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**Navigation in the Network
Conceptual Consistency
and Complex Constructions**

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The new digital era makes it possible to create networks, to conceive concepts and to follow these from sketch to construction and solution. The network of complex constructions is neither reality nor fiction. Parallel to mind and reality it provides a space where concepts are introduced and maintained and navigated with consistency throughout the project. Thus information tectonics become tool, method, market and space for the network of complex constructions.

The design formulated by the student in the digital media has in itself no physical content. A conceptual formulation of the structural and technical content is necessary, for the ideas to reach the ground. The conceptual approach is important also, because a concrete formulation that comes *too early might* restrict the student's imagination in the search for new ways. The dynamic development in architecture and technology due to the introduction of digital media has to be understood and grasped by the architectural student, regardless of his/her future role.

Traditionally, construction design is perceived as an assembly from given systems. The process is continuous and more or less "one-dimensional". In a modern building process, the input comes from many different sources, each of which wishes to optimize its own input. The result is often inconsistent solutions, where the architect's input ends up as merely a surface. This is unsatisfactory – technically, economically as well as architecturally.

However, with the introduction of the digital media architectural and structural consistency can now be reached. Through the network it is possible to handle complexities and to navigate by the guidance of concept. Below we have illustrated this with a built example designed by architect Tage Lyneborg, professor at the Architect School in Copenhagen.

System vs Network

In a teaching situation, where most of the "external" inputs come from the tutors, it is important to make the students aware of the conceptual approach to not only the architectural idea, but also to the technical and structural character of the concept.

The teaching of architectural construction is normally a process that goes from detailing to totality, a fact which might have seemed reasonable in a time where technology and architecture followed given guiding directives. Solutions based on given systems could then act as guidance for the scheme.

But system solutions no longer carry the same meaning. The experience of the present chaotic world and its myriads of virtual possibilities not only calls for new approaches to design but also for new ways of addressing and operating with architecture, technology and production within an emerging network.

The situation is a result of a radical change, in the industry as a whole as well as in the society, due to the development of the informational technology. It is not only the physical change in the architectural design studios, and in the production, but also a change in our minds, and in the relations we have to each other.

We must follow this in our teaching. Accordingly, emphasis moves from a con-

crete and rigid approach , into a way, which enables us to handle many possibilities in one grasp.

An overall understanding of structures is much more important than a detailed knowledge of possible solutions. The classical scientific way of teaching structural mechanics must be more or less overlaid by understanding reached from experiments. (fig. 1)

Some would say that you have to be able to calculate the bending moment in a beam, if you will make a realistic scheme. We say, that proportioning is often better than calculating – we have even developed diagrams for that type of problems. The IT media may become even better, but it will have to end with proportions instead of dimensions. (fig 2) The introduction of the small series of diagrams called "dimensions-skøn" ¹ has been a great assistant in our teaching. The question often not "how big?", but a discussion of the structural approach and concept.

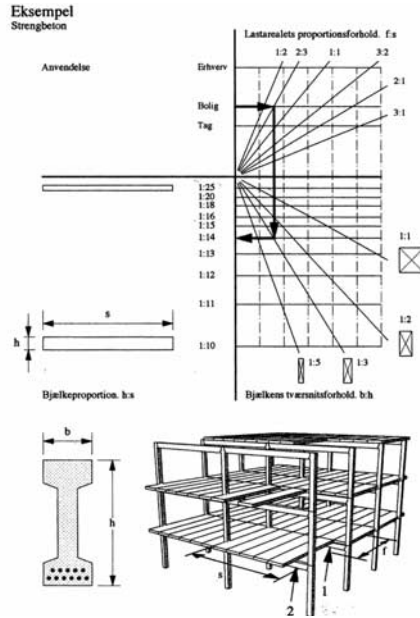


Fig. 1

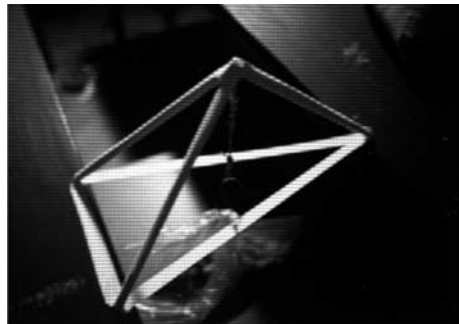


Fig. 2

Network – Clubhouse Undløse

A competition entry for a clubhouse in Undløse, Denmark, with limited economy and high architectural demands was developed by Professor Tage Lyneborg at the RDA-SA in Copenhagen with the assistance of some of his students. Here, the development of the roof structure was the main issue. The structural engineer (Ole Vanggaard), and a timber producer were invited to secure the economy of the design. A network was formed. The architects' conceptual starting point was a non-directional grid of slender timber beams. (fig 3).

