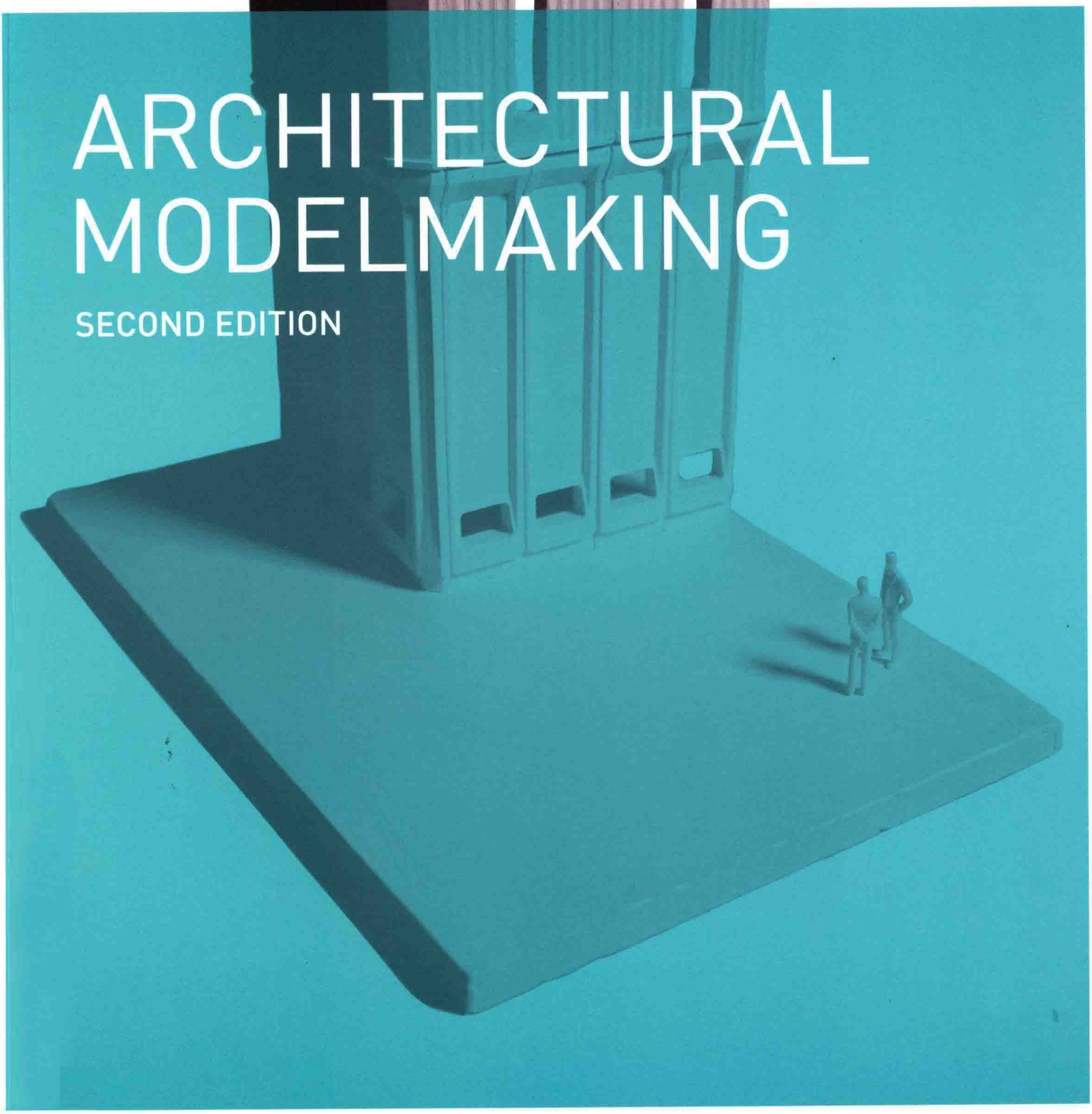
NICK DUNN

ARCHITECTURAL MODELMAKING

SECOND EDITION



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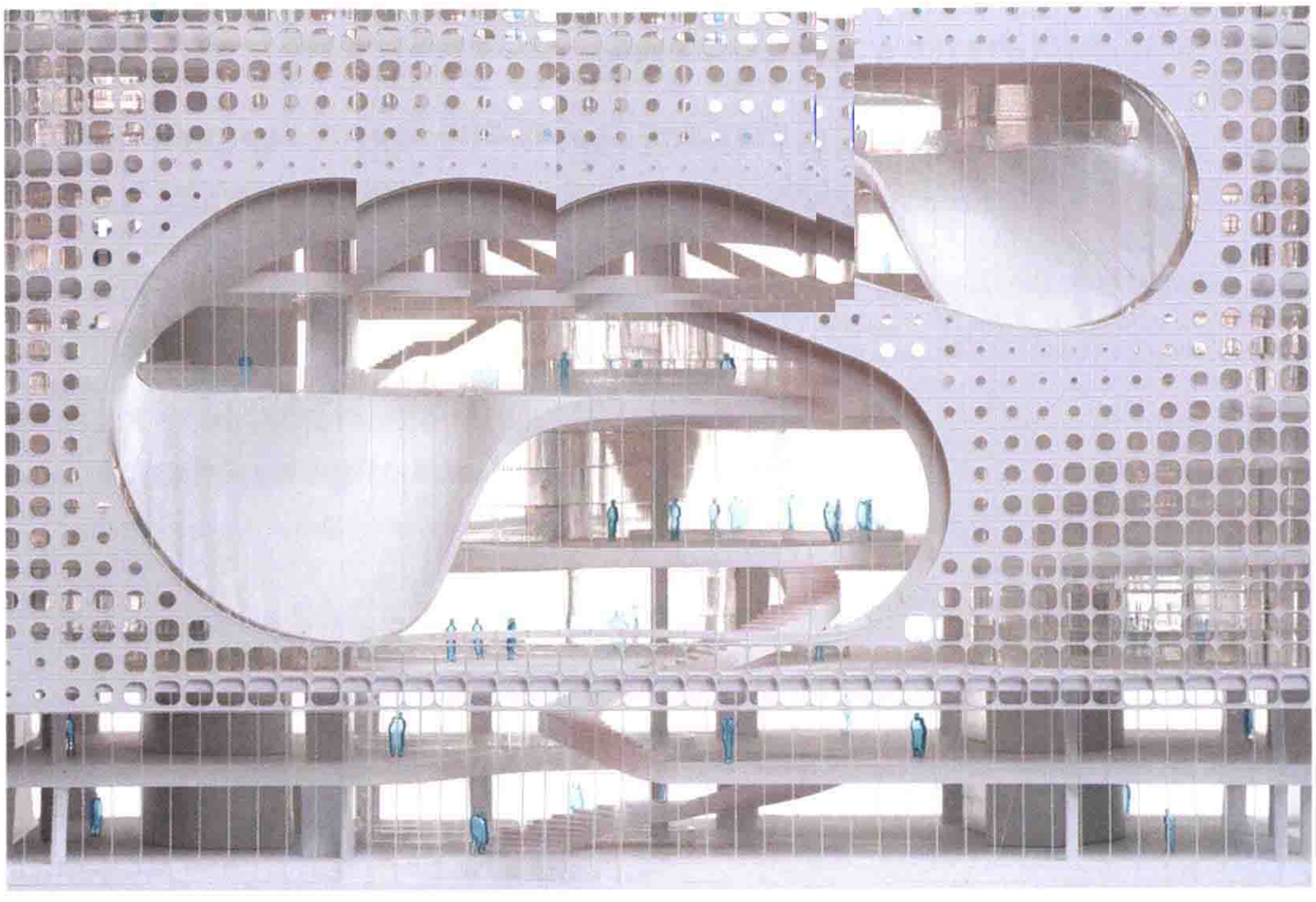

