

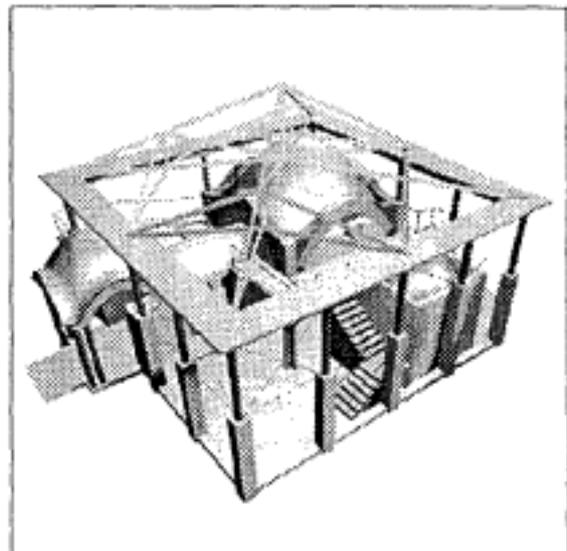
The Masonry House as a digital model

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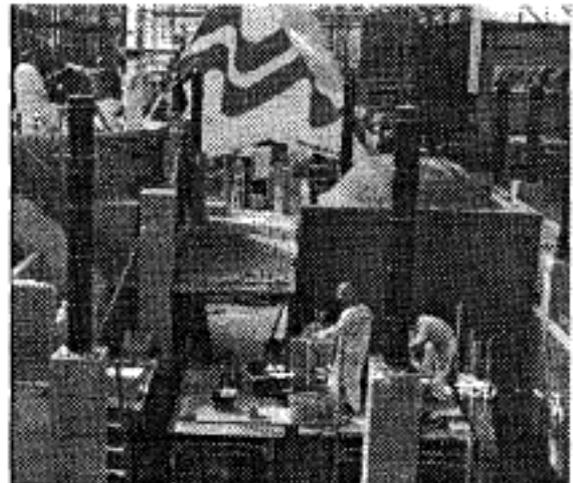
"The Masonry House" is an experimental building designed in connection with the building exhibition "Byggeri for Milliarder" ("Building for Billions") in Copenhagen. The house is intended as a collection of examples and did only exist during the week the exhibition was. "The Masonry House" contains examples of both old technology and attempts to show entirely new constructions and new ways of using masonry. The house is constructed as a combination of prefabricated elements, wall ribs, decks and walls, and of parts built on location, cupolas, stairs, etc. The building process with element assembling and construction had to be done in six days and demanded a precise organization and coordination with use from shift work.

The house had been in process for quite a long time, but in connection with the carrying out and preparation of information materials the Datacentre at the School of Architecture was involved in the project.

After having produced a spatial model of the house completed, the wish for describing the construction process arose; to produce a spatial time schedule" for the use of workmen and to describe the process in an animation film for the spectators at the exhibition.



The digital model



The real model

If the complete digital model of the house had been relatively quick to construct, then another systematization and complete different construction principle was called for when the house was to be described day by day in the different phases of the construction process.

It caused us to use principles developed by the organization of use of CAD in building and construction activities in Denmark, Abb (Autocad users in the building sector).

The organization has elaborated publications for coordination of project structuring:

- 1) Principle of common layer structure and
- 2) principle of use of reference files in project cooperations.

The layer structure was used in the construction of the single blocks with a division according to the building part. Simultaneously, each single part rooms, walls etc. was drawn corresponding to the output each single day.

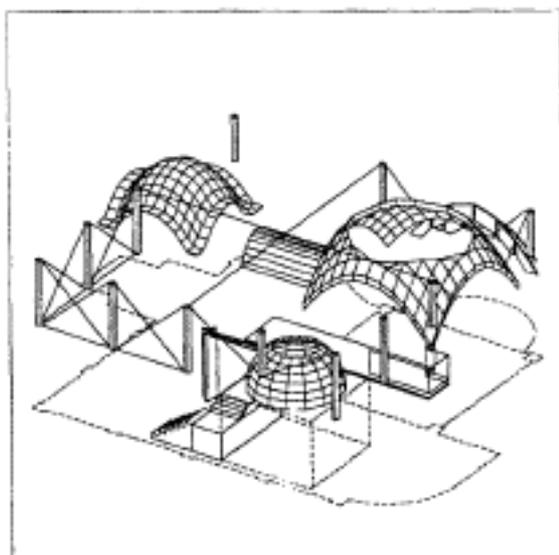
All blocks representing the work performed each single day was collected in model files, and put together they could show how far the house had got during one single day of the periode.

