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Megastructures

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Megaform versus Open Structure or the Legacy of Megastructure

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ABSTRACT

Since the financial crisis of 2008, architecture must face growing conditions of instability. This rekindles the necessity to integrate the parameter of uncertainty into architectural design much like the concerns developed by the radical architects of the 1960s. At that time, these architects associated with megastructures challenged the opposites: fix/transient, permanent/ephemeral, primary/secondary structure, indeterminate/determinate. They raised the questions of uncertainty, instability over time, and gave shape to this condition. Their predecessors inside Team X introduced concepts like the 'aesthetics of change' (Smithsons), the 'open form' (Hansen), 'open aesthetic' (Voelcker) and developed architectural theories regarding indeterminacy and fragmentation. Out of a synthesis of this theoretical background, we propose to withdraw a conceptual tool with which we review the approach of two contemporary architectural offices, particularly concerned by the question of indeterminacy, uncertainty, open aesthetics and open structure in their achievements. Doing so, we aim to provide insights of what can constitute a legacy out of megastructuralist theory and identifies conceptual shifts.

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KEYWORDS

Open Structure; Megaform; Bigness; Indeterminacy; Megastructure

Introduction

In recent urban and architectural developments, the phenomenon of the 'very large building', the 'Bigness' has figured as an unavoidable feature of the contemporary architectural landscape.

In order to challenge the 'hypersize', architects tracked back some conceptual developments made in the 1960's and made some explicit references to some of the megastructuralist followers of that period.

But what are exactly the theoretical texts defining the megastructure? What are the continuities and the conceptual differences between megastructure and contemporary architectural landscape? How can we read the original text of Maki and Wilcoxon in order to take a critical look at contemporary projects? What is the necessity to look back to those texts in order to understand the contemporary thoughts on indeterminacy?

The September 2011 issue of the journal OASE addressed the question of uncertainty in architecture. The editorial of this issue made the assertion that, in the context of continued economic instability since the financial crisis of 2008, the rapid variations in political, social and economic parameters had a negative effect on architectural design which is generally created over the long term. This observation rekindled the necessity to integrate the parameter of uncertainty into architectural design much like the concerns developed by the radical architects of the 1960s¹.

1. Klaske Havik, Véronique Patteeuw and Hans Teerds, "Editorial, Productive Uncertainty/Indeterminacy in Spatial Design, Planning and Management", OASE, no.85 (2011): 3-5.

In this article, we propose to analyse the theoretical developments of the 50s to 70s which addressed the questions of indetermination, adaptability and evolution in architecture, while also dealing with the opposites big-small, collective-individual, artificial-spontaneous, permanent-temporary, structure-filling. From an historical point of view, relying on our archives research, we will emphasise the first use of the word 'megastructure'

From this point, we will withdraw two concepts which appear to us as a possible synthesis of the megastructuralist developments. We will then illustrate our hypothesis, using our understanding of Maki and Wilcoxon's text about megastructures, the work of two contemporary architects who incorporated these issues into their concrete achievements, integrating the questions of impermanence, unpredictability, indetermination, landmark, building as a city.

The 'aesthetic of change': issues of evolution of the architectural form

In the nineteen-fifties, some architects began to question the building model defined by composition principles stable over time and instead searched for formal principles involving possibilities of evolution, growth and flexibility.

These preoccupations were initiated by the 'Constructionists' and the

'Independent Group', both based in London². These two groups had in common the identification of the notion of indetermination in architecture.

In 1951, in London, the Institute of Contemporary Arts and the Independent Group presented an exhibition entitled 'Growth and Form'. The title of the exhibition deliberately echoed the book *On growth and form*, by the biologist D'Arcy Wentworth Thompson which was published in 1917³, and the exhibition referred to drawings from Thompson's work, presenting patterns of biological growth. These patterns were interpreted as possible formal models including possibilities of evolution over time without changing nature.

In 1956 the CIAM X of Dubrovnik was organised, where the theme of evolutive and adaptable architecture was one of the main topics debated. The framework⁴ was written by Alison and Peter Smithson, members of the Independent Group. In this text, they particularly highlight the concept of 'change' in architecture.

The introduction of these subjects as major preoccupations represented a break with concepts of architecture that were based on the artwork as a finality. This sequence initiated the development of theories of change in the modern movement.

In 1957, another member of the Independent Group, James Stirling, published an essay in the *Architects Year Book 8*, where he stipulates:

'The application of orthogonal proportion and the obvious use of basic geometrical elements appears to be diminishing, and instead something of the variability found in nature is attempted. "dynamic cellularism" is an architecture comprising several elements, repetitive or varied. The assemblage of units is more in terms of growth and change than of mere addition, more akin to patterns of crystal formations or biological divisions than to the static rigidity of the structural grid'⁵

This statement illustrates the quest for an architecture that is no longer generated by a system of simple proportions and geometries, but by more flexible processes, inspired by cellular and molecular systems of organisation.

This publication also contains an article by Peter and Alison Smithson: 'The Aesthetics of Change'⁶. In this article, drawing on the case of the university, the Smithsons tell us that the university and the city are growing and changing. Consequently, the new buildings of a university should no longer be conceived according to traditional aesthetic theory in which the part and the whole are in a finite relationship with each other, the aesthetic of each being 'close'. Their aesthetic must be an 'aesthetic of change'. Retrospectively presenting their Sheffield project, completed 4 years earlier, the Smithsons described the system of footbridges connecting the old building with the new as a 'linkage' between independent elements, an elevated street. The facade, in addition, is made up entirely of screens,

2. For further developments, see Jonathan Hughes, "The Indeterminate Building", in Jonathan Hughes and Simon Sadler, eds., *Non-Plan: Essays on Freedom, Participation and Change in Modern architecture and Urbanism*, eds. Jonathan Hughes and Simon Sadler (Oxford: Architectural Press, 2000),): 90-103.

3. D'Arcy Wentworth Thompson, *On Growth and Form (2nd edition)*, (Cambridge: Cambridge University Press, 1942).

4. Alison and Peter Smithson, "Draft Framework 4, 1956, Concept Document for CIAM X", in Max Risselada and Dirk van den Heuvel(ed.), *Team X 1953-1981, In search of a Utopia of the Present* (ed.), eds. Max Risselada and Dirk van den Heuvel (Rotterdam: NAI Publishers, 2005), 48-49.

5. James Stirling, "Regionalism and Modern Architecture", *Architects Year Book*, no.8, (London: Elek Books, 1957),): 62-68.

6. Alison et and Peter Smithson, "The Aesthetics of Change", *Architects Year Book*, n°no. 8, (London: Elek Books, 1957),): 14-22.

allowing all the class changes inside but without changing the external aspect.