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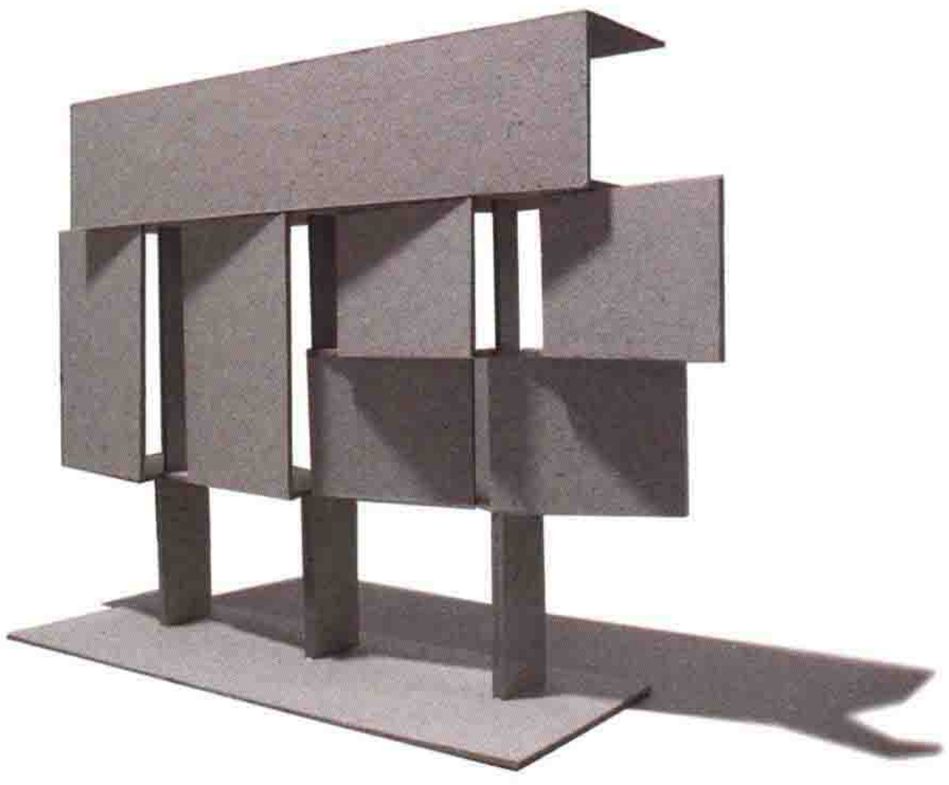

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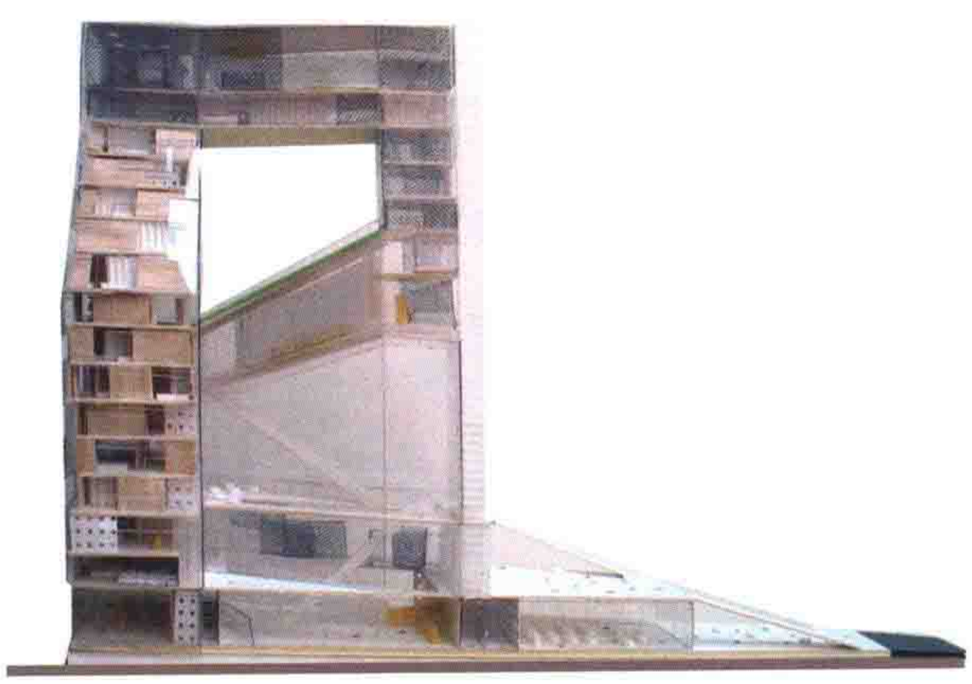

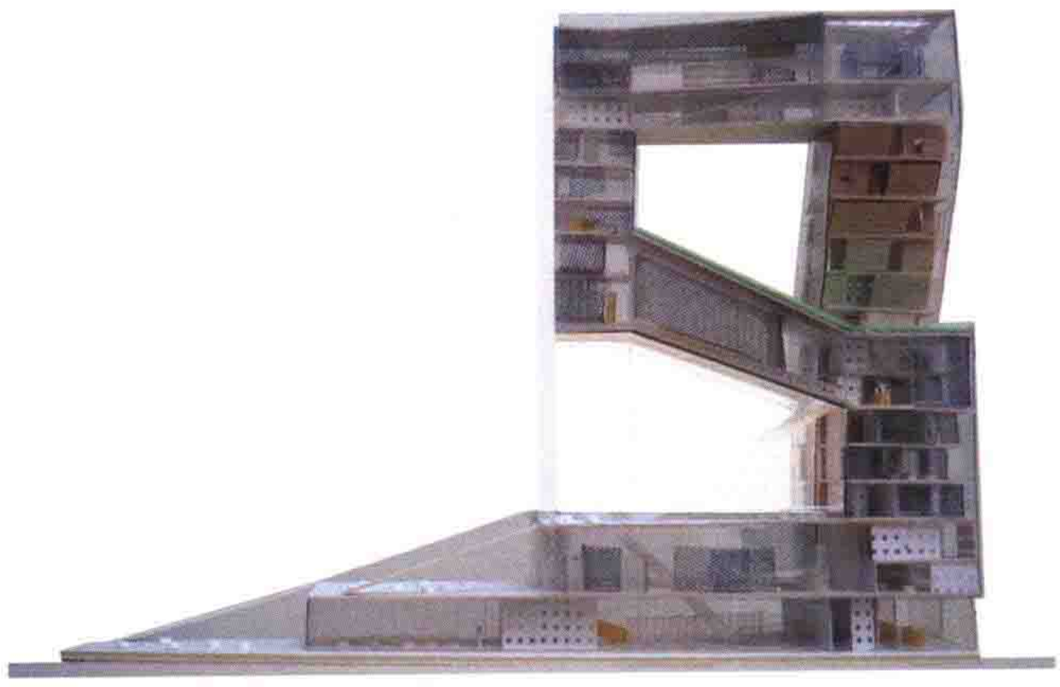

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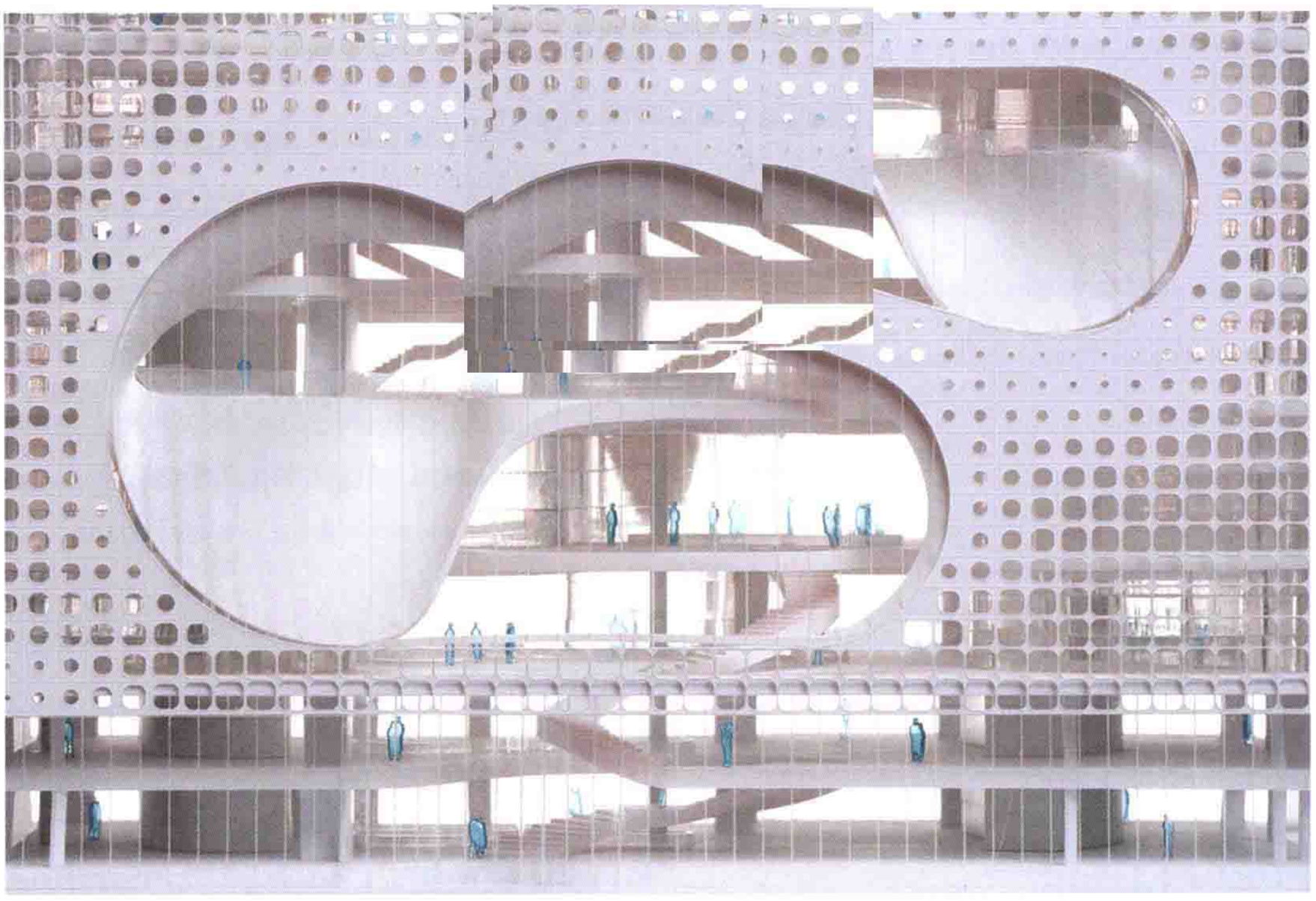

