic kind of urban community in the world. These settlements are the spatial illustration of poverty in the cities and the dwellers in these kinds of settlements are those who could not find the economic opportunities within the cities. Cities claimed to be a "land of wishes" to attract rural residents. But the promise of the "land of wishes" remains undelivered and the informal settlement appears as a way to alleviate the problems of the homeless. Iran is one of the developing countries in the Middle East where its cities have had to deal with informal and squatter settlements. These settlements, common in most of the big cities in Iran, grew up in 1944 when economic policies were adopted from developed countries. Economic policies and imported industry had a deep effect in Iranian cities. The producer cities changed to consumer ones. Rural residents migrated to cities to find a better job and life because of economic problems. The villages became vacant and the cities could not meet the requirements of the growing population. So the emigrants had to settle in suburbs or the vacant land within the cities. Due to the poverty, informal settlers tend to corrupt and illegal ways of earning money. The residents of these settlements had no citizen's rights. They had to live in deteriorating, unstable homes which were erected over night.

The aim of this article is to introduce the reasons for the appearance of informal settlements in Iran, a survey of their geographical locations, and spatial situation of their house and lands. Economical and social information of the residents will be explained. The government's response of destroying the settlements will be described. Finally the dangerous effects of destroying these settlements and the right alternatives will be surveyed.

KEYWORDS: Government Response, Informal/Squatter Settlement, Spatial Situation.

1.1 INTRODUCTION

Informal settlements are a significant problem especially in third world countries. Historically, after the Industrial Revolution and when capitalistic powers gained authority, Europe was transformed from the feudalism system to a new capitalism and bourgeoisie one. This great leap had many consequences in different aspects. Economical structure changed which led to the transformation in spatial system of the cities, alternation in cultural and social structure, governmental structures transformation, etc. These great changes caused industry to come into power and small workshops transformed to big factories. The need for a labour force was felt in this new path. Political changes, transformation of feudalism to capitalism, the inefficiency of old systems and the transformation of agricultural products into industrial products caused the labour force come to cities from their villages to work in the factories, And after work, tired and exhausted, return to their villages to rest. Rural labour forces could not buy a house in the cities due to the high prices; therefore, in order to prevent exhaustive commuting, they built some huts using flimsy basic materials in the suburbs and thenceforth the first informal settlements were produced.

In third world countries, the informal settlement phenomenon appeared by economical policies of the developed countries under the title of the third world growth and development programs. Active industrial areas attracted the labour force from different regions of the country and the excess labour force settled in suburbs and inappropriate and deteriorated buildings. New colonial programs in the third world countries were performed in order to break the social-economical structure of these countries. These events promoted the informal settlements phenomenon greatly, so that today 30% of inhabitants in big cities of the third world live in some huts. (Shakuei, 1976).

In Iran, intense growth of informal settlements has commenced since 1951. Before that year, there were some informal settlements in the south of Tehran; but after 1951 they were intensified due to new policies of the government. There were lots of immigrations from villages to the cities so that the proportion of immigrants was increased from 11% in 1956 to 22.6% in 1977. This great immigration which will be discussed in later sections in more detail, established the primary base of informal settlements in Iran. In the next part, we will consider the

condition and reasons of informal settlements in Iran, features of informal settlements and how the government should treat informal settlements.

1.2 CONCEPT OF INFORMAL SETTLEMENTS

Huts and slum areas are the most regrettable form of chaotic and unshaped development in cities (Farid, 1989). In the big cities of the developing countries, due to the shortage or lack of the land, poor and low-paid people are forced to build their humble houses in slanting foothills of the valleys and torrential fields or the lands beside the polluter and dangerous industries.

Figure 1.1 Informal settlement in Iran (Morad aab hill,Karaj,Tehran).

There are lots of definition intermixtures and different opinions about informal settlements. Some of them are as follows:

1. *Shanties* can scattered in different parts of the city, while *informal settlements* generally are evolved in the lands of the suburb where is no legal supervision.
2. Charles Abrams - housing expert - believes that a building or a part of the city in which there is destruction, deficiency of preparing medicinal services, population density in houses, cultural and educational poverty, lack of the necessary tranquillity and dangers of natural disasters such as flood, can be regarded as hut or shanty neighbourhood." (Shakuei, 1976)
3. The concept of squatter literally refers to the dwellers who build a settlement in a very short time (night-long) in another person's land without any permission.(Hatami Nezhad, 2003)

To include all the opinions in this paper, we consider any settlements with the following characteristics as an informal settlement:

- Self-constructed, spontaneous houses without having the ownership of the land.
- Spatially located in the geographically dangerous and improper regions.
- Lack of the necessary urban services and facilities in the region like water, electricity, school, medical clinic, public transportation, etc.
- Settlers are those who could not being fit in the urban economy.

1.3 REVIEW OF THE INFORMAL SETTLEMENTS IN IRAN

In Iran, we have two kinds of informal settlements: Inner-city and outer-city. Both of them sited in deteriorated lands but as economical situation inner-city informal settlements have better situation than the outer-city one.

In general, suburbanite is referred to a person who is settled in the cities but due to different reasons he or she has not been able to be harmonized with the social and economical system of the city and therefore they can not use the urban services. It should be mentioned that not all the suburbanites are those immigrants from villages to cities, some of them are permanent dwellers of the cities, yet due to the economic poverty, they live in the houses which are not standard. (Abedin Darkush , 1993)

1.3.1 Suburbanite's Houses

Suburbanite's houses are in the steep and narrow alleys. Architectural forms are derived mostly from the special culture of the dwellers in the region. The houses are constructed by nondurable materials.

1.3.2 Population Structure of the Suburbanite Region

Population structure of these regions is mostly youth. The population of men is higher than women. The residents marry when they're very young and endogamy is very common in such societies.

1.3.3 Health and Welfare Services for Suburbanites

The level of health condition is too low; pollution and disease is noticeable in such regions. Carelessness of the officials to health issues of the residents, high population, evacuating the sewage in the alleys are some of the reasons of the pollution and diseases in these regions.

1.3.4 Suburbanite's Culture

Due to the common problems that the residents have, they depend on each other and they benefit from their strong relationships. They have created a very strong mental boundary around themselves and it is difficult for strangers entering their regions. Although suburbanites are capable of causing damages, but usually they have healthy and respectable life and they don't accept sinful people in their community. (Mashhadizade, 1995)

1.3.5 Occupation and Income of the Suburbanites

Due to the incapability in being absorbed in urban economy, Suburbanites don't have a permanent job. Because of having no specialization, generally they are occupied in low level jobs such as construction labour jobs, selling cigarettes and balloons, garbage collecting, carwash, etc.

1.4 REASONS OF ESTABLISHING INFORMAL SETTLEMENTS IN IRAN

The most significant issue in establishing informal settlements in Iran can be found in the reasons of immigration. Following the changes in the economical activities of urban, rural and tribal societies, their state have transformed from productive to consumptive. When modernist thoughts were appeared in Iran, the country was not a producer any longer but it changed to a consumer country that should import most of its requirements. Thenceforth villages were not brisk anymore and the cities flowered. The repulsive factors of the villages and attractive factors in the cities are as follows:

1. living problems in the villages and having not enough land, water, and income
2. unavailability of doctors and medicine
3. having no religious, cultural and technical centre
4. natural damages and drought

5. having not enough security on some villages (Hosseinzade Dalir, 1982)

Villagers immigrated to the cities. On the other hand, settlement of the tribes doubled their problems and they were forced to find a new kind of living. As the result of all these events, villages remained without any resident and villagers having no skill but traditional agriculture, rushed to the cities. There was not a proper house or a suitable job for this great population in the cities. Therefore villagers built shanties in the lands which were not belong to anyone and then they dwelled there. A chart is provided in figure 2 for studying the reasons of informal settlements:

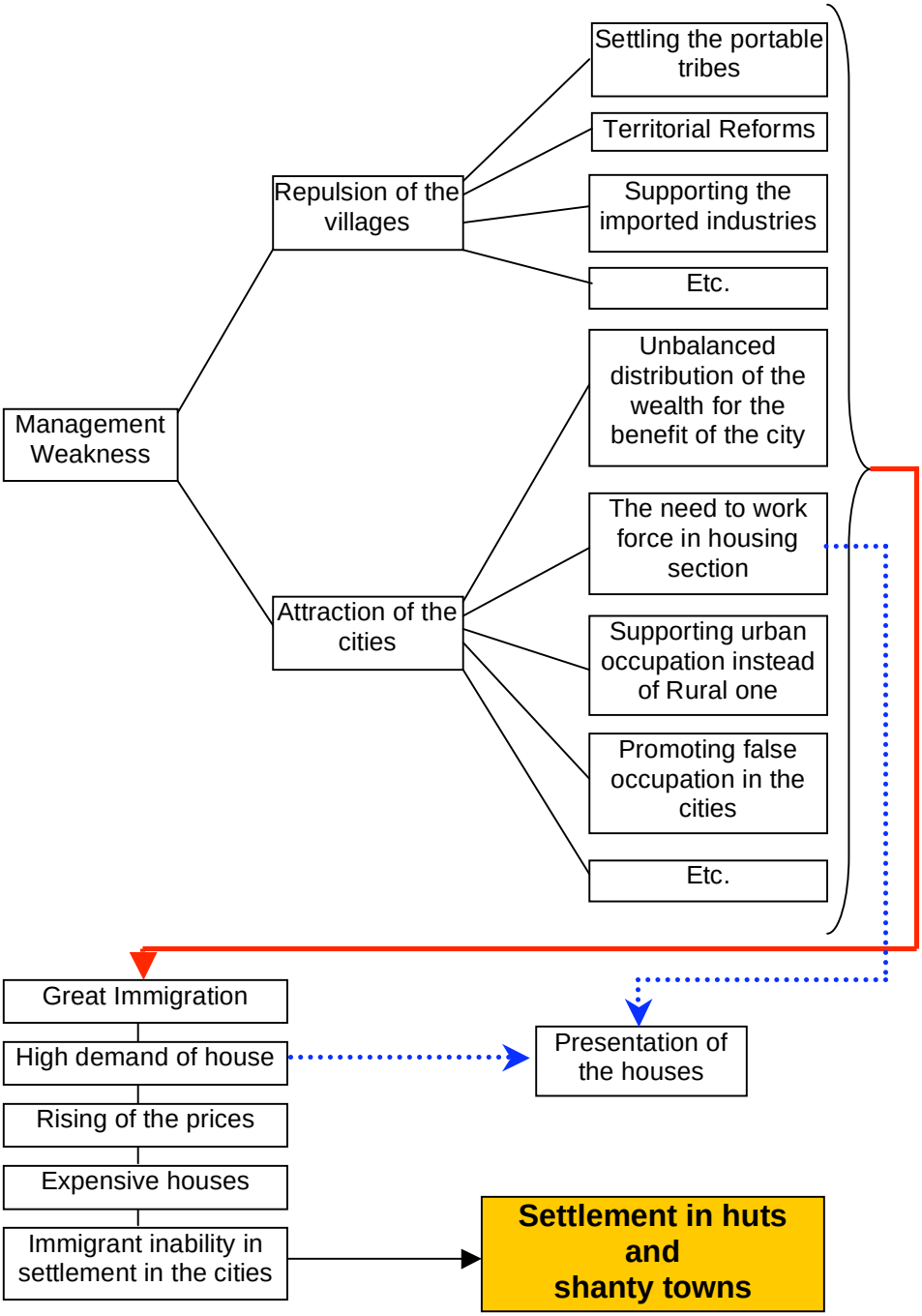


Figure 1.2 The Reasons of Informal Settlement in Iran.

1.5 PROBLEMS OF SUBURBANITES IN IRAN

Suburbanite housing is still the big problem in every decision making level in Iran. Governmental organizations have proposed many programs to solve this problem but due to the following reasons, they did not succeed.

Figure 1.3 Informal settlement in Iran (Morad aab hill, Karaj, Tehran)

1.5.1 Not Identifying the Target Groups

One of the issues causing those programs fail is that there is no proper and clear definition for the groups that the programs intend to provide settlement for them. In the first development program report delivered to the parliament has been mentioned that the government should provide welfare for all the citizens. Basically it is not clear that housing program has aimed at which groups. By these kinds of general programs, the cooperative associations can not prepare policies about land, loan, credit, etc to be useful for suburbanite housing problem.

1.5.2 Loan and Credit Policies for Providing Houses

Loan policies are among the strategic factors in providing settlement. Equipping the financial resources, decreasing loan application fees, improving the efficiency of the financial mediators and predicting the security systems to guarantee its return were considered the actions in housing section of the government. But the most important factor has been ignored: providing loans for needy people. For example those families, who do not have enough income even for their every day requirements, how can they afford the down payment of the loans? There should be some policies in the banks to support these families.

Since 1938 when only 25% of the country population were living in the cities, to make the cities more attractive, loans were available to those who wanted to live in the cities. Paying these loans has increased cash in the society which causes the increase of inflammation. Consequently the price of land, construction material, machinery and the final products which are the houses is increased. So we see that these kinds of loans could not solve the housing problem of suburbanites.

Recently Iranian banks have tried to facilitate to give the loans to the builders instead of buyers. This can be a good strategy if the banks supervise the usage of the loans.

1.5.3 Land Allocation

Land is the first principal component of housing. In the past, because of the superfluity of the land, this issue was not significant; but, nowadays due to the rising of demands and population, the price of the land has increased. Three different governmental policies made the informal settlements worse.

Firstly, in the third development program of Iran (1962-1967), providing comprehensive and detailed designs were approved in the parliament. This means that any projects were supposed to determine the boundaries of the cities. In other words, just people within the cities receive different urban services. So the desirability of the outside lands and consequently the price of these lands decreased. Therefore poor people who could not afford settling in the cities chose these regions.

Secondly, in the guidance of providing comprehensive plan, there was a rule that all the housing layouts in the cities have to be designed over 300 square meters. This caused poor people could not afford to buy a house within the cities.

Finally, the approval of “urban lands” enactment had an impact on the informal settlements. This enactment approved the dedication of the derelict lands exclusively to the government. After preparing these lands to be proper for construction, government were selling them to those who could guarantee to pay back the available loans on them. Therefore unemployed people or people with less or irregular income were not eligible to buy these lands in the cities.

All these mentioned policies worsened the situation of the poor people and made progress in the informal settlements.

1.5.4 Centralized Government and a Lack of Coordination among Governmental Organizations

Iran’s political system is too centralized and decisions are made top-down without paying attention to specific domains. Specifically the suburbanite housing problem cannot be solved by taking this type of decision-making.

Also it should be mentioned that the governmental organizations in Iran are not well coordinated. The ministry of urbanism and housing is not able to solve the housing problem alone and all the governmental organizations in all levels from national to local should be coordinated to solve this problem.

1.5.5 Destructive Actions

One of the most current reactions of the government to informal settlements in Iran is to destroy such regions. According to principle 43 of the Islamic Republic of Iran Constitution, having a house is the right of every Iranian and based on the principle 31 providing a proper house for Iranians is the government’s responsibility; but, without paying attention to these principles, the destruction takes place. These destructive reactions just increase the problem of informal settlements. Because after destroying these ghettoes, their dwellers are divided into two groups. One group choose other places in the suburb, which are geographically worse than their previous regions, and build their unofficial houses again over night. And the other group come to the deteriorated parts of the cities. By increasing the demands for these shanties within the cities, their prices increase accordingly. Suburbanites who can not afford to rent even these shanties are forced to live with several families in a single house. Health condition and economic difficulties has worsened the problems of these new dwellers and also make the appearance of the city painful and terrifying.

Reviewing the mentioned cases, you can notice that in Iran, the decisions regarding the suburb fabrics are made without attention to time, place, and inner characteristics of such fabrics and its consequences directly affect the suburbanites and the city and it’s residents are affected indirectly.

1.6 CONCLUSION

Since the 1950’s up to now, Iranian cities have had problems with informal settlements. Basically, financial policies of western governments in Iran caused villagers from different cultures to immigrate to the suburbs and establish these settlements. These communities have not only created socio-economical problems within their settlements but also for the cities.

Iran's government has not yet been able to solve the problems associated with these settlements even by using different policies. Improper policies have worsened the case and informal settlements have become a cancerous tumor inside and outside of the cities.

Based on the reasons of failing governmental programs, which described in this paper (like weak recognition of target groups, wrong loan policies, centralized political decisions, destructive actions and etc.), we can say that the very first step of dealing with this problem in Iran is to study the situation professionally and then taking proper actions by using the bottom-up decision-making approach.

1.7 REFERENCES

Abedin Darkush, Saeed, 1993, *City Economic Principles*, published by markaz-e-nashr-e-daneshgahi, Tehran, Iran.
Farid, Yaddollah, 1989, *Geography and Urbanism*, published by Tabriz University, Iran.
Hatami Nezhad, Hessein, 2003, *Informal Settlement in the World*, Journal of Shahrdariha, Vol. 50, Tehran, Iran.
Hosseinzade Dalir, Karim, 1982, *Research about Informal Settlers in Tabriz*, Published by jahad-e-daneshgahi (Tabriz).
Mashhadizade, Naser, 1995, *Urban Design in Iran*, published by Elm-o-Sanat University, Tehran, Iran.
Shakuei, Hosein, 1971, *Suburbanites*, published by Tabriz University, Iran.