In their article, the Smithsons also presented the Santa Monica house, designed and built by Charles Eames. For the Smithsons, this project was the expression of a 'transient aesthetic'⁷, composed of elements that could be easily replaced over time and therefore expressing an 'aesthetic of change'.

7. SmithsonIbid., "The Aesthetics of Change", 22.

The indeterminate building: growth and adaptation

The 'aesthetic of change' approach initiated by the Smithsons would be further developed in the project for the Northwick Park Hospital, designed by John Weeks of the Llewellyn Davies and Weeks firm of architects, and also a member of the Independent Group.

Before coming to this project, we should recall that Richard Llewellyn Davies, an associate of John Weeks, gave a conference to the Architectural Association in 1951 on the topic of 'Endless Architecture'⁸. Integrating other disciplines distinct of architecture, Davies referred to the writing of James Joyce as 'endless writing', as some of his works have no beginning, middle or end.

8. Richard Llewellyn Davies, "Endless Architecture", *Architectural Association Journal*, no.67 (1951),): 106-113.

These considerations on endless architecture were followed by the architects in the aforementioned project. The authors developed a strategy of indetermination, in order to construct a project subject to unpredictable modifications, integrating growth dimensions and changes due to the obsolescence of hospital departments. In order to be conceptually 'endless', Weeks indicated that the size of the hospital project was not determined because the 'growth of the different departments would be typically unequal and difficult to predict'⁹.

9. John Weeks, "Indeterminate Architecture", *The Transactions of the Bartlett Society*, Volume 2, no.193 (1-1964): 83-106.

The team of project authors therefore suggested a 'street' on which several departments of the hospital interconnect. Only the widths of the volumes are defined, their lengths remaining undetermined. The departments are therefore free to develop independently of each other. The interior of the buildings can, thanks to their structural system, be subdivided, in a way that is not connected with the expression of the outer envelope, following the suggestion by the Smithsons for Sheffield, and concretising an 'aesthetic of change' and a system of 'linkage'¹⁰, the backbone of the project.

10. Alison and Peter Smithson, *Ordinariness and Light. Urban Theories 1952-1960 and their application in a building project 1963-1970* (Cambridge, Mass.: Faber, 1970), 157.

Regarding this project, it is interesting to note that Weeks added that the shape of the entire building should not be closed, or 'finished': 'The ideal of unity with constant relationships cannot be attained', said Weeks. Such a building must be geometrically "a-formal"¹¹.

11. Ibid.Smithson, *Ordinariness and Light*, 90.

The indeterminate strategy in architecture has to be compared with the Hansen's preoccupation, opposing the couple closed form/open form at

the Otterlo congress in 1959¹².

First, Hansen introduced his conference by an open criticism of the lacks of architectural norms which had been practiced before. He denounced the inability of 'closed architecture' to adapt to the 'changes imposed by life'¹³.

On the other side, the quality of the 'open form' takes into account the initiative of the resident, considering him as an actor in the formation of his environment. 'The completely new task of the architect: a communicative transmission to our psychology of the organic and bountiful chaos of events in a form received by this manner [...] The manifestation of the Open Form will be therefore the discernibleness of the individual in the multiple, and the discernibleness of the number [...] The Open Form differs from the Closed Form by recognizing concrete people—not the abstract so-called 'average'—by leaving a margin for evoking one's own latent essence'¹⁴.

Architecture should therefore serve as a support to these unpredictable events and as an object which allows the process of appropriation. This embodies the notion of change initiated in Dubrovnik and developed in the different articles by the Smithsons.

'The Closed Form has created aesthetics for its own use. The Open Form - the art of events - will also look for its own methods of study, its own means of expression, its own aesthetics. The Open Form, being the form of the sum of events - of the sum of individualities of a given group - should in consequence lead us to the expression of a form of the "milieu"¹⁵.

The search for open form, or open-ended architecture has largely characterized the architectural discourse during the 1960's and found an echo in the megatructuralist proposals.

From structuralism to megastructuralism

During the first congress of Team X in Otterlo, the participants drafted a conceptual approach focusing their energy on resolving the polarities mentioned in Dubrovnik: Individual/collective, Permanent/change, Physical/ spiritual, Interior /exterior, Whole /Part¹⁶.

This projectual strategy integrates two opposite and complementary considerations: the first one calls upon the formalisation of a long-term element and takes the shape of a primary structure and the second one refers to the contingency of ephemeral elements which evolved due to human appropriations and as such incorporates a degree of indeterminacy. These secondary system 'can be modified by individuals or group of users, enabling them to express in a creative way, their different identities'¹⁷. This way of designing is indubitably structuralist.

12. Oscar Hansen, "La Hansen, "La forme ouverte dans l'architecture – l'art du grand nombre", *Le Carré Bleu*, no.1 (1961),): 4-5.

13. Hansenbid., "La forme ouverte dans l'architecture", 4.

14. Ibid.Ibid., 5.

15. IbidIbid., 5. The term '*milieu*' comes from the original french French version and is preferred here to 'group', used in the first translation, which we believe narrows the meaning.

16. Alison and Peter Smithson, 'Draft Framework 44', 1956, Concept Document for CIAM X, in Max Risselada and Dirk van den Heuvel(ed.), *Team X 1953-1981, In search of a Utopia of the Present* (ed.), eds. Max Risselada and Dirk van den Heuvel (Rotterdam: NAI Publishers, 2005), 48-49.

17. Report of the group discussion "Growth and Change" at CIAM 9 in Dubrovnik in Oscar Newman, *CIAM'59 in Otterlo*, (Zürich: Verlag Girsberger, Zürich, 1961, p.), 15.

The Smithson discussing the characteristics of a permanent and an ephemeral structure, in an article published in 1960, define this couple as 'fix' and 'transient'¹⁸. This word has many acceptable variations according to the different proposals the Smithson did. The 'fix' can take the shape of permanent structures or buildings (infrastructures, institutions) and are opposed to 'transient' which evoked small buildings or shops. These can also constitute the different elements of a program or the pre-existing situation of a site, as it was the case in the Berlin-Hauptstadt proposal. Nevertheless, it is interesting to note that in Peter Smithson's text, the introduction of a difference in terms of cycle of life, between the 'fix' elements and the 'transient' ones. Following Smithson, the long-term structure has a lifespan from twenty-five to fifty years and the transient elements, such as houses, supermarkets, shops,... has the same obsolescence than cars or washing-machine. In every cases, the 'fix' appear like 'a system of permanent points of references, necessary to the stability of the individual'¹⁹. This conception has to be compared with Habraken's²⁰ definition of 'infills' and 'support' published the year after.

