Concretion, abstraction: The place of design processes in the theory of architecture
Case study: Herzog & De Meuron

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Introduction

I began to think about the relation between the design process and the theory of architecture when I was in charge of the construction lesson at the Catholic University of Louvain (UCL - Université Catholique de Louvain). I realized that my students did not have access to an important part of the architectural profession. They could not measure the importance of materials and their use in the conception process of the project. And I had the feeling that the design process affects today the theory of architecture. Therefore I based my teaching on case studies. Doing this, I noticed that the design practice today operates more by "examples" than by general understanding. When considering examples, designers are confronted with a tension between reproduction and differentiation (they take over interesting features but also the need to innovate). Through the understanding of contemporary architect's practices, it might be possible to identify some useful tools or principles that enable an open evolution of practices without constraining them into preestablished moulds.
Observing contemporary architecture, as a practitioner and teacher, I become aware of the difficulty to understand the constitutive rules of a project and even when one can identify some, they are often limited in reach. The qualifiers for the word architecture have multiplied over time: minimalism, hygienism, socio-participationism, formalism, high-tech, low-tech, sustainable and eco are some examples. After one century of avant-gardes, architectural practice has been scattered in uncountable styles and streams. This has lead to a free market situation in which architects are confronted by an almost endless catalogue of approaches and styles: between multiple-choice and pragmatist refusal, this context provokes an issue with arbitrariness and relevance. This is probably not an isolated phenomenon. The deconstruction of the architectural design field certainly has its counterparts in other artistic disciplines.
My thinking is fuelled by my cultural position as a European French speaking architect and teacher of architecture.
Jacques Lucan in "On en veut à la composition" (Jacques Lucan, 2002) makes the assumption that the term composition is no longer able to describe the architectural design process. He affirms that architecture does not respond anymore to compositional logics and objectives that make the necessary correspondence of the parts in the unity of the whole the understanding key of architecture. The issue of composition has always played a central role in architectural theory. According to Jacques Lucan, the traditional relationships between the parts ensuring the unity of

the whole, which are embodied in the compositional rules and objectives, fail to give an exhaustive account of most contemporary design processes.

To understand the loss of universal rules (composition) and common ideal (beauty), we can refer to the conference of Bernard Huet "Sur un état de la théorie de l'architecture du XXème siècle" (Bernard Huet, 2003).

Vitruvius, Alberti and architecture theorists, who have followed them, do not make the distinction between architecture and the art of construction. The architect is omniscient and proficient in all disciplines. Traditionally, the architectural treaties are articulated in four parts, no matter how many books they consist of. A first part defines and outlines what architecture is. In this part, the author positions himself in the field of the existing treaties. The other 3 parts redefine or actualize the Vitruvian categories: firmitas (solidity: construction and architecture), venustas (beauty: how to compose) and commoditas (utility: what architecture is for architecture). Until the eighteenth century, it was around theses common themes that the architectural debate was being built. A first rupture happened with the affirmation of Boullée, stating : "Vitruvius is wrong, there are two parts in the architecture, there is art and science and only art, i.e. Art, not the art of building; only art falls under the area of architecture" (Etienne-Louis Boullée, 1968) . For Boullée, Architecture lied in the project itself and not in the built reality. The unity of the Vitruvian trilogy was broken apart.

One can note that this epistemological shift coincided with the appearance of the first engineering schools in France (Ecole Nationale des Ponts et Chaussées was founded in 1747 by Jean-Rodolphe Peronnet following a royal decree). The outbreak of engineering schools fundamentally changed the construction field. The appearance of tender offers and constructive details caused the disempowerment of craftsmen.

This implied a gradual dislocation of the profession of the architect and of the craftsmen, who lost control over some parts of their field, which were based on tradition, and were now confronted with the integration of a group of specialists into the design process.