The International Student Design Competition for An Open Architecture

The International Student Design Competition

We are pleased to announce the first international student competition on Open Building, developed by Jia Beisi, Associate Professor at the University of Hong Kong. It *provides a unique opportunity for future architects to challenge conventional approaches to design, and to investigate and develop new concepts for an open and sustainable architecture for the 21st century.*

Thirty-six entries were received, from Europe, North America, South America, Southeast Asia and East Asia. The international jury worked in a three-stage process in selecting two co-first place winners, a second and a third place winner.

The Competition Challenge:

The Competition projects are expected to assume a temporal identity in architecture through the maximization of its momentary and fleeting event-structure. Entries should place strong emphasis on performance of buildings and neighborhoods on the time axis. In so doing, they should offer **a critical look at architectural traditions, including the idea of** architecture as stones-in-the-water monuments. In addition, a new understanding of environment and sustainable development now calls for an architecture of **process, based on new methodologies and software**. Therefore, entries will need to describe approaches to composing **transparent processes and open-ended** environments that establish connections between people and their surroundings, between the past, present and future, and that allow them to experience these places and built-form through **thoughtful re-use and rediscovery.**

This is an open competition with limited restrictions. It is intended to challenge students, working individually or in teams, to explore a variety of design issues related to open building principles in an urban context. (www.openbuilding.org)

Studio teachers and students are encouraged to explore the many varied functional, social, political, aesthetic and environmental issues in different scales and type of projects, for their own places or cities. It also allows the students, with the approval of the sponsoring faculty member, to select a site, a community, and building use type. Explicit application of advanced BIM-related software is strongly encouraged.

AWARDS:
First Prize: $1000
Second Prize: $600
Third Prize: $400

(Actual awards: two co-first prizes awarded $800 each, and a second and third prize)

All student prize-winners are offered a $800 stipend when they attend the conference, to help cover the costs of attendance.

Winners: Co-First Place

Project Name: **Repository / Scavengers**
Entrant: Chong, Low Cheh
Master of Architecture, National University of Singapore, School of Design and Environment, Dept of Architecture
Advisor: Mr. Florian Benjamin Schaetz, visiting fellow, Dept of Architecture, National University of Singapore

Project Name: **Neutral Open Space**
Entrant: Chae, Min Seok
Master Candidate, Housing and Interior Design
Yonsei University, Seoul, South Korea
Advisor: Lee, Hyun Soo, Professor

Second Place

Project Name: **Rehabilitation after Earthquake**
Entrants: Zhou, Luhan and Chengbo Wang
Bachelor Degree Candidates
Department of Architecture, Southeast University, Nanjing, China
Advisor: Yong-gao Shi

Third Place

Project Name: **farming PARK**
Entrant: Austin Nicholas Tragni
mARCH I Candidate
Parsons the New School for Design, Brooklyn, New York, USA
Tutor: Stella Betts; director of the thesis program at Parsons, The New School for Design, and also a Partner at Leven Betts Architects

Sponsors of the student design competition

- Kieran Timberlake Architects
- Bensonwood Homes
- Ellerbe Becket Architects and Planners
- Anshen+Allen Architects and Planners
- Shepley Bulfinch Architects
- Venturi, Scott Brown And Associates
- Kajima USA
- Institute for Digital Fabrication (Ball State University)
- Center for Energy Research, Education and Service (Ball State University)
- Building Futures Institute (Ball State University)

Student Competition Jury

- Shigeru Aoki, Architect, Professor, Tokyo Metropolitan University
- Jiasheng Bao, Architect, Professor of Architecture, Nanjing University, China
- Shinichi Chikazumi, Architect, Shu-Koh-Sha Architecture and Urban Design Studio, Tokyo
- Renee Y. Chow, Associate Professor of Architecture, University of California Berkeley; Principal of Studio URBIS
- Gong, Kai, Professor, Head of Architectural Department Southeast University, Nanjing, P.R. China
- Jaehoon Lee, PhD, Professor, Head, Department of Architecture, Dankook University, Korea
- Ulpu Tiuri, Architect, Ulpu Tiuri Architects, Helsinki
- John Waugh, Architect, Ellerbe Becket Architects, Minneapolis

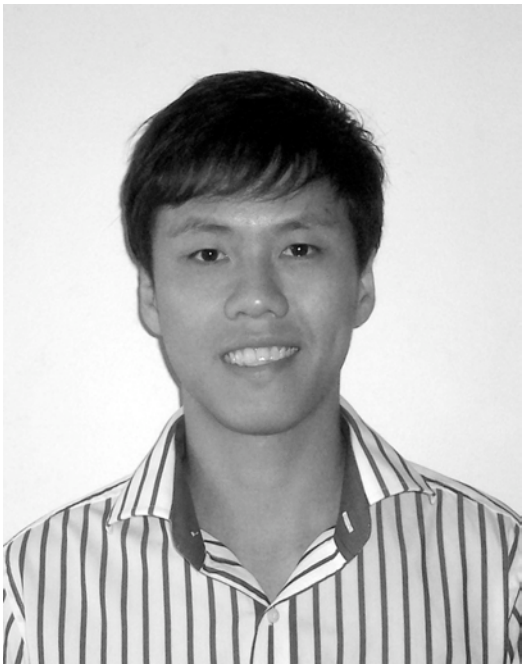
CO-FIRST PLACE WINNER

Project Name: **Repository / Scavengers**

Entrant: Chong, Low Cheh

Master of Architecture, National University of Singapore, School of Design and Environment, Department of Architecture

Advisor: Mr Florian Benjamin Schaetz, visiting fellow in the Department of Architecture, National University of Singapore




| temporary storage


| 'permanent' storage
galleria


| fly-by-night flea market


| living quarters
sleeping
washing
cooking


| rest area
sleeping
eating

The Everyday |

This project started as an exploration of an everyday that exists beneath the gloss of Singapore architecture and urban spaces. In this context, the project sets out to investigate the everyday life in Little India, one of the more authentic areas of Singapore that has not been gentrified and is able to retain its rich flavour of local living.

In Little India, it is revealed that many activities are tactical in nature, where users appropriate indeterminate spaces according to their intentions and subvert the planned meaning of the spaces. The prevalent recycling activities in particular demonstrate a repertoire of appropriation tactics. And at the bottom of these recycling activities are the scavengers, destitute individuals who roam the streets scavenging for discarded items, without any reprieve from a permanent shelter. The project thus seeks to design a repository for these scavengers, a collective place to facilitate their everyday activities, while adopting in the design process appropriation tactics observed in Little India. Inferring from these tactics, the intent is to generate strategies in the design process. It is also an allusion to the tactics of the scavengers, where appropriation is part and parcel of their everyday activities. For one, vacant buildings and empty plots become opportunities for appropriation, where they become venues for the expression of new meanings through the individuals and groups who appropriate these spaces.

The project ultimately aims to demonstrate how an honest display of life in its most ordinary can actually be the richest representation of Singapore reality.