This primary/secondary duality is also mentioned by megastructuralist followers and theorists. But for them, the ambition is to 'surpass the sociological functionalism of Team X: not to look for architectural forms appropriated for the society which change, but to invent systems that represent and anticipate its change itself'²¹. As relayed by Dominique Rouillard, 'the megastructure goes back from the permissive urbanism of Team Ten [...]. In it, it also finds its structural approach'²². The megastructure gives shape to the opposition of the permanent and the transient mentioned by Peter Smithson and aforementioned. The proposal takes the shape of a three-dimensional urbanism, containing ephemeral prefabricated buildings, instead of architectural buildings.

In spite of the consideration of scale in the design issue, from our point of view, what conceptually links Team X and megastructures, is the desire to give shape to indeterminacy, articulating transient and permanent design, representing or anticipating the perpetual change of the society.

Following Archigram's statements, indeterminacy is not the result of the different life cycles of the fix and transient of a megastructure, but rather due to a certain programmatic indeterminacy that can support all appropriation scenarios, open-ended, and thus constitutes what we can consider as a legacy of megastructuralist theories, since indeterminacy continues today, to occupy a part of the contemporary architectural production. In this regard, Archigram told us:

18. Alison and Peter Smithson, "Fix : permanence and transience", *Architectural Review* (december December 1960), : 437-439.

19. Peter Smithson, "Letter to America", *AD*, (mars Mars 1958).

20. N. John. Habraken, *Supports : an Alternative to Mass Housing*, (London, New York : The Architectural Press Praeger, 1972) ; originally published in dutchDutch, *De dragers en de mensen : het einde van de massawoningbouw* (Amsterdam : scheltemaScheltema&Holkema, 1961).

21. Dominique Rouillard, *Superarchitecture. Le futur de l'architecture 1950-1970*, (Paris : Editions de la Vilette, 2004), 14.

22. Dominique Rouillard, *Superarchitecture. Le futur de l'architecture 1950-1970*, *ibid ibidem*, 83.

'INDETERMINACY – RELAXED SCENE

Oxford Dictionary definition : Indeterminacy : "Not of fixed extent or character, vague, left doubtful". Archigram usage : Of varying evaluation. Not one answer. Open-endedness.

Archigram propositions worry the mainstream deep down because they threaten the propriety of Architectural values. 'Good' architecture, as most architects regard it, involves preferred forms, arrangements or formulae. Most often these have a moralistic "rightness" in the argument somewhere.

To be seen to be doing the right thing is regarded if not always admitted to. If we fly directly in the face of this, we fall into a trap. If we purposely do the opposite we simply mirror the close-endedness of 'good'....buttoned-up architecture.

Indeterminacy is not immoral....it is a-moral.[...]The real indeterminate is a relaxed, easy going scene²³.

23. Peter Cook, "Indeterminacy – Relaxed Scene", *Archigram*, no.8 (1968).

Theoretical origins of megastructure

In his book *Superarchitecture*, Dominique Rouillard pinpointed the first use written use of the word 'megastructure'²⁴ in 1962 in an article written by Peter Smithson, describing Kenzo Tange's project for Tokyo Bay. Fumihiko Maki and Ralph Wilcoxon give us respectively a definition of the megastructuralist issue in 1964 and 1968, which will then be relayed in Banham's book in 1976.

24. Rouillard, *Superarchitecture*, 14.

As part of our research, we have been able to find a precedent for the use of the term "megastructure". In our archive research, we discovered a correspondence sent by Fumihiko Maki himself, to a printed edition of the Post Box for Habitat edited by Jaap Bakema. It was actually composed of correspondences sent by architects who proposed to share their thinking about the issue of housing for the Great Number. In the ninth edition, containing correspondences from December 31, 1961 to May 5th, 1962, Maki proposes a text, dated from April 1962, on collective forms in which he details us the three types of form: compositional, megastructural and group-form. This text is therefore a precedent in the use of the term 'megastructure'²⁵.

25. Fumihiko Maki and Jerry Goldberg, "Linkage in collective form. Collective form Report 2'2", in Jaap Bakema, "' Post Box for the Development of the Habitat'", *Newsletter*, #no.9, (June 1st, 1962).

In this article and in the 1964 publication, Maki theorizes the concept of megastructure or megaform.

For Maki, also relying on a reading of Tange's project, as Peter Smithson did, 'the megastructure is a large structure in which all the functions of the city or parts of the city are contained. [...] In a sense, it is a man-made feature of the landscape'²⁶. The Japanese architect also opposes the idea of a macro-structure capable of lasting according to a longer

26. Fumihiko Maki and Masato Ohtaka, "Collective Form. Three paradigms'paradigms", in ed. Fumihiko Maki (ed.) Fumihiko Maki,, *Investigations in Collective Form* (Saint Louis, 1964), 8.

life cycle, and a micro-structure, or secondary system, which corresponds to smaller units that can be plugged into the structure and be modified according to a shorter life cycle.

Four years later, Wilcoxon drew up the preface of his book *Megastructure Bibliography*, including a definition in four points of the megastructure. This last one is 'not only as a structure of great size, but... also a structure which is frequently:

1. *constructed of modular units;*
2. *capable of great or even "unlimited" extension*
3. *a structural framework into which smaller structural units (for example, rooms, houses, or small buildings of other sorts) can be built – or even "plugged-in" or "clipped-on" after having been prefabricated elsewhere ;*
4. *a structural framework expected to have a useful life much longer than that of the smaller units which it might supports.*²⁷

27. Ralph Wilcoxon, *Council of Planning Librarians Exchange Bibliography (Monticello, III)*, (Charlottesville: University of Virginia, 1968), 266, 1968, 2.

As mentioned by Banham²⁸, in his book on megastructures, Wilcoxon's definition includes a multitude of considerations that are not present in Maki's one, but have in common the distinction of the fix / transient pair, a primary / secondary structure, joining the Smithson's that we have previously mentioned. This conception of what we can mention as an 'open structure' is what we identified as the first conceptual legacy of megastructuralist theories. The second one is according to our reading, the capacity of the building to contain the functions related to the city, because of its formal strength and size, and in so doing, becomes a landmark.

28. Reyner Banham, *Megastructure. Urban Futures of the Recent Past*, (London, Icon Editions, 1976), 9.

In 1966, the German architect O.M.Ungers published an essay 'Grossformen im Wohnungsbau'²⁹. Through this text, Ungers gives us a definition of architecture as a figure capable of having a morphological impact on the city. Although *Grossform* literally means 'large form', the definition of 'large' focuses on the strength of a form rather than its size. The architect's concerns are about an expression of formal coherence.

