
"FULL-SCALE EXERCISES:
SPATIAL EXPERIMENTS IN LAUSANNE AND VIENNA"

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Abstract

This contribution deals with the question, what the simulation in full-scale can convey to the architecture students within their architecture studies. Is it predominantly their independent investigation of architectural space, an aid for decision making regarding their confrontation with "space" as such? Or should the student rather rely on his own imagination? Apart from some exceptions it is the built space that is the subject of all and every planning work, and it is then at the latest that all the advantages and shortcomings are uncovered. Spatial experiments performed in Lausanne in Vienna are introduced, special attention been given to the specific methodical procedure involved.

What is a full-scale laboratory?

Many facilities, both on the inside and on the outside could be declared as a "full-scale laboratory". Dealing with in-situ experiments the main aim is to erect a (part-) model in full-scale, e.g. a section of a façade, and to examine its effect within its future spatial surrounding. This procedure may lead to further improvements which, if possible, are to be depicted directly in the 1:1 model. As soon as building construction is ready to commence the 1:1 model is removed. In situ-model work of this kind is rather of inferior importance, as constructional realization of the study projects are not intended within one's studies. But, so that not only "paper-architecture" is created during the studies, model work in full-scale in laboratory conditions could represent an alternative. Under such conditions the future situation is not taken into account in the simulation process and thus work in the laboratory is always dealing with different experiments. In practical work the presence of an appropriate basic equipment or the technical infrastructure has to be taken into consideration in this context, as too much working capacity would have to be applied for the erection of auxiliary constructions otherwise. Though a well-functioning laboratory can rely on sufficient pertinent experience of its staff, it often is the unfavorable economic relation between expenses, effort and usefulness that 1:1 models are so rarely built.

There are various objects where 1:1 model depictions would seem particularly useful:

- Individual units, such as hotel rooms (multipliers),
- Prototypes when only little space is available,
- Testing of minimum dimensions (e.g. sanitary facilities),
- Fair stalls and exhibition buildings,
- (Artistic) spatial installations,
- Testing of intended optical delusions,
- Construction projects with no relevant experience data, etc.

Above enumeration is not to be regarded as complete, additions to it result from respective technical equipment and working plan of the specific laboratory.

Experiments In Full-Scale

In the course of the university year of 90/91 full-scale experiments were performed both in the full-scale laboratory at the ETH Lausanne and in the provisional Vienna full-scale laboratory. Before commencing work the frame topic was agreed upon being "Space for a ...", the maximum dimensions of the complete room(s), being limited to a surface area of 6x9 m and a maximum height of 7 m. Ideas as to formal representation of the spatial concept including color-, light- and material-effect were elaborated together as was the full-scale model.

The Viennese students attending this subject chose "Space for a Bibliophile" (pict. 1) for the model representation in full scale on the approx. 60 m² working area. Bookcases and gallery were used within the conception of the room in order to demonstrate the variety of literature and reading experiences with specifically dedicated zones. First the structure of the side walls was erected by means of 6 m scaffold tubes and -ties. Taking the complete room height into account a painter's travelling scaffolding system was used. The working gallery as well as the mobile erecting platform as intended in the developmental planning of the full-scale laboratory would have been very handy in this respect. In order to achieve larger spans than 6 m several tubes were connected by means of scaffold ties. After the side walls the gallery and the bookcases were drawn up. The next step consisted in producing shelves for these space-dominant elements using corrugated cardboard and wood (pict. 2). Painting the surfaces amounted into rather a great deal of work. We also experimented with a mollino-material at the same time which also lends itself to different color shades.

During work one thing became very clear: scheduling is of utmost importance, as at times there were too many willing to work and then too few to continue.

After completing cubature experimenting with artificial light began. This had to be stopped prematurely due to the lack of sufficient light fitting types. At the end of the second working week - building work proceeded in stages - there was a concluding discussion with all participants in the 1:1 model.

Time till that was used to "re-construct" the working model. It was obvious that a full-scale model principally is governed by other conditions and offers other possibilities than a 1:100 scale model. When looking at a scale model an overall view is furnished which actually does not exist in reality. On the other hand the 1:1 model makes for a perception of space and relations of views which are not offered by the scale model in the same extent.