The nineteenth century and the industrial revolution confirmed the role of engineers by the apparition of new materials such as steel and reinforced concrete, modifying deeply the construction field. This epistemological shift pushed theorists to reinterpret architecture from the Antiquity and of the Middle-Age. This new knowledge questioned the composition processes. Viollet-le-Duc and Gottried Semper were the first to actualize the rupture of the Vitruvian trilogy in theory and in practice. Viollet-le-Duc proposed a theory based on the art of construction itself, in which spatiality was the result of a structural or constructive principle. On the other hand, Gottfried Semper proposed a theory in which spatiality was realized through the disposition of skins ("Prinzip der Bekleidung"). Structure and construction became spatially irrelevant and hidden necessities.

Since then, the Vitruvian categories can be thought separately. This has widened the field of research in architecture considerably and was echoed by "engineer architecture», represented in France at the end of the 19th century by architects like La Brouste and A. Perret. Since the beginning of the 20the century, the avant-garde experiments of the functionalist, formalist and constructivist architects developed the dislocation of the Vitruvian trilogy further. Their projects were mainly directed to one single Vitruvian category and marginalize the other two. Since the end of the 20th

century, the freedom made possible by the Vitruvian dislocation seemed to question fundamentally architectural processes. A shift from a coercitive traditional unity towards a libertarian specialized dislocation had taken place. Are there still recognizable principles inherent to architectural processes? Are there still identifiable endogenous dimensions of architecture?
It is noticeable that nowadays built projects must meet an amount of rules located outside the field of architecture (urban planning, safety, firefighter, budget, image or marketing,…) that dislocate the profession even further. As a practitioner, one can question if there are still common "codes" for architects? Many architects "who build" offer a specific approach to the act of building, as if this was an inalienable aspect of architecture feeding it from the first sketches. I propose that a possible stable ground to all built projects remains in the act of construction. Here I would like to overcome the theoretical "skin-structure" debate induced by Viollet-le-Duc and Gottfried Semper, in order to focus on the making of architecture.

Case study: Herzog & de Meuron

In this contemporary context Herzog & de Meron modified the approach of doing architecture. They propose new design processes detached from tradition without at the same time denying it. They explore and push further the concrete constructive realities of our digital-industrial world. '(…) Herzog & de Meuron have established central position in the architectural discourse through acts of making.' (Nicholas Olsberg, 2002, p8)
The following analysis is based on both their saying and their realized projects. We will base our reflection on the text of a lecture done by Jacques Herzog in 1988 ("The Hidden Geometry of Nature").

1. Architecture of reality

1.1. Tradition

> 'Before I became an architect I went to school for so many years that I learned, and probably changed my own nature in doing so, to do everything with my head.' (Jacques Herzog, 1988)

Jacques Herzog observes this rupture between thinking and doing, between the hand and the head without sadness. Before, tradition was a matrix of comprehension and the identity of things. Since industrialization and since the craft tradition no longer exists, there are so many possibilities, so many directions that can on the one hand make architects and architecture feel lost but on the other open new ways of thinking architecture. Herzog & de Meuron are representative of this new approach and their work is fueled through their reflection about this situation. They affirm that their work stands in no real tradition with earlier architecture. They explore this new field trying to understand what industry offers and analyze the products which are available. They look for a new "tradition" of the use of construction products in architecture. In order to get to that point, they try to be close to the real world and the reality of things surrounding them.

1.2. Reality

> ‘The culture in which we live today, especially the western one, is a culture of blending and mixing substances until they are unrecognizable.’ (Jacques Herzog, 1988)

It is very difficult or impossible to return the constituents of a product to their natural cycle. That means that we cannot understand their constitutional nature anymore. With this observation, Herzog & de Meuron search to find the invisible world in the visible one. The title of the article, “The Hidden Geometry of Nature”, summarizes their interest in the understanding of the mechanism of nature and not the outer appearance of it.
Today, for Herzog and de Meuron, a wall, a floor or a ceiling do not possess their own certainty anymore. They do not constitute the fundamental objects of architecture. Both architects are looking for a new place for these components and for new compositions in the world.