29. Oswald. Mathias Ungers and, Erika Mühithaler, (eds.), 'Grossformen im Wohnungsbau', published as #no.5 of *Veröffentlichungen zur Architektur* (Berlin : TU Berlin), december December 1966). It was later published in *Aujourd'hui : Art et Architectures*,s #no.57-58, (October 1967,): 108-113.

"Only when a new quality arises from beyond the mere sum of individual parts, and a higher level is achieved, does a *Grossform* arise. The primary characteristic is not numerical size. A small house can just as well be a *Grossform* as a housing block, a city district or an entire city".

To illustrate his idea of *Grossform*, Ungers relies, among other things, on projects of his Team ten colleagues. Based on these projects, Ungers shares his definition of *Grossform* with four formal categories:

1. 'The existence of an over-accentuated element
2. The existence of an additional binding element
3. The existence of figure and theme
4. The existence of a system or an ordering principle'.³⁰

30. Oswald. Mathias Ungers, '«Notes ont Megaform' », in O.M.Ungers, Erika Mühithaler (eds.), 'Grossformen im Wohnungsbau', eds. Oswald Mathias Ungers and Erika Mühithaler, (Berlin, TU Berlin, 1966), 6.

The German architect tells us of four categories of *Grossform*: 'Street,' 'Plateau,' 'Wall,' and 'Tower'. The first two categories are labeled 'functional' while the latter are described as formal and express an interest in form as visual impact. This last grouping, the wall and the tower, highlights the interest of Ungers in typologies. Through these affirmations, Ungers shows the tendency towards architectural autonomy which distinguishes his approach from Team Ten principles.

At the end of his manifesto, Ungers shares an important point, announcing the prelude to the "archipelago city" when he answers: 'Why *Grossform*?'

'Grossform creates the framework, the order and the planned space for an unpredictable, unplanned for, spontaneous process – for a parasitic architecture. Without this component any planning remains rigid and lifeless.'³¹

To illustrate his point, Ungers appeals to the imagination of the medieval city of Arles. The capacity of the formal framework is here disconnected from social connotation and ideology.

The explicit emphasis is made on the typical strong forms of architecture, able to integrate interchangeability.

In 1969, Superstudio, in an article in *Domus*, "Discorsi per immagini", evokes similar concerns to the formal power of architecture approached by Ungers. The Italian architects will explain their concerns in a series of collages and a text about the "Continuous Monument".

Although Superstudio's proposals are based on the language of megastructures, representing a 'total urbanization model', its formalization is made of a continuous three-dimensional structure. The pattern of the grid spreads across the territory, impassive, "neutralizing", with the aim of returning to the eternal monument. The imaginary conjured up in the collages made by the Italian radicals, undeniably appeal to the power of architecture, as an act of creation "appearing as the only alternative to nature"³². Superstudio imagine a future 'in which all architecture will be created with a single act, from a single design capable of clarifying once and for all the motives which have induced man to build dolmens, pyramids, and lastly to trace (ultima ratio) a white line in the desert. The Great Wall of China, Adrian's Wall, motorways, like parallels and meridians, are the tangible signs of our understanding of the earth'³³.

It is interesting to note that the imaginary here is also typological, as are the 'Wall' and the 'Tower' of Ungers. The power of these artefacts, these *objets trouvés*, to act on the territory, to become a landmark, and therefore by extension, to become a *Grossform*, are for us a second legacy of the megastructure discourse also put forward by Banham.

31. Oswald Mathias.M. Ungers, and Erika Mühithaler, (eds.), *Grossformen im Wohnungsbau/Wohnungsbau*, not numbered (translation by the author), original quote: 'Warum Grossform?... Die Antwort: Die Grossform schafft der Rahmen, die Ordnung und den geplanten Raum für einen unvorhersehbaren, nicht planbaren lebendigen Prozess, für einen parasitäre Architektur. Ohne diese Komponente bleibt jede Planung starr and leblos'.

32. Superstudio, "Discorsi per immagini", *Domus*, no.481 (1961). It was later published and translated in English in Peter Lang and William Menking, *Supersudio, Life Without Objects*, (Milan, Strika editore, 2003), 122.

33. Peter Lang, and William Menking, *Supersudio, Life Without Objects*, (Milan, Strika editore, 2003), 122.

In 1976, in his book about megastructures, Reyner Banham speaking of the Atomium building designed for Brussels Expo '58, Reyner Banham tells us that this project 'has something of the overscale and landmark qualities that many megastructures were later intended to present'³⁴.

34. Banham, *Megastructure. Urban Futures of the Recent Past*, 40.

At this stage, we wish to synthesise from our reading of the megastructuralist definitions, theoretical contributions by distinguishing two key concepts both of which are linked to the understanding of architecture as a dynamic and evolutionary process: the open structure and the megaform. These two concepts are essentials and both represent two variations in the contemporary developments of the megastructuralist discourse.

The 'Open Structure'

The 'open structure' results from an application of the principles of 'growing form' and 'aesthetic of change' as previously described. It represents a way of understanding architecture not as a finished object, but as a perennial support enabling temporary appropriations that are sustainable to a greater or lesser degree. The concept of an 'open structure' also presupposes a capacity for growth and transformation in time, without change of nature. Following the biological and molecular structures put forward by the Independent Group in the exhibition *Growth and Form*, it is organised around principles of spatial arrangements, 'patterns', offering supports and facilities for the implementation of functional programmes that are partially or totally indeterminate.

This principle supposes a possibility for evolution of architecture over time, considering that the programmes which take place in the structure as defined can be added, withdrawn or modified without changing it. The structure, whether or not it is seen as perennial, possesses a greater sustainability than the programmes it welcomes.

An architecture incorporating the 'open structure' principle can also be designed in such a way as to expand over time, extending the principles of arrangement from which it was organised in the first place, like the 'endless architecture' theorised by Llewelyn Davies and Weeks, and whose principles are applied to the Northwick Park Hospital project.

Applying the 'open structure' principles involves defining the minimal spatial characteristics necessary for the viability and quality of an architecture intended to develop over time and/or to receive variable programmes over time.

In addition to the theoretical origins mentioned above, this principle of the 'open structure' was largely applied in the neo avant-garde projects developed during the 1960s by the members of Team X, their successors, such as Yona Friedman and his *Urbanisme Spatial* and, in its more recent

developments, by some contemporary architects who specifically refers to Friedman, such as Lacaton and Vassal³⁵.

35. Cristina Diaz Moreno and Efrén García Grinda, "Everyday Delights. A conversation with Anne Lacaton and Jean Philippe Vassal/Vassal", *El Croquis*, no.177/178 (2015), : 27.