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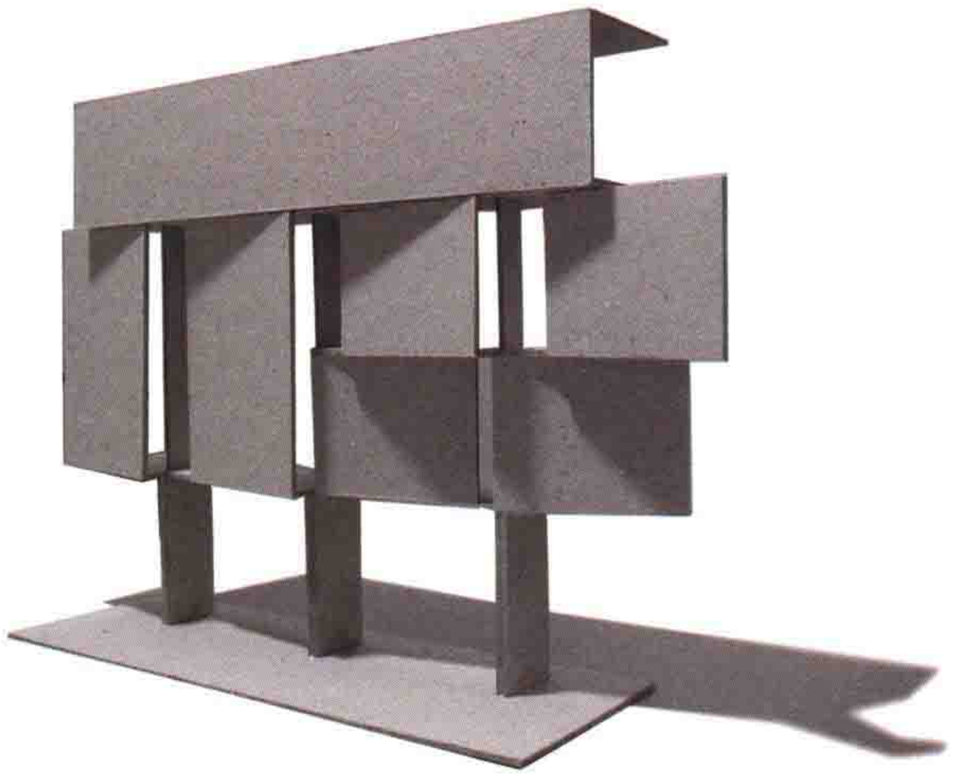

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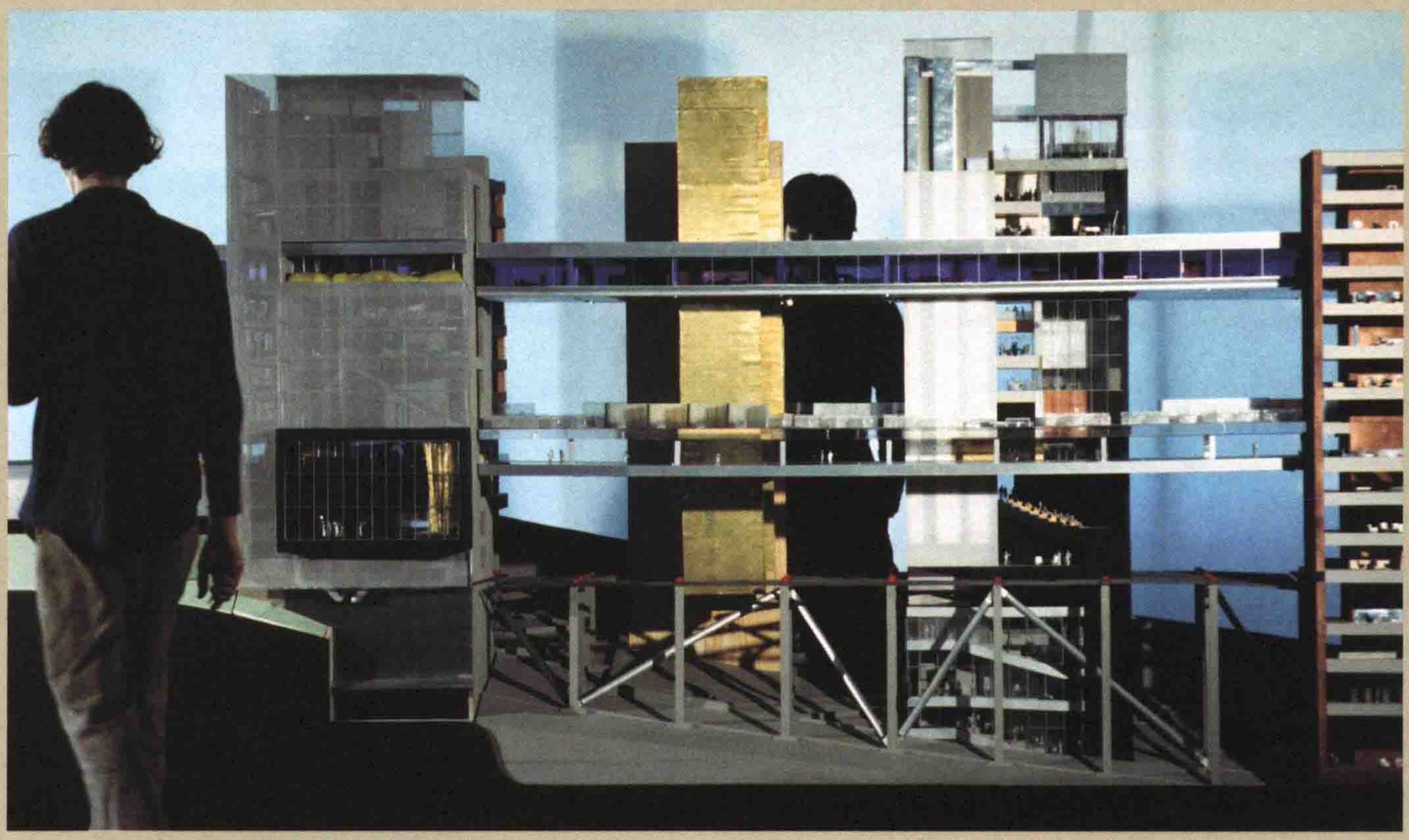
Introduction

Why we make models

The representation of creative ideas is of primary importance within any design-based discipline, and is particularly relevant in architecture where we often do not get to see the finished results, i.e. the building, until the very end of the design process. Initial concepts are developed through a process that enables the designer to investigate, revise and further refine ideas in increasing detail until such a point that the project's design is sufficiently consolidated to be constructed. Models can be extraordinarily versatile objects within this process, enabling designers to express thoughts creatively. Architects make models as a means of exploring and presenting the conception and development of ideas in three dimensions. One of the significant advantages of physical models is their immediacy, as they can communicate ideas about material, shape, size and colour in a highly accessible manner. The size of a model is often partially determined by the scale required at various stages of the design process, since models can illustrate a design project in relation to a city context, a landscape, as a remodelling or addition to an existing building, or can even be constructed as full-size versions, typically referred to as 'prototypes'.