| Repository

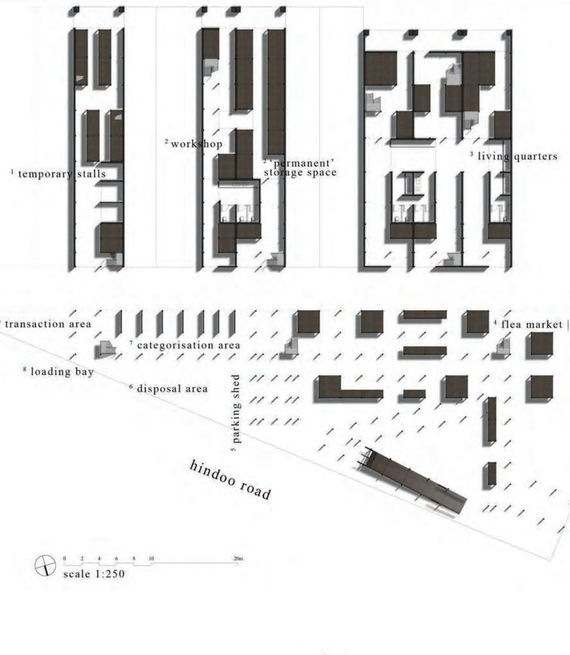

| workshop
dissection

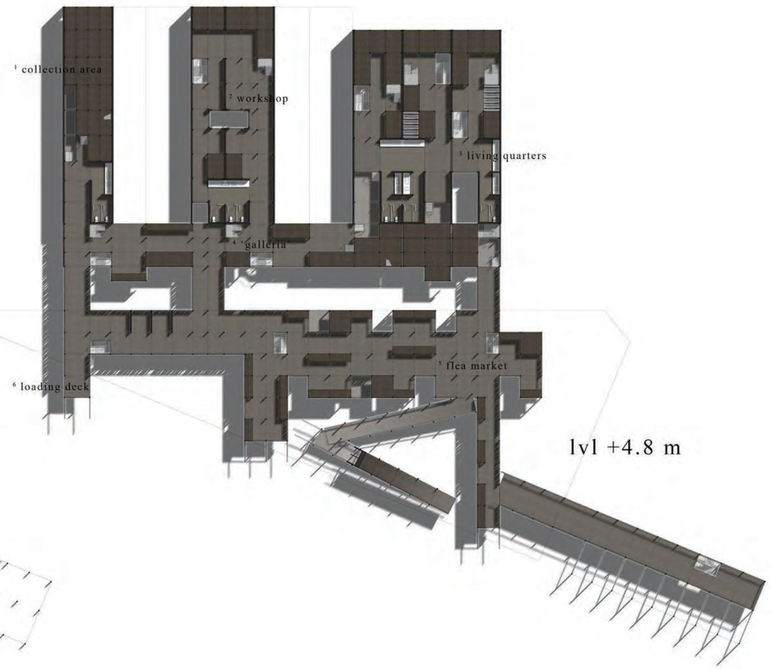

| disposal area
sanitarisation


| parking 'shed'
trolleys
bicycles
tricycles

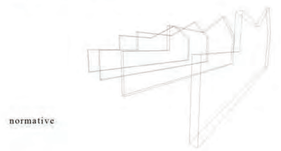

| loading/unloading bay


| transaction area
weigh station

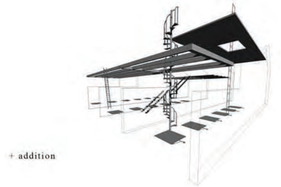


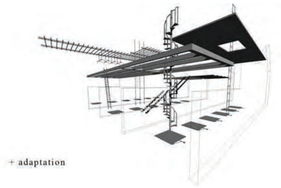


| Concept Diagram

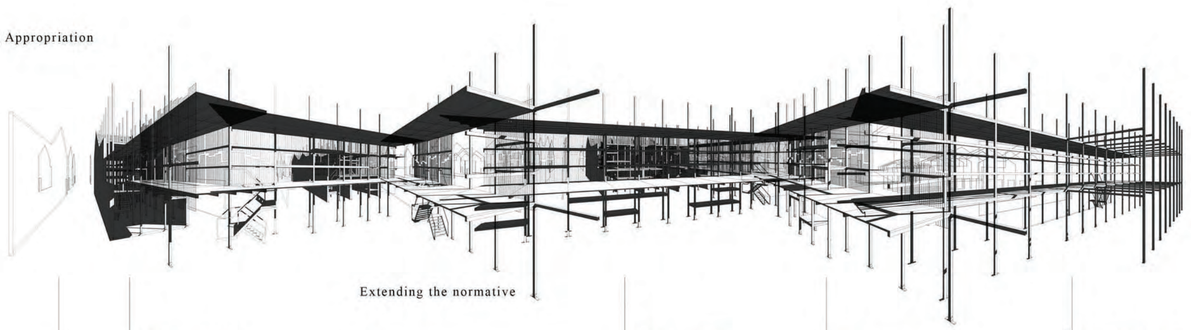

normative

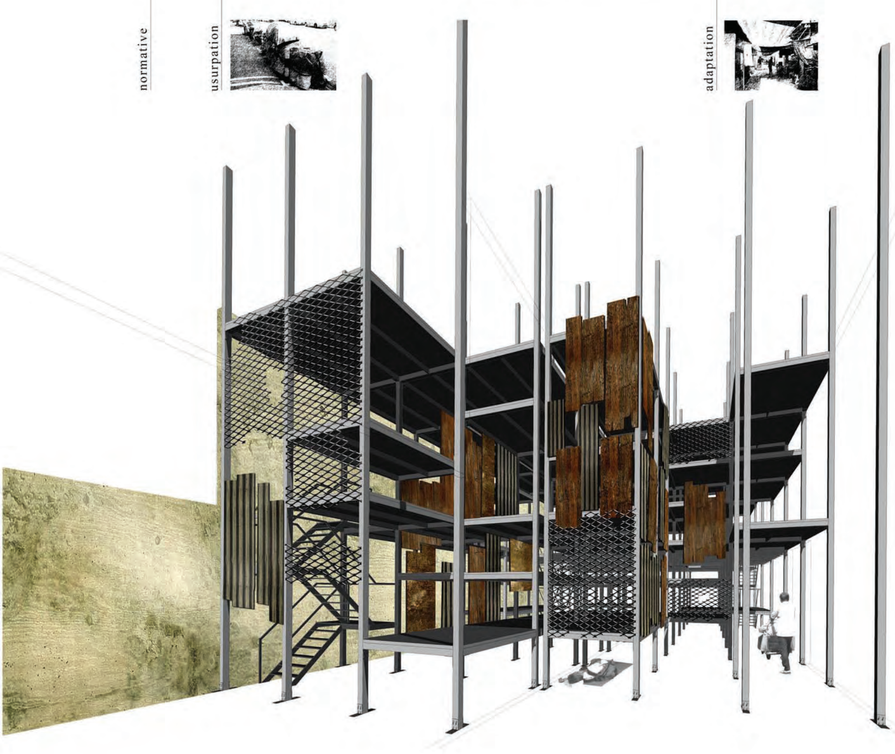

+ appropriation

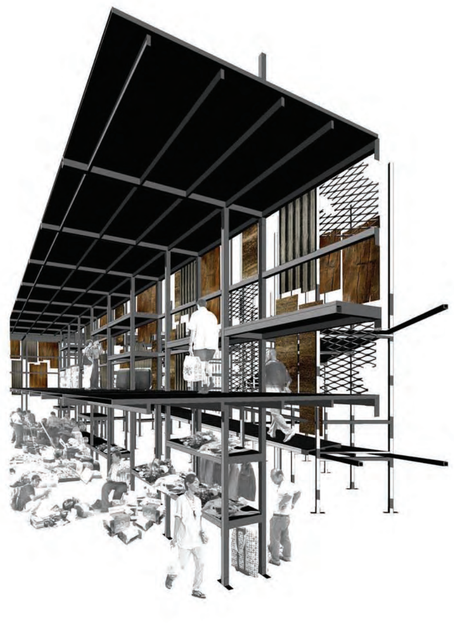

+ addition

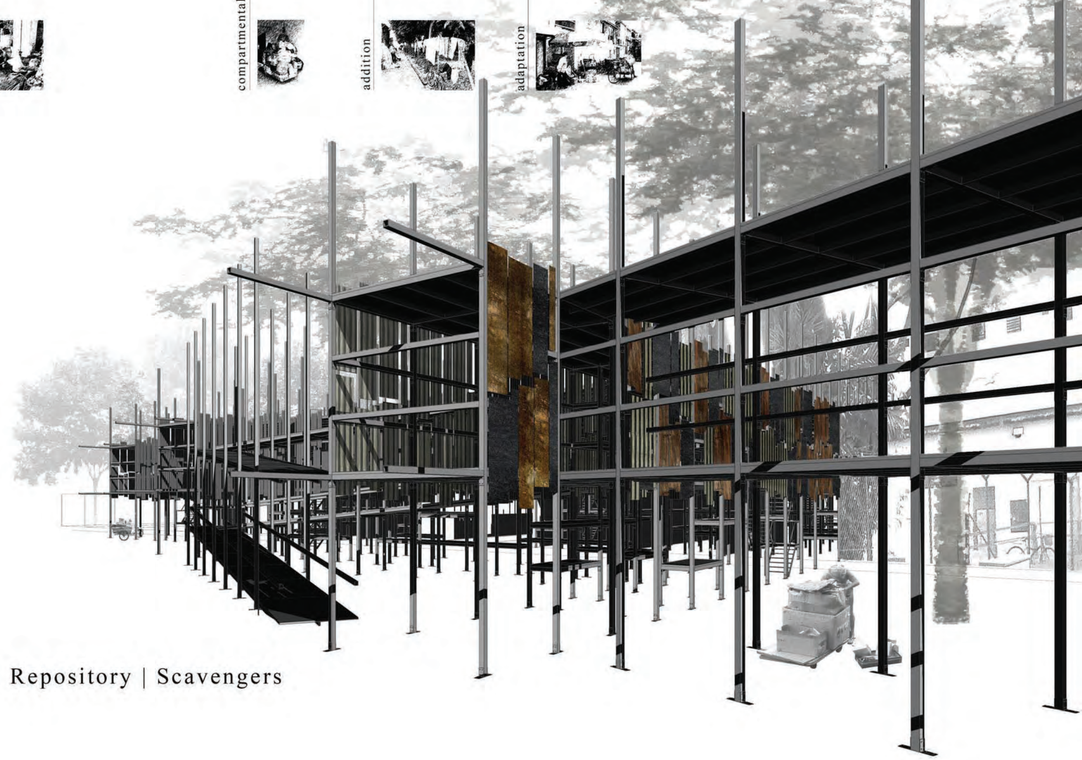

+ adaptation

| Appropriation


Extending the normative






Repository | Scavengers

CO-FIRST PLACE WINNER

Project Name: **Neutral Open Space**

Entrant: Chae, Min Seok

Master Candidate, Housing and Interior Design
Yonsei University
Seoul, South Korea

Advisor: Lee, Hyun Soo, Professor

NEUTRAL OPEN SPACE (中性空間)

for all kinds of life style

This project is about future housing which use the concept of Korean traditional courtyard and room. Korean traditional courtyard is a space that isn't limited particular function. Space feature is defined by tools. So, there isn't anything in Korean traditional courtyard even tree. We can define this space as open space which can contain various life and needs. This house is applied moving wall, rotating wall, CELL. Public and Private space are divided flexibly.