> ‘I believe we are trying to create piece of reality that can be dismantled, if you will, and therefore becomes understandable. After all, we are surrounded by so many things and secrets we cannot decipher, to which we have no access. For that reason, we are producing objects that offer their own language. Such an offering expresses hope.’ (conversation between jacques Herzog and Theodora Vischer, 1988 in Gerhard Mack, 1997, p216)

When elaborating their projects, there is no hierarchy , all internal (programmes, …) and external (site, context, …) constraints are equally taken into consideration without trying to imitate the surrounding urban context or conventional types (without any link to tradition). The architectural object is therefore unique and every project has its own Gestalt that tries to express the reality of the project. In this way they also avoid arbitrariness in their projects.
How is this applied to the realization of projects? Observing some of their projects, we would like to explore how they make the genesis of a project intelligible, the mechanism of it or the mechanism of the “new” use of material. How do they manage to avoid arbitrariness?

2. The material’s space

The following three categories of projects represent the coherence and diversity of the Herzog & de Meuron approach towards construction and materiality.

2.1. The box – non structural stacking

(Figure 1) In a first set of projects, Herzog & de Meuron use the figure of the rectangle and the box. On the occasion of the award of the Pritzker price, they declare that in this period this conceptual a priori expressed the wish to work beyond figurative temptations. It was a reaction against post-modernism and deconstructivism. And a way to create unitary projects. As explains Jacques Lucan, the objective is to render the building, as built object, comprehensible without the help of exterior references, but

comprehensible in itself as syntaxic structure that links all the elements it is composed of.
The composition of the outer walls of the Tavole House, of the Ricola warehouse and of the winery provide us with a first indication of this approach. We realize that they stem from the same way of construction, a non bearing stacking. On the contrary, the reasons or motivations of this stacking are not the same in the three projects cited. They are closely linked to the characteristics of each project.
The Ricola warehouse in Laufen, Switzerland, consists of a stacking of boards (in cement panel) with the objective of linking the scale of the building to the site (the dimensions of the steel structure of the warehouse are huge). On the other hand, this construction technique through stacking constitutes an analogy to the interior stocking system. Hence, the external structure corresponds to the internal one.
The Tavole House in Italy is a building made of dry stone, as the buildings surrounding it. The house distinguished itself through the implementation of the dry stone in a concrete structure which makes the non-structural role of the stones noticeable. Through this particular way of working, they recall tradition and allow the appropriation of the building by the human being. It is not only a technical consequence.
The Gabion facades (wire containers filled with stones) of the Dominus Winery in California, USA, show first of all the inventiveness and the altered use of a construction product which was initially to be used by industry in order to prevent erosion, and here, in this particular example, used to build a wall. The combined gabions and walls allow the isolation from heat during the day and from cold at night. Their density makes this wish to isolate and protect the maturating wine comprehensible. The filling of the wire containers made of basalt stones collected on site and being of varying density allows the infiltration of light from the exterior to the interior during the day and inversely at night. The gabion takes a new shape and its characteristics are exploited in a way which was originally not imagined by its producer. They invent a vernacular form! (Figure 2)

2.2. the twisted box – structure + skin
(Figure 3) In other projects, the box is transformed. It is no more necessarily a warrant of independence for post-modernism. The plans of buildings such as the signal box 4 in Basle, the library of the BTU or the Laban center are deformed and their geometry complexified, which is not only due to the contextual constraints.
Here, the unity of the building is not linked to the shape (of the box) anymore, but is constituted by the skin. The skin wraps around, adapts to and bends according to geometry. The complexity of the reading of the building's different shapes is “compensated” or emphasized by the unity of the skin. The structure of these buildings is simply constituted in relation to the programmes and the internal spatial necessities (column-beam structure, carrying wall, …). The skin is fixed to this in a regular way. It is in some way subordinated to the structure. It plays with the light and allows to “regulate” the relation between the inside and the outside.
We perceive the signal box in Basel like a steel monolith although the building consists of a structure and a skin. The skin plays an essential role in the creation of the monolith because it makes the different levels disappear. But it also remains intelligible as such, given that it consists of horizontal louvers made of Corten steel