Megaform as architectural permanence

In order to maintain a reciprocal relationship with the territory, the context, the theoretical conception of the megastructure gives us to read an inherent potential: that of becoming a landmark. In 2009, Kenneth Frampton conceptualizes this potential to be a 'powerful landscape' and refers to it as 'megaform'³⁶, referring to Maki's text and hinting connections with Ungers's *Grossform* preoccupations. For Frampton, the architects

36. Kenneth Frampton, *Megaform as Urban Landscape*, (Michigan, University of Michigan, 1999), 28.

*'can only intervene urbanistically in an increasingly remedial manner and that one effective instrument for this is the large building program that may be rendered as a megaform – as an element which is due to its size, content and direction has the capacity to inflect the surrounding landscape and give it a particular orientation and identity. I believe that such forms are capable of returning us to a time when the prime object was not the proliferation of freestanding object but rather the marking of ground'*³⁷.

37. Kenneth Frampton, *Megaform as Urban Landscape*bid., 40.

The English critic opposes the term 'megaform' to that of 'megastructure', returning to the original text of Maki dating from 1964. For him, a differentiation must be made between the two terms. In the 1960s, the two words were synonymous, but here a nuance is introduced: 'Thus, while a megaform may include a megastructure, a megastructure is not necessarily a megaform'³⁸. To support his remarks, Kenneth Frampton gives us a proposition of definition in 5 points:

38. *Ibid.*bidem, 16.

1. *'A large form extending horizontally rather than vertically*
2. *A complex form which, unlike megastructure, is not necessarily articulated into a series of structural and mechanical subsets as we find for example in the Centre Pompidou*
3. *A form capable of infecting the existing urban landscape as found because of its strong topographical character*
4. *A form that is not freestanding but rather insinuates itself as a continuation of the surrounding topography, and last but not least*
5. *A form that is oriented towards a densification of the urban fabric'*³⁹

39. *Ibid.*bidem, 20.

To illustrate his point, the historian of Columbia University reminds us of some projects of Botta and Snozzi, including the project of 'viaduct' block for an administration center in Perugia in 1977. This artifact or megaforms *objet trouvé*, the viaduct, joined the considerations of the 'Continuous Monument', and its demiurgic impact on the territory. It also reminds us of the Ponte Vecchio, evoked by Wilcoxon as the 'purest example'⁴⁰ of a

40. Banham, *Megastructure. Urban Futures of the Recent Past*bidem, 13.

megastructure. The infrastructural character of the bridge, the viaduct, are references to *objets trouvés* evoking the universe of the megastructure and constitutes the second living heritage of megastructures.

Nevertheless, just as Banham announced the death of Megastructure, the model of megastructure did not last as a universalizing model of urbanization, but what constitutes its legacy, namely the concepts of open structure and megaform has known a major conceptual change: their formalization took the shape of fragments of cities and no longer the one of a totalizing urban model.

However, some contemporary practices still looks for the desire to give shape to landmark and indeterminacy, articulating transient and permanent design, representing or anticipating the perpetual change of the society and in so doing constitutes a legacy of megastructure to urban theory and history.

From massification to fragmentation: a shift towards a post-universal context

If the theoretical developments operated in Dubrovnik and Otterlo had the objective of a deep critical redefinition of modernist theories, they shared with it the ambition of a radical and global transformation of living conditions, without any limits of scale through time and space. As above-mentioned, the megastructure shared the same ambitions.

At the beginning of the 70s, in the context of deep questioning of these global models, the Smithson, members of the Independent Group, like Reyner Banham, wrote a series of articles in which they reconsidered the notion of the collective and suggested a change of point of view. Starting from an architectural theory based on massification (the greater number), they suggested reorienting towards a fragmentation, offering more individual freedom, an 'increased model of diversity'⁴¹. The most striking article indicating this reorientation was published in *The Violent Consumer, or Waiting for the Goodies*, written in 1974 after abandonment of the collective housing project of Robin Hood Gardens:

'The idea of fragmenting the mass movements, compartmenting in free choice, is worth trying [...] Fragmentation, so that the pieces each become the size that mends minds, responding to those demands in society that are poles apart at the moment : the wish for anonymity - or identity; the desire for patterns of association – or disassociation; a turn away from the solution to be universally consumed towards solutions personally made or chosen; a return to different quality of life to be enjoyed in built places...

*We must move on to that next level where the underlying belief in brotherhood is rooted in a sufficiently strong trust that we are all Greeks [...] to allow society to freely fragment, become compartmented, group in its own loose way, seek difference in quality through effort in work- or not, as the case may be.*⁴²

41. Dirk van den Heuvel, "Team Ten Diagrams", *Daidalos*, no.74 (2000),): 50.

42. Alison Smithson, "The Violent Consumer, or waiting for the goodies", *Architectural Design*, no.5, (1974),: 274-279.

The question of the multiplicity of singularities was already present in the conference on the open form by the Hansens and the considerations of Archigram on indeterminacy. But here it reaches a supplementary degree of impregnation. It is no longer a case of only considering the individual, but also groups at all scales ('fragmenting the mass movements', 'patterns of association', these being left to their free association, not determined by patterns or predetermined structures).

In 1978, Rem Koolhaas published *New York Delire*⁴³. He described there the town as an 'archipelago' as 'cities within cities'. The more each island celebrates different values, different identities, and the more the unity of the archipelago as a system is reinforced. In this model, 'change' is contained in the components of the islands, which freely develop in relation to each other while also interacting with each other. These considerations on fragmentation appeared barely four years after the article by Alison Smithson and two years after Banham's publication on megastructures. It initiated the idea of the town in the town, later developed in the work of the OMA. The idea of 'cities within cities' also reminds us Maki's consideration on megastructure and 'The megastructure is a large structure in which all the functions of the city or parts of the city are contained'⁴⁴. In his work, Koolhaas, referring to the 'self-monument'⁴⁵ identifies in its capacity to gather the functions of the city, in the indeterminacy represented by its typical plan, in the landmark that it symbolizes, the true theoretical model of the big building.

Bigness as a contextualized Megaform

First of all, to understand this project strategy, it seems important to us to identify in Rem Koolhaas' remarks, an interest in the speech of the Team X architects and their criticism of the closed form. In an article published in *El Croquis*, Koolhaas tells us that he will understand 'retrospectively' the Smithson's investigations into the dis-order, the indeterminacy and will say about his plans for La Villette and the Hague City Hall. that they 'were to some extent one-sided dialogues with the Smithsons'⁴⁶. To this he adds that he has tried to find, to solve, by telling us about indeterminacy, 'what the Smithson - or the Team X - have always left unresolved, namely'⁴⁷, 'how it is possible to combine a real indeterminacy with an architectural specificity'⁴⁸. This change of scale of consideration, from an urban reflection to architecture, is made explicit by Koolhaas and crystallizes in his conception of Bigness.

