

ARC 6989: Reflections in the Architectural Design

**Talk about model making and its irreplaceable role in the process of
architectural design**

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1. Introduction

People have realised the importance of models in the architecture process for 500 years, and their use has grown exponentially in the twentieth and early twenty-first centuries. In this essay, I will talk about why we make models and how we make them. Firstly, I will examine the nature of models and explain why they are such important design and presentation tools. Then, using illustrations, demonstrate how we make them. I will look at the three vital decisions that should be made within the process of making a model- the decisions of scale, material and type.

2. The Model Defined

Architecture has always required representation. Architects have creative ideas, and in order to visualise and communicate these ideas, many forms of architectural representation - the working drawing, the perspective, the computer and physical model - have been used during this process. Of all these forms of representation, models are the only three-dimensional reflection of the architect's idea, which will ultimately be built as a physical, three-dimensional thing.

Fundamentally, the physical architectural model is closer to reality than other kind of media. Instead of trying to imagine it, the model allows us to perceive a three-dimensional experience, which is more accessible to a wider range of people, such as the tutor, the client or the public. Moreover, models are easier to understand than any other kinds of image, compared to the architect's drawings they require less architectural background, and can provide information of a building more than an infinite number of perspective views. Models have what architect Peter Pran of NbbJ describes as "a kind of universal language. Everybody can understand a model; that is

the beauty of it. Freehand renderings and three-dimensional computer renderings have great appeal, but models speak to us all.”¹

Today’s models have become to extremely varied. There is an explanation for the complexity of models: no model can convey everything about a project. Each model indicates a series of decisions about what to show and how to show it. Each separate choice has an effect on how the model looks, for example: the selection of the one way to convey to others what you are trying to do, and one way to convey to yourself something you can meditate upon, enter into a critique with, and develop more ideas from.”²

Compared to other forms of representation model may have many unique advantages, but they also have limitations. They cannot reflect every aspect of the architect’s line of thought. The reduced scale of a model can cause confusion and restriction. They cannot travel around as easy as a drawing. Yet, given the history of the model, and how the models of famous architects continue to be depicted in the media, we can easily understand why models are so important to the process of architecture.

3. A Decision of Scale

The choice of scale is a significant decision. It is the first thing a model maker should consider before embarking upon a model, it influences the amount of detail that a model can convey and determines the texture of materials in the finished model. There is a balance between the wrong and the right scale. And there are a lot of outside factors that influence the decision of the scale balance. Is the size suitable for transportation? Will the interior spaces be visible?

The overall size of the project and the amount of the information available will usually determine the choice of the scale. As Ross Wimer said, “The bigger the scale

¹ Peter Pran, interview with author, January 25, 2000.

² Hani Rashid, interview with author, March 3, 2000

gets, the more detail you have to have, and the more you have to understand the design to make the model look convincing. So it takes a while to get up to a big scale.”³ Models are made throughout the design process in every size and scale. The smallest model can be held in the palm, while the largest may be the same scale as the real building.

2.1 Full-scale Models

Models have their limitation, and it is only at full scale that a model can fully reflect how a particular detail will operate. Essentially, working at 1:1 means working with real materials, simulation only when absolutely necessary; and studying the effects of bringing separate elements together.

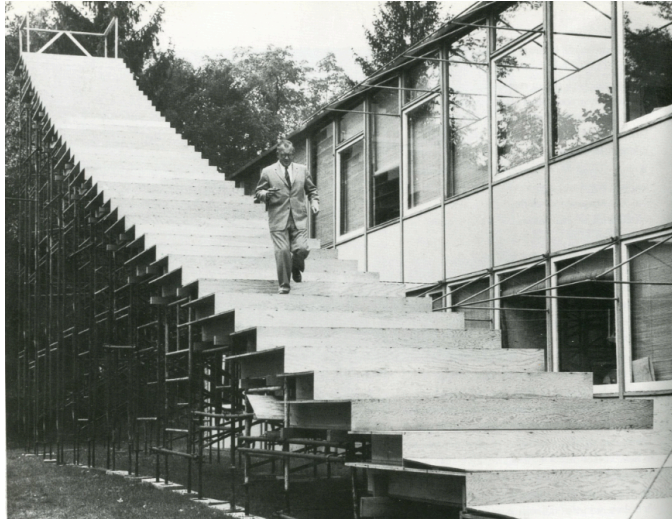
Full-scale models of buildings are apparent in both schools and practices. Professor Mark Burry has been running courses in full-scale models for senior architecture



students for more than 20 years. He has found that in working with full-size projects students observe that what they design might be influenced in reverse. This activity provides students with interesting insights regarding the foundry work, the

dangers of welding and the propensity of each material. One of the examples of a practice working at full-scale is I. M. Pei’s model for the extension to the Louvre. A simple metal frame was erected on-site, with the intention of winning the confidence of the French people with his proposal – an unusual glass pyramid for the Louvre. Another is a plywood replica of the access stairway to the St. Louis Gateway Arch. Eero Saarinen used this model to see if the lengthening of each successive step would

³ Wimer,interview.