Throughout history, different types of models have been used extensively to explain deficiencies in knowledge. This is because models can be very provocative and evoke easy understanding as a method of communication. Our perception provides instant access to any part of a model, and to detailed as well as overall views. Familiar features can be quickly recognized, and this provides several ways for designers to draw attention to specific parts of a model. A significant advantage of using models is that they are a potentially rich source of information – providing three dimensions within which to present information, and the



Members of the Office for Metropolitan Architecture (OMA), with a design development model for the Universal Headquarters, Los Angeles.

opportunity to use a host of properties borrowed from the 'real' world, for example: size, shape, colour and texture. Therefore, since the 'language' of the model is so dense the 'encoding' of each piece of information can be more compact, with a resulting decrease in the decoding time in our understanding of it.

In order to understand architecture, it is critical to engage in a direct experience of space. As Tom Porter explains in *The Architect's Eye*, this is 'because architecture is concerned with the physical articulation of space; the amount and shape of the void contained and generated by buildings being as material a part of its existence as the substance of its fabric'.[1] The organization and representation of space is not the sole domain of architecture – other visually orientated disciplines such as painting and sculpture are equally engaged with these tasks, but on different terms. The principal difference between these disciplines lies in a concern with the function of the final 'product'. In the case of painting or sculpture, such purposes are typically visual alone. By contrast, the creative process in architectural design often results in a building that has a responsibility to address additional concerns such as inhabitation, climatic considerations and maintenance. The considerable amounts of expense, resources and time invested in building architecture at its full-size scale demands that we need to be able to repeatedly describe, explore, predict and evaluate different properties of the design at various stages prior to construction. This raises an important issue concerning modelmaking since, as with other modes of representation in architecture, it is not a 'neutral' means for the conveyance of ideas but is in fact the medium and mechanism through which concepts and designs are developed. This point is reinforced by Stan Allen writing about architectural drawing, as he suggests it is 'in some basic way impure, and unclassifiable. Its link to the reality it designates is complex and changeable. Like traditional painting and sculpture, it carries a mimetic trace, a representational shadow, which is transposed (spatially, across scale), into the built artefact. Drawings are, to some degree, scaled-down pictures of buildings. But to think of drawings as pictures cannot account either for the instrumentality of architectural representation nor for its capacity to render abstract ideas concrete.'[2] Considered in this manner, the discrimination on behalf of the modelmaker to decide which information to include, and therefore which to deliberately omit, to best represent design ideas becomes crucial.

As practitioners, architects are expected to have a highly evolved set of design skills, a core element of which is their ability to communicate their ideas using a variety of media. For the student learning architecture, the problem of communicating effectively so that the tutor may understand his or her design is central to the nature of design education; spatial ideas can become so elaborate that they have to be represented in some tangible form so that they can be described, explored and evaluated. This situation becomes complicated since 'crosstalk occurs between different

Left
The team at the in-house modelmaking facility at Rogers Stirk Harbour + Partners works on a 1:200 model of The Leadenhall Building, London.

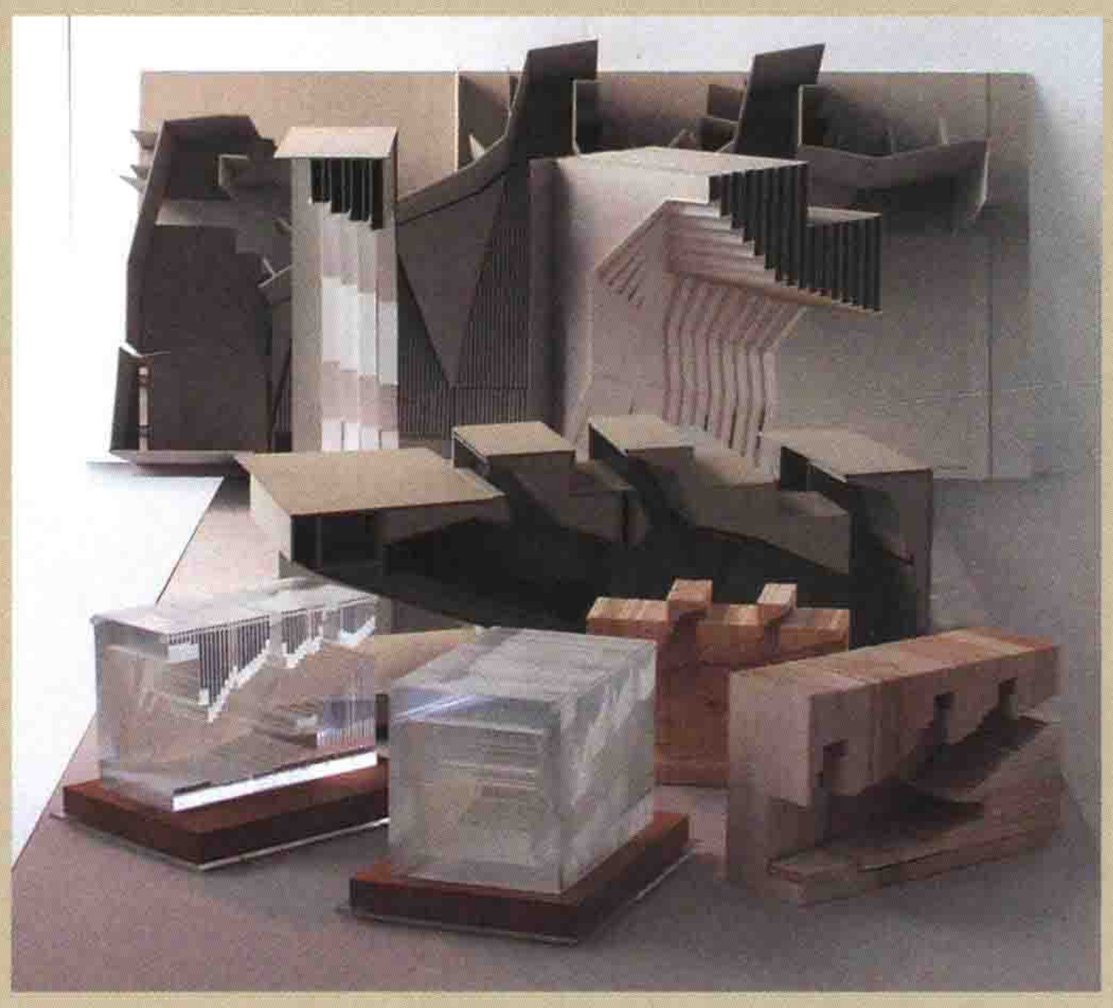
Right
Antoine Predock working on a clay model for Ohio State University's Recreation and Physical Activity Center, en route to a project presentation, 2001. On his website, Predock refers to the importance his clay models have within his design process: 'compared to a drawing on paper, the models are very real; they are the building'.

methods of communication so that they form a coherent presentation' but they may also contradict one another.[3] However, this delivery of ideas is not simply for the benefit of a tutor or review audience. The modelling of an architectural design has important advantages for a student during the design process as he attempts to express his ideas and translate them, allowing the designer to develop the initial concept. However, it is important to emphasize the performative nature of models at this point since they, as with other media and types of representation, are highly generative in terms of designing and are not simply used to transpose ideas. This establishes a continuous dialogue between design ideas and the method of representation, which flows until the process reaches a point of consolidation. This latter point is important and something we shall return to again and again throughout the course of this book.

Fundamentally, the physical architectural model allows us to perceive the three-dimensional experience rather than having to try to imagine it. This not only enables a more effective method of communication to the receiver – such as the tutor, the client or the public – but also allows the transmitter – such as a student or architect – to develop and further revise the design. As Rolf Janke writes in the classic *Architectural Models*, 'the significance of a model lies not only in enabling [the architect] to depict in plastic terms the end-product of his deliberations, but in giving him the means – during the design process – of actually seeing and therefore controlling spatial problems'[4]; while Criss Mills asserts that 'models are capable of generating information in an amount of time comparable to that needed for drawing, and they offer one of the strongest exploration methods available'.[5]

At this stage it is worth expanding further upon the use of a model by a student of architecture, since it is a common assumption that an architect has sufficient experience and skills to employ a variety of design processes and methods of communication as required by the task in hand. When developing design ideas as a response to studio-project briefs, the employment of various methods of communication is a prerequisite for the thinking process necessary for a student to deal with the complexity of architectural design. Unlike the final presentation type frequently found in architectural practice and exhibited to the public, in educational environments models and drawings are not seen as end products in order to 'sell' the solution, but as vehicles for thought or tools with which ideas can be developed and expressed. More specifically, the use of different communication methods encourages greater exploration of a student's ideas. This is because different visualization methods and techniques provoke different thought processes, and inspire greater insight during the design process. Every model has a specific purpose and user, as it is not possible to embody all potential design ideas within a single one. In the first instance it may function purely as a design tool, allowing the designer to explore a particular idea or analyze successive developments. Secondly, it may be used to present or demonstrate design ideas to an audience – allowing others to share the designer's vision. Whilst it is tempting to rigidly classify different types of

1:20 model of a temporary pavilion by 6a architects in the process of being made. The intricate pattern directly replicates that of the final intervention and uses the same process of manufacture, albeit on a smaller scale.