This preoccupation where the city is perceived from the perspective of architecture also recalls Ungers' essay on *Grossform*. The essential difference between O.M. Ungers, in particular, and Rem Koolhaas, is that *Grossform* is mainly defined by its formal qualities, whereas Bigness defines himself from its scale which transcends the form entirely. According to the Dutch architect, a new type of building, the "very large

43. Rem Koolhaas, *New York Delire*, (Marseille: Editions Parenthèses, 2002), 294.

44. *Ibid.*, *Ibidem*, 8.

45. Rem Koolhaas, *New York Delire* *Ibid.*, 100.

46. Alejandro Zaera Polo, "Finding Freedoms : Conversations with Rem Koolhaas'Koolhaas", *El Croquis*, no.53 (1992),): 16.

47. Alejandro Zaera Polo, 'Finding Freedoms : Conversations with Rem Koolhaas' *Ibid.*, 16.

48. *Ibid* *Ibidem*.

building" demanded by contemporary programs is announced by the skyscraper and corresponds to the first truly metropolitan building of the twentieth century. The enumeration of the principles of Bigness published in the book *S, M, L, XL*, states a clear principle of indeterminacy: 'In Bigness, the distance between the heart and the envelope increases to the point that the facade can no longer reveal what is happening inside. The humanist expectation of "honesty" is doomed; interior architecture and exterior architecture become separate projects, one being linked to the instability of programmatic and iconographic demands, the other - agent of disinformation - offering the city the apparent stability of an object'⁴⁹. This analogy emphasizing the dichotomy between form and function has already been put forward by Ungers when he evoked the city of Arles⁵⁰. The relations between the founder of OMA and the German architect have been established since 1977, especially during the participation of Koolhaas in a 1977 studio.

In short, Koolhaas "combines architectural specificity and programmatic instability"⁵¹

The project to meet this objective can work by assembly, as that was the case with the proposal for the extension of the Dutch Parliament to The Hague in 1978. This project proceeds by stacking programs designed by three different architects: Hadid, Zenghelis and Koolhaas, the latter ensuring the connections between the different parts, all taking the form of a "guitar". It is for this project to design a small skyscraper without spatial articulation between the levels. Vertical circulation is provided by an elevator. This project is presented by the OMA as a questioning of three considerations: the fragmentation of a set into smaller components, the aporia of contextualism and finally, the traditional typology.

Programmatic instability represents a new kind of 'open' form and goes beyond composition because it calls for strategies. It seeks to respond operationally to the development of a contextualized architecture, responding to a metropolitan condition, which is no longer satisfied with being like the megastructure, 'criticism as decoration'⁵². Koolhaas applies also in a processual way, the observations of 'determined elements' and 'indetermined'⁵³ one that Candilis mentioned as a model of design for housings. Koolhaas applies it to all programs as 'generic' and 'specific'. The first theoretical considerations of this approach have been tested in the Hague City Hall project and exposed in a publication 'Indetermination and specificity'⁵⁴.

According to him, a new type of building, the "very large building" demanded by contemporary programs is announced by the skyscraper and corresponds to the first truly metropolitan building of the twentieth century. The enumeration of Bigness principles is first published in OMA-Rem Koolhaas. For a culture of congestion. The principles or theorems will be taken up in *S, M, L, XL* and are here entirely quoted:

49. Rem Koolhaas, "« Bigness or the Problem of Large »", dans in O.M.A. Rem Koolhaas et Bruce Mau, *S,M,L,XL*, (New York, The Monacelli Press, 1995), 499-502.

50. O.M.Ungers, and Erika Mühithaler (eds.), 'Grossformen im Wohnungsbau', 6 ibidem.

51. Rem Koolhaas, "I combine Architectural Specificity with Programmatic Instability", conversation with Jaime Yatsuka, in *Telescope*, Tokyo, no.3, (1989,): 7.

52. Rem Koolhaas, "Bigness or the Problem of Large", in O.M.A. Rem Koolhaas et Bruce Mau, *S,M,L,XL*, (New York, The Monacelli Press, 1995), 499.

53. Georges Candilis, «, ' Proposition pour un habitat évolutif' évolutif», in *Le Carré Bleu*, no.2 (1959,): 4-5.

54. Dans Patrice Goulet, (édéd.), *Six Projects*, (Paris-Rome, Ed. Carte Segrete, 1990), 181-223. Le projet est publié dans *The project is published in O.M.A. Rem Koolhaas et Bruce Mau, S,M,L,XL*, op.cit., 544-569.

1. *Beyond a certain critical mass, a building becomes a Big Building. Such a mass can no longer be controlled by a single architectural gesture, or even by any combination of architectural gestures. This impossibility triggers the autonomy of its parts, but that is not the same as fragmentation: the parts remain committed to the whole*
2. *The elevator – with its potential to establish mechanical rather than architectural connections – and its family or related inventions render null and void the classical repertoire of architecture. Issues of composition, scale, proportion, detail are now moot. The ‘art’ of architecture is useless in Bigness.*
3. *In Bigness, the distance between core and envelope increases to the point where the facade can no longer reveal what happens inside. The humanist expectation of “honesty” is doomed: interior and exterior architecture become separate projects, one dealing with the instability of programmatic and iconographic needs, the other – agent of disinformation – offering the city the apparent stability of an object. Where architecture reveals, Bigness perplexes; Bigness transforms the city from a summation of certainties into an accumulation of mysteries. What you see is no longer what you get.*
4. *Through size alone, such buildings enter an amoral domain, beyond good or bad. Their impact is independent of their quality.*
5. *Together, all these breaks – with scale, with architectural composition, with tradition, with transparency, with ethics – imply the final, most radical break: Bigness is no longer part of any urban tissue.
It exists; at most, it coexists.
Its subtext is fuck context⁵⁵.*

In Koolhaas' vision, the idea of indeterminacy remains ubiquitous, but is understood as a world in perpetual change, where areas are left free to allow future modifications. These concerns allow us to hang this design on an open order and an open aesthetic. Unlike the megastructure, for which Koolhaas tells us that Friedman's *Urbanisme Spatial* is a 'criticism as decoration', because it is not located, universal, the work of the OMA is again focused on the architectural specificity and so project a fragment that 'represents the city; or better still it is the city'⁵⁶, reminding again Maki's definition of what a megaform is.