In this project, it is assumed 2 hypothesis. First hypothesis is that space package which is merged various furniture product is generalized. Second hypothesis is that almost people have CLONEY. CLONEY means clone + key. It is digital personal device like cell phone. In the future, CLONEY and house which has sensor can communicate each other. Optimized environment data is recorded into CLONEY. If resident inserts CLONEY into another house, house can serve optimized environment to resident.

This project handles resident's diversity and variation by using modular system and variable wall system based on technology. So, base concept of this project is in accordance with open housing concept.

INTRO

Design Flow

Future Housing & Science, Society

Future Housing? Variable, Sustainable

Using Concept of Korean Room and Garden

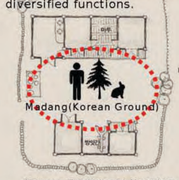
It is proposed the future Housing which is resident-made & Variable, Sustainable

Society & residents needs are diversified. And diversified LIFE...
But limited space. Space in the future must be changed by human's life
It needs 'Neutral Space' that can accommodate diversified human life

DESIGN CLUE

■ 'Madang'(Korean ground) : Ma + Dang --> the best space in house

Madang's features are vague.
Sometimes public, private, semi-...
It depends on the situation.
This is open space for accomodating diversified functions.



Korean Traditional Housing Plan

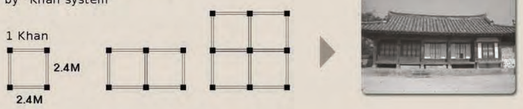
'TOOLs' for functions

- Outdoor Bathtube
- kimchi materiors
- kitchenete
- water for pray
- Play & Games
- Table & Chair

- Bathroom
- work table
- kitchen
- religous altar
- livingroom
- playground
- diningroom

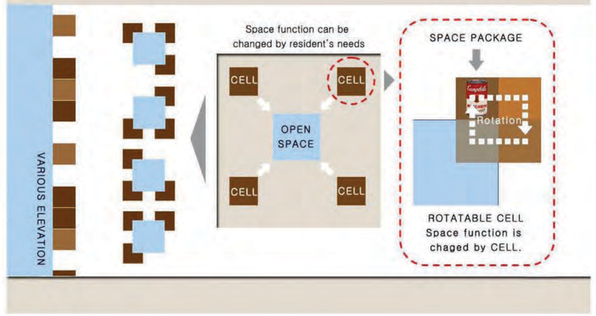
■ Korean traditional Modular System "Khan"

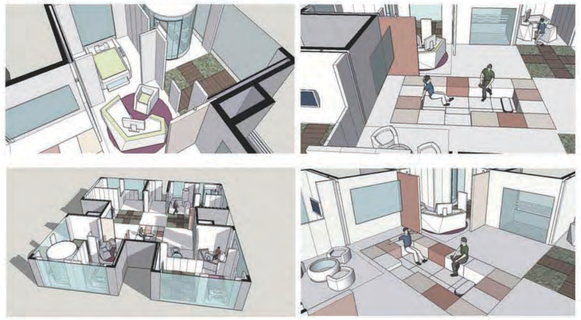
space extension & reduction by "Khan system"



CONCEPT

Open space can accommodate various needs and be divided





FUTURE LIFE

FUTURE SOCIETY

-Increase of salary women and elderly worker
-Change of Family style
(increase of celibacy, single elderly)
-job nomad : explosion of traditional job system
-Issue of sustainable society
-Development of trasportation
-Cyber community
-Development of Media Network

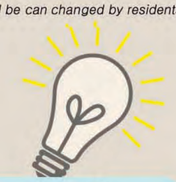
FUTURE SCIENCE

-Generalized RFID technology
-Ultra Wide Band, Display Innovation
-Infomation Network
-Commercialization of Robot
-Alternative energy
-Nano-technology
-Generalized the genetic engineering
-Alternative vehicles reducing air pollution

FUTURE RESIDENT

-Diversity Human, Needs : flexibility
-Ubiquitous Housing
-Wellbeing, Healing House
-Future Designer : lifestyle advisor
-Resident-made Housing
-Systemized Architecture Materior
-Recognition of resident environment / reaction
-->customized environment
-Main stage of Office, Clinic, Entertainment
-Energy generating station

Future Housing can accommodate diversity. and be can changed by residents



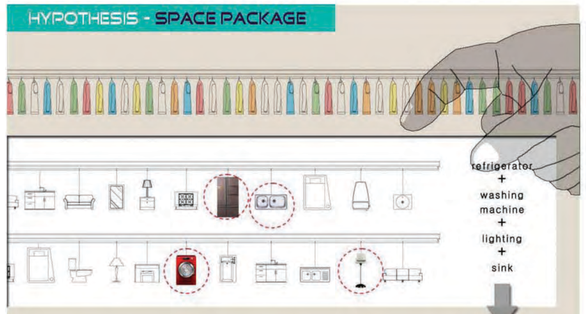
Designer in the future?

USER = CREATOR ...

DESIGNER= ADVISOR

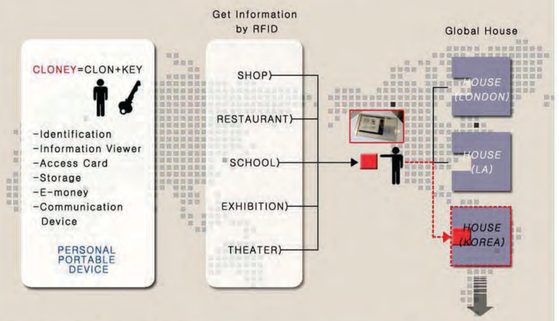
DESIGNER= SUPPORTOR

HYPOTHESIS - SPACE PACKAGE

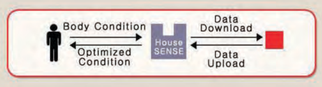


CUSTOMIZED FURNITURE
DO IT YOURSELF FURNITURE

HYPOTHESIS - OPTIMIZED BY CLONEY

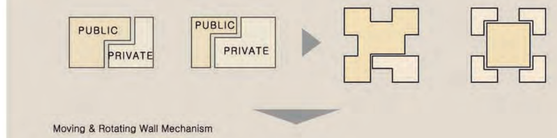


House which has sensor is sensing the resident body condition. The data of resident condition is uploaded to CLONEY. If you has CLONEY, you can live at the optimized enviroment wherever you are.



VARIATION 1

■ Private and Public space are devided flexibly



Moving & Rotating Wall Mechanism

Moving wall can control the boundary of public and private space.

VARIATION 2

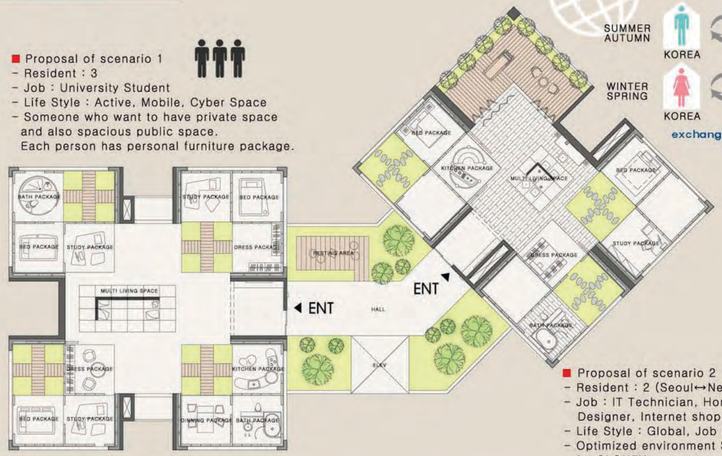
■ Arrangement 'Favorites Space' by rotatable Cell

Choose a space package of high frequency at life stage boundary!!!