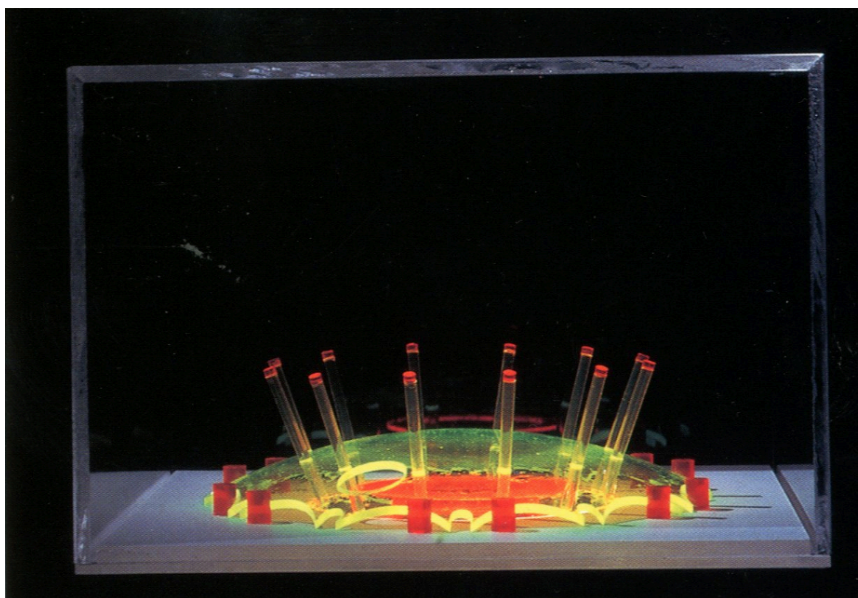
pose a problem for walking.

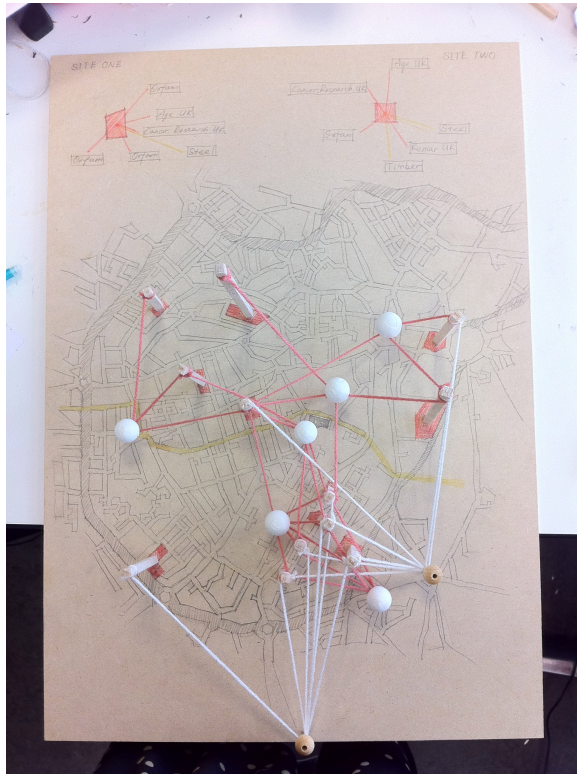
2.2 Reduced Scale Models

While the large-scale models are widely used for design purposes, it is a fact that models at a reduced scale are

used in a larger number. A small-scale model is much faster to make and can enable materials and construction sequences to be anticipated. Moreover, during the design-development process, working with a smaller and simpler scale of model makes it much easier to enhance and edit ideas.

A 'minimodel' by the Richard Rogers Partnership of their Lloyd's of London Building is a good example of a reduced scale model. At 1:1000, it seems that the model would be far removed from the final Lloyd's scheme to the real building. But in fact, even at such small scale, it is instantly recognisable and can still represent the essential idea.





Reduced scale models are widely applied in a particular kind of expression- analysis of the network. I have made a network model of Sheffield city center for selecting a site for my project. In this model, the reduction of the scale allowed me to use coloured string to separate the site into sections, making evident the otherwise invisible networks.

A Decision of Material

The purpose of the model, the stage of the design process and how fast it needs to be made are the three questions the maker should ask themselves before selecting the materials. If the model is to be relatively abstract, it makes sense to that just select one kind of material and focus on the form and mass of the design. Compared to using a multiple kinds of materials, a single one can be manipulated and treated in different ways. Once the first material has been selected, additional materials can be considered, with thought given to whether their use will aid the representation of the scheme or its underlying concepts. Now it seems that we have endless possibilities- paper, wood, plastic, metal, and more recently countless new choices have been added: epoxy resins, fiberglass, metal foils, etc.

2.2 Paper and Cardboard

Paper and cardboard are easily available and economical making them a great material to start with. This is a model made using by textured and colored cardboard, it clearly illustrates the flexibility and adaptability of this kind of material.