55. Rem Koolhaas, "Bigness or the Problem of Large", 499-502.

56. Koolhaas, "Bigness or the Problem of Large" *ibidem*, 515.

Typical Plan

To focus again on the notion of indeterminacy and non-plan, Adrien Besson⁵⁷ shares with us a research on the issue of 'open planning', as discussed by the Quickborner Team in Germany in the 1960's planning means 'a way of designing office spaces without using partitions'⁵⁸. The resulting spaces are neutral spaces, and therefore indeterminate. All the elements are movable and thus of 'plug-in' type, according to Lefaivre's research for the facilities of Mies van der Rohe. The other elements not having an indeterminate, provisional nature, being able to be modified at any time, and which are of the order of permanence, are the core of circulation and services. These concerns are reminiscent, on a different scale, of the notions of fix and transient of Smithson as well as the 'determined' and 'indetermined' elements of Candilis. This opposition between the determined and the indetermined, the fix and the transient, the permanent and the ephemeral, appears thematically in the project for the headquarters of Universal in Los Angeles and designed by OMA. About it, Koolhaas says: 'The neutrality of each floor is given by the presence of four cardinal points: towers that interpenetrate office spaces to provide the specific requirements and needs of the generic floors. Where office spaces are indefinite, the identity of each tower is singular'⁵⁹. This approach integrates the idea of indeterminacy of the Typical Plan as Rem Koolhaas speaks of it in *S, M, L, XL*: 'Typical Plan implies repetition - it is the umpteenth and there must be many - and the indetermination. To be typical; he [the plan] must be sufficiently indefinite'⁶⁰.

In a later presentation of the project, Rem Koolhaas adds: "The organization of the building becomes a literal diagram of the particular and the generic: specificity in the vertical dimension, generic space of offices in the horizontal. As tumultuous as the composition of society becomes, the office floors provide the necessary flexibility, while the towers ensure that a single unit is preserved"⁶¹.

The 'Typical Plan' combined with 'Bigness' as a strategy of design integrates the indeterminacy of a 'relaxed, easy-going scene' where everything can happen and the physical presence of a big building, represents a megaform, a landmark, forming as such, from our point a view, one conceptual rapprochement of megastructures issues. These considerations find a clear expression in OMA's project for Rue de la Loi in Brussels

OMA –The Megaform of Rue de la Loi

The proposal of the Office for Metropolitan Architecture tries to answer two contradictions inherent to the program:

'- to improve the urban qualities of the already congested Rue de la Loi by doubling its density;

57. Adrien Besson, *Stratégies versus composition*, PhD presented in 2009, l'EPFL, 79.

58. John Pile, *Open office planning*, (London: The architectural Press, London, 1978,), 11.

59. Rem Koolhaas, "Introduction", *a+u*, n0no. 1(, 2001,): 7.

60. Rem Koolhaas, "Typical Plan", O.M.A. Rem Koolhaas et and Bruce Mau, *S,M,L,XL*, op.cit., 333-351.

61. Description of the project in *El Corquis*, no. 131-132 ("AMOMA Rem Koolhaas (I) 1996-2006"), (2006,): 108.

- to create a new European quarter on a site which is already occupied by a traditional example of the European city. The first issue is morphological, the second symbolic. To answer his stakes, Rem Koolhaas and his team propose the use of a *objet trouvé*, the 'portico', the classic emblem of the 'public'⁶².

To respond to these challenges, Rem Koolhaas uses a '*structure à l'enjambée*'⁶³ to reduce the footprint of the proposed building, and frees up the street. The project borrows from Superstudio the use of a three-dimensional neutral grid, leaving nothing to perceive of what is happening inside. It is important to remind that Koolhaas was close to Natline, since 1970, and has borrowed heavily from the universe of representation of the Italian radicals⁶⁴.

The whole passes over the neighborhood, imposing itself as a landmark.

About that, the OMA will tell us:

'As a skyline, the contrast between the European and the private orientation, represents a prototype of retroactive planning that is not based on the power of the Tabula Rasa, but that accepts the givens of Conferences of Political Space from Washington's Mall to the Forbidden City.

The project is made up of several fragments, which 'Together, this chain of fragments offers an exemplary demonstration of the combination of the modernity and history that is the essence of the European project'⁶⁵.

This example of design illustrated here by a proposal for the city of Brussels, relies on representations and vocabulary of the megastructure: the three-dimensional grid and programmatic indetermination. The proposal is also monumental, borrowing the repertoire of *objets trouvés*, while wanting to mark the skyline of the European capital. This proposal is a legacy of megastructuralist theory and contemporary development

Lacaton and Vassal: extra space and 'open structure'

On their return from Africa, Anne Lacaton and Jean-Philippe Vassal worked on the project of the Latapie house. For these architects, it was important to think of housing in an alternative way. This project was an occasion for them to think about the type of housing an ordinary family could afford. According to building standards, they could consider a house that was 80m² in size. The objective followed by the architects was to produce a bigger house, 'not an extra 10m², but perhaps twice as big if possible, because we are intimately convinced that you'd live better in a big house and that also offers an opportunity to have different sorts of spaces and atmospheres'⁶⁶. The architects responded to this equation by designing the accommodation inside an agricultural greenhouse, an

62. Description of the project on www.oma.eu.

63. Expression borrowed from Yona Friedman, "Urbanisme Mobile", *l'Architecture d'Aujourd'hui*, no.102, (1962); 76.

64. For further developments on Rem Koolhaas's relationship with Natline, see Dominique Rouillard, *Superarchitecture. Le futur de l'architecture 1950-1970*, (Paris : Editions de la Vilette, 2004), 511-526 and Roberto Gargiani, *Rem Koolhaas-The Construction of Merveilles*, (Lausanne, PPUR, 2011), 5-6.

65. Description of the project on www.oma.eu.

66. Rem Koolhaas, *New York Délire*, (Marseille: Editions Parenthèses, 2002), 294.

industrial device making it possible to provide an inner space with a controlled climate and with very low construction costs.

This 'extra space' is also mentioned by the architects as 'double space'⁶⁷ depending on the project. Their quest for a complementary space changes architecture by offering a better quality of life to the residents, and freedom of appropriation by the fact that the available surface is not totally invested by a determined program.

For the authors of the project, 'You don't have to conceive everything; you just have to give [the inhabitant] the potential space to be used and appropriated. If you give enough qualities and a range of capacity, then you provide maximum opportunities for everybody and the project will assume to be changed, transformed and re-appropriated'⁶⁸.

For Lacaton and Vassal, this possible degree of appropriation and freedom is a definition of 'luxury': 'luxury is linked to freedom of use and a high level of possibility and minor constraints, in order not to set limits to your imagination and desires and is not linked to the cost'⁶⁹ of a construction. By the way, the architects humorously adopted a famous advertising slogan from a car brand, "What if real luxury was space"⁷⁰.