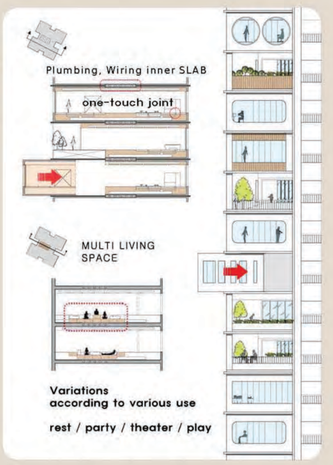
■ Application of empty CELL space

PLAN, SECTION

■ Proposal of scenario 1
- Resident : 3
- Job : University Student
- Life Style : Active, Mobile, Cyber Space
- Someone who want to have private space and also spacious public space. Each person has personal furniture package.



■ Proposal of scenario 2
- Resident : 2 (Seoul↔New York)
- Job : IT Technician, Homepage Designer, Internet shop MD
- Life Style : Global, Job Nomad
- Optimized environment Service by CLONEY



SECOND PLACE WINNER

Project Name: **Rehabilitation after Earthquake**

Entrants: Zhou, Luhan and Chengbo Wang

Bachelor Degree Candidates
Department of Architecture
Southeast University
Nanjing, China

Advisor: Shi, Yong-gao

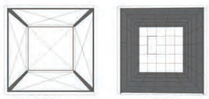




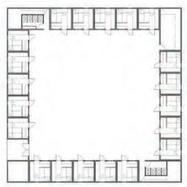



REHABILITATION AFTER EARTHQUAKE

The catastrophic Wenchuan **earthquake** which hit Sichuan Province of China four months ago had thrown us into a profound reflection: While we can provide tents and other facilities to help the survivors pass through the period, how can we help them recover psychologically and inject the courage against the quake into their later life? While speed and scale have become the foremost demand of the temporary facilities, how can we avoid the waste of energy and resources in the transformation from the temporary to the permanent? Could we intertwine these two concerns and make them contribute to each other in the reconstruction?
The OPEN BUILDING in the extended field, no longer confined into a mere internal flexibility of living space but extended to the task of maintaining a prolonging memory of the neighborhood and build/alter in a more ecological way, might effectively respond to these concerns. In this design, temporary residence is designed to be a solid capsule. In the later stage of constructing permanent buildings, these capsules are integrated so as to preserve the family memory during the unforgettable time . The permanent building is divided into support and infill :government constructs the support which provides platform for building and communication space; the rest can be completed with local material by the residents themselves. In this way, people will participate in the construction to satisfy his specific needs and answer the change of the family size of the survivors. The capsules can move along the individual apartment as well as along the track into the court. This enables the change of apartment space in the regular time and provide a gathering space in some special occasions. As a whole, the block acts as a support for the capsules.

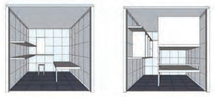

structure

shade

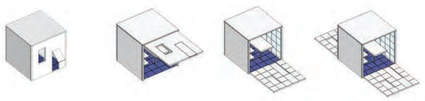

a group with 20 living capsules and four service capsules at four angles.

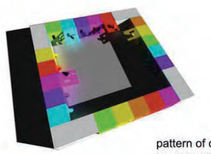

anchor points


furniture



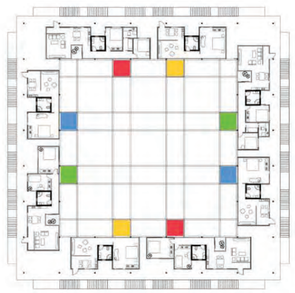
With anchor points people can fix prefabricated furniture in different ways as he likes.


flexible structure makes the capsule more open to the court.


pattern of court follows local traditional residence.


extended family nuclear family DINK

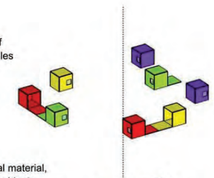
With anchor points people can fix prefabricated furniture in different ways as he likes.



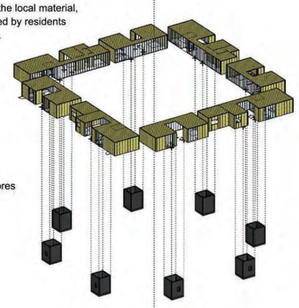
The capsule can slide along the individual apartment so as to meet different needs .
A used as a kid's room adjunct with his parents'room.
B used as a normal room.
C used to enlarge the area of the livingroom.

The permanent building is divided into the support and infill. Government constructs the support in a prototype with concrete and steel, which forms a pattern of court and cloister communication space; meanwhile, the rest can be completed with local material such as bamboo by the residents themselves

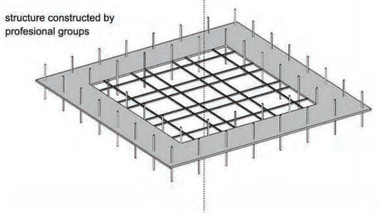
Sliding system of temporary capsules

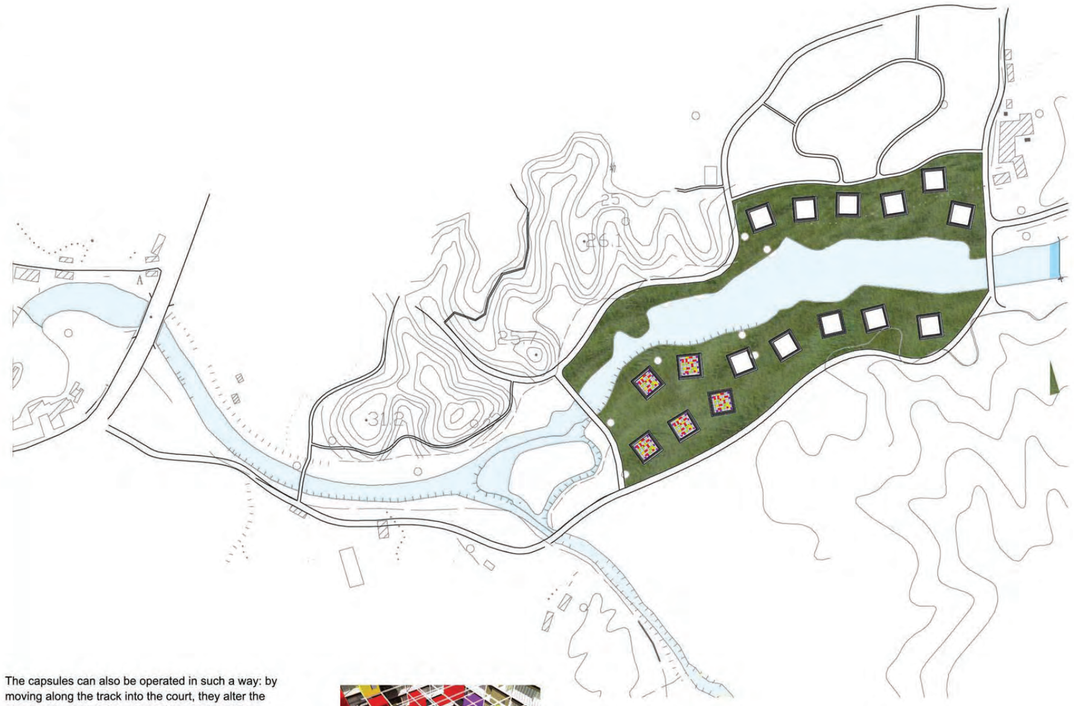


bamboo ,the local material, constructed by residents for rooms.

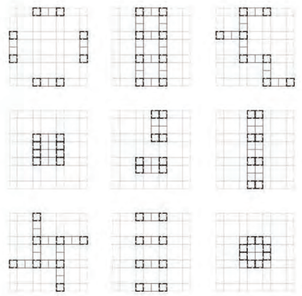

service cores

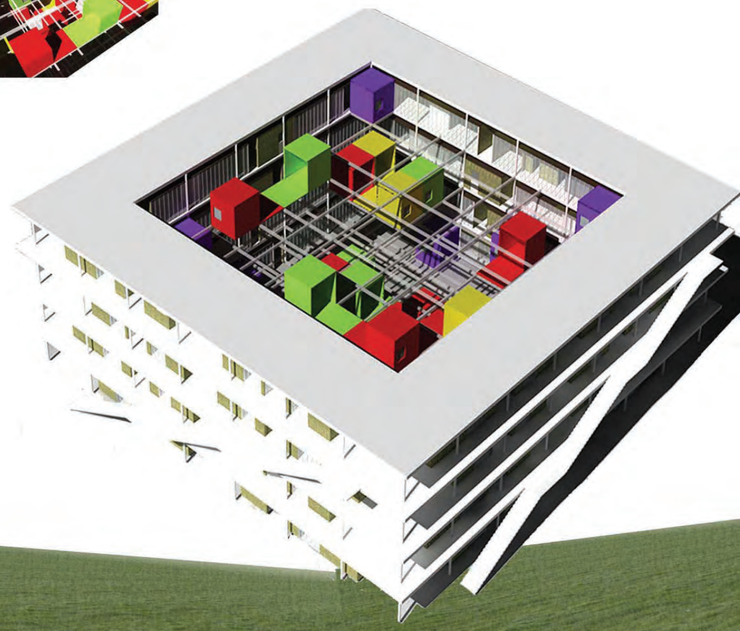
structure constructed by profesional groups





The capsules can also be operated in such a way: by moving along the track into the court, they alter the apartment space in the regular time and provide a gathering space in some special occasions such as memory day of the earthquake or some other festivals . as a whole, the block acts as a support for the capsules.





