

Adaptability of Project Specific Typologies – AgwA studycases

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ABSTRACT

The physicality of architecture at the start of the XXIth century is an urgent issue. It should be enough to mention the short term building trends, the omnipresence of sustainability and energy savings, the influence of industrial (post)globalization, the pressure exerted by fast emerging countries, or the omnipresence of virtuality and of non-physical designing tools. In today's divergent contexts, styles and approaches, it appears necessary for practicing architects to establish renewed and adapted operational frameworks, which make it possible for this diversity to coexist. The reality of the act of construction remains a possible common framework for architecture. In consequence, the relationship between architecture and structure appears to be very relevant. We propose to analyze a particular approach through various projects of the Brussels's based architecture office AgwA (the authors are its partners). The illustrated projects aim to identify space and structure. However, space does not follow blindly the structural design. Rather, the structure follows flexible general principles, which allow variations in shape, size, material, design, and consequently can be used coherently in very different situations.

KEYWORDS: architecture, structure, practice

1 INTRODUCTION

Some comments should be made on the nature, the scope and the consequence of the analysis we make of our own projects.

First, it is necessary to mention that the analysis requires some distance from the design process. Often, we were not explicitly conscious of the structural analysis when we were in the design process itself. It would seem strange to us to attempt to apply predefined design strategies to a project, as this would lead us to neglect the specificity of each project. However, in the latter projects, the consciousness has grown of the global attitude, but it is always pushed to an unspoken background in the design activity itself.

Second, we need to clarify the objective of these analyses. It is not our intention to discover some inherent, hidden truth in the designs and their process. Rather, the analysis is made from the point of view of a designer, with its position and tools. We look at the designs in order to discover possible ways of approaching architecture, that may be useful to practitioners. Our intention is to make use of the designs to extract and define possible useful design tools. Whether they are really what is at stake in the project, or if this exhaustively explains the structural approach, become secondary. It even is a fundamental condition of this kind of analysis : extracting a specific conceptual tool, means that it is extracted from other dimensions that disturb the perception thereof. We refer to such design tools as “praxemes”. The word “praxeme” is a contraction of “praxis” (action) and “semeion” (sense, meaning). We use it to refer

to a piece of knowledge that cannot be considered independently from the practice. It is distilled from the practice and informs the practice in return.

2 A TRANSVERSAL APPROACH

In this paper, I will rather privilege a transversal approach, shuffling through a collection of projects, instead of going in depth in to each design process. By doing so, we will be able to focus on the design attitude on the subject of structure, and hopefully, to deduce regularities and variations in the collection. The aim is to extract workable design attitudes that may help to clarify the understanding of the practice itself, and provide shareable and useful tools to fellow designers or students. This paper elaborates further on a paper presented in the framework of the ICSA 2013 conference held in Guimaraes, Portugal, entitled “AgwA study cases on structure and architecture”.

3 VERTIGO: COEXISTENCE OF STRUCTURE AND ARCHIRECTURE

The shape of Vertigo’s polycarbonate skin has been defined according to a set of constraints, resulting in an irregular shape avoiding contact with the ground. The structure sustaining the skin is a pragmatic triangulation which is left as is. The coexistence of the structure and skin, each of them following its own rules, becomes a main condition of the project. There is virtually no mutual influence of the skin and the structure, and the two are shown equally. This independence is absolutely not a semperian negation of construction, but it neither is an attempt of integration into one unique phenomenon.

4 METAL: VARIATIONS ON A STRUCTURAL PRINCIPLE

For the refurbishment of this existing tyre workshop, all disturbing vertical structural elements are suppressed by the use of large beams overarching space from neighbour to neighbour. This principle is the project red line.

The existing building consists of large concrete frames on the first floor that liberate space from disturbing vertical structural elements between the two neighbouring walls. On the second floor, similar, smaller frames provide zenithal light to the level below, and provide lateral views to the second floor.

This principle of large beams freeing space completely becomes the essence of the structural approach. It is a very simple, flexible principle, that doesn’t give indications on the shape, design, or materiality of the structural elements. In consequence, it gives freedom in the solving of local issues and situations. A variation of strategies was developed around this principle.

The flexibility induced on the formal and material level allowed us to respond specifically to very local constraints and situations, without losing the sense of coherence of the whole.

5 PHILIPPEVILLE: MULTIPLICATION

The porous, dotted contour of the spaces of the Philippeville restaurant are materialized as simple, identical wooden columns, distributed over the whole building with a unique interdistance. The multiplication and density creates a sense of collectivity. This in return allows derogations to the rule : suppression of some columns, filling of the space between other, and differentiating of structural solutions for the roofs (open roofs, flat roofs, pyramidal roofs). The principle of multiplication allows for the columns to disappear as individual elements, and the gain force as a collective phenomenon. It ensures resilience towards local specificities or constructive constraints. This project was limited to the competition stage, so the structural strategy in this case aims at setting the framework for a process.