that transform themselves in order to let the light penetrate. In addition, the Corten steel cover constitutes a Farraday cage, protecting the electrical equipments. Hence, the skin is not added onto the building, but forms itself the building, touching upon several dimensions: technical, symbolic and visual,…
The polycarbonate facade of the Laban Center in London establishes a relationship between the dancers' movements and the light. It is the external materialization of internal principles of the programme where everything turns around the bodies' movements for which light is essential. Inside, the different spaces transform themselves under the pressure of three vertical knots, introducing instability of movement into the architecture. The coloured, translucid skin reflects this tension at the outside. Through the size of the panels and the regular fixation system the polycarbonate skin is subordinated to the building.
The amide shape of the Cottbus library is the result of an urban strategy which takes into consideration the students' movements and hence creates a specific presence of the building. The concrete structure is covered by a square-shaped glass curtain wall of. The glass is reciprocally printed on. The prints alter completely the perception we would have of a glass building. It takes away the reflections and hardness of the glass and contributes to the homogeneous aspect of the building.
These projects use techniques (fixations, under structure,…) that are specific to the products (copper, polycarbonate, curtain wall of glass). However, through their specific application (transformation of the copper louvers, variation of colour and integration of reflecting window, glass serigraphy), these industrial techniques are being transcended. Herzog & de Meuron use colour (Laban center) or ornament (BTU library) in order to allow different readings of the shape. Thanks to this way of proceeding, the selected shape does not constitute the single determinant of the project and its perception. Shape is not arbitrary anymore because it is multiple. 'It is difficult for us to say: that's the form I want, no doubt about it. Ornament has helped us overcome the obstacle of form.' (el croquis 129-130) (Figure 4)

2.3. formal unity – independent skin

(Figure 5) "take zoning as a design guideline" (Herzog & de Meuron, Prada Aoyama, Milan, 2003, P88-89). In this case it is the scarcity of the plot which motivates the architects to take maximum advantage of the urban regulations. The shape built itself around the legal obligations. The transformations extend into the 3 dimensions, one does not distinguish the roof facades. The diamond-shaped glass have both a convex and concave shape, are at the same time flat, translucid, transparent and reflecting and emphasize that way the volumetric variation. Through these phenomenons, shape finds its objectivity. The model becomes the conception tool of the project and it is the model that is closest to reality. The external skin is unique and through its geometry in facet it is self-supporting and therefore becomes somehow independent from the internal structure. True this "new independence" the skin additionally becomes a structural element of the internal space supporting the floors.
In this case, industry serves architecture. A unique system of application specific to the project is established in order to put the façade into place. It is no longer the industry that gives the commands, but the architects that produce the material. (Figure 6)

Conclusion

Notwithstanding the great diversity of the Herzog & de Meuron projects, we can identify their common objectives. Their buildings demonstrate the importance of process in theory. Nowadays there is no longer a formal ideal, but an ideal of process entailing a certain shape.

In the absence of theoretical means of orientation or tradition, the design process becomes the magic key to understanding and creating projects. Every project stems from a unique process where there is no hierarchy between the various parameters influencing the project. By contrast, all the projects aim to reach a single objective: to be comprehensible (the genesis of the project, its shape, the invention of materials,...) without reverting to a state of absolute nature at the same time. They consider architecture in the context of our real world (post-industrial, computer,...) and wish to provide a reading of this reality through their projects. They reinvent tradition.

Can we say that today the design processes have become part of theory? Or is the position of Herzog & de Meuron isolated?

We can observe that there are other contemporary approaches that share the fundamental idea of "the act of building" as endogenous architectural force that enables to get out of the infernal spiral of "everything is possible".