The session-like character at the ETH Lausanne within the framework of a tight program called for exact planning regarding time schedule. That some of the students had already gained working experience at the provisional full-scale lab at the Vienna University of Technology proved very useful. A complete working surface of approx. 280 m² was at our disposal at the full-scale laboratory of ETH Lausanne. Following a brief introduction realization of the projects in full-scale immediately commenced. At the end of the first work day the projects were practically finished. Before noon of the second day a presentation of the projects and a concluding discussion took place. The discussion mainly dealt with the results of the experiments performed and the team work involved and particularly stressed the significance of solving certain problems together. The results of the individual groups then were regarded in relation to the experiment they chose. What was objected was that the space between the individual spatial project had been insufficient which resulted in unfavorable working- and light-conditions. To escape the modul-system based on the building blocks hardly was possible without further auxilliary means. No building parts not fitting into the horizontal-vertical scheme could be implemented. Furthermore, we realized that projects with a building height amounting to more than 3 m take up an extreme amount of working time due to fact that a second floor had to be erected. Regarding the former provisional conditions in Vienna the observation of the working steps accompanying the simulation process and the discussion with the "lab

assistants" of the full-scale laboratory at the ETH Lausanne were followed with great interest.

Even though time in Lausanne was pretty limited 6 full-scale experiments were carried out all in all. Amongst others the "Space for a Bibliophile" served once more as the starting point for an experiment (pict. 3). Erection of side walls was executed much faster in Lausanne than it had in Vienna and the window openings showed much better on them. The staircase, the gallery and the lacking of colors, however, posed greater problems. Regarding further development of the experiments an additional day for experiments, e.g. concentrating on the effect of artificial lighting could have proved useful. The erected rooms actually were only partly "utilizable".

The experiment defined as "Space for a Fatalist" in Lausanne was then repeated in Vienna for comparison purposes (pict. 4-5). According to the students' opinion the fatalist does not care at all, how he lives and what happens, this gave way to a structure finding and formation based on random sequence. Space-dominating were the line-relations which had come about within the drafting procedure and which determined the positioning of the walls, the staircases and the platform. The structure of the building blocks in Lausanne - technically very profound - distracted from the the actual intentions as such according to the opinion of all participants in this experiment, as the desired degree of abstraction was reduced.

The building schedule in Vienna was similar to the one initially described for the experiment "Space for a Bibliophile". Participants, however, received a precise time schedule, in order to prevent any unnecessary idle time. A complete working week was allotted for the experiment. Due to lack of space the 1:1 model was slightly reduced. Contrary to the experiment in Lausanne the used material (steel tubes, corrugated cardboard and textile) was not so dominant and the desired high degree of abstraction could be achieved (pict. 6). Due to the use of the scaffolding construction system formal line-relations were already observed during construction work. Despite spartanic conditions during construction the 1:1 model became more detailed and concrete. In case of a further development of such experiments in the future considerations should be made, as to the benefit of graphically recording (intermediate) results in the course of experimenting.

General Assessment

After conclusion of all experiments a general assessment began attempting to point out both positive as well as negative aspects and to consider the possibilities of use in architecture. The following is a enumeration of frequently obtained very outspoken remarks to this subject:

- The actual dimensions and proportions of a 1:1 model can be perceived directly without having to think "in a roundabout fashion". The possibility to recognize weak spots is improved as well as the manner of dealing with any shortcomings regarding design or any "surprises". The accessibility and the experiencing of the constantly changing building conditions in every one of its phases lead to new aspects regarding designing.

- The relation to the experimental surface in the laboratory to its surroundings can be received as disturbing, especially as far as the light situation is concerned. Furthermore, major attention is given to the material as such . The significance of coordination of building steps is not to be underestimated. Even applying the greatest amount of caution and the respective safety measures dangerous situations may occur at the building site.

- Easily performable and simple solutions have to be available as far as production of walls, ceiling and levels are concerned. Considerable restrictions may, however, result from the module system, as is the case when for instance slanted walls and rounded elements - shapes beyond the orthogonal geometry - are practically not to be used. A certain intuitional finesse for statics and practical feasibility, the handling of tools and team-work is promoted.

- If short-term changes of spatial relationships in situ become possible very simply the following feedback is furnished: try - change - check - etc. The 1:1 model can be efficiently used for demonstration and testing of various materials, even in connection with differing color- and light effects.

- Presentation of the material character is of more importance regarding full-scale model as with the scaled down model. Some surface structures cannot be satisfactorily simulated by other means. If too much is abstracted in this respect a different impression of the architectural space could result. Complicated light- and color concepts might be difficult to be realized. In every-day practical work full-scale modelling is time- and work-intensive considering the results. It has to be based on

the individual case, how "far" the degree of abstraction should reach.

The comparison Lausanne-Vienna was not only very educational for me, but also for the students involved. I would like to submit a proposal at this end of this paper to reflect upon the establishment of an Erasmus-network in the field of Full-scale Modelling, as also EFTA-countries - though limited - may participate in the Erasmus-program of the EC.

Bibliography

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