THIRD PLACE WINNER

Project Name: **farming PARK**

Entrant: Austin Nicholas Tragni

mARCH I Candidate
Parsons the New School for Design
Brooklyn, New York, USA

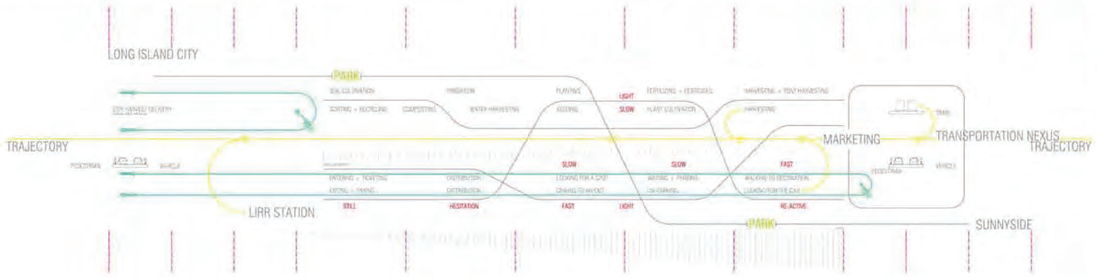
Tutor: Stella Betts; director of the thesis program at Parsons
The New School for Design, and also a Partner at
Leven Betts Architects

(The project with which I won this award is being exhibited
at the Center for Architecture in New York City)

LONG ISLAND CITY : FARMING PARK

All too often do we see land being taken away for parking and at the same time the reclamation of abandoned and vacant parking lots to turn into viable land, specifically farms in urban environments. The project attempts to combine these two typologies to co-exist on one site, and bring the process of food production and consumption in direct contact with a major multi-modal transfer point between the car and New York City's existing public transportation network.

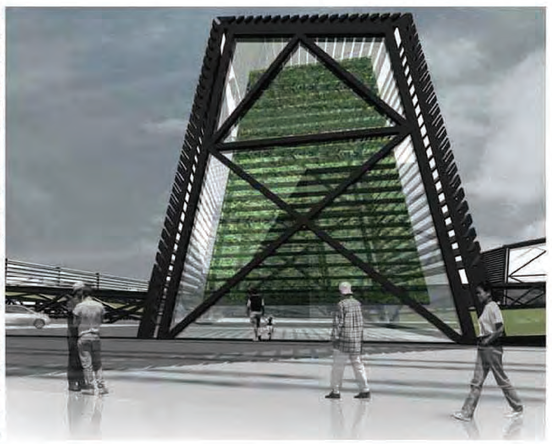
The project, which is a park and ride facility and urban agricultural farm, has developed as a response to some of the impacts of urban growth, specifically addressing New York City's congestion pricing scheme. The potential for many of the surrounding neighborhoods of Manhattan's Central Business District to be even more congested with vehicles looking to avoid paying additional fares is a concern for the people living in those areas. The project will provide an alternative option for those accessing NYC by car and also challenge the conventional function of a park and ride facility to provide a greater good for those users and the surrounding neighborhoods.

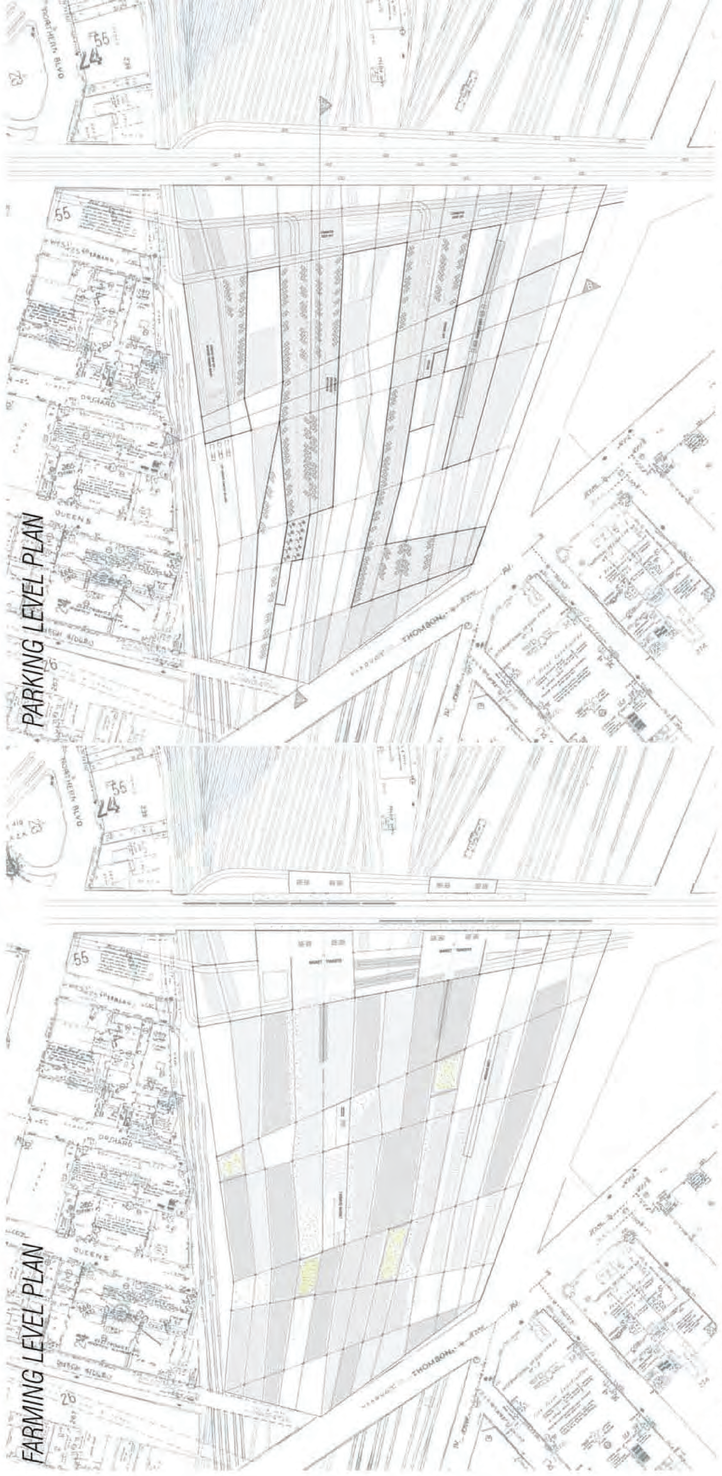


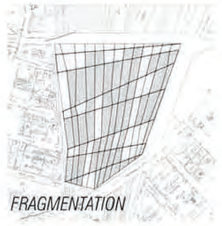
The process of selecting a site is extremely important in that it needed to satisfy a number of certain urban criteria. Both programs want to be located adjacent to a major transportation nexus in addition to having a large amount of currently vacant land for farming. This adjacency facilitates the consumption of fresh produce at that multi-modal transfer point. The project it sited above the Sunnyside Rail Yards between Long Island City and Sunnyside, Queens; two growing neighborhoods of Manhattan.

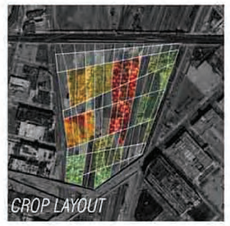
This site connects the urban farm to a larger existing network of food distribution within NYC, specifically City Harvest, which is an organization that collects and redistributes wasted food from NYC's restaurants. The connection with City Harvest is the exchange of wasted food to be used as compost in the farm - for fresh food to be delivered to local markets and enhance food security. The community based infrastructure centralizes food production in this urban context and creates a continuous productive landscape out of this enormous vacant land.