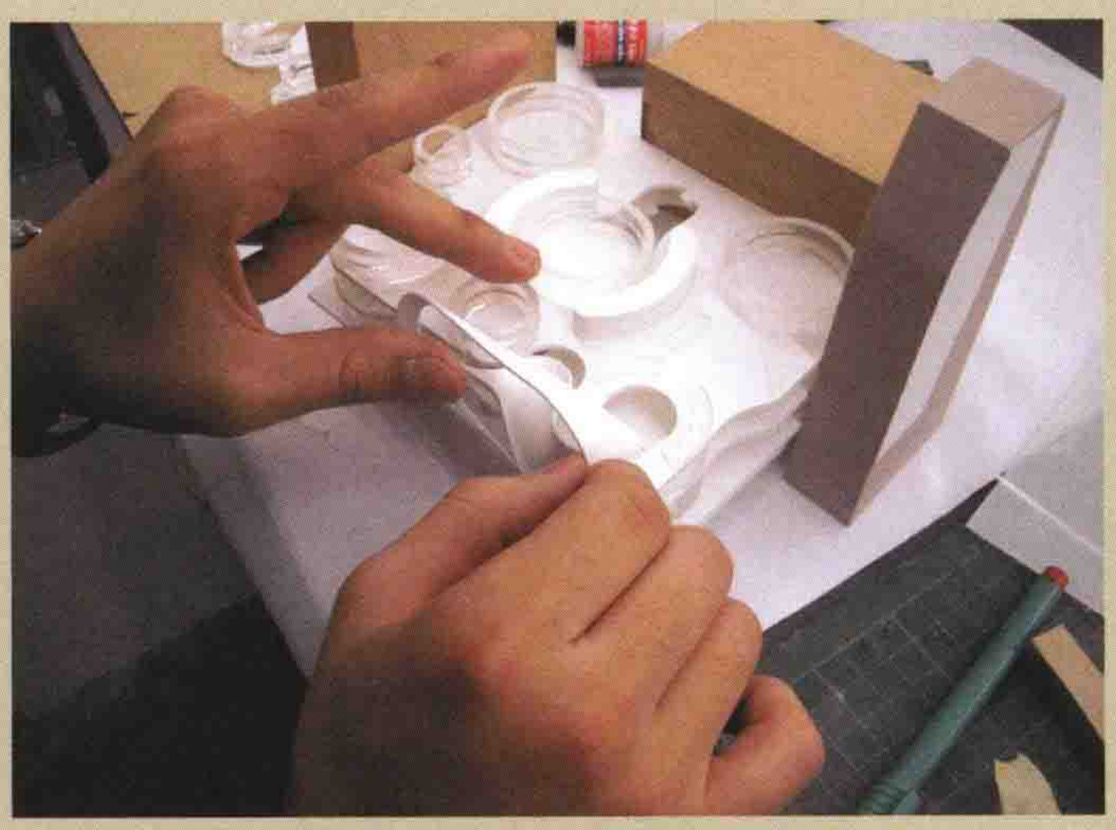


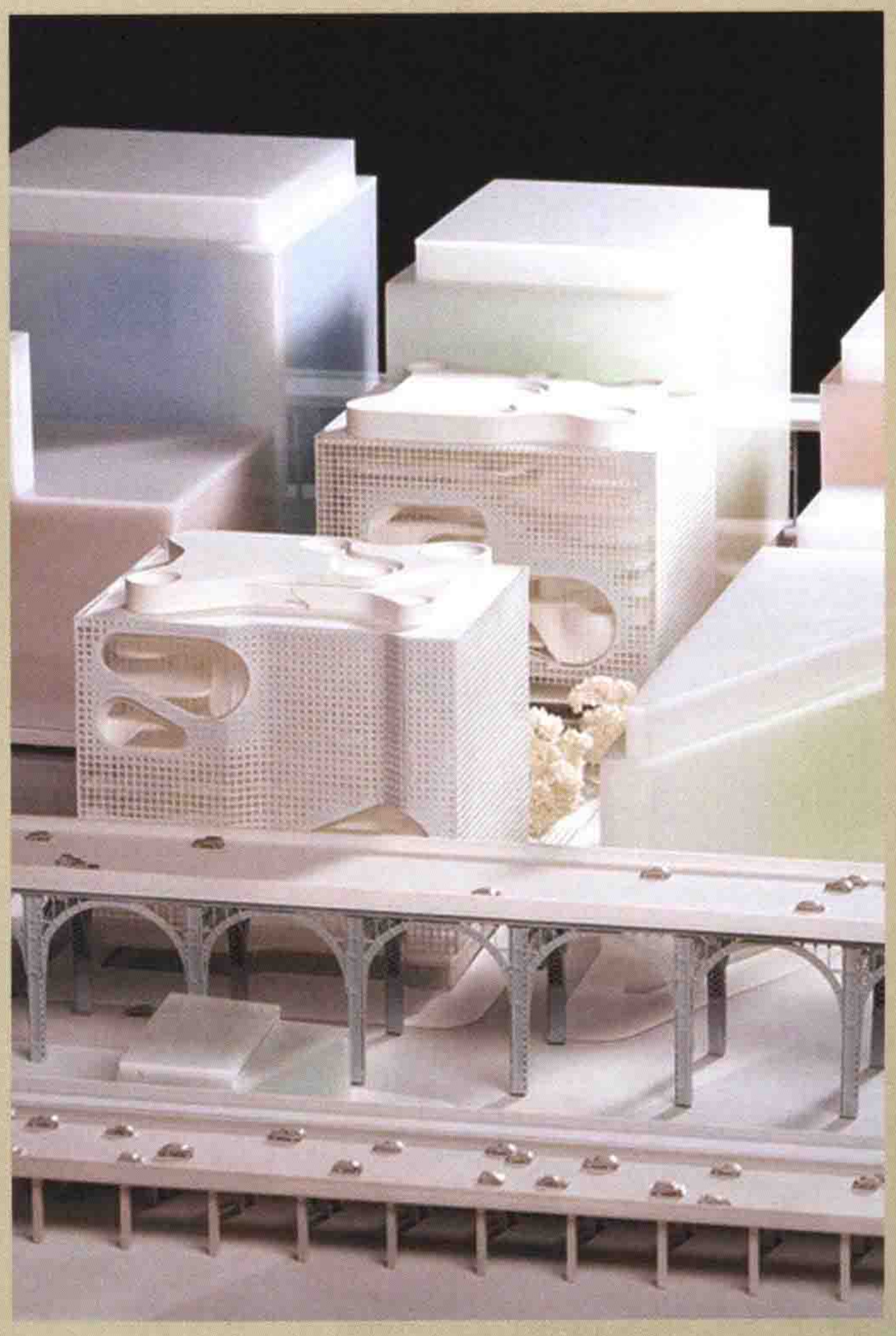
A variety of explorative models by Grafton Architects for their Università Luigi Bocconi scheme in Milan. Note the range of materials used and their resultant differing effects on the spaces within the models.