Det Murede Hus - Bella Center 1993 • Produktionsplan

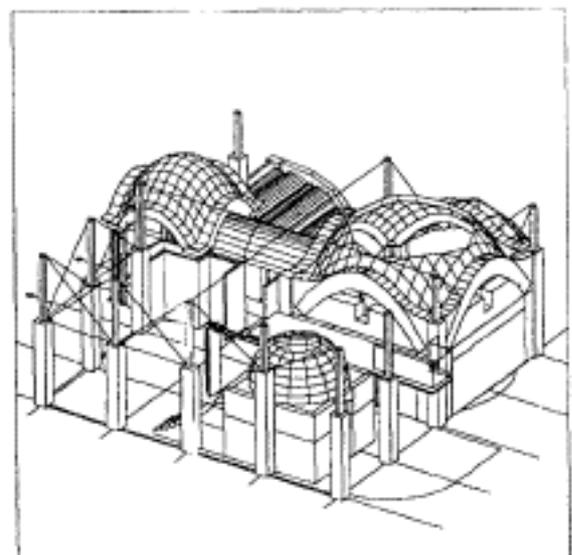


Dato: Onsdag den 21. april		SB/Dato: 22.03.1993 Rev.: 1			
Aktivitet	1.	2.	3.	4.	Bemærkninger
03 Opsvingning af alle knuder					
Opsvingning indkants knuder					
Stilling af brede søjler og søjler					
04 Montering af gulvbjælke + søjler					
Montering af skive elementer					
Trapper					
05 Montering af rumstuds i tre søjler					
06 Overfladebehandling - den sidste					

The normal time shedule chart



The work to be done on the day

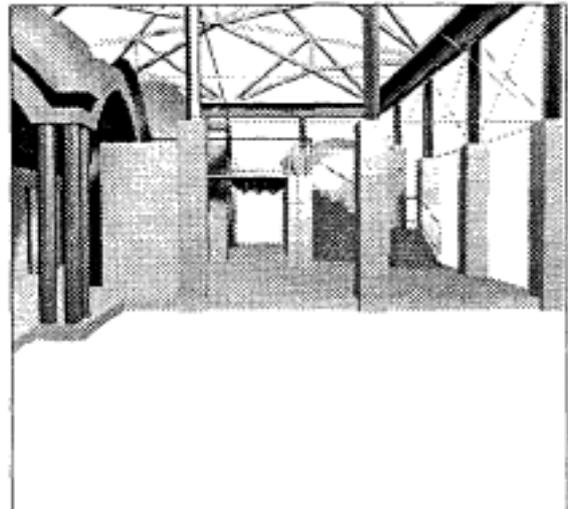


The situation in the end of the day

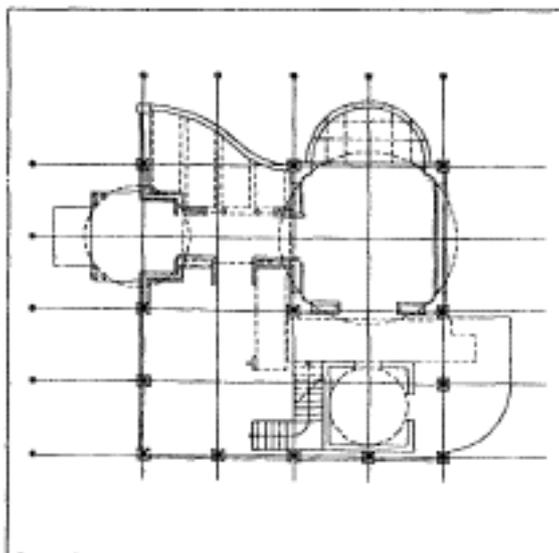
The layer structure based on Sfb building part codes contains a facet describing the material. Therefore it was easy to transport the AutoCAD model to 3Dstudio and Animator-pro and then construct a model with light and shadow, animation of the building, process and a run through the house.

Beyond the modeling of the single parts of the house in different stages in relation to the building process they were Made in differnt detail degrees. It was then possible to redefine tho single blocks to be able to reproduce as well spatial form as structure as desired.

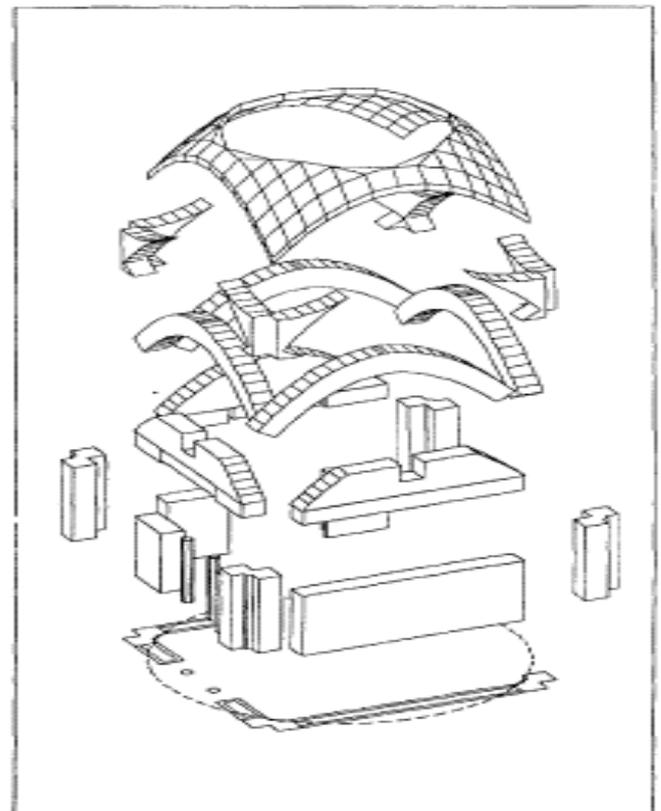
The very manipulation with the many blocks happened in a model file where all the blocks were placed. As required the blocks were redefined with a special block without contents, called "nothing". In this way all references were maintained in the drawing and the building process of the single parts of the house could be carried out independently. It was for instance possible to remove a single room, the cupola in a room etc. without affecting the rest of the model and possible to replace the deleted by recalling the original blocks. Perhaps there are possibilities in the solution with the "nothing" block. It functioned.