The structural concept had to be one of an assembly of one-dimensional tim-

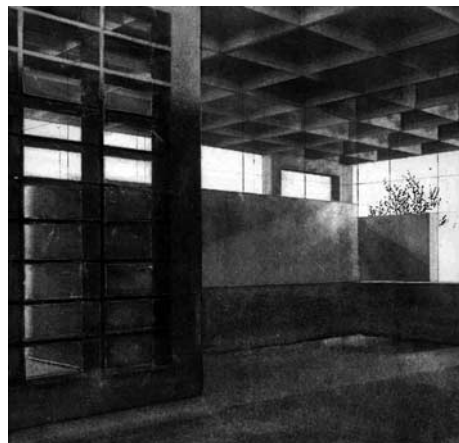


Fig. 3

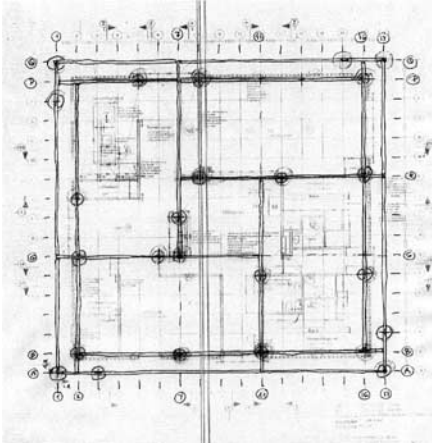


Fig. 5

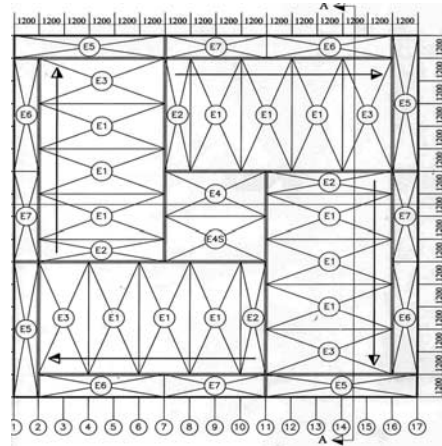


Fig. 6



Fig. 7

ber beams. A wonderful timber structure from the Alhambra (fig 4) was introduced as concept, for the structure and transferred into a swastika system (fig 5) supported upon 5 frames. The structural calculation proved the realizability of the system, but also, that it was too flexible. A concept of supplementary supports, where columns were possible as part of walls, lead to a concept of an "ad hoc" structural approach within the original architectural concept. This is not what engineer Cecil Balmond of Arup engineers, in his Berlin "manifesto" from 1995 calls: "ad hocism, which is collage". It is more a non-linear approach to the formal grid system in his terminology.²

The producer's conceptual entrance was one of industrial timber elements spanning one direction in between the main beams of the swastika. (fig 6) Because the architectural concept was loosened by an ad hoc approach, and the old structural swastika concept made it possible, the concept of the producer could be fulfilled with very little extra material by means of thin non-structural ribs. The final (fig. 7) solution won, both architecturally and economically, due to the holistic approach to the problem.³

Acting within the Network

The digital network makes it possible to handle the input of many different actors. Thus, the network becomes a field of construction, where the project evolves as the result of the interdependence of its actors. The role of the architect is to function as the manager of the concept, the navigator within the network, that safeguards the development of the concept – as a virtual and physical construction.

The teaching of architecture, of construction and network will introduce the mean of how to act. Teaching could be paralleled to simulation or game. In this way, the use of the digital network becomes a valuable help when it comes to learning and teaching architecture, to the development of experiences and the establishment of interdependent relations that will eventually be presented as constructions and projects. Different actors will be introduced in the digital network. Their actions will affect the project in different way. For the architect, to act within the network means to nourish the concept, to develop and experience effects and consequences of the concept. The architect ensures the consistency throughout the project, establishing the concept as a project of interdependent relations. The architect gathers and considers the input from the different actors of the network. Eventually, the concept becomes a project and establishes its own actions.

References

- 1 Ole Vanggaard, Eskild Pontoppidan: Dimensionsskøn. Kunstakademiets Arkitektskole. (In Danish) Can be obtained directly from the author: ole.vanggaard@karch.dk
- 2 Cecil Balmond: Informal, Prestel, ISBN 3-7913-2400-4.
- 3 Tage Lyneborg: Clubhouse in Undløse. Arkitektur DK August 2004.