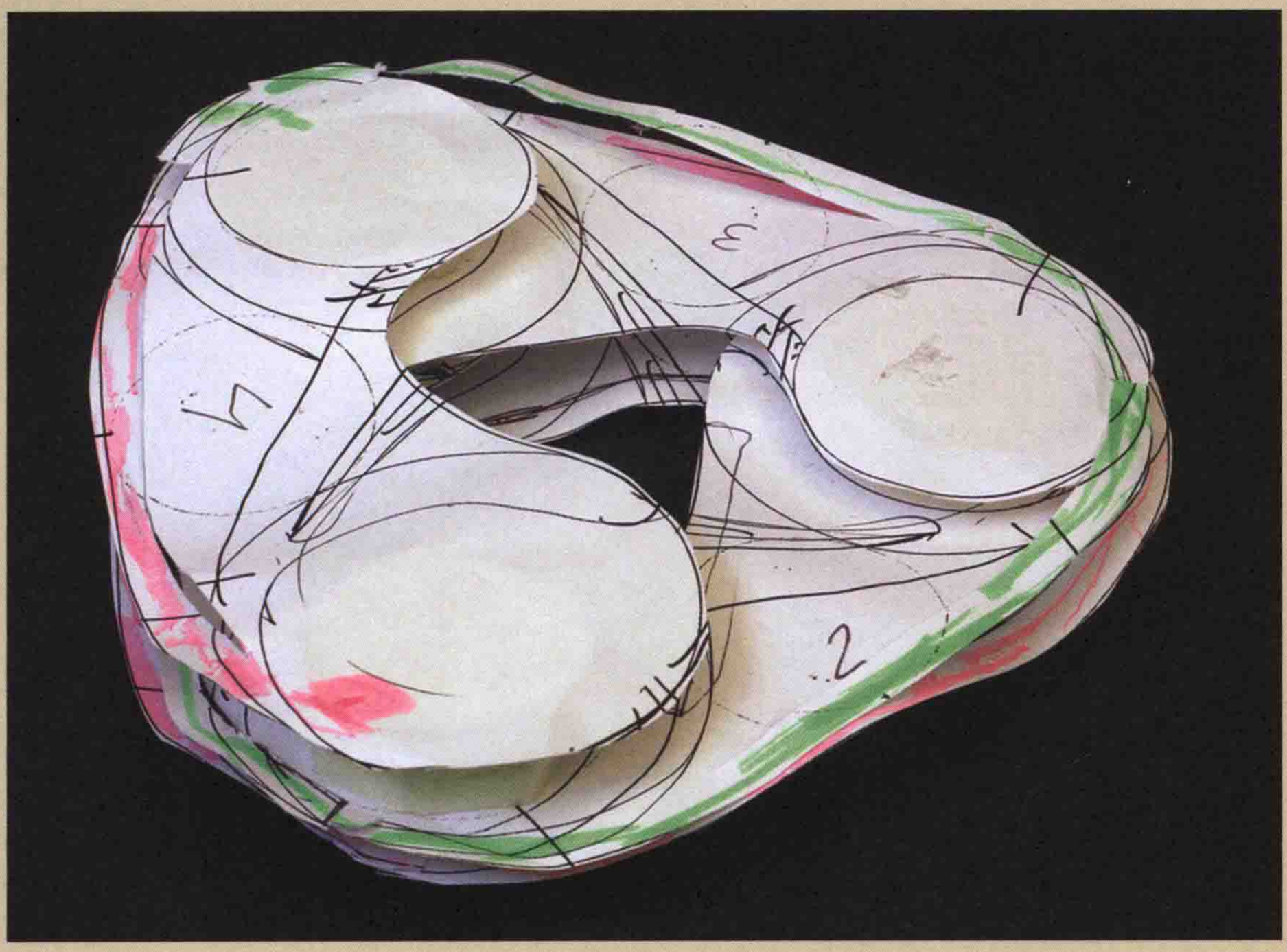
model, and indeed this book will look at the full spectrum available, it is apparent that most models are dynamic in nature and have at least a dual function depending on who is using them and why and when they are employed throughout the design process. Marcial Echenique first described the difficulty of architectural model classification in his essay of 1970, 'Models: a discussion', wherein he defined a model as 'a representation of reality, where representation is the expression of certain relevant characteristics of he observed reality, and where the reality consists of the objects or systems that exist, have existed, or may exist.'[6] This short introduction seeks to demonstrate the significance of models not only as aids in the decision-making process, but also as a means of generating, searching and investigating creative impulses. Before moving onto the main part of the book there follows a brief overview of the role of the model in history, an explanation of the format of the book, and some basic information on the type of equipment necessary to begin making models.

Below left and right
Presentation model for UNStudio's design for the Columbia Business School, New York, under construction (left) and the finished result (right).

Bottom left
A modelmaker at Alsop Architects in the process of assembling a presentation model for the CPlex project, West Bromwich (the completed building is known as The Public).