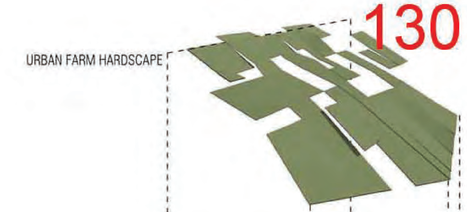
This project, while designed specifically for New York City, can also be thought of as a prototype for how to address urban vehicular growth and food security in cities around the world. The site chosen in NYC is not much different than what can be found surrounding other large urban areas. Most large cities have some form of public transportation infrastructure, and accompanying that is always a rail yard; a potential farming site

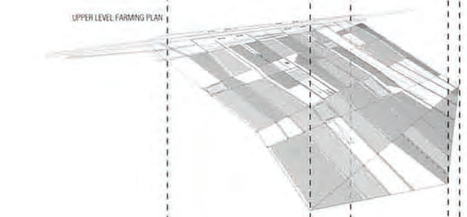


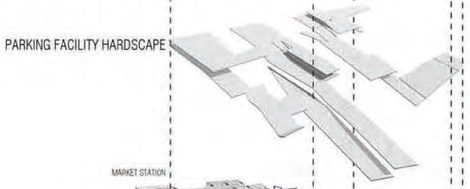


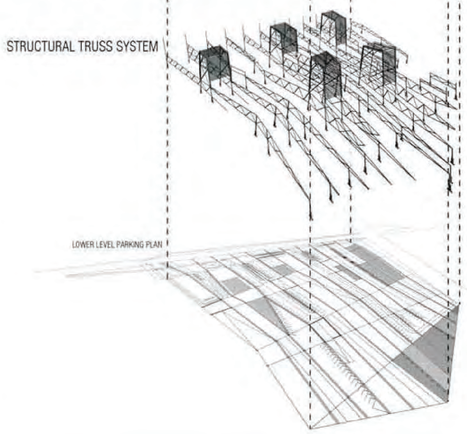


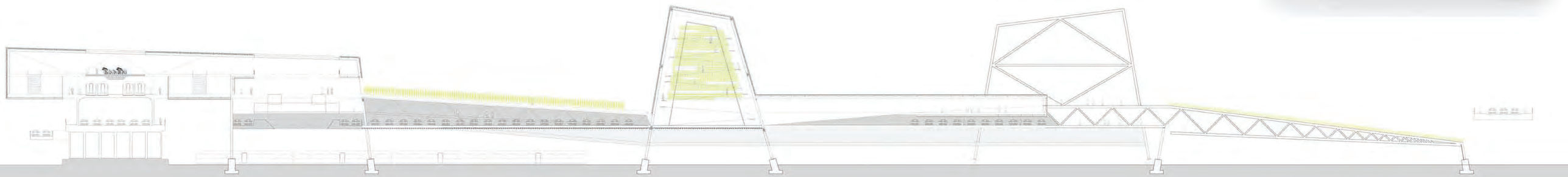












CONFERENCE PARTICIPANTS

CONFERENCE ORGANIZERS and PARTICIPANTS

Conference Chair
Stephen Kendall, PhD, Professor of Architecture, Ball State University skendall@bsu.edu

Conference Co-Chair
Michael Gibson, Instructor in Architecture, Ball State University mdgibson@bsu.edu

Graduate Assistant
Tyler Sanders, Master of Architecture graduate student, Ball State University, tjsanders2@gmail.com

Keynote Lecturers

Renee Y. Chow, Associate Professor of Architecture and the Eva Li Chair in Design Ethics, Department of Architecture, University of California Berkeley; Principal of Studio URBIS
http://www.studiourbis.com/

Andres Mignucci, FAIA, Architect, Andres Mignucci Architects; Professor of Architecture, University of Puerto Rico http://andresmignucci.com/

Jia, Beisi, PhD, Associate Professor, University of Hong Kong, jia@arch.hku.hk

Dietmar Eberle, Professor of Architecture ETH Zurich and former Dean; Principal Baumschlager and Eberle, Architects http://www.baumschlager-eberle.com

Paul Lukez, AIA, Paul Lukez Architecture
1310 Broadway, Somerville, MA 02144
plukez@lukez.com, www.lukez.com, www.suburban-transformations.com

Jorge ANDRADE
Metropolitan Autonomous University of Mexico
jandrade@correo.xoc.uam.mx

Aoki, Shigeru
Tokyo Metropolitan University
shigeruaoki@aokou.jp; saoki@tmu.ac.jp

Chae, Min Seok
Yonsei University
lanvan@korea.com

Chen, Shang-Feng
Southeast University
sunphone@live.cn

Chong, Low Cheh
National University of Singapore
g0705899@nus.edu.sg

Cong, Ning
Harbin Institute of Technology
congningjiaojiao@163.com

Fukao, Seiichi
Tokyo Metropolitan University
sfukao@tmu.ac.jp

Geraedts, Rob
TU Delft
r.p.geraedts@tudelft.nl

JANZ, Wes
Ball State University
wjanz@bsu.edu

Kadowaki, Kozo
Tokyo Metropolitan University
kkad@ecomp.metro-u.ac.jp

Kobata, Seiji
Urban and Housing Technology Research Institute Urban Renaissance Agency
s-kobata@ur-net.go.jp

Raymund Königk
University of Pretoria
raymund.konigk@up.ac.za

Minami, Kazunobu
Shibaura Institute of Technology
k-minami@sic.shibaura-it.ac.jp

Li, Haile, ZCHS Architects, Chongqing
lhail@vip.sina.com

Thomas K. McPeek, Southern Illinois University
ktmcpeek@siu.edu

Nascimento, Denise Morado
Universidade Federal de Minal Gerais
dmorado@arq.ufmg.br,

Ren, Zhijie
University of Hong Kong
renzhijie@gmail.com

Happy Ratna SANTOSA
Institute of Technology Sepuluh Nopember (ITS)
happyratna@yahoo.com

S. Gerald SHALL
Temple University
sgshall@temple.edu

Shi, Yong-gao, SEU
archistone@163.com

Sone, Yoko
Nihon University
sone@cit.nihon-u.ac.jp

Taguchi ,Makiko
Graduate student
Nihon University

Wang, Chengbo
Southeast University
luluhan0459@163.com

Wu, Yi-Ling
Ming Chuan University, Taipei
Yiling@hotmail.com

Yu, Shao
Harbin Institute of Technology
shaoyuu@163.com

Zhou, Li-jun
Harbin Institute of Technology
ccc82281438@163.com

Zhou, Luhan
Southeast University
luluhan0459@163.com

Ali ZOUQI
Central Azad University, Iran
azouqi@gmail.com

Ball State Univesity

Guillermo Vasquez de Velasco
Dean, College of Architecture and Planning
Ball State University
Guillermo@bsu.edu

Michel Mounayar
Associate Dean, College of Architecture and Planning
Ball State University
mmounaya@bsu.edu

Mahesh Senagala
Chair, Department of Architecture
Ball State University
Mahesh@bsu.edu

Ken Holland, Dean
Rinker Center for International Programs
Ball State University
kmholland@bsu.edu

THE EDUCATION FOR AN OPEN ARCHITECTURE CONFERENCE is a forum for environmental design educators, students, and practitioners from around the world concerned for the future of architectural education. It has a specific focus: The design of open-ended yet sustainable physical environments. The conference / workshop will have paper sessions, exhibits of student and professional work focused on the conference theme, and selected real-time DESIGN EXERCISES that will serve as a platform for discussions.

The built field - bigger than any profession and following its own laws - embodies environmental patterns and social structures of influence and responsibility, where conventions, levels of intervention, and shared themes frame our professional contributions. Both everyday and exceptional places coexist in the built field, in which designing, and innovation, are continuous processes. Teaching principles of open architecture is thus very important in helping students understand how the built field works, and how we might intervene to make it better.

Open Architecture concerns at least three main principles: change, levels of intervention, and distributed design.

How can environmental design education - around the world - do better in meeting these challenges? How are we doing and what needs to be done?

^ Project: Papendrecht; Molenvliet, NL
Architect: Van der Werf
Photo: John Carp

^ Project: The Solids; Amsterdam, NL
Architect: Baumschlager & Eberle
Image: Baumschlager & Eberle

^ Project: Waalveste; Zaltbommel, NL
Architect: Willems van den Brink
Photo: Willems van den Brink

^ Project: Arabianranta; Helsinki, Finland
Architect: Kahri & Assoc. and PlusHome
Photo: Stephen Kendall

Back Cover:
Next 21: Osaka Gas Planning Team: Yositika Utida, Shu-koh-sha Studio, Kazuo Tatsum, Mitsuo Takada, Seiichi Fukao; Osaka, Japan; Image: Seiichi Fukao
Front Cover:
(T) Informal Settlement in Lima, Peru; Image:unknown source
(B) Ino Hospital in Bern, CH; Photo: Stephen Kendall