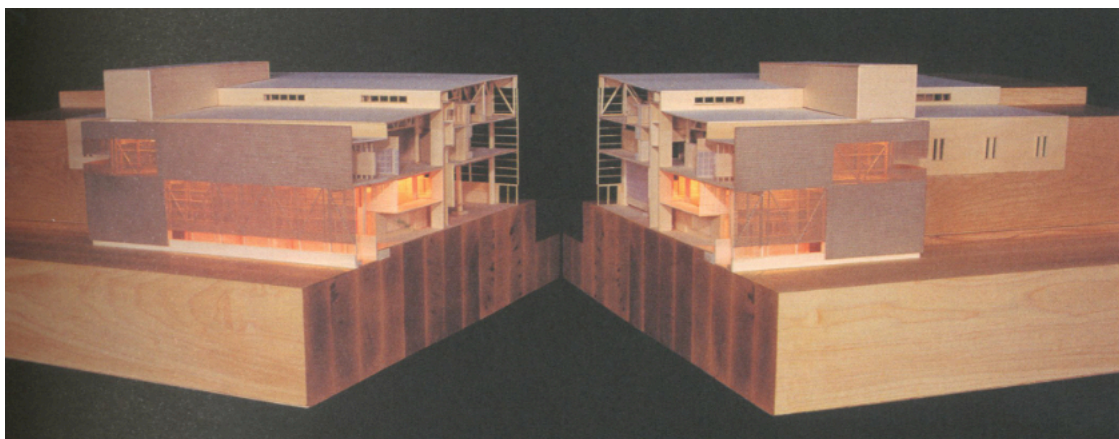


But the disadvantages of paper and cardboard are apparent. It is Difficult to join paper cleanly, and it is too delicate for move around.

3.2 Timber

Another of today's primary model-making materials is timber due to its versatility and relative ease to work. Timber can be polished very finely and then treated in a Variety of ways. It can be varnished and painted, but the majority of models retain the material's natural aesthetic appeal.

In this sectional model, two different types of timber were used to distinguish the section and enable the viewer to see the internal spaces.



This massing model is made using roughly cut pieces of softwood. It enables the designer to test various interactions of the blocks, and when a decision is reached the pieces can be glued to create a more permanent model.

3.3 Plastics

There are a variety of different plastic products available, and they all share some key

characteristics, as all plastics can be processed easily and with a high degree of accuracy. Transparency is a most significant characteristic, and one that has profoundly influenced recent architecture.



The acrylic roof and floors enable the viewer to experience the interior spaces of the building.

3.4 Metal

Metal is a typical material used by Professionals, such as SOM, who use sheets of metal to clad wooden blocks in many of their models. Metal rods, sections and mesh may model structural elements and a variety of other components.



3. A Decision of Type

The last section of the model's story is its type. The purpose of the model should be identified from the outset in order to maximize the results given the limitations on time, materials and effort. It is helpful to establish what the model is to represent or illustrate in terms of ideas. Depending on when, how and by whom the model is used within a design process, there exist a number of model types, such as concept models, design development models, structure models

and presentation models.

3.1 Concept Models

The growth of theory within the disciplines is one of the major improvements in the architecture academic environment, and this improvement has led to an increase in the use of conceptual models. One of the unique features of this type of model is that they are not necessarily made to scale and can be made out of whatever may be close to hand.



In this example, a peeled eggplant has strips of its skin pinned in place to represent the idea of a façade wrapping around the building core.

3.2 Design Development Models

Design development models are made by the designer to illustrate the thought, effort and time that have been committed to investigating design ideas. They always indicate the evolution of a design and represent the errors that have been made during the creative process. Most design development models are produced in architecture schools. Students make this kind of model to explore the possibilities in order to reach a suitable response to the studio project.

3.3 Structural Models

As the name suggests, these models are made for testing the structure of projects. Compared to a drawing, the biggest advantage of a structural model is that they allow the designer to understand how these components support each other in a three-dimension way. Furthermore, the structural concepts and design ideas can be tested through making structural models. It is important to made this kind of model during the design process, all the concepts and spatial explorations should be based on the success of structural models.

3.4 Presentation Models

A presentation model is always concerned with showing how the building will look in reality, so this type of model always has a major role in the communication of a design proposal. However, no matter how precise this type of model may be it still provides critical distance As a result of its scale and maintains a degree of abstraction.

6. Conclusion

This essay has described the three key decisions when model making, investigating what scale they may choose from, illustrating what they may be made from and explaining why they may be produced. The use of model is currently at the peak of history. The model will continue to evolve, and the possibilities are exciting. The most exciting evolution in architectural model making is the overlaps between digital and traditional design process and techniques. No matter how the techniques change, nothing can replace the role of model in the process of architectural design.

Bibliography

Busch, A., *The Art of The Architectural Model*, Design Press, New York, 1998

Sheil, B., ed., *Design through making*. Chichester : Wiley-Academy, London, 2005

Dunn, N., *The Ecology of the Architectural Model*, Peter Lang, Oxford, 2007

Dunn, N., *Architectural modelmaking*. London: Laurence King. 2010.

Moon, K., *Modeling Messages: the Architect and the Model*, Monacelli Press, New York, 2005

Ratensky, T., *Drawing and Modeling: A Guide for Students of Architecture an Design*, Whitney Library of Design, New York, 1983