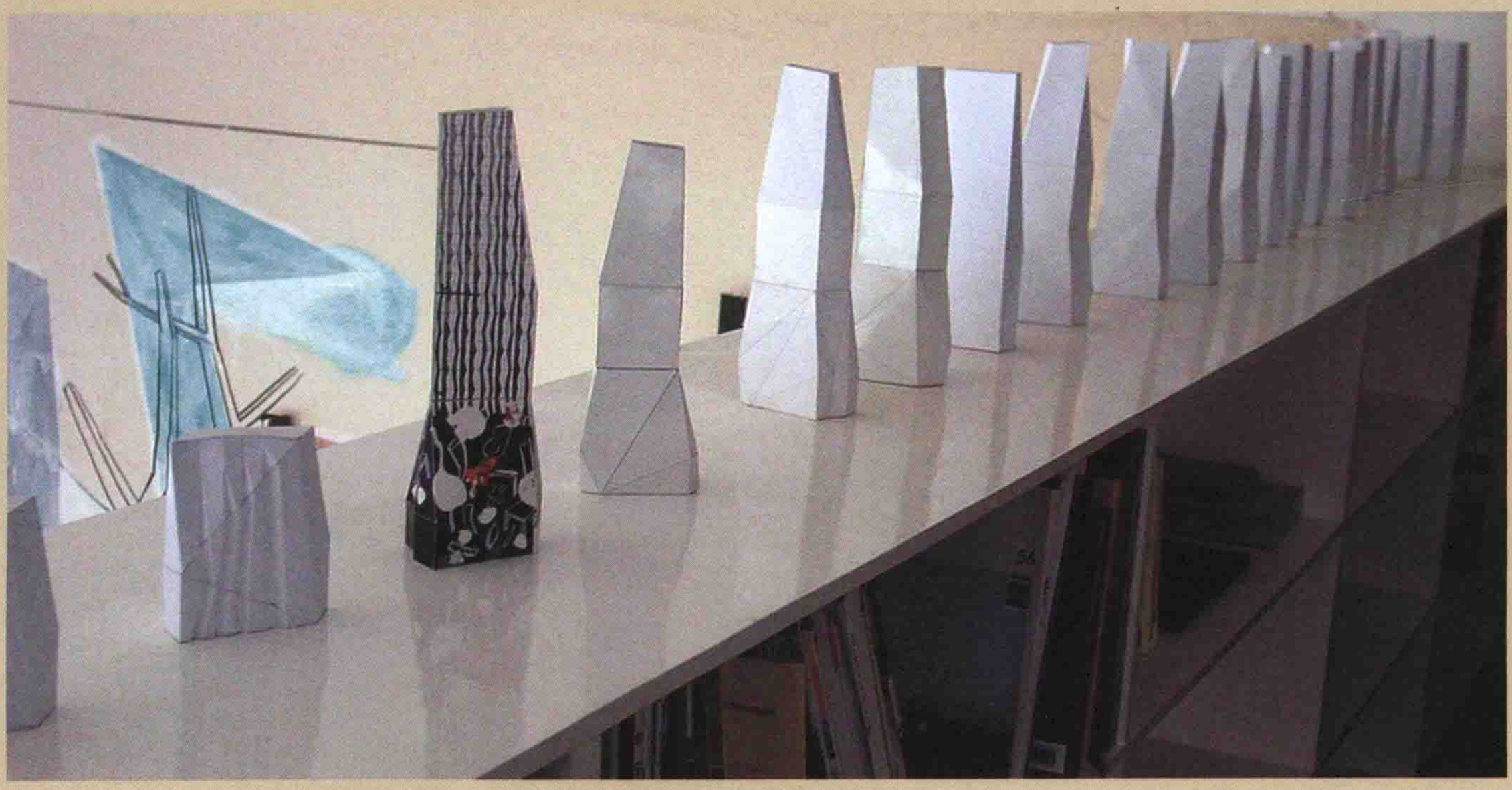




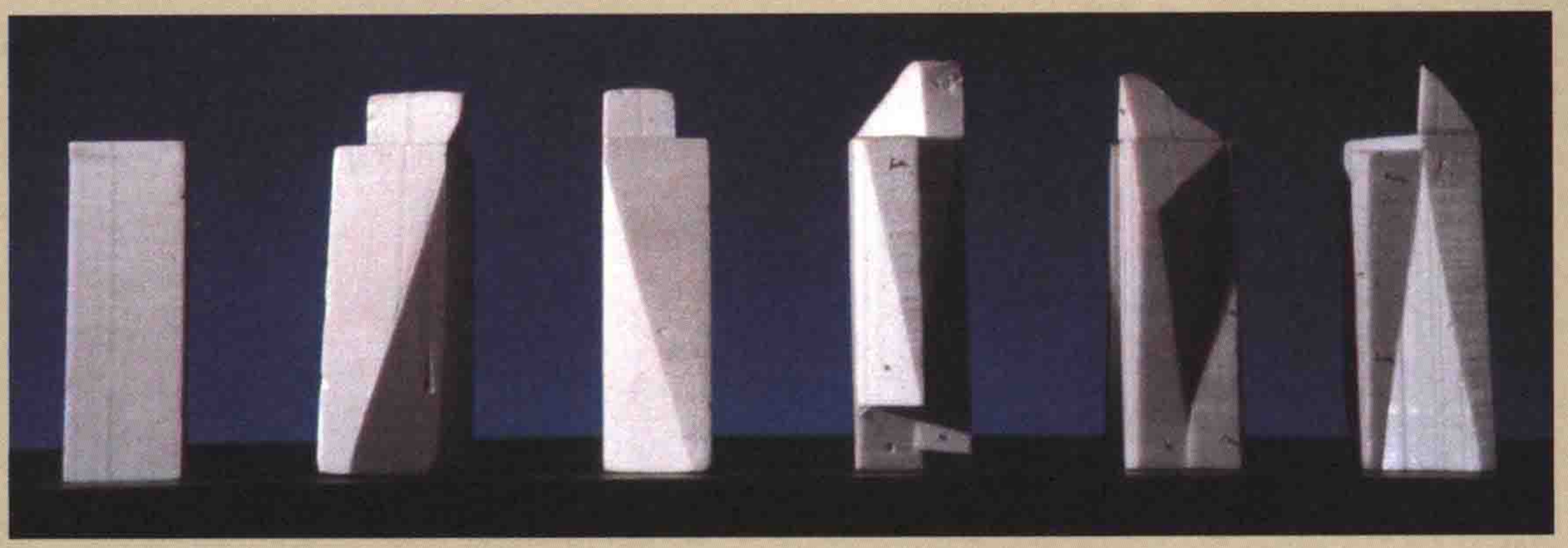


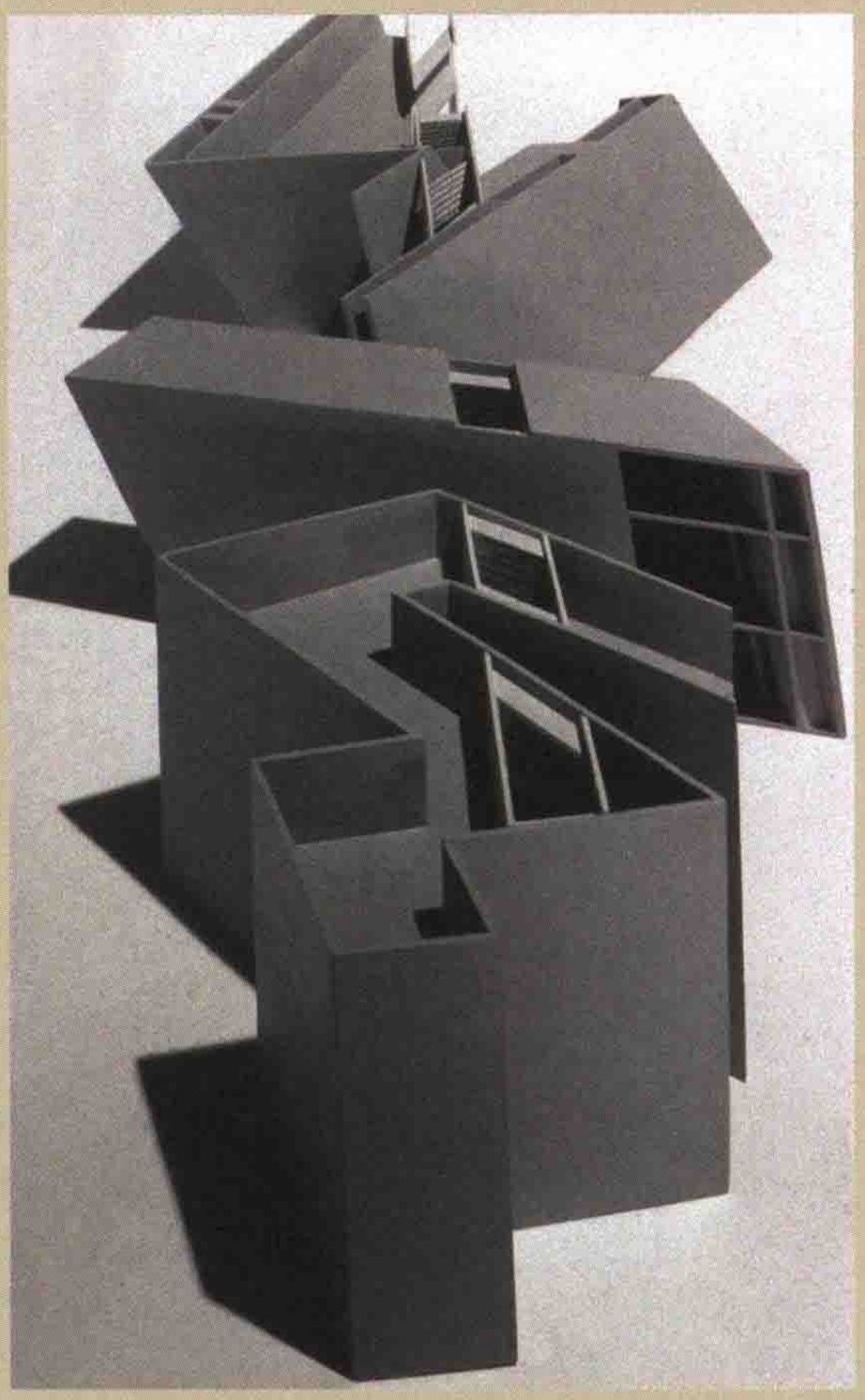
Above
A quickly produced design-development model made by UNStudio during their process of composing the geometry for the Mercedes-Benz Museum in Stuttgart. Models such as these provide architects with flexible tools, through which they can explore ideas in a fast and effective manner.

Below
The number of models made to investigate design ideas obviously varies from project to project, but a series of models that clearly communicate the process through which a concept has evolved are not uncommon, as shown here.



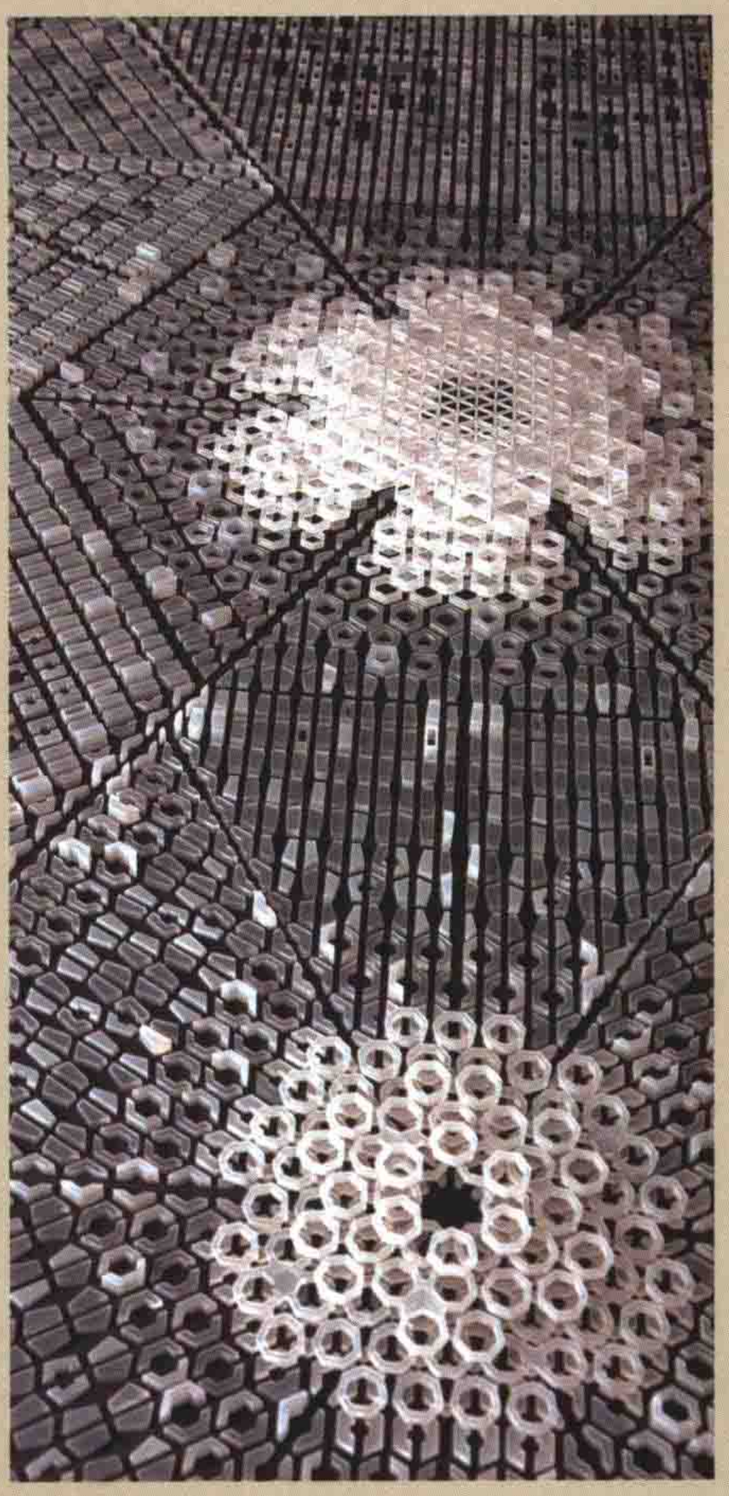
Right
Series of design-development models for Coop Himmelb(l)au's SEG Apartment Tower, Vienna, illustrating the increasing articulation of the tower's form in order to maximize its passive-energy performance.