The Herzog & De Meuron way questions what the materials afford. They push materials to the limits of their capacities and twist their usual applications. Their buildings show real openness to the world. They take part in the movement of their time and put it in question, by grasping bits from the stream and bending them to obtain some kind of truth. They operate a shift from "construction products" to "architecture's material". Through their projects, they explore the material components and reorganize them to push them beyond their internal law confronting them with reality.

By contrast, an architect such as Peter Zumthor proposes to respect what materials want, following their natural "folds". He creates conditions in order to allow the materials to develop themselves without external interference through the principle of interiority. His buildings are timeless and outside of the chaotic contemporary stream of information, materials, signs and products.

Some other architects attempt to remove materiality from architecture, following Toyo Ito, SAANA or Ishigami. In their projects, the materiality seems to become more or less absent. This absence creates a kind of timeless spatiality which is not necessarily open or closed. However, this approach is not a negation of matter (in the sense of Semper), as making matter disappear implies a very strong commitment to materiality and very sophisticated technological solutions. Unlike Zumthor's retraction from the contemporary fluxes by an absolute interiority, and autonomy of the crafted materials, and unlike Herzog & De Meuron, who surf and distort the wave of the industrial production, SAANA or Ishigami intend to absorb the unpredictability of the world by a transparent or absent materiality.

Figures

Figure 1: plans of the Tavole House (Italy), the Ricola warenhouse (Swiss) and the Dominus Winery (USA) (source Gerhard Mack, 1997 and el croquis 60+84)

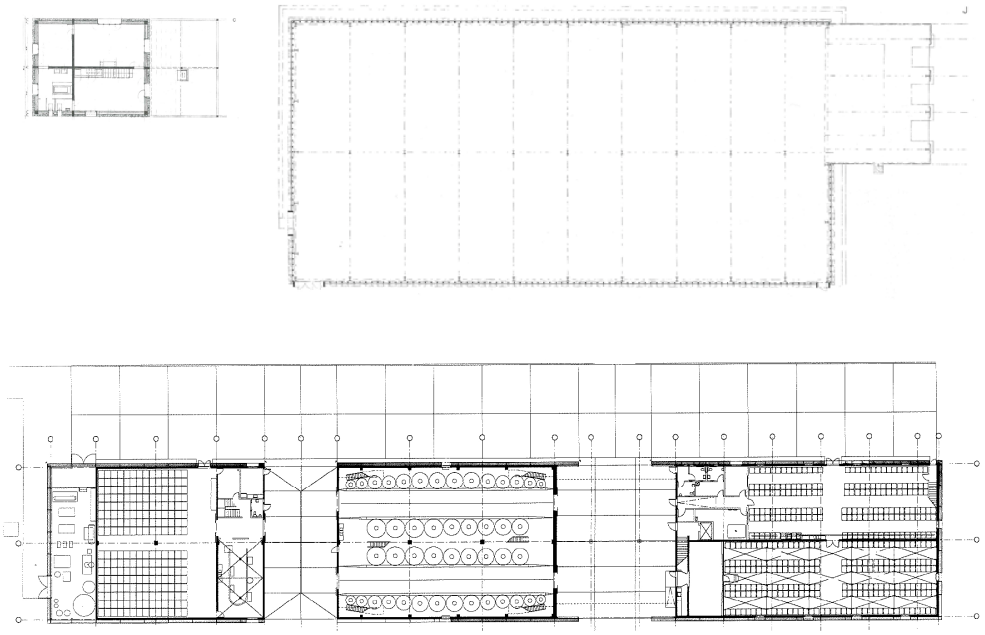


Figure 2: details of the Tavole House (Italy), the Ricola warenhouse (Swiss) and the Dominus Winery (USA) (source Gerhard Mack, 1997 and el croquis 60+84)