The model in 3DSTUDIO used to make animations of the building process and walk through the house



All references to blocks are to find in the plan



Elements in a single part of the house

Conclusion:

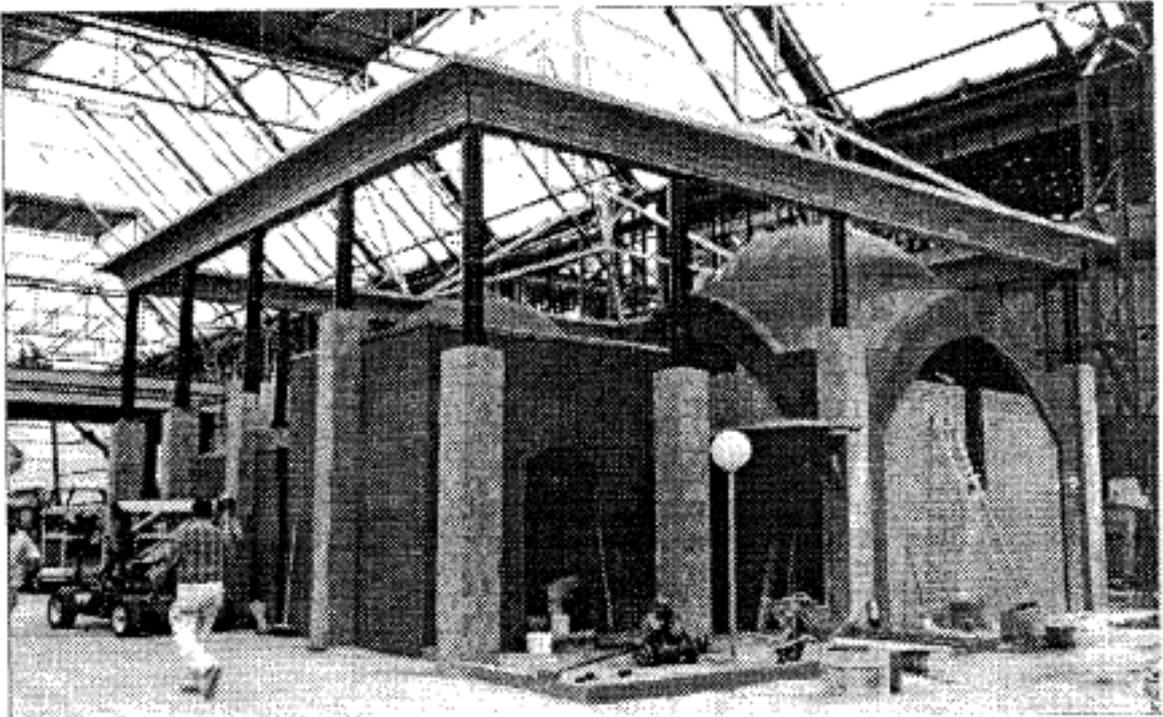
The result of the spatial time schedule appeared in practice to be of great importance for the work of the assembling of the house. In addition to that the project gave rise to the wish of being able to use spatial time schedules in connection with administration, control and following up of the project process. By comparing the digital model with the current result it will visually be a help to estimate dissimilarities between the arranged and the real prooress, and in that way get a fine tool of control.

In the masonry house where the process only was six days, you had a good material in a short time as the process was registered via photo series which have given us the possibility of making different experiments with visual estimation of plan versus reality.

The project had its basis directly in relation to the building parties, but seen from a view of teaching I also find that the masonry constructions sketched will be able to inspire the students in their problem solving in the future. Both with and without CAD-system. But - in addition to that - I find it essential that the systematism in the very model building is studied and included in the teaching as an important professional tool of information handling in the project process.

In this process I think it is important that the professional purposes dominate compared to the sophisticated CAD-system.

The principles the CAD-technology already imply to utilize the professional possibilities are far from being integrated in thc architect study and not at the drawing offices in Denmark either. But we are working on the subject.



The almost finished model in the afternoon the day before the exhibition opened.

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