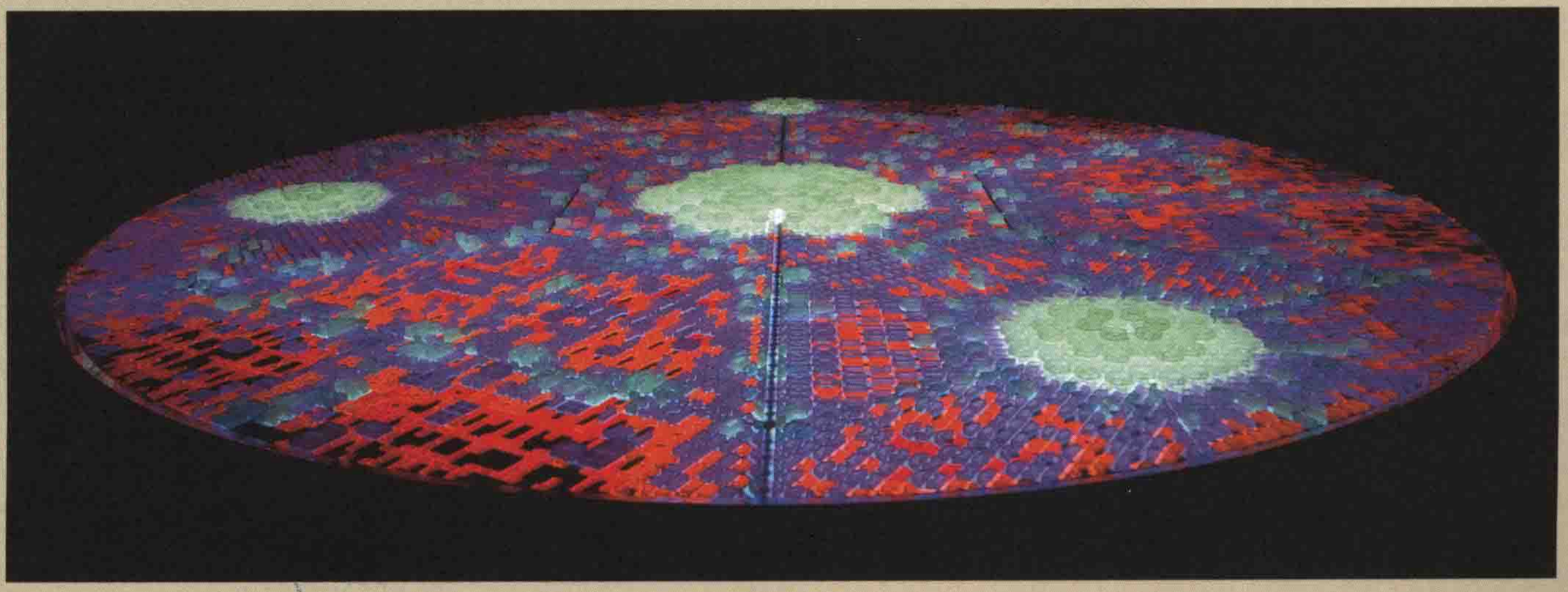


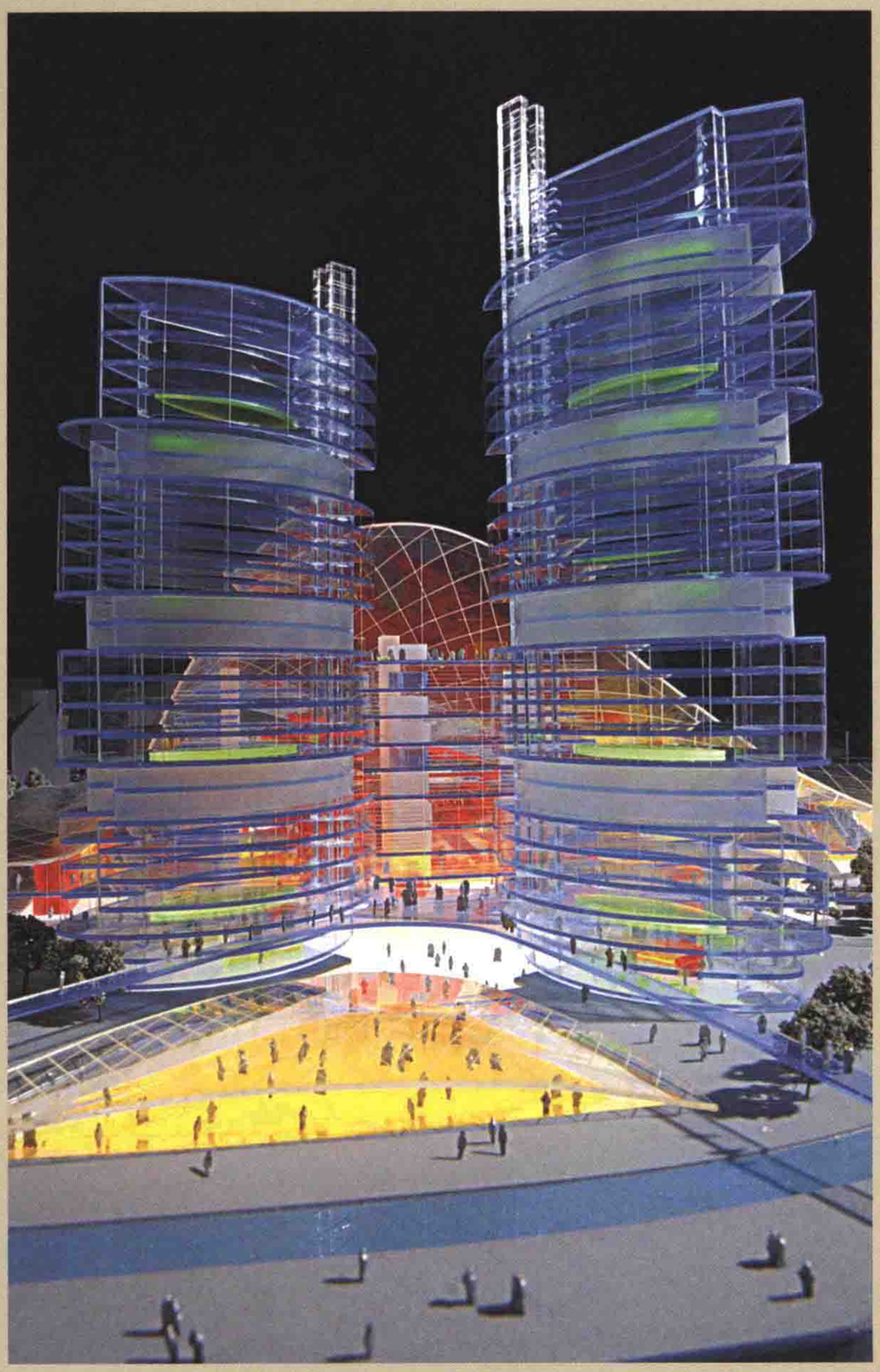


Left
Explorative model for Daniel Libeskind's design for the Jewish Museum, Berlin. This model was made to examine the relationships between the voids of the building and its powerful generative geometry.

Below and right
The effect of lighting upon a model and how it communicates its ideas is beautifully illustrated by this design for a new urban vision, FREE city, by the practice FR-EE (Fernando Romero), which uses different colours to indicate the various zones and networks. The master plan synthesizes three existing urban typologies: the radial city, the hexagonal connection and the urban grid. The scheme organizes the city in a radial manner, creating a hierarchical zoning strategy and allows for continuous growth in all directions. A rectangular grid is superimposed in each sector and hexagonal rings optimize the proximity between the various axes.







Above
Sectional model for CPlex project by Alsop Architects, investigating internal characteristics of the design.

Left
Competition model for the Fourth Grace, Liverpool, by Rogers Stirk Harbour + Partners, 1:500, illustrating the urban scale of the scheme.

Right
Coop Himmelb(l)au's presentation model for Museum of Knowledge, Lyon, France, 2010-14. Note the careful use of lighting within the model to enhance the effect of the project's sculptural forms and their interplay with space.