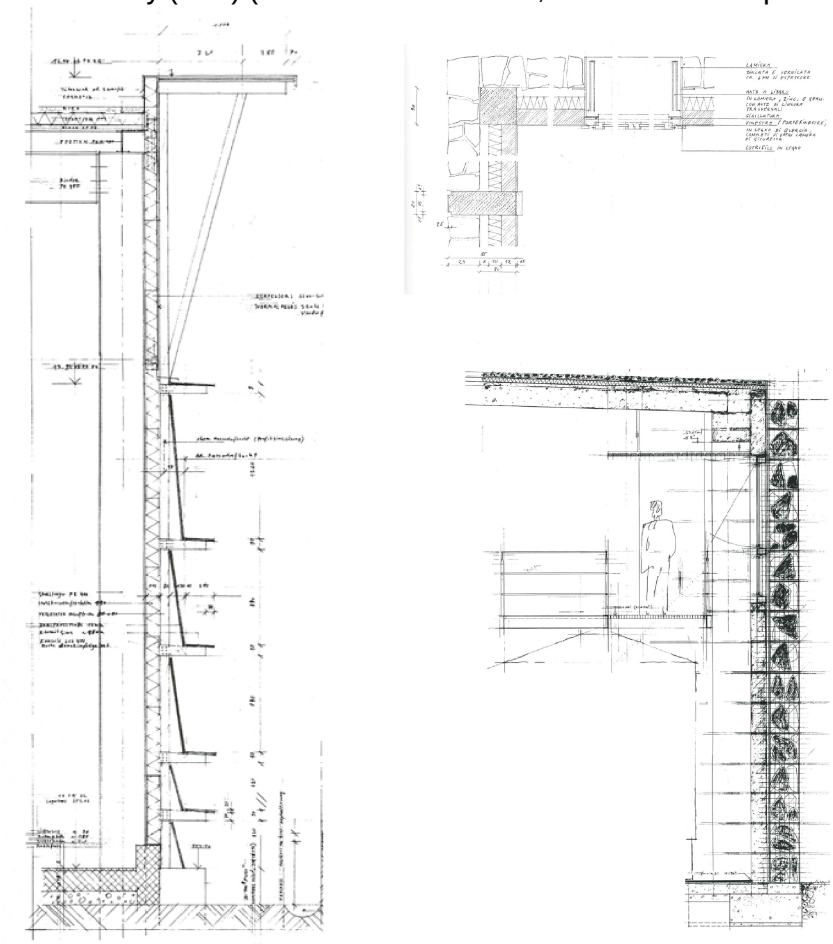


Figure 3: plans of the Laban Center (UK), the Cottbus library (Germany) and the Signal box (Swiss) (source el croquis 129/130 and el croquis 60+84)

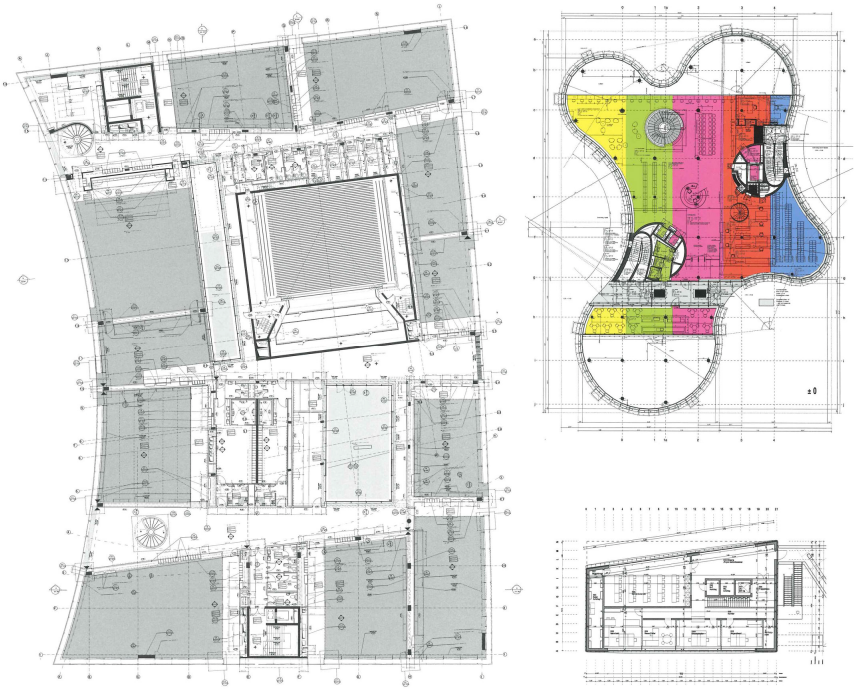


Figure 4: details of the Laban Center (UK), the Cottbus library (Germany) and the Signal box (Swiss) (source el croquis 129/130 and el croquis 60+84)