In a text published in 2014⁷¹, the architects claimed principles that were very close to the definition of the open structure mentioned above. Besides, the term 'open structure' is cited in this text:

'We always aim to make [the structure] independent of what it contains, so as to let this content emerge. The structure should be free, very roomy, in order to create a new rapport with climate and the ambience, a new rapport with activity so as to produce the conditions for mobility and enjoyment. A structure that generates urbanism through its capacity to interfere with existing structures and activate the urge to continue the city. We always approach this concept of an open structure through the imaginary aspect of the fabric, the imaginary aspect of the expanse [...]'⁷²

In this short extract we find the two general principles of the open structure: programmatic indetermination ('the structure independent of what it contains') and the possibility of growth ('activate the urge to continue the city', 'imaginary aspect of the expanse').

Later, Lacaton & Vassal spoke about the possibilities offered by the use of agricultural greenhouses as a basic structure for creating housing or other programmes, as 'an open structure for inventing climate and ambience'⁷³. They indicate that, contrary to the usual 'defensive'⁷⁴ approaches concerning the insulation of buildings, agricultural greenhouses are envelopes that 'play and react with the outside'⁷⁵.

The architects also claim to have conceived the architecture 'from the interior. [...] We do not think of the exterior project as an act of distancing in itself, but we try to construct a multitude of situations of uses that are linked and connected to each other'⁷⁶. This approach to space 'from the

67. Cristina Diaz moreno Moreno and Efrén García Grinda, "Everyday Delights.", . A conversation with Anne Lacaton and Jean Philippe Vassal", *El Croquis* no.177/178 (2015), 9.

68. *Ibid.*, 11.

69. *Ibid.*, 17.

70. Anne Lacaton, *Conférence in BOZAR, Bruxelles, 4/12/2008*.

71. Anne Lacaton and Jean-Philippe Vassal, "Structural freedom, a precondition for the miracle", in *Lacaton & Vassal. Recent work*, 2G, no.60 (2012), : 162-175.

72. *Ibid.*, 162.

73. *Ibid.*, 166.

74. *Ibid.*

75. *Ibid.*

76. Diaz Moreno and García Grinda, "Everyday Delights.", 25.

interior' resonates with the suggestions of Mereau-Ponty, cited by Lucan when he evokes architecture as a 'milieu'⁷⁷: 'I do not see it [space] in terms of its external envelope, I live it from within, I am included in it. After all, the world is around me and not in front of me'⁷⁸.

Mostly, Lacaton and Vassal tries to build an 'open structure' made of a three-dimensional structure containing transient functions. Lacaton and Vassal, by referring explicitly to Friedman and Frei Otto⁷⁹, by shaping the dual primary/secondary structure, try to pay tribute to megastructure even if their scale of project represents a 'fragment'⁸⁰ of a city and not a total model of urbanization.

The open structure of the School of Architecture in Nantes - Lacaton and Vassal

For Lacaton and Vassal, the notion of 'extra space' is decisive in the conceptualization of their project. It is a complementary space, indeterminate, free of appropriation, considering various scenarios, not imagined in the initial programs given to the architects. In the case of the Nantes School of Architecture, the addition of an indeterminate space, similar in size to the initial program, is obtained not by a duplication of the budget, but by a reflection on the subject, on the constructive system and by conviction in an open-ended approach, allowing the created places to reinvent themselves, putting the user as an actor, able to invest this space without programming. Here, the process used to reduce construction costs, allowing a multiplication of the requested program, is obtained by a process of 'cross-typologisation'⁸¹. This process aims to import for a different program, a foreign construction to the original program. The system adopted as part of this school takes the form of a multi-level car parking building. This 'cross-typologisation' makes it possible to generate a spatial experience in connection with that of a warehouse, a shed, offering an increased flexibility sought. It is not a question of composing a space, but rather of generating an environment offering 'the imaginary of a huge shed, like the big industrial halls Alstom [located] near the site'⁸².

Regarding the *tracé*, defining in this case, the structural aspect, it breaks down into two systems:

- The primary structure of the three main levels, is made of reinforced concrete and consists of a square grid of 10x10m poles. Its load capacity allows trucks to arrive inside the project, and allows students to build on a 1:1 scale. It offers the advantage of longer durability than the secondary structure

- The secondary structure, lighter is made of steel, and offers unscheduled trays, creating a system suitable for its extension and its future development. These 'infills' are similar in their plastic expression, to an 'aesthetics of change', as the Smithson had approached from the

77. Jacques (Lausanne, EPFL-PPUR, 2016)

78. Maurice Merleau-Ponty, *L'Œil et l'esprit* [1964] (Paris: Gallimard, 2002), 59.

79. Diaz Moreno and Garcia Grinda, "Everyday Delights.", 27.

80. Ibid., Ibidem, 25.

81. Ilka et and Andreas Ruby, "Extra Space, Extra Large: On the Recent Work of Lacaton & Vassal", in *2G Books*, (2007,): 7.

82. Anne Lacaton and Jean-Philippe Vassal, "La libertad structural, condicion del milagro - Structural Freedom, a Precondition for the Miracle", *2G*, no. 60 ("Lacaton & Vassal"), (2012):, 162.

case of the Eames and forms a programmatic indeterminacy.

The main floors have a double height configuration, allowing secondary subdivision. They are connected by an external ramp and gradually bring the ground surface into contact with the sky in a continuous movement. The project offers promontories, points of view, making possible an architectural walk offering in its realization, a view on the Loire.

From a systemic point of view, the structural grid adapts to the layout of the plot. It is deformed where the plot folds. The overall shape is thus obtained by extrusion of the permissible surface.

Conclusion

In our article we have highlighted the first use of the word 'megastructure' by Fumihiko Maki in a letter sent to Jaap Bakema in April 1962.

Through our reading of the definition of megastructure by Maki and Wilcoxon, the concepts of 'open structure', 'indeterminacy' and 'megaform' were put forward.

Firstly, 'Bigness' offers a convincing model of hypersize building trying to combine 'indeterminacy and specificity', 'fix and transient', permanent and ephemeral. It also represents a 'megaform' which 'is a city' that inflects its surroundings becoming as such a landmark. The repertoire is the one of megastructures, offering a three-dimensional structure, exploring the realm of *objets trouvés*.

Secondly, the 'Open structure' shapes the opposite primary/secondary structure, offering a neutral plan, able to welcome undetermined programs. In the work of Lacaton and Vassal, this duality is also accentuated by an 'aesthetic of change' representing the capacity of a building to change.

We also highlighted the main conceptual change, which occurs in the scale of consideration: the universalizing model becomes a fragment. Nevertheless, this fragment is the expression of the public as well as the individual and can express further developments of open-ended design, relying on 'Open Form' issues.

These potential legacies suggests that megastructure theories are still relevant in the contemporary urban and architectural discourse and can be explored in order to address the question of uncertainty in architecture and to enliven the way we experienced buildings.