6 PERONNES: DEFORMATION

This sports center hosts a variety of buildings, which share the feature of panoramic windows on the ground level, that are completely free of columns. A system of orthogonal concrete walls with door-like openings and cantilevers suspend the facade beams and create the spatial relationships between interior spaces.

This scheme is deformed and adapted to the variable geometries and situations. This principle allows the shape of the structural walls to vary widely. The flexibility of the structural principle is ensured by its morphing from one shape into another. This is a kind of restriction of the variation principles of the Metal project : variations are strictly limited to the shape of the structural walls, not the materiality or the typology.

7 FORT VI: THE LIMITED COLLECTION

The spatial organization of the Fort VI sports school can be considered as a layered variation of the Philippeville project. Consequently, the structural issue is more complex. Instead of looking for a structural common denominator through typology or shape, we decided to work with one identical material for all structural solutions. The structure proposes a variety of typologies and dimensions, and ensures coherence through the systematic use of concrete.

The challenge to provide a structure for a three-dimensional puzzle is that the arrangement of spaces doesn't proceed from an inherent constructive logic. Also, spaces vary widely in length, width and height. We decided to take advantage of the diversity of situations to implement a wide range of structural solutions in concrete. It is a principle of limited collection, with no other rule than its limitation. It's a kind of uniform and organized disorder (or is it disordered uniformity?).

8 NIEUWPOORT: WHAT THE MATERIAL WANTS AND WHAT IT AFFORDS

For this small three levels tower in the port of Nieuwpoort, housing office space and storage for the port's shuttle service, a full wooden construction was intended. At competition stage, the construction was symbolized as a traditional insulated sandwich. However, the very high energy standard (passive house standard) looked not very compatible with this type of detailing. So, the decision was made to make use of CLT (cross laminated timber). This changed had almost no visible impact on the overall shape. However, the learning of the specificities and technical possibilities offered by the material became a fundamental point in the process. The detailing was highly influenced, and the material is being used in some "unintended ways" additionally to the standard possibilities. The floor slabs are left visible on both sides, staircases are built, etc. In this process, it is the structural solution that opens doors for the architectural design, which questions the structural solution in return.

9 DRIES: ITERATIVE SEARCH TOWARDS UNICITY

Dries is about the creation of a 90sqm walkable platform in the courtyard of a small school in Antwerp. Budget and timing are very strict. A very close collaboration with the structural engineer takes the shape of an iterative search. In each stage, a wide set of solutions is explored in order to extract an efficient and elegant solution. First, a global typology is developed. Then structural possibilities explored. In the current stage, we are looking for ways to optimize the chosen typology. In this process, a total identification of architecture and structure occurs: the structure becomes the architecture. In a way, our role as an architect becomes the one of a coach, who in fine leaves the athlete in the competition.

This process is very similar to the process of the Carré des Arts projects (covering of a huge courtyard), which was investigated in my doctoral research.

10 CONCLUSION

The strategies above are specific to each project. However, they share common features like the induced formal flexibility, or the identification with the architectural design. The approach of structure is at the same time carefully calibrated, and loosely processed. It is an issue of balance between control and adaptation.

Structural strategies play an important role in most projects of the office. Instead of “structural design”, we like to speak about strategies, because this allows understanding the behavior of the structure, to frame a dialogue between structure and architecture, rather than establishing a coercive carcan for structure or for architecture.

This collection is not intended as an exhaustive set of tools. Also, it is important to notice that these strategies are not exclusive: they can overlap and appear simultaneously in most cases. In this paper, I focus only on my own design practice. Obviously, a similar work can be done regarding other relevant practices. This paper sketches which kind of tools can be used to look at such practices, and which kind of results can be expected. However, as the way of investigating the designs is often strongly related to the design process itself, and not only on the design object, there is an obstacle to overcome when researching on another’s design: how can you access this process-related information? My partner, Benoît Vandembulcke, is doing such work. Solutions to solve the problem can vary. In some cases, focusing on the design object itself is sufficient. In other cases, the process can be re-constituted from available fragments. Sometimes interviews, also with third parties as the engineer or the client help a lot to put the design object in perspective. Available writings help. But always, it is important to remember that the goal is the non-exhaustive and non-exclusive naming of powerful design strategies.

The usefulness of naming this kind of design strategies is located on different levels. By doing so, they become more consciously active in the design practice. It allows also sharing this knowledge about the processes and the designs themselves, which could prove as useful for fellow practitioners as it is to us, in the case of this paper addressing our own practice. In the educational context, I have already tested to use some of them in design studios, which proved very effective in guiding the students to understand how structure can become a driving force in their designs.