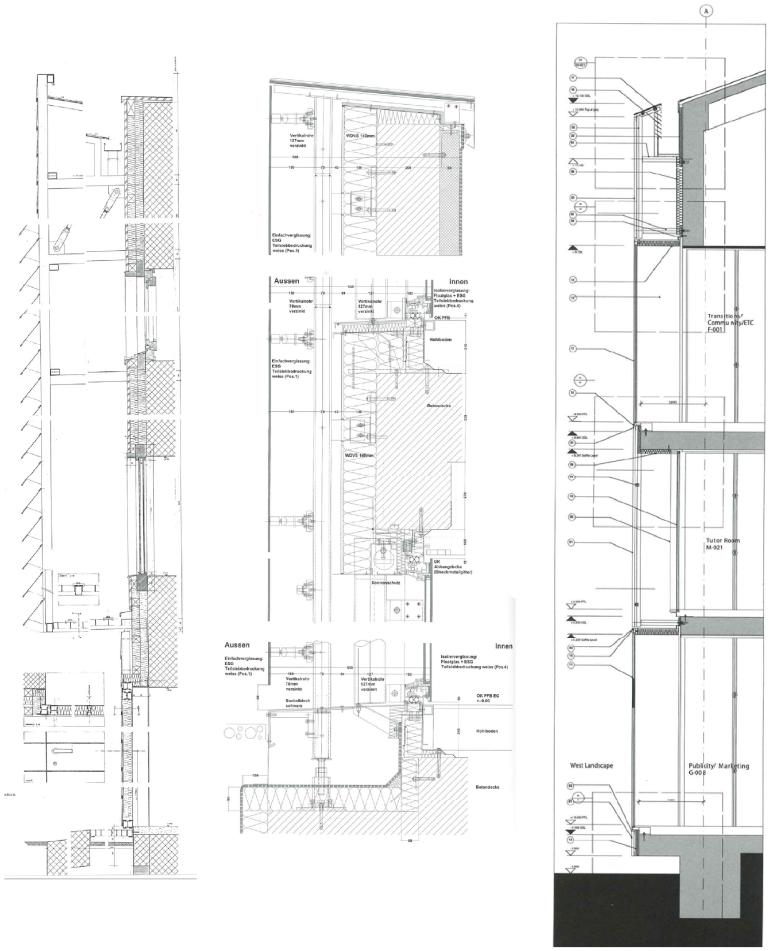


Figure 5: models of the Prada Aoyama (source Herzog & de Meuron, Natural History)

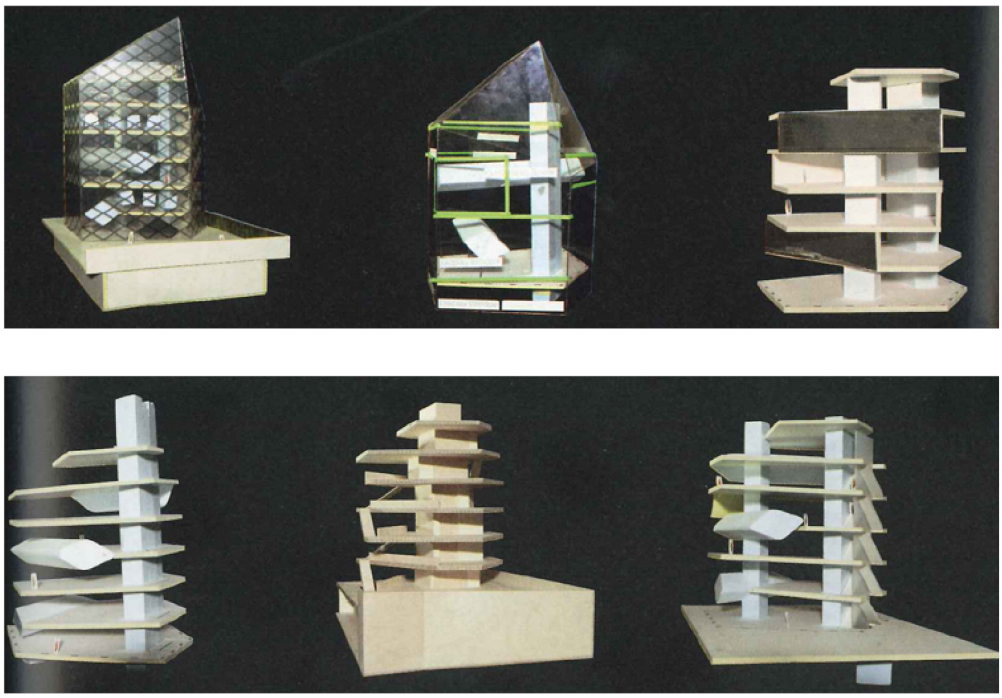
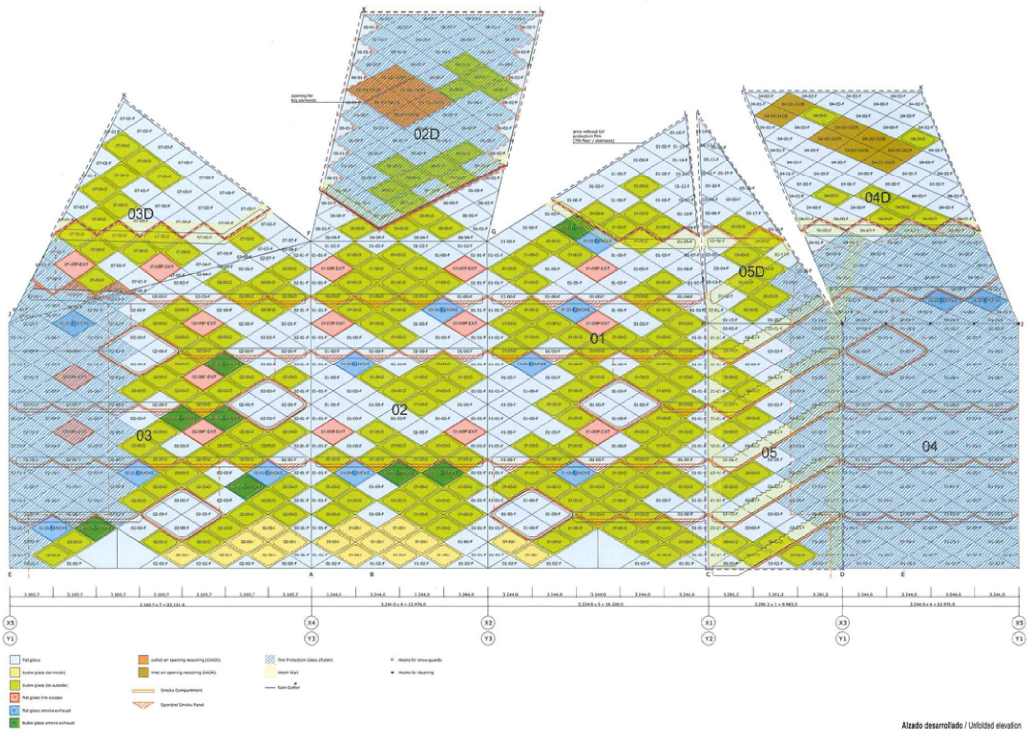


Figure 6: detail of the skin of Prada Aoyama (source el croquis 109/110)



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